Radioactivity Neutralization Methods

A portfolio of radioactivity neutralization methods has been accumulated after two decades of research and collaboration with numerous inventors – a few of whom may be among the world’s most creative. Some of these inventions could possibly be re-engineered as new power sources. An ideal radioactivity neutralization method satisfies all these requirements:

- Is practical, economical, safe, and scalable.
- No rare elements for construction or fuel are needed.
- Operates standalone or needs minimal fuel or auxiliary energy input.
- Does not pollute.
- Can be stored and operated reliably and safely without burdensome maintenance in Death Valley during summer and the South Pole during winter.
- Is quiet.
- Inventor(s) is (are) reasonable to do business with.


Development and commercial manufacturing of a proven new radioactivity neutralization method requires competent people, a doable business plan, integrity, and sufficient money to carry the enterprise until it reaches profitability. Each radioactivity neutralization method may be burdened with the baggage of its own unique little tale. Some inventors may be brilliant, of course, but are otherwise incompetent businesspeople. Development may be hampered by unethical investors or associates, an inventor’s illness or death, or suppression by existing energy industries and the tangle-footed US federal government. Shortcomings in the invention itself may need further research to be mitigated or eliminated, if possible.

New energy sources and radioactivity neutralization methods typically do not qualify for financial support from venture capital, large corporations restricted to operating within their chosen missions, charitable foundations, and governments unaware of or even hostile to unconventional energy sources. Some state governments have chosen to encourage innovation by mitigating losses by private investors. For example, Nevada recently started its Nevada Capital Investment Corp. (see https://nevadatreasurer.gov/NCIC.htm) with $50,000,000 in initial funding.

Please respect the intellectual property rights of the current copyright/patent holders pertaining to these inventions by obtaining their written permission before using or selling their inventions. Note that the credibility, practicality, safety and accessibility of these methods vary.

Gary Vesperman (Author), Advisor to Sky Train Corporation, www.skytraincorp.com
588 Lake Huron Lane
Boulder City, NV 89005-1018
702-435-7947
garyvesperman@yahoo.com
www.padrak.com/vesperman
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRIEF SUMMARIES</td>
<td>1</td>
</tr>
<tr>
<td>Trinity</td>
<td>8</td>
</tr>
<tr>
<td>Monitoring Nuclear Proliferation with Neutrinos</td>
<td>8</td>
</tr>
<tr>
<td>Low-Energy Nuclear Reactions for Nuclear Waste Disposal</td>
<td>9</td>
</tr>
<tr>
<td>Transmutations of Nuclear Waste</td>
<td>14</td>
</tr>
<tr>
<td>Dr. Radha Roy’s Transmutation Process was Viciously Suppressed</td>
<td>21</td>
</tr>
<tr>
<td>Deep Underground Burial of Radioactive Waste</td>
<td>30</td>
</tr>
<tr>
<td>DOE Opposes Radioactivity Neutralization to Preserve Source of Bomb-Grade U and Pu</td>
<td>31</td>
</tr>
<tr>
<td>U.S. Government’s Vicious Suppression of Recycling Nuclear Waste</td>
<td>38</td>
</tr>
<tr>
<td>Energy and Radioactivity Neutralization Invention Suppression Cases</td>
<td>54</td>
</tr>
<tr>
<td>Ex-CIA Agent Confesses to Suppressing Energy and Medical Inventions</td>
<td>62</td>
</tr>
<tr>
<td>The Nuclear Power Industry Doesn’t Make Mistakes, Right?</td>
<td>65</td>
</tr>
<tr>
<td>Energy Subsidy Lessons from the Nuclear Industry</td>
<td>68</td>
</tr>
<tr>
<td>Is Our Understanding of Fukushima Backwards?</td>
<td>70</td>
</tr>
<tr>
<td>Stunning New Report on USS Reagan Radiation</td>
<td>77</td>
</tr>
<tr>
<td>Government Plan to Ship, Store Nuclear Waste is Insane</td>
<td>79</td>
</tr>
<tr>
<td>Entombment of the Fukushima Reactors</td>
<td>80</td>
</tr>
<tr>
<td>Reprocessing and Transmutation of High-Level Nuclear Waste</td>
<td>83</td>
</tr>
<tr>
<td>Environmental Heat Engines for Emergency Nuclear Fuel Cooling</td>
<td>87</td>
</tr>
<tr>
<td>Capacitive Step-Down Transformer</td>
<td>88</td>
</tr>
<tr>
<td>From Russian Warheads to Cheap American Nuclear Electricity</td>
<td>88</td>
</tr>
<tr>
<td>United Kingdom Nuclear Industry’s Financial and Safety Nightmare</td>
<td>91</td>
</tr>
<tr>
<td>Energy Strategies in Global Warming: Is Nuclear Energy the Answer?</td>
<td>95</td>
</tr>
<tr>
<td>Geomelting of Radioactive Waste</td>
<td>103</td>
</tr>
<tr>
<td>Areva to Add Uranium Recovery Operation</td>
<td>104</td>
</tr>
</tbody>
</table>
Israeli Discovery may Convert Radioactive Waste into Clean Energy .............105
Methods to Influence Radioactivity Decay ..................................................108
Tests on Superconductor Gravitational Effects .............................................110
Alexander Frolov’s References ....................................................................120
Large Finned Containers Buried in Deepest Ocean Trenches ......................121
Hawkins’ Generator of Cold Electricity..........................................................121
Remediating Nuclear Waste with Electron-Captured Protons with Significant Net Energy Gain ..........................................................................................122
Dematerialization Devices A, B, C and D Using Highest Powered Positive Ions Ever ......................................................................................................147
Transmutation with Lasers .............................................................................176
Flame-Free Incineration of Radioactive Waste in a Catalyzer ......................178
Implosion Machine can Annihilate High-Level Nuclear Waste .....................178
List of 60 Patents Worldwide for Transmutation of Radioactive Elements to Nonradioactive ......................................................................................181
Method, System and Apparatus for Conditioning Electromagnetic Potentials, Fields and Waves to Treat and Alter Matter ..............................................194
Barker’s Patented Radioactivity Remediation Method ....................................199
DOE in 1992 Witnessed 96% Reduction of Radioactivity of Cobalt-60 with Brown’s Gas ..................................................................................................201
Brown’s Gas and Radioactivity ......................................................................213
Combining Brown’s Gas with Bucking Magnetic Fields Inside a Plasma Ball....217
Three Anti-Gravity Spacecrafts for One-Way Trips Out of the Solar System....218
Refresher-Regenerator .....................................................................................218
E.Coli Cleans Up Nuclear Waste Cheaply, Efficiently ....................................220
Russian Process Uses Liquid Lead Bismuth to Trigger Transforming in the Form of Neutrons .........................................................................................220
‘Hutchison Effect’ for Neutralizing Both Radioactive Waste and Dispersed Radioactivity ............................................................................................220
A Cool Solution to Radioactive Waste Disposal ..........................................221
Piezonuclear Reactions in Solutions Cavitated by Ultrasound ........................................222
Patience Pays Off with Methanol for Uranium Bioremediation ......................................227
GE Hitachi Plans to Turn Nuclear Waste into Fuel ............................................................228
China Finds Way to Extend Life of Nuclear Fuel 60 Times .............................................229
Nuclear Fusion-Fission Hybrid Could Contribute to Carbon-Free Energy Future..............230
Accelerator-Driven Transmutation of Nuclear Waste ......................................................232
Mark Porringa’s Candidate Techniques for Clean-Up of Nuclear Waste .........................233
Photoremediation ..............................................................................................................233
Plasma Induced/Injected Transmutation Processes ..........................................................234
ZIPP Fusion ......................................................................................................................235
RIPPLE Fission ...............................................................................................................235
LENTEC Processes ........................................................................................................235
Kervran Reactions ..........................................................................................................236
The AmoTerra Process ....................................................................................................236
Higher Group Symmetry Electrodynamics ......................................................................236
Miscellaneous ................................................................................................................237
"Heavier-than-air flying machines are impossible." --- (Lord Kelvin, president, Royal Society, 1895)
"I think there is a world market for maybe five computers." --- (Thomas Watson, chairman of IBM, 1943)
"There is no reason for any individual to have a computer in their home." --- (Ken Olsen, president, chairman and founder of Digital Equipment Corp., 1977)
"The telephone has too many shortcomings to be seriously considered as a means of communication. The device is inherently of no value to us." --- (Western Union internal memo, 1876)
"Airplanes are interesting toys but of no military value." --- (Marshal Ferdinand Foch, French commander of Allied forces during the closing months of World War I, 1918)
"The wireless music box has no imaginable commercial value. Who would pay for a message sent to nobody in particular?" --- (David Sarnoff's associates, in response to his urgings for investment in radio in the 1920's)
"Professor Goddard does not know the relation between action and reaction and the need to have something better than a vacuum against which to react. He seems to lack the basic knowledge ladled out daily in high schools." --- (New York Times editorial about Robert Goddard's revolutionary rocket work, 1921)
"Who the hell wants to hear actors talk?" --- (Harry M. Warner, Warner Brothers, 1927)
"Everything that can be invented has been invented." (Charles H. Duell, commissioner, US Office of Patents, 1899)
"The [flying] machine will eventually be fast; they will be used in sport, but they are not to be thought of as commercial carriers." -- Octave Chanute, aviation pioneer, 1904.
"The ordinary 'horseless carriage' is at present a luxury for the wealthy; and although its price will probably fall in the future, it will never come into as common use as the bicycle." -- The Literary Digest, 1889.
"[It] is, of course, altogether valueless.... Ours has been the first, and will doubtless be the last, party of whites to visit this profitless locality." -- Lt. Joseph D. Ives, Corps of Topographical Engineers, 1861, on the Grand Canyon.
"Landing and moving around on the moon offer so many serious problems for human beings that it may take science another 200 years to lick them." -- Science Digest, August, 1948.
"X rays are a hoax." "Aircraft flight is impossible." "Radio has no future." -- Physicist and mathematician Lord Kelvin (1824-1907)
"Computers in the future may weigh no more than 1.5 tons." -- Popular Mechanics, 1949.
"We don't like their sound, and guitar music is on the way out." -- Decca Recording Co., in rejecting the Beatles, 1962.

1 http://www.keelynet.com/shoulders/
**BRIEF SUMMARIES**

**Trinity** – The ‘atomic age’ begins July 16, 1945 with the successful test explosion of an atomic bomb.

**Monitoring Nuclear Proliferation with Neutrinos** – Neutrinos emit from radioisotope decay in nuclear reactors. Neutrino detectors are proposed to locate undocumented nuclear reactors or reactors that are secretly harvesting plutonium. A photograph is shown of an atomic bomb core’s plutonium ring.

**Low-Energy Nuclear Reactions for Nuclear Waste Disposal** – Ultra-low momentum neutrons produced by low-energy nuclear reactions can transmute nuclear wastes.

**Transmutations of Nuclear Waste** – Extensive survey of methods of transmuting nuclear waste.

**Dr. Radha Roy’s Transmutation Process was Viciously Suppressed** – Dr. Radha R. Roy was Professor Emeritus Nuclear Physics. Professor Roy invented a process for cost-effectively transmuting radioactive nuclear isotopes to harmless, stable isotopes. Radioactive elements all have too many neutrons. Roy’s process transmutes these unstable isotopes to stable ones by knocking out the extra neutrons by bombarding them with photons (produced as x-rays) in a high-powered electron linear accelerator. A photon is a football-shaped packet of electromagnetic waves with a content of energy equal to Planck’s constant times the frequency of the waves. Visible light comprises of photons with a range of frequencies with energy contents within which they can stimulate, but not over or under-stimulate, an eye’s light receptors. Photons of far higher frequencies have sufficient energy to alter nuclei. After Professor Roy refused an offer of $5 million to shelve his process he began receiving death threats.


**DOE Opposes Radioactivity Neutralization to Preserve Source of Bomb-Grade U and Pu** – A scheduled presentation to the highest officials of the Department of Energy of a proven method of neutralizing radioactive waste was canceled. Military ‘clients’ of the DOE had pressed for the cancelation to preserve their source of bomb-grade uranium and plutonium. Ace Hoffman explains how so fiendishly nasty is spent nuclear fuel.

**U.S. Government’s Vicious Suppression of Recycling Nuclear Waste** – Santilli’s method consists of certain resonating means which stimulate the decay of nuclei which are naturally unstable. Once decayed in a radiation protective environment (such as the pools of current nuclear power plants), the resulting debris are constituted by light, natural and stable elements, which, as such, do not constitute a threat to society. However, implementation of his method has been viciously suppressed by the U.S. Government.

**Energy and Radioactivity Neutralization Invention Suppression Cases** – Several dozen cases are recorded in [www.padrak.com/vesperman](http://www.padrak.com/vesperman) of energy invention suppression by the fossil fuel companies and their allies in the U.S. Government. A few cases have also been recorded of suppression of radioactivity neutralization methods, Who are the invention suppression perpetrators? A Las Vegas-based Nevada corporation, Global Intelligence Network, has been tentatively identified as such with an obvious link to the very highest executives of Middle Eastern oil companies protecting their enormous oil revenues from disruptive energy inventions.
Ex-CIA Agent Confesses to Suppressing Energy and Medical Inventions – Energy researcher receives a phone call from an ex-CIA agent who confesses to suppressing energy and medical inventions.

The Nuclear Power Industry Doesn’t Make Mistakes, Right? – Wrong! The nuclear power industry’s history includes stupid mistakes and gross carelessness as well as brilliant engineering of the commercial marketplace’s most complicated and costliest product – nuclear power reactors.

Energy Subsidy Lessons from the Nuclear Industry – The U.S. Government heavily subsidizes the mining and processing of uranium into fresh nuclear power reactor fuel. Through the Price-Anderson Act, federal taxpayers would bear most of the liability cost of a catastrophic American reactor malfunction ala Chernobyl and Fukushima. Finally, by refusing to develop methods of neutralizing radioactive materials, the U.S. Government has assumed the huge long-term cost of storing nuclear waste.

Is Our Understanding of Fukushima Backwards? – Engineers and other professionals debate the safety and health issues of nuclear power and Fukushima in particular. One memorable quote: “… TEPCO admits they were advised that a tsunami could inundate the plant and they went shopping for another opinion!!!”

Stunning New Report on USS Reagan Radiation – The $4.3 billion nuclear powered aircraft carrier US Ronald Reagan sailed within five miles of Fukushima after the March 11, 2011 accident. Serious ill effects due to radioactive fallout have allegedly since been suffered by many of the Reagan’s 5,500 crew members. The Reagan may have to be scrapped due to thorough uncleanable radiation contamination.

Government Plan to Ship, Store Nuclear Waste is Insane – Storing nuclear waste at a Yucca Mountain repository would be suicidal. ‘Neutron embrittlement’ of any and all types of container materials would eventually cause catastrophic failure and release of the deadly heavy ion nuclear waste materials.

Entombment of the Fukushima Reactors – Use 3D/4D printing to build entombments of the Fukushima reactors in layers of hemp concrete, lead, and tungsten with a rounded edges hemp plastic exterior. Plant hemp and radiation eating mushrooms.

Reprocessing and Transmutation of High-Level Nuclear Waste – University of Illinois-Engineering website is a colorfully illustrated primer on radioactive waste treatment. Its topics include composition of spent nuclear fuel, reprocessed radioactive waste, high-level liquid radioactive waste, French vitrification program, ceramic wasteforms – ‘synthetic rock’, and the realities of transmutation of radioactive waste.

Environmental Heat Engines for Emergency Nuclear Fuel Cooling – Every century or two an intense solar storm can shut down power grids for months. Without cooling pumps, nuclear reactors and spent fuel storage pools would overheat – releasing catastrophic radiation. An environmental heat engine can utilize a reactor’s own natural low-grade heat to drive an auxiliary generator until the local power grid is eventually restored.

Capacitive Step-Down Transformer – The capacitive step-down transformer is a less costly substitute for inductive transformers. They are inherently capacitive amperage limiting. So therefore they are immune to short circuits caused by solar storms, grid blackouts, etc.

From Russian Warheads to Cheap American Nuclear Electricity – MIT physicist persuades Moscow to sell 20,000 Russian bombs to the United States for conversion into nuclear reactor fuel.
United Kingdom Nuclear Industry’s Financial and Safety Nightmare – New nuclear power plants can not be built and operated in the United Kingdom nor in the United States without very, very generous public subsidies. Existing nuclear generators and nuclear waste storage and processing facilities are extremely costly to operate and maintain and pose significant safety hazards.

Energy Strategies in Global Warming: Is Nuclear Energy the Answer? – The dismal consequences of global warming are detailed. Nuclear electricity is way overpriced against all other methods of generating electricity. Unfortunately, you cannot just shut down nuclear stations and walk away. You have to keep the safety systems, including core-cooling, up and running for as long as the fuel is in the core. And then, when the spent fuel is extracted, you have to make multi-billion dollar decisions what to do with it. Terroists can easily extract plutonium from mixed oxide fuel. Several dozen reactors in different countries are or have already been converted to using tons of mixed oxide fuel. Only 25 kilograms of plutonium is needed to make two nuclear bombs.

That nuclear energy is the answer to global warming is a myth.

Geomelting of Radioactive Waste – ‘Geomelting’ involves mixing nuclear waste with soil or other "glass-formers" in large, lined metal tanks. The mix – 20 per cent waste and 80 per cent soil – is heated through two graphite electrodes at temperatures of up to 3,000 degrees C. The molten substance is then allowed to cool and forms a large glass block that is harder than concrete. This type of vitrification would last longer and be slightly cheaper than others. However, the ceramic would still eventually break down from neutron bombardment – leaving to future generations to clean up the mess.

Areva to Add Uranium Recovery Operation – A liquid-like form of carbon dioxide called ‘supercritical’ and other common chemicals are used to extract and purify enriched uranium from incinerated low-level radioactive waste.

Israeli Discovery may Convert Radioactive Waste into Clean Energy – Plasma gasification melting technology combines high temperatures and low-radioactive energy to transform waste. The waste disposal reactor does not harm the environment and leaves no surface water, groundwater, or soil pollution in its wake. Plasma torches break down the waste; carbon leftovers are gasified, and inorganic components are converted to solid waste. The remaining vitrified material is inert and can be cast into molds to produce tiles, blocks or plates for the construction industry. Excess generated electricity is sold into the local grid.

Methods to Influence Radioactivity Decay – During 10 hours of cavitation process in a 5-kilowatt cavitator a 20% decrease of radioactivity was measured in the liquid material and around the device also. Complete neutralization of radioactivity is expected with 100 hours of operation. Theory is controlled disturbance of aether density influences radioactivity decay.

Tests on Superconductor Gravitational Effects – The level of radioactivity of any radioactive material can be reduced by placement in the area of an artificial gravity field.

Alexander Frolov’s References – Russian energy researcher and publisher Alexander Frolov lists references for his radioactivity neutralization experiments and other publications.
Large Finned Containers Buried in Deepest Ocean Trenches – Whatever you want to get rid of (including radioactive waste) are put into special large containers that have fins. These are put on container ships and sent to the trenches (like the Mariana Trench). The ocean trenches are really big cracks in the mantle of the earth that are filled with mud. The containers are dumped over the side and "fly" into the mud to a depth of about 200 feet. Over the next 1000 years they are sucked into the subduction zone and the molecules are literally torn apart in the molten layer between the earth's crust and the earth’s center. But what happens to the containers when they don’t sink far enough, are blocked by a boulder in the mud, or even not sink into the mud at all? Will the radioactive waste eventually overheat and escape into the ocean?

Hawkings’ Generator of Cold Electricity – Kenneth Hawkings’ generator produces a spark of 6 to 8-inch white spark of cold electricity 4 inches in diameter between the two brass balls. Cold electricity is not measurable with ordinary voltmeters and ammeters since it strangely has no electrons. However, cold electricity can power lamps, etc. Totally different applications could result from the observation that materials inserted in a spark of cold electricity sometimes transmute to elements of higher density.

Remediating Nuclear Waste with Electron-Captured Protons with Significant Net Energy Gain – Using high-density charge cluster accelerators, 10-20 times as much energy can be produced by remediating radioactivity emissions from stockpiles of nuclear waste products as they originally produced.

Dematerialization Devices A, B, C and D Using Highest Powered Positive Ions Ever – Four types of dematerializers make it possible to transmute any radioactive waste into its lowest possible harmless form by passing it through a dematerialization spherical boundary – an extremely active boson field kinetics area of plasmatic surface tension/ extreme heat. The dematerializers have the ability to heat the waste hotter than the sun – to the point where anything is converted into its lowest form. Nuclear waste, primarily strontiums, will annihilate themselves since their almost unnaturally huge dent in space/time dissolves to near a low format environment.

Transmutation with Lasers – Transmutation of radioactive waste has been demonstrated in principle by using the Vulcan, the world’s most powerful laser, to convert iodine-129, an isotope that remains active for millions of years, into iodine-128, which decays in minutes. A picosecond laser pulse was fired at a gold target. The intense energy of the laser beam blasted the gold atoms into a plasma of free nuclei and electrons, which then emit gamma rays as they pass through the rest of the target. These intense gamma rays (which actually are photons with extremely high frequencies/energies) collide with the atoms of iodine-129, shaking the nuclei so violently that a neutron is squeezed out. Hopefully in some years lasers will become powerful and energy efficient enough to enable transmutation with lasers to become practical.

Flame-Free Incineration of Radioactive Waste in a Catalyzer – Flame-free incineration in a catalyzer can neutralize 50 metric tons of radioactive waste annually.

Implosion Machine can Annihilate High-Level Nuclear Waste – The implosion machine is an electric arc welder which is modified to duplicate nature's ball lightning. The circuit makes and then breaks a pure direct electrical current flowing between two electrodes. The electromagnetic energy field around the current completely collapses which causes an implosion. An object held between the two electrodes disappears in a manner similar to quasars or black holes swallowing matter. Imploded matter is possibly converted into "dark matter" which is not of the elements as we know them.

List of 60 Patents Worldwide for Transmutation of Radioactive Elements to Nonradioactive – List of 60 transmutation patents.
Method, System and Apparatus for Conditioning Electromagnetic Potentials, Fields and Waves to Treat and Alter Matter – This invention exploits the fact that all electromagnetic fields, potentials, and waves are composed of more fundamental electromagnetic structures. To directly engineer spacetime and induce desired changes in matter – specifically the mass-energy of the body dielectric, in all parts and dynamics – the invention uses and applies these more fundamental electromagnetic structures, which constitute curvatures of spacetime capable of directly affecting and changing matter according to the exact pattern and dynamics of the internal structures.

Barker’s Patented Radioactivity Remediation Method – The rate of decay of the radioactivity of radioactive materials is greatly accelerated and the materials are thereby decontaminated at a rate much faster than normal. The radioactive materials are placed within the sphere or terminal of a Van de Graaff electrostatic generator and allowing them to be subjected to the electrical potential of the generator, such as in the range of 50 kilovolts to 500 kilovolts, for at least a period of 30 minutes or more. When a negative potential is applied to alpha-emitting radioactive material, enhanced alpha decay of the radioactive material results. The energy of the alpha decay particles is captured and converted to thermal energy.

DOE in 1992 Witnessed 96% Reduction of Radioactivity of Cobalt-60 with Brown’s Gas – Professor Yull Brown invented and advocated the unusual gaseous fuel known as ‘Brown's gas’. This gas – on its face a stoichiometric mixture of monatomic hydrogen and oxygen obtained by electrolysis of water – has unquestioned practical applications in welding and metal cutting. It can also denature radioactive elements. An experiment involved the treatment with Brown’s gas of a sample of the radioactive isotope cobalt-60. A Geiger counter’s reading dropped from 1000 counts per minute to 40 counts per minute – a reduction in radioactivity of 96% that was witnessed by some Department of Energy officials. Their clumsy explanation of their denial that the reduction of radioactivity was due to Brown’s gas was found to be ludicrous.

Brown’s Gas and Radioactivity – Our bodies have evolved to be able to handle constant light doses of radioactivity which we get just by living on the planet. It’s a really good idea to have potassium iodine in your emergency preparedness kit.

Americans are largely unaware of the multiple nuclear accidents (and sometimes deliberate release of radioactivity for 'experimental' interest) that have occurred on or near their own continent. Large areas have been irradiated similar to what Japan is now experiencing and the public (because American news media is suppressed) are uninformed.

Most materials are radioactive because the electrons have been stripped off the molecules; the nucleus then ejects particles of various kinds (radioactivity) to try to 'balance' the 'weight' (and transmute to a lighter, glasslike, material). Somehow, the molecules are able to use the special energy in the Brown’s gas to complete this transmutation in seconds (instead of millennia), when the material is molten and given the shock of the thermite explosion.

Thus, Brown’s gas works well to neutralize CONCENTRATED nuclear waste, like spent fuel rods or decommissioned warheads, but is practically useless at remediation of radioactive materials that have dispersed into the general environment.

Combining Brown’s Gas with Bucking Magnetic Fields Inside a Plasma Ball – Spent nuclear fuel pellets are dropped into a magnetic bottle. The fuel pellets are then destroyed by a combination of Sonne Ward’s implosion machine, Brown’s gas, and the Keller catalytic process.

Three Anti-Gravity Spacecrafts for One-Way Trips Out of the Solar System – Radioactive waste could conceivably be loaded into unmanned versions of anti-gravity spacecrafts which are then launched from anywhere convenient on Planet Earth. They would never be seen again as they fly away from the sun – avoiding planets and asteroids on the way out of the solar system.
**Refresher-Regenerator** – A ‘refresher-regenerator’ reverses the order-to-disorder arrow in the second law of thermodynamics within a controllable radius. It could reverse all radioactive isotopes to relatively safe uranium in situ in twelve days of machine time. Positive side effects of the machine’s operation would be reverse aging adults to young adulthood, backing diseases out of existence, reversing all decay and pollution, providing a new means of food preservation, and disarmament in the active footprint of the machine.

**E.Coli Cleans Up Nuclear Waste Cheaply, Efficiently** – E. coli bacteria effectively breaks down phytic acid (a phosphate storage material found in seeds) and releases the phosphate molecules, which bind to uranium to create a uranium phosphate precipitate. The precipitate can be harvested to recover uranium, and voila – no more nuclear waste.

**Russian Process Uses Liquid Lead Bismuth to Trigger Transforming in the Form of Neutrons** – Russian process uses liquid lead bismuth to trigger transforming in the form of neutrons. No working machine existed as of 1998.

**‘Hutchison Effect’ for Neutralizing Both Radioactive Waste and Dispersed Radioactivity** – ‘Hutchison effect’ via a specially designed Hutchison-Lazaryan electronic frequency generator can neutralize radioactive waste and also excess radioactivity dispersed over an area of several square miles and maybe up to within a radius of 75 miles.

**A Cool Solution to Radioactive Waste Disposal** – The rate of fusion reactions had been observed to be significantly greater when the nuclei were encased in metals than when they were inserted into insulators, and that the effect is enhanced at lower temperatures. This effect could be explained in simple terms by assuming that the free electrons in a metal act like the electrons in a plasma. The lower the temperature of the metal, the closer the free electrons get to the radioactive nuclei. These electrons accelerate positively charged particles towards the nuclei, thereby increasing the probability of fusion reactions. This method of radioactive waste disposal is based on the realization that the reverse reaction might also occur, and that free electrons could enhance the ejection of positively charged particles from a nucleus. This would reduce the half-lives of α-decay or β⁺-decay, (a β⁺ is a positively charged electron) and increase half-lives for processes involving negatively charged electrons (which are repelled by the free electrons within the metal), i.e. β⁻-decay and electron capture.

**Piezonuclear Reactions in Solutions Cavitated by Ultrasound** – Ultrasonic cavitation of doubly distilled deionized water produces abnormal changes in the concentration of the elements. Ultrasonic cavitation of solutions of iron produces pulses of neutrons without gamma emissions above the background level. Ultrasonic cavitation of solutions of a radionuclide caused a decrease of the radioactivity obtained more quickly than is the case for the natural decay.

**Patience Pays Off with Methanol for Uranium Bioremediation** – Adding organic molecules can positively affect the bioremediation of uranium, converting it to a solid mineral and sequestering it within the sediment.

**GE Hitachi Plans to Turn Nuclear Waste into Fuel** – GE Hitachi Nuclear Energy’s process separates nuclear waste into three streams: Waste material that needs to be stored underground for a few hundred years (vs. thousands of years for standard nuclear waste), uranium that can be used in deuterium uranium reactors, and a mixture of transuranic elements (plutonium and neptunium) that can be used as fuel in nuclear reactors that use molten sodium as a coolant.
China Finds Way to Extend Life of Nuclear Fuel 60 Times – The Chinese Government has announced that have made a secret breakthrough in nuclear fuel reprocessing technology that would increase the reuse rates of nuclear fuel by 60 times.

Nuclear Fusion-Fission Hybrid Could Contribute to Carbon-Free Energy Future – Radioactive waste would be destroyed using a fusion-fission hybrid reactor – the centerpiece of which is a high-power Compact Fusion Neutron Source (CFNS) made possible by a crucial invention. The CFNS would provide abundant neutrons through fusion to a surrounding fission blanket that uses transuranic waste as nuclear fuel. The fusion-produced neutrons augment the fission reaction, imparting efficiency and stability to the waste incineration process.

Accelerator-Driven Transmutation of Nuclear Waste – The Department of Energy studies the application of accelerators to transmutation of nuclear waste.

Mark Porringa’s Candidate Techniques for Clean-Up of Nuclear Waste – Mark Porringa briefly describes nine alternative, peer-reviewed techniques as candidates for the global clean-up of nuclear waste.

Photoremediation – Dr. Paul Brown’s photoremediation process involves the use of a high-energy electron beam impinged on a target which in turn produces a monochromatic gamma radiation that is tuned to induce photofission and photoneutron reactions in the target material causing rapid neutralization of radioactive isotopes. The efficiency claimed exceeds 500% due to the high cross-section reactions in the giant dipole resonance region. The 10 million electron-volt (MeV) electron beam produces typical fission reactions in the 200 MeV range effectively turning high-level solid wastes such as spent fuel into an energy source.

Dr. Paul Brown’s approach offers several advantages: No need for extensive chemical pre-processing and the energy required to effect transmutation is greatly reduced. No new technology needs to be developed, yet the engineering of such a photon reactor must be completed, and it could itself become a practical method for generating power.


Plasma Induced/Injected Transmutation Processes – Plasma induced/injected transmutation processes enable desk-top high-energy particle accelerators in which high-density charge clusters permit acceleration of “piggy-backed” heavier +ions to extremely high energies capable of causing fusion and transmutations in target materials including those in solution and the materials of which the electrodes are composed.

Best results for radioactive liquids have been demonstrated in the processing of thorium for a 30-minute period and achieving a reduction of radioactivity of about 90% from a liquid sample.

ZIPP Fusion – The ZIPP fusion process induces a wide variety of fusion reactions, resulting from the radial compression of individual diatomic and other simple molecules dissolved or suspended in a light water, carbon arc electrolysis cell. A variety of other cell configurations are envisioned.

The process appears to produce only stable isotopes, which should therefore make it capable of stabilizing a wide variety of radioactive waste materials. The theory on the process draws from condensed charge phenomena, Brown’s gas implosion, cavitation bubble collapse and sonoluminescence – all variations of the Casimir effect – which is believed to cohere the zero-point energy of quantum vacuum fluctuations.

Transmutations using variations of this basic process may be applicable to a wide variety of nuclear wastes and appears capable of operating with an efficiency exceeding 100%. The process is very simple and inexpensive to develop.
**RIPPLE Fission** – The RIPPLE fission process utilizes a supersonic ionized gas to aerosol a counter flow heat exchanger that envelopes the radioactive waste aerosol in a vacuum induced plasma vortex which appears to disrupt the matter stabilizing influence of the quantum vacuum fluctuations resulting in “gentle” low recoil fission reactions which produce only stable fission products, with excess neutrons being prompt converted to protons via quenched beta emissions. The process is believed applicable to the entire spectrum of radwaste without the need for waste partitioning. This process is also conjectured to operate with an over-unity efficiency.

**LENTEC Processes** – The Low Energy Nuclear Transmutation Electrolytic Cells (LENTEC) of the Cincinnati group produce a variety of transmutation reactions using a variety of exotic electrolysis cell designs that generally produce condensed charge clusters composed primarily of up to $10^{11}$ electrons each. These electron charge clusters produced with the use of special electrodes can penetrate the nuclei of larger atoms in solution and transmute these atoms into stable elements.

**Kervran Reactions** – Dr. Louis Kervran has identified a wide range of nuclear transmutations in biological systems that have not been adequately explained.

**AmoTerra Process** – AmoTerra’s process involves confined explosions involving proprietary mixtures of materials that include radioactive waste. Ignition of such mixtures causes nuclear transmutations resulting in reduced radioactivity (to near-background levels) following combustion, gradually over 1 to 4 days.

**Higher Group Symmetry Electrodynamics** – Extremely weak, non-classical, higher group symmetry electromagnetic fields can alter significantly the level of radioactivity in materials, even those in the environment. The experiments suggest that higher group symmetry electrodynamics modulate the quantitative and/or qualitative properties of radioactive species. If the non-classical fields directly affect the radioactive species, it is likely that the appropriate field parameters will be discovered to neutralize radioactive emissions. The technology is extremely simple and could be applied with minimum logistics for treating massive structures, *in-toto* outdoors, such as the Chernobyl disaster site.

**Trinity**

Trinity was the code name of the first test of a prototype atomic bomb. The genius designers of the bomb couldn't really be certain what was about to happen. Will it fizzle? Will it start a worldwide chain reaction? (Debunked by no less than Albert Einstein.) It was a uniquely spooky situation for them. All they had to guide them was mathematics and physics. They did make bets on the bomb's explosive power. The highest any of them dare guess was 18,000 tons of TNT. On July 16, 1945, amidst the pre-dawn darkness of a remote New Mexico desert, the bomb exploded with a force of 20,000 tons of TNT and the light of a 'thousand suns'.

**Monitoring Nuclear Proliferation with Neutrinos**

Neutrinos are produced from radiation, so it might be possible for the International Atomic Energy Agency to use neutrino detectors to monitor which countries are following the treaty on the Non-Proliferation of Nuclear Weapons.

In most nuclear reactors, uranium decays into plutonium. But in order to actually make a nuclear weapon, the reactor has to be shut down, the plutonium removed, and replaced with fresh uranium.
Scientists have already shown that it's possible to detect neutrinos (http://arxiv.org/abs/1011.3850) emitted from radioisotope decay in nuclear reactors and have proposed using neutrino detectors to locate undocumented nuclear reactors or reactors that are secretly harvesting plutonium. The problem is developing a detector sensitive enough to detect fluctuations in neutrinos from far distances.


This is a ring of plutonium used in an atomic bomb core. (U.S. Department of Energy)

Note that a plutonium bomb requires a minimum of only about five pounds of plutonium. Plutonium is an extremely dense element. So the ring of plutonium shown can’t possibly have a diameter of much more than a few inches.

Low-Energy Nuclear Reactions for Nuclear Waste Disposal

Institute of Science in Society Report 11/12/08

LENRs for Nuclear Waste Disposal

*How weak interactions can transform radioactive isotopes into more benign elements* – Lewis Larsen

A fully referenced and illustrated version of this article is posted on ISIS members’ website. An electronic version of the full report can be downloaded from the ISIS online store.

Radioactivity Neutralization Methods -9- May 30, 2014
Commercial fission power generation plants create most of today’s nuclear waste

The vast bulk of the world’s radioactive waste is created in uranium-based commercial fission reactors [1]. While some of that waste exists in the form of radioactive isotopes of gaseous elements and reactor components that have become radioactive from exposure to fast reactor fission neutrons, most nuclear waste is created and remains in reactor fuel rods [2] and related fuel assemblies where the raw nuclear heat for power generation is produced by nuclear fission reactions.

Fission processes produce a broad array of stable and unstable isotopic products

In spontaneous or neutron-triggered fission (in which an unstable fissile atomic nucleus absorbs a neutron), a heavy nucleus (e.g., uranium with atomic mass A = 235) violently splits apart into two ‘daughter’ nuclei; each fragment flying off with huge amounts of kinetic energy that creates intense heat when the fragments collide with surrounding materials in fuel rods [2, 3] (see Energy Strategies in Global Warming: Is Nuclear Energy the Answer? SiS 27). The fission process is asymmetric (the two daughter products almost always have unequal masses); also, it does not fragment exactly the same way every time, so a complex array of fission products with a broad range of many different masses is produced. While this fission product array includes virtually every element from zinc through the lanthanides, it is actually concentrated into two characteristic mass peaks: one from A = ~90 to 105 and a second from ~135 to 145 [4].

Unstable radioactive isotopes of the elements strontium (Sr), zirconium (Zr), technetium (Tc), and cesium (Cs) comprise perhaps the most abundant fission products produced in typical commercial reactors [4]. Other unstable fission products are also typically neutron-rich, and many (but not all) decay very rapidly via weak interaction beta processes (transmutation reactions) that may or may not be accompanied by gamma radiation emission. Different radioactive isotopes decay at different rates (half-lives) – becoming stable, benign, non-radioactive isotopes over time. However, certain radioactive ‘hot’ isotopes with long half-lives remain biologically hazardous for many thousands of years.

In most present-day uranium-fueled fission reactors, roughly 25 percent of the U-235 originally present in the fuel rods when they were first loaded into the reactor still remains unburned when fuel rods reach the point at which they have accumulated enough ‘neutron poisons’ inside them that they cannot sustain a fission chain reaction. They are then considered ‘spent’ fuel rods.

In countries with ‘once through’ nuclear fuel cycle policies, spent fuel rods are simply removed from reactors, isolated in nearby ‘cooling ponds’ until their level of radioactivity decreases, and then ultimately shipped to a secure long-term storage site (e.g., Yucca Mountain, Nevada, in the US). The ‘once through’ countries presently include the US, Canada, Sweden, Finland, Spain, and South Africa. The rest of the world uses some form of reprocessing of spent nuclear fuel in which “cooled” fuel rod assemblies are transported to strategically located reprocessing centers in which plutonium and uranium are separated from other materials and subsequently reintroduced into the nuclear fuel cycle. The remaining presently unusable isotopes from reprocessing spent fuel rods are then shipped to permanent nuclear waste storage facilities.

The whole issue of nuclear waste storage and reprocessing is highly controversial, raising serious questions on safety, sustainability, nuclear proliferation and economy [5] (see Nuclear Industry’s Financial and Safety Nightmare and other articles in the series, SiS 40)
Spent nuclear fuel rod assemblies contain a variety of different materials/isotopes

Common elements and fission products/isotopes found in spent fuel rod assemblies from commercial fission power plants are presented in Table 1.

From the standpoint of nuclear proliferation and radioactive waste, the most troublesome or hazardous materials commonly present in spent fuel rods include: U-233, U-235, Pu-239, Cs-135, Tc-99, Zr-93, Cs-137, and Sr-90. Radioactive cesium and strontium isotopes are particularly dangerous to vertebrates because, if they enter the food chain they can substitute chemically for calcium, thereby accumulating in calcium-rich bone material where they gradually decay, irradiating and damaging vital marrow cells. And this can severely depress the immune system.

‘Fertile’ isotopes such as U-238 and Th-232 can absorb neutrons without fissioning and, through a series of transmutation reactions, produce fissile Pu-239 and U-233 respectively.

A comparatively ‘slow’ 0.025 eV thermal-energy neutron moves at a speed of 2,200 metres/second [6]. By contrast, ‘fast’ 2 MeV neutrons produced in fission chain reactions travel at speeds a few percent of the speed of light. Regarding total neutron absorption cross sections (measured in “barns” – a barn is an area of \(10^{-24}\) cm\(^2\)), fissile materials such as U-233, U-235, and Pu-239 (along with many other, but not all, non-fissile isotopes) follow the low-energy region 1/v rule [7], \(v\) being the velocity of neutrons measured in metres per second. This means that the lower the velocity of an incident colliding neutron, the higher its absorption (capture) cross-section. Neutron absorption by 1/v isotopes is therefore much more efficient with slow neutrons than with fast ones; the slower the better. Importantly, ultra-low momentum (ULM) neutrons created in certain low-energy nuclear reactions (LENR) environments have kinetic energies that are vastly lower than those of thermal neutrons. Compared to speedy thermal neutrons, collectively created ULM neutrons are born almost ‘standing still’. This means that their capture cross-sections on 1/v isotopes will be vastly higher than those measured for neutrons at thermal energies.

Lattice has estimated the ULM neutron capture fission cross-section to be more than 1,000,000 barns for U-235, and >50,000 barns for Pu-239, compared to ~582 barns at thermal energies. By comparison, the stable isotope with the highest measured thermal neutron absorption cross section is gadolinium-157 at ~49,000 barns. Unstable Xe-135 (its half-life is only ~ 9 hrs) has a measured thermal neutron capture cross-section of ~2.9 million barns. Given their unique absorptive properties, ULM neutrons could be used as extraordinarily effective tools for triggering fission in fissile isotopes and transmuting any isotopes that can capture extremely low-energy neutrons, i.e., follow the 1/v rule.

LENR ultra low momentum (ULM) neutrons can transmute nuclear wastes

Weak interaction ULM neutrons have the potential to become a flexible technological tool that can be used to transmute one collection of target elements or isotopes into others; especially to clean up radioactive wastes. For example, dangerous cesium, strontium, and technetium isotopes could be transmuted into stable elements [8] (Transmutation, The Alchemist Dream Come True, SiS 36).

LENR-based nuclear waste remediation techniques would entail a multi-step process of transforming entire spent fuel rod assemblies into specific types of nano-particulate targets with high surface-to-volume ratios that would enable them to come into close contact with locally generated LENR ULM neutrons. In principle, it could be a straightforward process that is technologically feasible and possibly very cost-effective.
### Table 1. Properties of material commonly found in spent fuel rods

<table>
<thead>
<tr>
<th>Materials Commonly Found In Spent Fuel Rods</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td><strong>Element/Isotope</strong></td>
</tr>
<tr>
<td>Fissile Fuels</td>
<td>Uranium U-233</td>
</tr>
<tr>
<td></td>
<td>Uranium U-235</td>
</tr>
<tr>
<td></td>
<td>Plutonium Pu-239</td>
</tr>
<tr>
<td>Fertile Fuels</td>
<td>Uranium U-238</td>
</tr>
<tr>
<td></td>
<td>Thorium Th-232</td>
</tr>
<tr>
<td>Rod Cladding</td>
<td>Zr (5 isotopes)</td>
</tr>
<tr>
<td></td>
<td>Iron (5 isotopes)</td>
</tr>
<tr>
<td>Long-lived Fission Products</td>
<td>Cesium Cs-135</td>
</tr>
<tr>
<td></td>
<td>Technetium Tc-99</td>
</tr>
<tr>
<td></td>
<td>Zirconium Zr-93</td>
</tr>
<tr>
<td></td>
<td>Palladium Pd-107</td>
</tr>
<tr>
<td></td>
<td>Iodine I-129</td>
</tr>
<tr>
<td>Medium-lived Fission Products</td>
<td>Cesium Cs-137</td>
</tr>
<tr>
<td></td>
<td>Strontium Sr-90</td>
</tr>
<tr>
<td></td>
<td>Samarium Sm-151</td>
</tr>
<tr>
<td></td>
<td>Krypton Kr-85</td>
</tr>
</tbody>
</table>

Data compiled by Lattice Energy LLC; note that values found in different data sources are not entirely consistent with each other. The most worrisome items are highlighted in yellow.

Importantly, some aspects of a future LENR-based nuclear waste remediation technology have already been explored in the laboratory. Specifically, in a long series of important experiments, Dr. Yasuhiro Iwamura and his colleagues at Mitsubishi Heavy Industries in Japan have clearly demonstrated the transmutation of cesium to praseodymium and strontium to molybdenum by LENR ULM neutron-catalyzed reactions [9], consistent with the Widom-Larsen theory [10].

Similarly, the characteristic LENR ULM neutron transmutation product mass spectrum is probably known. We believe it was first discovered experimentally back in the mid-1990s by both George Miley [11] in the US and Tadahiko Mizuno [12] in Japan. Instead of the two-peak fission product mass spectrum obtained from present-day nuclear reactors, it is a distinctive 5-peak mass spectrum that appeared in Miley’s experimental data.
Working ‘backwards’ from the experimentally measured product spectrum, Miley interpreted this transmutation data as being a supposedly ‘slow’ fission spectrum of hypothetical unstable “complex nuclei” with atomic masses \( A = \sim 40, 76, 194 \), and one superheavy at \( A \sim 310 \), that were produced during the LENR process.

In our opinion, Miley’s interpretation of the above data was incorrect. On the contrary, according to the Widom-Larsen theory of LENRs, the data reflects a unique, characteristic signature of the absorption of large fluxes of ULM neutrons by atomic nuclei and related rapid beta decay processes. In that regard, we developed a simple 2-parameter optical model of ULM neutron absorption [13] that produces striking results when compared to Miley’s data (see Transmutation, The Alchemist Dream Come True, SiS 36 [7] for a simplified description of the model).

The five peaks traced out by the solid line in Fig. 1 below [13] represent the output of the simple 2-parameter optical model of ULM neutron absorption that is simply overlaid on top of the product mass spectrum observed in one of Miley’s multiple LENR experiments. The five experimentally measured mass spectrum peaks in Miley’s data line-up with the model’s five calculated maximum resonance peaks for absorption of ULM neutrons as a function of atomic mass (\( A \)). The degree of correspondence is noteworthy.

![Figure 1. Miley’s experimentally observed isotopic production rates as a function of increasing atomic mass number is overlaid by the raw output of the Widom-Larsen theoretical ULM neutron optical absorption model with no forced fitting.](image)

Importantly, Miley and Mizuno’s observed array of transmutation products did not contain any significant or detectible amounts of hot radioactive or fissile isotopes; nor hard gamma radiation and energetic neutrons. Such results are entirely consistent with the Widom-Larsen theory of LENRs [10]. This data also strongly suggests that absorption of large fluxes of LENR ULM neutrons by mixed isotopic systems likely produces very unstable, extremely neutron-rich intermediate nuclear reaction products that quickly transmute into stable isotopes via serial cascades of very rapid beta decays.

Consistent with Miley, Mizuno, and Iwamura et al’s experimental data [9, 11, 12], the Widom-Larsen theory of LENRs [10] implies that if you ‘cook’ a collection of different elements/isotopes long enough with appropriately large fluxes of LENR ULM neutrons, the resulting transmutation product spectrum will eventually contain a complex array of almost entirely stable isotopes. Over long ‘cooking times’, benign transmutation products should be distributed across 5 characteristic mass-peak regions (shown in Fig. 1 above) that would be very similar to what Miley and Mizuno discovered over a decade ago.

**Spent fuel rod processing with LENR ultra-low momentum neutrons**

In the future, compact LENR ULM neutron generator systems could be developed and deployed for cost-effective on-site treatment of nuclear wastes presently stored in cooling ponds next to reactors that produced them. Spent fuel rod assemblies could be processed into particulates in on-site containment facilities and injected into co-located LENR-based transmutation reactors. These specialized reactors would then ‘burn’ hot radioactive wastes down to stable isotopes using large fluxes of ULM neutrons. If successfully developed, such a technology could significantly reduce nuclear waste remediation costs for decommissioning fission power plants, and significantly increasing their safety and profitability for those still operating.
Further potential applications for LENRS with regard to fission power generation

Rather than just burning up spent fuel rod assemblies located at reactor sites or after removal of fissile isotopes at reprocessing facilities, excess heat generated during waste burn up with LENR ULM neutrons could be harvested with various types of power generation technologies to produce additional electricity that could either be utilized locally at a commercial power plant or connected and sold into the electricity grid.

There is also the potential to design and construct revolutionary subcritical ULM-neutron catalyzed fission reactors. That topic will be discussed in the final article of this series.

The author declares his commercial interest as President and CEO of Lattice Energy LLC.

Source: http://www.isis.org.uk/LENR_Nuclear_Waste_Disposal.php

Transmutations of Nuclear Waste

By Las Vegas energy expert Robert A. Nelson www.rexresearch.com

The disposition of nuclear waste is one of the most serious technical challenges facing humanity. Long-term storage is not acceptable, yet it is all that we can do with the mess at this time. Meanwhile, many physicists are developing methods to render nuclear waste inactive by various forms of transmutation, the conversion of one element into another.

The rapid transmutation of radioactive elements to stable daughter elements can be accomplished in several ways. The first such method was proposed by Dr. Radha Roy (Physics Dept, Arizona State Univ.) in 1979. He used a linear accelerator to generate x-rays that knocked nuclei from the target elements (Cesium-137 and Strontium-90), resulting in short-lived isotopes. His work received notice in the New York Times in 1982 (April 6 & 13). Only 20 year later, the Los Alamos National Laboratory is developing a project for "Accelerator Transmutation of Waste". A prototype plant will be constructed within five years. Two US patents have been granted for the transmutation of nuclear waste with thermal neutron flux: #5,160,696 and #4,721,596 to Charles Bowman and Richard Marriott, et al., respectively.

Scientists at Europe’s CERN facility also are experimenting with ‘sub-critical’ nuclear reactions (they cease when not being triggered by a linear accelerator) that curtail radioactivity. The proposed European system has been named "Energy Amplifier" by Carlo Rubbia, the Nobel Prize winning physicist who designed it. The CERN website offers this explanation of their efforts:

"Intense linear accelerators would allow transmutation of long-lived nuclear waste which rapidly decays to become harmless or alternatively provide the beam which drives the Energy Amplifier – a fail-safe form of nuclear reactor using relatively innocuous thorium as its fuel."

The CERN Energy Amplifier would work by inserting tubes of radioactive isotopes into a block of lead. Protons fired into the lead by a linear accelerator would generate high-energy neutrons that would fission the target waste. When the neutrons pass through the resonant energy levels of the target isotopes, they trigger transmutation reactions. The molten lead also would serve to cool the system by its passage through a heat exchanger, and the waste heat could be used to generate electricity. The corrosive lead will be bubbled with oxygen to allow the formation of a protective coat of oxide on the reactor walls. The system has been criticized as too complex, and to date the researchers have only performed simulations and...
conducted a few experiments on isolated aspects of the system. For example, the CERN scientists have transmuted technetium-99 in a lead block.

The Americans and Europeans refuse to cooperate on the project; each group claims the other has copied their ideas.

In August 2003, Ken Ledingham (University of Strathclyde, Glasgow) announced in the Journal of Physics (D: Applied Physics) that the transmutation of nuclear waste had been accomplished by means of the giant Vulcan laser (Rutherford Appleton Laboratory, Oxfordshire). The toxicity of a few million atoms of iodine-129 was reduced by a factor of 100 in just a few minutes. The end product iodine-128 has a half-life of only 25 minutes, while the half-life of iodine-129 is 15.7 million years. The Vulcan laser fired a pulse of a million billion watts at a gold target, which generated gamma rays that detached neutrons from I-129, resulting in I-128.

According to Ledingham, the technique could be applied to other radioactive wastes such technetium-99, strontium-90 and cesium isotopes. A different process would be required for plutonium and americium and other radioactive isotopes. The laser process, however, requires enormous amounts of power. The Vulcan laser would have to be fired 10^{17} times to transmute all the atoms of the 46-gram target mass. The Vulcan laser currently can fire only once an hour.

Research team member Karl Krushelnick, a laser physicist (Imperial College, London), said, "You would need to build a number of power stations to transmute the waste from another power station."

Although the laser opens a new pathway to the deactivation of nuclear waste, it also requires that the spent reactor fuel be reprocessed. According to Ian McKinley, from the Swiss company, Nagra, which processes nuclear waste, reprocessing is "extremely expensive and increasingly unpopular".

Fortunately, there are several other, relatively simpler ways to solve the problem. Soon after Pons and Fleischman announced the discovery of Cold Fusion (CF) in 1989, researchers began to announce the anomalous production of elements, beginning with helium and tritium and continuing into the heavy atoms. By 1995, about 120 papers had reported the CF production of tritium in experiments with palladium. During the same period, several scientists developed applications of CF for the remediation of nuclear waste.

Early in 2000, Dr. S.X. Jin, Chief Scientist at Trenergy, Inc., announced his design for a new type of proton particle accelerator that would generate up to one million times greater proton density at the target than any existing particle accelerators. Hal Fox, editor of the Journal of New Energy in which the report appeared, offered his opinion of the new technology:

"In my judgement, the development of this new technology would allow for the on-site transmutation of high-level radioactive wastes into stable elements. Billions of dollars can be saved by not packaging, transporting and storing these wastes in geological storage for 10,000 years."

In the early 1990s, physicist Ken Shoulders received five patents for his discovery of the High-Density Charge Cluster (HDCC), "a relatively discrete, self-contained, negatively charged, high-density state of matter... [a bundle of electrons that] appears to be produced by the application of a high electrical field between a cathode and an anode" (i.e., 2-10 kv at the tip of a sharply pointed electrode). It can also be described as ‘a spherical monopole oscillator’. Shoulders has given it the name ‘Electrum Validum’ (EV), meaning ‘strong electron’, derived from the Greek ‘elektron’ (electronic charge) and the Latin ‘valere’ (to be strong, having power to unite).
Shoulders also invented a method of plasma-injected transmutation for the remediation of nuclear waste by EVs. He has demonstrated the complete elimination of radioactivity in high-level nuclear material.\(^2,3,4,5\)

EVs apparently function as a collective accelerator with sufficient energy to inject a large group of nuclei into a target and promote nuclear cluster reactions. The composition of EVs allows for the inclusion of some 10\(^5\) nuclides. Ions can be added to EVs until the net charge becomes positive. Such EVs are called Nuclide-EVs (NEVs). Shoulders states:

"The NEV acts as an ultra-massive, negative ion with high charge-to-mass ratio. This provides the function of a simple nuclear accelerator. Such nuclear reactions are fundamentally an event involving large numbers and not one of widely isolated events working at an atomic level."

Shoulders offers an *ad hoc* explanation of these results as being "due largely to a nuclear cluster reaction having an unknown form of coherence".

Other researchers (Rod Neal, Stan Gleeson, "The Cincinatti Group", William Barker, etc.) also applied for patents on similar applications. The Neal-Gleeson Process has been shown to stabilize naturally radioactive solutions of thorium and uranium compounds up to 70% within a few hours in an electrochemical reactor. Thorium can be fissioned into mercury and neon. Valve metals (whose oxides emit electrons) can be excited to produce galvano-luminescence in aqueous solution. When the charge gradient exceeds a critical threshold of 1 MeV, sparks are produced in the form of charge clusters that are believed to be the active mechanism in this method of transmutation.

In their reports of the experimental results, Neal and Gleeson, *et al.*, noted:

"Because there is a close agreement between the reduction in thorium and the reduction of radioactivity of the thorium daughter products, it is assumed that the Neal-Gleeson Process has about the same capability to change both thorium nuclei and the nuclei of the daughter products into other elements which are not radioactive...

"A process which can cause the higher atomic number elements to be split into smaller elements appears to be a desirable method by which certain radioactive elements can be handled. It is highly desirable to be able to select process-control parameters so that only stable daughter nuclei of the parent elements are produced. In this way, the radioactivity of today's highly radioactive slurries can be ameliorated."

Australian inventor Yull Brown developed a novel method of electrolyzing water to produce a compressed stoichometric mixture of hydrogen and oxygen ions (popularly known as 'Brown's gas') that is burned in a 2:1 ration. Since the early 1980s, Yull Brown claimed to be able to transmute radioactive material into inert forms by fusing it in the flame produced by his hyfuel. His patents mention that "The invention also relates to atomic welding..." (USP 4,014,777 and 4,081,656).

Yull Brown's first successful experiment with cobalt-60 radionuclides reduced the activity by about 50% in 10 minutes. The process was replicated by the Baotou Nuclear Institute (China) in 1991.

---

\(^2\) Shoulders, Kenneth R.: US Patent 5,018,180; "Energy Conversion Using High Charge Manipulation of High Density Charge"; *ibid.*, USP 5,054,047; "Circuits Responsive to & Controlling Charged Particles"; *ibid.*, USP 5,123,039; "Energy Conversion Using High Charge Density"; *ibid.*, USP 5,148,461; "Circuits Responsive to Charged Particles".


\(^4\) Shoulders, K.: *EV: A Tale of Discovery*; 1987, Jupiter Technology, Austin TX.

\(^5\) Nelson, Robert: *Infinite Energy* 18: 58-63 (1998); "Ken Shoulders' EVs".

Radioactivity Neutralization Methods -16-  May 30, 2014
In a demonstration witnessed by former US Congressman Berkeley Bedell, the radioactivity of americium was quickly reduced by 2500% with Brown's torch. The Geiger counter reading registered 16,000 curies/minute before, and less than 100 curies/minute after treatment. Congressman Bedell said:

"It has been my good pleasure to witness experiments done by Prof. Yull Brown in which it appeared to me that he significantly reduced the radioactivity in several nuclear materials. Under the circumstances, I believe it is very important for our federal government to completely investigate Dr. Yull Brown's accomplishments in this area."

If the US government is completely investigating Brown's gas, it is doing so in complete secrecy.

In August 1992, Yull Brown made another demonstration before several members of the Department of Energy and Hon. Dan Haley at the request of Congressman Bedell. The Geiger counter reading from cobalt-60 was reduced to 0.04% of the original level.

Another demonstration was conducted for a group of Japanese nuclear scientists, at which time cobalt-60 was reduced from 24,000 mR/hr to 12,000 mR/hr with one brief treatment.6,7,8

Paul Brown (Nuclear Solutions, Aurora CO) has developed a novel method to remediate nuclear waste by photonuclear reaction with gamma rays. The technology utilizes principles of physics – giant dipole resonance – that have been overlooked in their possible application in treatment of nuclear waste. Brown states:

"Photonuclear reactions induced by gamma ray absorption by the nucleus, do not suffer the shortcomings of neutron reactions. Simply stated, the process is gamma irradiation with energies greater than the binding energy of the neutron to the nucleus. That is, a gamma photon of an energy equal to or greater than the binding energy which comes close to the nucleus is absorbed through giant dipole resonance resulting in the emission of a neutron. This well-known nuclear reaction has dramatic application to waste remediation...

"The neutrons produced by the (γ,h) processing may in turn be used for neutron transmutation by the processes... For many fission products the neutron capture cross sections in a thermal spectrum can give substantial transmutation rates..."

Brown has proposed another application of giant dipole resonance in a theoretical ‘photon reactor’ that would produce power by burning nuclear waste:

"A linear accelerator, preferably of the monochromatic type, accelerates electrons which are directed onto a high Z target such as tungsten to generate gamma rays about 9 MeV, which are directed onto the fuel material such as U-238 which results in the (g,γ) reaction, thus releasing about 200 MeV. A reactor built according to this principle requiring an accelerator driven by 1 MeV will develop about 20 MW of power. The reaction is not self-sustaining and stops when the beam is turned off. This accelerator driven reactor may be used to burn up spent fuel from fission reactors, if simply operated at 10 MeV.

---

7 Haley, Dan: Planetary Association for Clean Energy Newsletter 6 (4): 8-9 (July 1993); “Transmutation of radioactive materials with Brown's Gas”.
8 Planetary Assoc. f. Clean Energy Newsletter 6 (4): 10-11 (July 1993); "Yull Brown's gas".
The photo-fission results in typical spent fuel waste products such as cesium-137 and strontium-90, which undergo photodisintegration by the \((\text{g},\text{e})\) resulting in short-lived or stable products. Chemical separation of the spent fuel isotopes is not necessary..."^9

Gerardo International, Inc. is developing an Accelerated Decay Energy Converter (ADEC). The system utilizes stimulated radioactive decay to extract electrical energy directly from the atom:

"ADEC does not change the mechanism of spontaneous radioactive decay; it changes the probability of which atoms will undergo decay and when the decay will occur. As atoms exhibit no statistical memory, the event of a neighboring atom's spontaneous decay in no way influence the likelihood or unlikelihood of decay of a selected atom. As the extraction of power from the nuclear is accelerated, the material's natural emissive lifetime will be exhausted in direct relation."

Ronald Brightson (Clustron Sciences) has presented theoretical and experimental evidence for the validity of his own "Nucleon Cluster Model" (NCM), which predicts that a relatively low-energy photon can promote a nuclear reaction under certain specific conditions. Brightson analyzed the periodicities and systematics of atomic numbers and masses and deduced that all b-stable nuclides are composed of deuterons (neutron-proton clusters), tritons (neutron-proton-neutron), and helium-3 proton-neutron-proton nuclei. His patent application includes a method of remediating nuclear waste by the induction of fission in the radioactive isotopes. The imposition of an external magnetic field in resonance with the magnetic moment of a particular nucleon cluster (neutron-proton, neutron-proton-neutron, proton-neutron-proton) can excite the select cluster (without disturbing other clusters in the target) to burst from the nucleus and perform a transmutation to daughter products of smaller mass and greater stability.

A catalytic process for transmutative remediation of nuclear waste was invented by Jack Keller in 1993. AmoTerra announced a method of transmutation to neutralize radioactive material at a congress on low-energy transmutation (ICCF-5 in Monaco) in 1996. He utilized ignition methods such as those developed by Joe Champion. When AmoTerra applied the treatment to nuclides, the radioactivity was greatly reduced after the ignition.

In their analysis of the "energy gain and nuclear transmutation by low energy \(p\)- or \(d\)-reactions in metal lattices", Heinrich Hora, George Miley, and J. Kelly offered hope for the transmutation of nuclear waste and plutonium:

"One can actively incorporate nuclides into the surface area of the active metals or nearby. These additional nuclides can then be subject to low-energy nuclear transmutation...

"One application of the mentioned transmutation is the long-lived nuclear waste from nuclear fission reactors... It is an important aim to make plutonium fully extinct by nuclear transmutation into chemically different nuclei... These kinds of nuclear transmutations are indeed possible by using ion beams... of more than \(10\) MeV per nucleon or spallation processes with up to \(10\) GeV protons. In view of the very expensive accelerators needed for this purpose, and [because] the ion currents are very small, there is no economic possibility in sight from this method. The invention described in this (Clean Energy Technology) patent [for] the low-energy transmutation by protons provides a low-cost method for converting the long-lived waste nuclides and plutonium into harmless non-radioactive elements."^10

---


^10 Hora, H., et al.: *Infinite Energy* 12: 48-52 (January-February 1997); "Energy gain and nuclear transmutation by low energy \(p\)- or \(d\)-reactions in metal lattices".
Beginning in 1958, Russian geophysicist Dr. Georgiy S. Rabzi developed methods of transmutation that combined geo-electric and artificial fields and temperature control to direct transmutation in solids and liquids. For example, a 99.5% Pb was treated at 650°C to yield up to 3% Ag, plus Cd and Ge (15 March 1994). No radioactivity was observed in any of the experiments. At the ICCF-5 meeting, Dr Rabzi claimed that his "natural cold fission" is a safe method with which to stabilize nuclear waste.

Numerous reports in the literature of physics describe deviations (from 0.1 to 5%) from the standard constant decay rates of natural radioactivity, some by extra-nuclear influences (including the human mind). Physicists Elizabeth Rauscher, Glen Rein, and associates have investigated the interactions of cobalt-60 with non-Hertzian energies such as the scalar fields generated by the ‘Smith coil’ (a Caduceus-wound coil invented by Canadian engineer Wilbur B. Smith in the 1960s). When energized (3 mA/5 W), the non-inductive Smith coil (8.2 ohms) reduced the background radiation by 97% (from 0.5 mR/hr to 0.0015 mR/hr). Yet when applied to cobalt-60, the radioactivity increased from 150 to 250 mR/hr! 11

Gerardo International, Inc. has developed an "Accelerated Decay Energy Converter" (ADEC) that makes use of stimulated nuclear decay to directly extract electrical energy from radioactive material. ADEC changes the probability of atomic decay and its timing: "As atoms exhibit no statistical memory, the event of a neighboring atom's spontaneous decay in no way influence the likelihood or unlikelihood of decay of a selected atom. As the extraction of power from the nuclear material is accelerated, the material's natural emissive lifetime will be exhausted in direct relation."

A few other exotic possibilities may exist for the transmutation of nuclear waste, such as the radionic transmutations demonstrated by the amazing DeLaWarr Camera. Tom Bearden and others have recommended the use of scalar interferometry to withdraw energy from the nucleus in a gentle manner, or by outright dematerialization. 12

Thomas Bearden proposes a method that "may be used to hasten the decay of long-lived and dangerous radioactive isotopes" in his US Patent Application, "Method, System & Apparatus for Conditioning EM Potentials, Fields & Waves to Treat & Alter Matter":

"A further discussion will explain the particular mechanisms involved in modifying the decay rates of nuclear materials. Nuclear physics models assume that, within a heavy slow-decaying nucleus, there are particles that "rattle around" a very large number of times before spontaneously tunneling through the surface and escaping, to provide ? decay. For the long-lived decay of U-238, e.g., the ? particle must present itself at the barrier some \(10^{38}\) times before it succeeds in tunneling through. Hence an ?-decay will likely occur on the average of once every 4 billion years! The disintegration energy of this long-lived U-238 nucleus is 4.25 MeV. However, the transmission coefficient of a barrier is very sensitive to small changes in the total energy of the particle seeking to penetrate it. As an example, a change in the disintegration energy to 6.81 MeV results in barrier penetration of the ? particle very quickly – indeed, in only 9.1 minutes. By use of time-density charging, it is straightforward to raise the disintegration energy of an otherwise long-lived U-238 isotope to 6.81 MeV or even higher, after a certain longitudinal EM wave radiation time. (In this instance, the addition of necessary phase conjugates to accomplish time-density charging happens in the vicinity of the irradiated nuclear mass.)

It follows that a readily usable process can be designed to decay the long-lived U-238 isotope quickly, and similarly with other radioactive isotopes having very long half-lives. Indeed, ‘mixes’ of appropriate spacetime curvature engines can be designed to minimize actual radioactive emission, with the vacuum itself undergoing energetic processes that accept the excess energy in virtual state rather than radiating it away into 3-space as observable transversely-polarized nuclear decay contaminants. Nuclear wastes can be irradiated at a safe distance by an interferometer such as 1600. Alternatively, the interferometer 1600 can condition the local vacuum in a specified disposal region by projecting the desired spacetime curvature engines, which become imposed on matter in the region by time-charging and subsequently emitted over a period of time through the process of excitation decay. Then the isotopes to be nullified can just be transported into the area and ‘parked’ there while the conditioned active vacuum performs the necessary nullifying electronuclear interactions.

"Fig. 19 shows an apparatus that may serve to alter and nullify hazardous chemical wastes by creating time-reversal zones within a reaction vessel. A time-reversal zone has the characteristic of reversing the electrical attraction and repulsion forces upon many charges within the zone. In such a zone, a hydrogen bond may become an anti-hydrogen-bond, thus loosening the bonds. As the bonds break, the chemicals may be altered to harmless new forms. As an example, the H-bond interactions in a hazardous chemical compound are due to protons. As time passes and the time-reversal zone strengthens due to time-density charging, the exposed hydrogen ions (protons) in the chemical acquire additional time-density charge, whereupon some begin to repel (due to the time-reversal of their attraction) while others continue to attract (due to the remaining time-forward component). As the time-reversal strengthens, repulsion equals and overtakes attraction, thereby dissolving the H-bond. The chemical thereby separates into component parts and component chemicals. Exposure can continue until the remaining chemical byproducts are harmless. In this manner, hazardous chemicals including dangerous chemical warfare agents may be rendered harmless. For the safety of operating personnel, the time-reversal zone may be established inside a protective reaction vessel from a little distance away..."

Radioactivity also can be increased by simple means. The German Dr. Alois Gaschler applied for a British patent in 1925 for the enrichment of uranium by a treatment with several kilowatts of direct current:

"The behavior of uranium and thorium and their salts in the electric arc and in the glow discharge has been examined. In no case could there be observed an alteration in the radioactivity or in the chemical activity. A perceptible transmutation effect was, however, unexpectedly found when strong rushes of momentary high-tension currents were sent through a narrow fused quartz tube provided with tungsten electrodes and containing mercury and uranium oxide. The tube was fixed vertically in a stand, so that the mercury filled the lower part of the tube and one tungsten electrode was completely covered by it. On the surface of the mercury was a relatively thin coating of uranium oxide which had been carefully freed from radioactive byproducts, especially from uranium-X, before it was introduced into the quartz tube. The sparking distance between the tungsten electrode and the mercury-uranium oxide electrode was about 15 cm. The intensity of the electric discharge varied between 0.3 and 0.4 amps.

"Under the influence of repeated electric discharges during about 30 hours, relatively strong and increasing radioactivity b and l rays] showed itself. The b and l ray activity varied between 1.4 and 20 times the radioactivity of an equally large amount of uranium oxide in equilibrium with its decay products, and increased proportionally to the energy applied and to the time.

"One obtains an even greater proportion of uranium X if one makes the electric discharges pass within a thick-sided quartz or porcelain vessel between a tungsten point and mercury covered with a thin coat of vaseline and uranium oxide. This coating possesses such a high electric resistance that, even when applying the highest tensions which can be obtained, one is obliged to diminish greatly the sparking distance in order..."
to obtain a discharge. This proceeding offers the advantage that the energy is concentrated into a very small space. Consequently one can show, after half an hour's work, the production of relatively large quantities of uranium X.

"The production of uranium X considerably in excess of that produced by spontaneous decay is to be explained only by the fact that, under the influence of the electric force, an acceleration of the radioactive transmutation of uranium takes place."13

Dr. Thomas H. Moray developed a method in the 1950s to enrich uranium by high-energy bombardment. He treated the ore (in a chemical solution) with x-rays (up to 24 MeV). The average ore contained 0.23% uranium oxide. After irradiation, the ore yielded from 7-75% uranium oxide! In 1953, Moray proposed that the Atomic Energy Commission investigate the "aging" of atomic ores by a "breeding type reaction with high-energy particles or x-rays in the presence of a proper environment". The AEC declined to grant a contract.

Perhaps fortunately, the technologies invented by Gaschler and Moray are dormant. Meanwhile, it is imperative that we develop every possible pathway to the deactivation of nuclear waste and weapons.

Source: http://www.rexresearch.com/articles/nukewa.htm

Dr. Radha Roy’s Transmutation Process was Viciously Suppressed

The problem of radioactive waste disposal is the paramount environmental issue of our time. There is already much irretrievable radioactive pollution worldwide that will plague the earth’s biosphere for millennia to come and threatens the gene pool of thousands of future generations.

The nuclear waste problem is totally unresolved. There are no sites, no containers and no places on earth that can safely contain radioactive waste materials. No container will outlive the radioactivity of its contents. Areas contaminated with radioactive waste are uninhabitable for the lifetime of their radioactive contents, which can amount to half a million years. Unless a process for transmuting radioactive wastes is developed, the best that we can hope for is above ground disposal sites managed by responsible people with valid monitoring systems. It is impossible to monitor radioactive waste that has been dumped into rivers or the ocean, buried in the ground or shot into space. What kind of legacy are we leaving our children and their children? Is there hope? Yes, but only if we develop a process for transmuting radioactive materials to harmless products invented by the late Dr. Radha Roy.

Dr. Radha R. Roy was Professor Emeritus Nuclear Physics, Arizona State University. Dr. Roy's specialty was: "Experimental nuclear physics with emphasis on ionization of electron and positron, scattering of electron and positron. Interactions of photons with matter involving photoelectric effect, compton effect, pair, triplet, and multiplet production. Nuclear reactions and energy levels of nuclei. Fission of uranium and Californium. Nuclear instrumentation."

Dr. Roy was also designer and former director of the nuclear physics research facilities at the University of Brussels in Belgium and at Pennsylvania State University. Builder and Director of the Brussels Physical lab for eight years, he was an associate of the daughter of physicist Madame Curie and an associate of the elite

---

nuclear physicists in Europe. Dr. Roy was an internationally known nuclear physicist, consultant, and the author of over 60 articles and several books. He was also a contributing author of many invited articles in a prestigious encyclopedia. He was cited in American Men and Women of Science, Who’s Who in America, Who’s Who in the World, and the International Biographical Centre, England. He won a variety of awards. He spent 52 years in European and American universities researching and writing recognized books on nuclear physics. He had supervised many doctoral students.

It was the March 28, 1979 Ten Mile Island nuclear power reactor partial meltdown (see for example http://en.wikipedia.org/wiki/Three_Mile_Island_accident) that moved Dr. Roy to spend the summer school break proving calculations to see if it was possible to cost-effectively transmute high-level nuclear waste. He found it could be done with existing infrastructure, commercially available machinery and current supporting technology.

Roy invented a process for transmuting radioactive nuclear isotopes to harmless, stable isotopes. This process is viable not only for high-level nuclear waste from reactors but also for low-level radioactive waste products. The process does not require storage of radioactive materials. There is no need for new equipment. All of the equipment and chemical separation processes needed are already well known. In addition, as the treated isotope rapidly decays into a non-radioactive element, heat is produced which can power the existing electric generators at each nuclear power plant where nuclear waste is stored in cooling ponds.

A newspaper editor persuaded Dr. Roy to release his Roy process to the press which was published in November of 1979. Roy announced his transmutation process and received international attention. The Roy process does not require storage of radioactive materials.

What’s the basis for the Roy process? If you examine radioactive elements such as strontium-90, cesium-137 and plutonium-239, you will see that they all have too many neutrons. To put it very simply, the Roy process transmutes these unstable isotopes to stable ones by knocking out the extra neutrons. When a neutron is removed, the resulting isotope has a considerably shorter half-life which then decays to a stable form in a reasonable amount of time.

How do we knock out neutrons? By bombarding them with photons (produced as x-rays) in a high-powered electron linear accelerator.

Before this process, the isotopes must be separated by a well-known chemical process. These portable units could be built and transported to hazardous sites of radioactive waste.

Dr. Roy completed the quantum electrodynamic calculations for three isotopes: Pu-239, Sr-90, and Cs-137....all others treated similarly. To give an example, cesium-137 with a half-life of 30.17 years is transmuted into cesium-136 with a half-life of 13 days. Plutonium-239 with a half-life of 24,300 years is transmuted into plutonium-237 with a half-life of 45.6 days. Subsequent radioactive elements which will be produced from the decay of plutonium-237 can be treated in the same way as above until the stable element is formed.

The Roy process could be developed in three distinct phases, according to Roy. Phase I consists of a theoretical feasibility study of the process to obtain needed parameters for the construction of a prototype machine. Phase II will involve the construction of a prototype machine and supporting facilities for demonstrating the process. Phase III will consist of the construction of large-scale commercial plants based on the data obtained from Phase II.
Cost estimates for Phase I and II were in the neighborhood of $10 million. For Phase III, Roy estimated a cost of $70 million. Says Roy, “It will be interesting to do a cost analysis of eliminating nuclear waste by using my process and by burying it for 240,000 years – ten half-lives of plutonium – under strict scientific control. There is also an ethical question: Can we really burden the thousands of generations yet to come with problems which we have created? There is no God among human beings who can guarantee how the geological structure of waste burial regions will change even after ten thousand years, not to mention 240,000 years.” Transmuting high-level waste would also guarantee international security by eliminating bomb-grade elements.

A Final Note

To those who say that a process for transforming nuclear wastes is an invitation to keep making them, I ask, when we find a cure for cancer, shall we say it’s okay to continue to eat, drink and breathe carcinogens?

"There is no way one can change nuclear structure other than by nuclear reaction. Burial of nuclear waste is not a solution." Radha R. Roy, Ph.D., Professor Emeritus Nuclear Physics

For more information, please contact:
Dennis F. Nester (agent for the late Dr. Roy)
4510 E. Willow Ave.
Phoenix, AZ 85032
(602) 494-9361
theroyprocess@cox.net

The Roy process patent application, apparatus and theory, which include the completed calculations for transmuting Pu-239, Sr-90 and Cs-137, can only be seen by scientists representing a company capable of realization who contracts with us.

Counter point on transmuting nuclear waste:

Transmuting nuclear waste is an old idea looked at decades ago, and then discarded by the scientific communities.

The reason was simple. Waste is a soup of thousands of unstable nuclei. EACH one would have to have a pure beam of particles hitting it in order to induce a transition to a lower state. Thus, you would have to a) chemically process all the waste – tediously separating out thousands of dangerous chemicals b) hit each one with a very fine-tuned energy of radiation in order to induce a transition.

As you can see, the problem is staggering. It is prohibitively expensive, and probably won't even work even if you spent billions and billions of dollars. Although in today’s new fast growth in science and the Internet, a new science might turn the old ways into new possibilities.

Anonymous.

Rebuttal to counter point request:

I hope you will add my 'rebuttal' below to the GDR web page. Dr. Roy suffered much for the Roy process, and it is a terrible disservice to him and the world who desperately need the Roy process, to let an 'anonymous' so-called scientist (dismiss) the Roy process of which they have little knowledge. Dr. Roy
told me there should be a cost analysis done comparing the Roy process and burying nuclear waste for the necessary 480,000 years – 20 half-lives of Pu-239.

Regards Dennis F. Nester

Rebuttal to: Counter Point on Transmuting Nuclear Waste by {Anonymous}

I knew Dr. Roy for ten years, during which time I typed up the first manuscript of his yet unpublished autobiography. Dr. Roy was a world leading nuclear physicist, first to discover fission particles, author of physics books used in universities worldwide, and author of invited articles in encyclopedia. He was a serious scientist who knew the nuclear industry from the ground up.

This "anonymous" person has no knowledge about the Roy process. It remains secret for the benefit of industries who need exclusive patent rights for commercialization.

Dr. Roy very well knew good science MUST BE cost effective, or it is no good, obviously. Dr. Roy was very famous in Europe, a fellow of the Curie Institute. He would NEVER embarrass his awesome credentials by announcing new science to the press, if he had any doubts about its feasibility and cost effectiveness.

Nuclear waste has become a multi-billion dollar economy.
See: http://headlines.igc.apc.org:8080/enheadlines/975378903/index_html

Corporate welfare for scientists. According to Public Citizen:
http://www.citizen.org/CMEP/RAGE/radwaste/prtransmutation.htm

The government’s Los Alamos (neutron) transmutation proposal, which IS NOT the Roy process, only partially reduces half-lives and 'creates' more nuclear waste which they then bury only to leak out or explode in time anyway. The DOE wants $280 billion over 117 years "to successfully implement the program" that does not work! Talk about double dipping! There should be a Nuke-gate Congressional investigation!

Dr. Roy was offered $5 million dollars by a group of lawyers representing a large company. Dr. Roy was about to sign contracts and told these lawyers he would be available to their company as consultant. Then these lawyers told Dr. Roy, "It is not going to be developed." They wanted to buy it....to kill it! Dr. Roy expelled these lawyers and began getting death threats!

I hope GDR will not publish "anonymous" incompetent critics who simply don't know what they are talking about in the future.

Sincerely,
Dennis F. Nester
Send your comments to, CommentsDrRoy@gdr.org


Published Date: 4/30/11
The original article below was first published in the summer of 1993. The information here is just as true today as it was then, perhaps even more so. Because we are still polluting the earth and its inhabitants with nuclear waste, disastrous nuclear accident and there are many nuclear reactors that have been built on unstable earthquake faults like the ones built in Japan. We are all ‘downwinders’ now.

The nuclear waste problem is totally unresolved. There are no sites, no containers and no places on earth that can safely contain radioactive waste materials. No container will outlive the radioactivity of its contents. Areas contaminated with radioactive waste are uninhabitable for the lifetime of their radioactive contents, which can amount to half a million years. Unless a process for transmuting radioactive wastes is developed, the best that we can hope for is above ground disposal sites managed by responsible people with valid monitoring systems. It is impossible to monitor radioactive waste that has been dumped into rivers or the ocean, buried in the ground or shot into space.

What kind of legacy are we leaving our children and their children?

Is there hope? Yes, but only if we develop a process for transmuting radioactive materials to harmless products invented by the late Dr. Radha Roy (see above).

Introduction

This article addresses nuclear waste contamination from ionizing radiation, the kind produced by nuclear plants, nuclear tests, medical procedures, food irradiators, facilities that sterilize via the use of radiation, and research facilities using radioactive isotopes. I will present a viable but yet untested process for transforming nuclear wastes to stable non-radioactive products — the Roy process (see above).

There are at least 121 nuclear reactors in the United States (as of 2011).

Used Nuclear Fuel and High-Level Radioactive Waste

A typical nuclear power plant in a year generates 20 metric tons of used nuclear fuel. The nuclear power industry generates a total of about 2,300 metric tons of used fuel per year.

Over the past four decades, the entire industry has produced about 62,500 metric tons of used nuclear fuel. If used fuel assemblies were stacked end-to-end and side-by-side, this would cover a football field about seven yards deep.

This tonnage does not include low-level wastes — materials that come in contact with radioactive substances. These wastes, such as gloves, filters, tools and clothing, come from nuclear power plants, hospitals and research centers that use radioactive substances. There are 100,000 U.S. facilities that use these materials. They produce 1.6 million cubic feet of low-level wastes each year.

Describing the contamination of earth by radiation as low-level ionizing radiation is misleading and implies that it is insignificant. It’s not. Low-level ionizing radiation means 5-15 reins (similar to a rad) or about what we all get each year if we don’t work in a nuclear plant. Dr. John Gofman, a pioneer on the health effects of ionizing radiation, calls this the doubling dose, the dose required to double the cancer rate.

More worrisome is Dr. Abram Petkau’s observation that it takes only 700 millirads of protracted radiation (from external or internal sources) to lyse (break) the cell membrane. By protracted, I mean over a period of time, instead of all at once. In the absence of antioxidant enzyme protection, such as superoxide dismutase and catalase, a mere 10-20 millirads were required to destroy the cell membrane.
P.S., We’re all deficient in antioxidant enzymes because there’s much more radiation-induced free radical damage than nature intended, thanks to the nuclear industry.

There has been no viable solution to the nuclear waste disposal problem. It is the greatest of all disposal problems, and not just because of clean-up costs. Radioactive waste sites are virtually uninhabitable for the lifetime of the radioactive materials contained, which can amount to thousands of years. There are no containers which will last as long as the radioactive materials stored in them, thereby promising leakage of the radioactivity into the water, soil and air.

The U.S. government and the Department of Energy (DOE) are faced with enormous volumes of radioactive waste, with no solution of how to store them.

An April 8, 1992, article in The Arizona Republic reported the results of an eight-month study by the Environmental Protection Agency on radioactive sites in the United States. The EPA designated 45,361 locations, including factories and hospitals, with nuclear waste contamination ranging from slight to severe.

Costs of the Nuclear Industry

Despite a one-half-trillion-dollar subsidy to the nuclear power and weapons industry over the last 40 years, nuclear power is a dismal economic failure and a safety nightmare. Here are some examples to illustrate the severity of these problems – both financial and safety.

On July 4, 1990, the DOE estimated costs for nuclear cleanup to be $31 billion over the following five years. This figure represents a 50% increase over 1989 projections. In 1991, DOE revised this estimate to $100 billion. I gasp at the thought of what today’s estimate would be (2011).

During the last 10 years the nuclear industry and the federal government have spent $6 billion on a plan to store 77,000 metric tons of radioactive waste in tunnels bored into the granite bedrock of Yucca Mountain, Nevada. The San Jose Mercury-News reported on July 14, 1992, that a June earthquake caused $1 million in damage to a Department of Energy building six miles from the proposed Yucca Mountain nuclear waste repository, Nevada. DOE scientists were rattled to discover that the epicenter of the quake was 12 miles from the proposed dump site.

In 1991, mining experts reported that a deep underground salt chamber in the New Mexico desert designated for the first U.S. tests of permanent radioactive waste disposal would probably collapse years before the tests could be completed. The $800 million DOE nuclear-waste disposal project was already years behind schedule when this ominous projection was made (June 14, 1991, The Arizona Republic).

Where Does the Waste GO?

Nuclear waste has been dumped into oceans, rivers and lakes, and into the ground. Leaking containers of radioactive wastes add to this on a daily basis, endangering the earth’s groundwater. There is no permanent storage site that is free from the hazards of radioactive waste.

The following examples are given to indicate the serious and unsolved nature of the nuclear waste crisis:

Port Granby, Canada, dump site: Port Granby, east of Oshawa, Canada, is one of three landfills in the Port Hope area storing radioactive waste from a nearby uranium processing plant. Over 40 years, more than half-a-million tons of radioactive waste was buried in 122 14-foot pits in the Port Granby dump. Years of public outcry forced the closing of the dump in 1988. Despite efforts to capture the seepage, radioactive...
groundwater from this site makes its way down the bluffs, where the current carries it towards Toronto. A greater fear are the cliffsides that are eroding. One day, the bluffs will send chunks of the dump site crashing into the water. Currently, anti-dump activists debate with nuclear officials over the perilous dump site, with no solution at hand. (New Magazine, Toronto, March 1993).

Russian Dumping: On September 2, 3, and 4, 1992, the Los Angeles Times reported on “The Soviets’ Deadly Nuclear Legacy.” From 1966 to 1991, the Russians dumped nuclear wastes into rivers, lakes and into the ocean. Russia’s deadly atomic legacy is just now coming to light in a report issued in March 1993 by Russian President Boris Yeltsin. From 1949 to 1956, nuclear waste from plutonium refining was dumped into the Techa River, even though radioactivity began showing up 1000 miles downstream in 1953. Today, gamma radiation on the river bank measures 100 times normal levels. Aware of the radioactivity in the Techa, Russian workers began dumping into Lake Karachai. Today, “to stand on its bank, even for a short time, would be deadly,” according to Mira Kosenko, M.D., of the Chelyabinsk Institute of Physics and Biology.

The Russians dumped at least 15 used nuclear reactors including six submarine units containing uranium fuel into the Kara Sea. According to Andrei Zolotkov, a radiation safety engineer, the entire hull section of the obsolete nuclear-powered icebreaker V.1. was cut out with blowtorches and sunk. The irradiated mass measured 65 by 65 by 35 feet, or as high as a five-story building. The results of this are now evident. Officials at the Northern Division of the Polar Institute of Fish and Oceanography in Arkhangelsk report that thousands of seals are dying of cancer. This was caused by radioactive pollution of the seabed plus fallout from Russian nuclear tests on Novaya Zemyla, the archipelago where the seals live.


The Hanford, Washington, crisis: A new EPA analysis revealed that Hanford workers dumped millions of gallons of radioactive waste into the ground. Some of the wastes were injected deep into the earth, while others were dumped into open trenches or ponds which were later covered with dirt. These wastes contain two long-lived carcinogens – technetium-99 and iodine-129. Technetium-99 has a half-life of 212,000 years, and iodine-129 a half-life of 16 million years. Because Hanford is located close to the Columbia River, radioactive isotopes continue to flow into the river.

In addition, storage tanks at Hanford are in danger of exploding due to continuous production of extremely reactive, labile products. This serious situation is described below.

Current Legal Methods of Nuclear Waste Storage

There are two storage methods. The most common is to store the radioactive waste in water pools made of reinforced concrete six feet thick lined with stainless steel. The second method is to store the material in dry casks which are transported by rail, truck or barge to outdoor storage sites where they are placed on 3-foot reinforced concrete pads.
Current Dump Sites (1997)

The 1980 plan for waste storage has unraveled. In this plan, the federal government would be responsible for high-level waste and states would take responsibility for low-level wastes. States could build their own waste sites or form compacts with other states to share common repositories. However, states encountered massive opposition when possible locations were chosen. The problem is unsolved.

The only two current disposal sites, in Richland, Washington, and Barnwell, South Carolina, are nearing capacity and will have to shut down. Wastes not allowed to go there are piling up in makeshift storage facilities across the United States. Currently, there are more than 100 makeshift sites in 41 states where nuclear waste is being stored in cooling pools. Many of these sites are in developing areas and some are near businesses, residential area and schools.

The fight over dump sites continues. As of Tuesday, April 1997, the Senate voted (65-34) to establish a temporary central storage facility for the nation’s 33,000 tons of nuclear waste at Yucca Mountain, northwest of Las Vegas. President Clinton is expected to veto it. If he does, the question of what to do with nuclear garbage will remain unanswered.

Opponents emphasize the danger of transporting hazardous nuclear waste through populated areas by rail or highways and believe that a temporary site in Nevada will lead to a permanent facility there. This temporary site would be above ground, but there is a proposed permanent storage location underground in the same area. This proposal is fraught with controversy.

The DOE says that four more years of study are needed before making a final decision. Why? An earthquake of magnitude 5.9 on the Richter scale occurred on June 29, 1992, just six miles from the proposed burial site. Since then, federal officials have had major problems convincing people that nothing can go wrong at their proposed nuclear dump site. Senator Richard Bryan (Democrat - Nevada) said of this quake, “Mother Nature delivered a wake-up call to America’s policy-makers. Placing high-level radioactive nuclear waste in an active earthquake zone defies common sense.” (San Jose Mercury News, Tuesday, July 14, 1992)

Most people are unaware of how grim it is to have 33,000 tons of radioactive garbage which will take from 30 to 480,000 years to decay to a harmless substance.

However, the government knows. That’s why their policy says that radioactive waste must be stored at least 10,000 years, even though this is hardly realistic. Let me explain. The range of half-lives of these materials varies from 24 seconds to nearly 15.9 million years. (Ultimately after a uranium atom fissions, a total of about 300 isotopes result as various isotopes decay to other isotopes of longer half-lives. Vesperman)

The half-life of a radioactive element is the time it takes it to decay to one-half of its mass. The whole lifetime of a radioactive element is its half-life times 20 years. This makes the situation grim. For example, the half-life of strontium-90 is 28 years. Multiplying this by 20 gives you a lifetime of 560 years. For plutonium-239 with its half-life of 24,000 years, has a whole-life of 20 X 24,000 or 480,000 years. Cesium-137 with its half-life of 30 years will hang around for 600 years.

“Do not be surprised if you learn that the nuclear industry makes billions of dollars by being a part of government’s policy of burial of nuclear wastes. It is not in their financial interest to try any other process. They are not idealists.” (Radha R. Roy, Ph.D., Professor Emeritus Nuclear Physics)
What’s Wrong with Storing Nuclear Waste Above Ground

Although above-ground storage has the advantage of access to being monitored, it is still not without unsolved dangers.

Nuclear waste is highly unstable and reactive. For example, at Hanford, Washington, radioactive wastes were stored in million-gallon tanks while awaiting a permanent (?) storage site (lots of luck!). These tanks contain plutonium wastes and organic materials. Chemicals in the tanks break down, producing hydrogen gas, increasing pressure inside the tanks. This lays the conditions for an explosion, which would spread contaminants into the atmosphere, the land and the water, not to mention the people and the animals.

In 1957, similar waste storage tanks exploded at the Russian Mayak plutonium plant and contaminated hundreds of square miles in the southern Ural mountains. According to a Thursday, January 28, 1993, Washington Post article, this explosion released two million curies over a huge territory, leading to the resettlement of 10,700 people. This disaster caused thousands of casualties.

In April 1993, several newspapers reported that yet another tank of radioactive waste exploded at a weapons plant in the secret Siberian city of Tomsk-7. This explosion contaminated 2,500 acres and exposed firefighters to dangerous levels of radiation. Tomsk-7 is believed to be about 12 miles outside Tomsk, a city of half-a-million people. Since Tomsk-7 is secret, it is not on ordinary maps (The Arizona Republic, April 7; The Washington Post, April 8, 14; The Register-Guard, Eugene, Oregon, April 7, 8, 1993).

What’s Wrong with Storing Nuclear Waste Below the Ground?

Only two problems: #1, there is no material that will outlast its radioactive contents; #2, radioactive wastes are so active that their contents continuously produce heat, hydrogen gas and other labile products. Who will monitor this for 10,000 years? How will the contents be stabilized to prevent explosions and leakage of radioactive waste into the groundwater? Who will pay the astronomical costs?

However, during the 1980s burial became the official government policy, despite the objections of many scientists, and national organizations concerned about dangers to the environment. (See “Deep Underground Burial” below.)

Original article published Summer 1993; Updated May, 1997.
Lita Lee, Ph.D.; www.litalee.com ; Lita@LitaLee.com

You may wonder why you have never heard of this unique piece of science, this discovery: "With the Roy process, high-level nuclear waste can be neutralized and totally eliminated at each reactor site, where the waste is now stored in cooling ponds. When treated with the Roy process, these unstable radioactive isotopes rapidly decay into stable, non-radioactive elements creating heat in the process which can be used to generate steam to power existing electric generators."

Thirty-two years ago Dr. Roy shared with the world that nuclear waste could be neutralized and eliminated.... began speaking out against 'nuclear power'.

For Dr. Roy storage of nuclear waste underground is not an option. With the plutonium dissolved in a solution for storage in containers, heat is generated from the process of the continual breakdown of the nuclear radiation. The containers would have to be cooled for 250,000 years. It can't be done...
Dr. Roy said there is a solution for the greatest environmental crisis facing the planet (see above).

The reason the nuclear industrial complex do not like this discovery is because it is one step away from effectively rendering their fear and terror 'nuclear mega power' into a neutral and non-active state. Dr. Roy's discovery could lead to a peaceful yet powerful way of deactivating Plutonium "The Lord of Darkness".

If brilliant minds took this further then there is a safe and fundamental way to alter radioactive elements rendering them harmless or neutralizing them altogether.

The key word is TRANSMUTE .. the process of transmutation would effectively end the dominance and fear of man-made nuclear weapons, nuclear power stations and nuclear waste. As soon as you understand a chemical or nuclear process and you understand its nature, then you also understand what neutralizes that process.

The nature of man-made nuclear radiation is designed to be out-of-control. It is the out-of-control nature of this science that makes the reaction so attractive to those who seek power through greater forms of destruction and the resulting fear. Take away 'out of control' and the elements no longer provide that power to those who would wield it.

I predict that scientists and physicists in the years ahead will re-discover and apply the transmutation of dangerous elements into harmless forms that nature can easily digest and recycle. Until then ... it is important to understand 'the lie' ... and why the lie exists.

Sources:  http://www.lightparty.com/Energy/Radioactive.html
http://www.litalee.com/shopexd.asp?id=478
http://www.physicsforums.com/showthread.php?t=5552
http://www.gdr.org/phototransmutation.html

**Deep Underground Burial of Radioactive Waste**

Gary Vesperman has seen a Department of Energy estimate that the life-cycle cost of the abandoned Yucca Mountain, Nevada radioactive waste repository would have been $150,000,000,000.

From: Tommy.Smith@rw.doe.gov
To: vman@skylink.net <vman@skylink.net>
Date: Wednesday, January 28, 1998 11:29 AM
Subject: Re: Low-Energy Nuclear Transmutation

Dear Mr. Vesperman:

Thank you for your inquiry to the OCRWM National Information Center. Funding for OCRWM activities is subject to the Congressional appropriation process. Funds have not been provided for the research you cited. The scope of scientific work conducted by OCRWM is prescribed by the Nuclear Waste Policy Act (1982) and its amendments.

Many possibilities for permanent disposal have been studied in depth.
Based on a final Environmental Impact Statement prepared in 1980, and recommendations from groups such as the National Academy of Sciences, the U.S. Geological Survey, and several scientific organizations, deep underground disposal was chosen as the best option.

I would like to recommend the Department of Energy's Office of Energy Research as an additional resource for research and development information and comments. The Internet address is http://www.er.doe.gov/.

Sincerely,

Tommy Smith
OCRWM National Information Center

http://www.ifoldsflip.com/i/260797 displays the February 16, 2014 copy of the Las Vegas weekly “The Sunday”. It includes an article which profiles the key people for and against restarting the abandoned Yucca Mountain nuclear waste repository.

DOE Opposes Radioactivity Neutralization to Preserve Source of Bomb-Grade U and Pu

From the compilation of “Energy Invention Suppression Cases” pp 85-87 at www.padrak.com/vesperman:

From: David G. Yurth
Sent: Saturday, April 15, 2006 5:27 PM
To: 
Subject: Remediating Nuclear Waste Materials - UNLV

Dear Mr. Tetreault: After reading your article in the Las Vegas Review Journal entitled “Nuclear Project Draws Interest,” I thought it may be of interest to you to know that the DOE has played this game with university and privately funded laboratories for many years. Perhaps the most comprehensive review of this subject ever undertaken was prepared by Mr. Richard Shamp, President of Nuclear Remediation Technologies, headquartered in Hyattsville, Maryland (301) 559-5057.

Beginning in 1997, NRT and its chief scientist S-X Jin [once the highest ranked particle physicist in the People’s Republic of China, until he escaped to the US in 1994 while addressing the Institute of New Energy symposium in Salt Lake City, Utah] have been submitting critical laboratory documents to DOE, demonstrating the effectiveness of known technologies used to remediate radioactive emissions generated by nuclear fuel waste materials in both solid and liquid form.

After being finessed into providing all the definitive laboratory data to Dr. Frank Goldner of DOE’s nuclear remediation division, then Secretary of DOE Spencer Abraham attempted to confiscate, classify and impound NRT’s technology while at the same time pretending to be considering providing grant money to support its continued development.

The fact that the technology in question had already been awarded six patents [K. Shoulders et al] was the only thing that prevented him from succeeding. Instead of providing grant funding, Dr. Goldner was instructed to put an end to NRT’s pursuit of DOE funding for the development and deployment of its technologies. And that is precisely what he did.
During a conference call held on November 15, 2003, I was informed by Goldner that not only did DOE not intend to ever provide any funding to anyone for the purpose of remediating radioactive emissions in spent nuclear fuels, he insisted that it is and will continue to be DOE’s policy for the next 40 years to encapsulate and bury every ounce of high-grade nuclear waste material stored in the US underground at Yucca Mountain.

Further, he told us that any attempt to obtain any high-level nuclear waste materials for testing by anyone, including government funded laboratories, would be arrested and jailed without access to legal counsel under the Export Administration Act. I still don’t know what the EAA has to do with remediating radioactive emissions, but that is what he said.

In 1999, while Elliott Richardson was Secretary of DOE, NRT was awarded a discretionary grant of $2,000,000 for the purpose of advancing its test schedule. The work was to have been undertaken in concert with Dr. George Miley, physicist in residence at the University of Illinois at Champaign-Urbana. Dr. Miley’s laboratory at the Champaign-Urbana campus was level 2 accredited by DOE, and was therefore acceptable as a test and development site. However, within less than 90 days after the announcement of the grant had been published, pressure from within the Department rose to such extraordinary levels that Secretary Richardson was forced to withdraw the grant, albeit grudgingly.

The only similar technology ever contemporaneously developed in the US for the remediation of radioactive emissions in high-grade nuclear waste materials was developed in the late 1990’s by Dr. Paul Brown and his colleagues at World Atomics in Colorado Springs, Colorado. After being granted several patents for the ‘Nuclear Spallation Device’ he designed, Brown contracted with several Japanese contractors to build three successively powerful prototype versions of his device.

He had them built in Japan because DOE actively intervened more than a dozen times to prevent US companies from building it. The problem with Brown’s device was that it was little more than a small, semi-controlled nuclear fission-powered device designed to continuously bombard nuclear waste material targets with a highly charged gamma ray field. Because it was so dangerous to operate, Brown was never able to obtain the necessary State Department or UN transport clearances to have it shipped across international waters into the US for further testing and development.

As you may recall, Dr. Brown was killed shortly thereafter under the most questionable of circumstances, just as the utility of his nuclear spallation technique was about to be publicly demonstrated in Japan.

(Only a month before he died, Paul Brown met with me, Gary Vesperman, and a few of my business and science associates in Henderson, Nevada to present his method of neutralizing radioactive waste. His method is detailed in “Radioactivity Neutralization with Paul Brown’s Gamma Ray Method”. A few weeks after Brown’s suspicious fatal car accident, Art Rosenblum also died in a car accident. Rosenblum had been enthusiastically promoting Randall Mills’ Blacklight Power Inc.’s energy source.)

We have known how to safely remediate radioactive emissions from spent nuclear fuels, both liquid and solid, for nearly a decade. We have the test data and prototype apparatus to prove it. That data, including all the protocols, policies, procedures and experimental design criteria associated with our work have been submitted to DOE many times over – Dick Shamp can tell you all about it if you want to go to the trouble to ask him – with the net result that DOE will not allow the US Postal Service to deliver our proposals any longer. If you want to see what is really going on with nuclear remediation, this is a very good place to begin.

Thanks for writing your article – you’re about to find out how big Pandora’s box really is.
Spent fuel is hot stuff. It's thermally hot – about 400 degrees Fahrenheit. That's not residual heat from when the fuel was in the reactor; it’s decay heat from fission products with relatively short half-lives – from days or weeks to about 30 years for most of them (most isotopes of iodine, cesium, strontium, etc.). The fuel will stay well above the boiling point of water for centuries or even millennia, although the temperature will keep dropping over time.

(Note: The term "short" for the half-lives of most fission products compares to uranium, which is a billion years or more, or even plutonium, which is 10s of thousands of times more radioactive (SHORTER half-life) than uranium. Fission products are thousands of times more deadly than that, not counting Pu and U's heavy metal horrors.)

And speaking of the boiling point of water, above that you get steam. Steam is particularly hazardous to the zirconium cladding of the fuel rods. The zirconium separates the hydrogen from the oxygen in the water molecules of the steam, and the hydrogen atoms combine with each other as $\text{H}_2$, which is explosive. Because it's so hot and radioactive inside the dry cask, they can't monitor this process near where it's happening, inside the "dry" cask. They need to monitor the water content, as well as the hydrogen, oxygen, helium, and "fission gasses" that are emitted.

After draining the fuel rods by slowly lifting the entire dry cask assembly out of the spent fuel pool (about 15 years after it was used in the reactor) about 25 gallons of water will remain in the fuel assembly. This water must be removed through repeated drying processes which are only partially successful each time. After that, water seepage into the dry cask is also an ever-constant threat.

There are now about 50 and will be approximately 150 dry casks at San Onofre. Each one will need a constantly-operating monitoring system to know the levels of hydrogen and other gases in each cask. Such systems have not been designed for horizontally-stored casks such as are used at San Onofre. Instead, walk-by monitoring will be done for escaping radiation. That's not sufficient.

The threat of water intrusion comes from many sources. The dry casks will supposedly be submersible to 50 feet of water, according to regulations. But on the other hand, they will barely be above sea level, and the California State coast and waterways brochures state that everywhere along California's coast, 50-foot tsunamis are possible. Should we risk these "dry" casks on a coast with 9 million people within 50 miles...
and with so little margin of error?

In some ways, it's too bad the fuel isn't hotter, because if the temperature is above the "brittle/ductile boundary temperature" (which varies for every alloy of cladding and everything else in a fuel rod assembly) then it's much easier to move. But instead, the fuel has been cooling to well below that temperature, and now it's very brittle and difficult to deal with. As it gets older it also gets more and more embrittled, and so, even more difficult to deal with. That is where we are heading here at San Onofre.

Additionally, in high burn-up fuel, the ceramic pellets of uranium dioxide, which forms the bulk of the mass of the fuel rods (uranium is 1.7 times more dense than lead) fuses to the zirconium cladding. This is a very serious problem during later transport of the fuel, especially during postulated (let alone, greater-than-postulated) accidents, because the weight of the fuel on the ring of zirconium cladding is all concentrated on the very thin areas between the fuel pellets. So a force that was supposed to be spread out along the length of a pellet (about an inch) is instead borne nearly entirely by mere fractions of a millimeter. A crack means deadly fission products escape, a full rupture of a fuel rod means pellets drop out and could cause a criticality event when they gather at the bottom of the cask.

There are no shipping containers which the NRC has licensed for transporting high burn-up fuel, and worries about criticality events is one reason why. There aren't even any dry cask storage containers which have been licensed beyond the 20-year period for storage of high burn-up spent fuel. As recently as last March, the NRC's own experts can be heard at a meeting stating that tests for the quality of such containers should take at least 10 years to conduct – and that's after the regulators have already conducted preliminary experiments to determine the type of testing that needs to be done! But it's the nuclear industry's job to actually do the tests (according to the NRC). The tests need to be done for each type of cladding. All zirconium alloys behave uniquely, and the industry hasn't even started to develop a plan for a test, let alone started a test of their systems for long-term storage or for transport afterwards.

However, despite these "known unknowns," high burn-up fuel IS being used around the country, and IS being loaded into dry casks, which are currently licensed for up to 20 years sitting on site wherever they happen to be produced. Never mind the pressures from vibrations of ocean waves and rails and truck routes a few feet away and all those unknowns. Never mind that there is no national plan to move the fuel ever. Never mind all that, so that operating reactor sites can keep making more waste.

High burn-up fuel allows reactor companies to keep operating even when they would otherwise be unprofitable. It also wears out the steam generators and/or other components of the reactor faster. It's no bargain for society to let the utilities get away with using high burn-up fuel!

Sincerely,

Ace Hoffman
Carlsbad, CA

Ace Hoffman, Owner & Chief Programmer, The Animated Software Co.
POB 1936, Carlsbad CA 92018
U.S. & Canada (800) 551-2726; elsewhere: (760) 720-7261
home page: www.animatedsoftware.com
From: Helen Caldicott
To: 'Gary Vesperman' <garyvesperman@yahoo.com>
Sent: Sunday, September 29, 2013 8:34 PM
Subject: RE: High burn-Up spent nuclear fuel: The problems multiply...

Gary this is high burn-up spent fuel, 4.5% enriched U-238 instead of 3%

From: Gary Vesperman [mailto:garyvesperman@yahoo.com]
Sent: Saturday, September 28, 2013 2:35 PM
To: Gary Vesperman
Subject: High burn-Up spent nuclear fuel: The problems multiply...

Ace writes here that the NRC has not licensed any shipping containers for transporting spent nuclear fuel. So how is spent fuel to be transported to the Yucca Mountain nuclear waste dump? I am confused about the Yucca Mountain dump. Gary Vesperman

From: David G. Yurth
To: 'Gary Vesperman' <garyvesperman@yahoo.com>
Sent: Saturday, September 28, 2013 3:03 PM
Subject: RE: High burn-Up spent nuclear fuel: The problems multiply...

Gary –

I have beat my head against this wall since 1994, when S-X Jin, David Faust and I began testing high-density charge clusters as a way of remediating radioactive emissions produced by spent nuclear fuels. We developed a system that was totally viable. We developed the math that explained what it was and how it worked. We conducted the experimental protocols for 7 years and documented the procedures that were used to enable and sustain it. We submitted this info to US DOE in 2003 by invitation. In 2004 our system was independently validated by the guys at Sandia Labs.

In 2005 I was contacted by Dr. Frank Goldner, the senior nuclear scientist responsible for developing and testing remediation technologies at the agency. He screamed at me and threatened to have me and Dick Shamp arrested under FISA unless we stopped sending documentation to the Department and discontinued our work. I stopped. Dick did not.

In 2009, after Obama was elected, Dick contacted the #3 guy at DOE, a career bureaucrat who has served as personal private secretary to the Sec’y of DOE for more than 30 years named Dr. Eysan Khan. He apologized profusely for the way we had been treated and invited me to come to DC to present the HDCC methodology to all 26 of his senior department heads. Two weeks before I was scheduled to make the trip, he called to tell me that he had gotten so much push-back from ‘clients’ of DOE about my presentation that he couldn’t tolerate the pressure. The presentation was cancelled.
This has nothing to do with Yucca Mountain. It has everything to do with the government’s secret and unlawful use of public utilities who generate atomic power as the source for high-grade uranium and weapons-grade plutonium. They don’t want the problem solved because it would deprive them of their only viable source of supply. They don’t give a fart in a windstorm about the risks they impose on local populations like Fukushima – all they care about is using nuclear weapons to control the planet. And they are getting away with it. That’s why this subject makes no sense to anyone who talks about it – the real agenda has nothing to do with public safety or possible catastrophic contamination of the planet.

Dave Yurth

Dave Yurth and Richard Shamp generated the following form letter March 6, 2006 as a way to respond to the inquiries they received after the release of an announcement that Nova Institute of Technology, Inc., had awarded a contract for development of their radioactive waste remediation technology to Nuclear Remediation Technologies, Inc. It tells their story and explains where their intellectual property could be applied to resolve the kind of problems now being dealt with at Fukushima.

[Date]

[Name]  
[Title/Company]  
[Address]  
[City/ State/ Zip Code]  
[Telephone]  
[Fax]  
[Email]  
[Web address]  

Ref:  \textit{NRT Proposal – Prototype Testing & Applications Development}

Dear [name]:

Nuclear Remediation Technologies and its affiliates have been working for more than a decade to develop a technology to neutralize the radioactive emissions generated by high-level nuclear waste materials. Our primary objective is to develop a technologically feasible, commercially viable means for neutralizing nuclear waste materials created by power plants and other essential strategic sources \textit{in situ}. We are convinced that it is simply suicidal to transport high-level nuclear waste materials across the country for burial under Yucca Mountain, the Goshute Indian Reservation in Western Utah and other similar waste depositories, as proposed by DOE. Even if the Yucca Mountain alternative were technologically feasible, the NRT solution will still save the nuclear industry and the taxpayers tens of billions of dollars each year. After conducting basic research for more than a decade to prove the technological viability of the underlying science used to reduce radioactive emissions in high level waste materials, NRT forwarded detailed development proposals to Secretary Spencer Abraham, Deputy Under-Secretary Frank Goldner and others at the Department of Energy (see background). Despite the fact that the technology has been categorically demonstrated to reduce alpha and gamma emissions from nuclear fuel wastes; and, further, in spite of the fact that all the data needed to rigorously document the efficacy of the proposed treatment modality has repeatedly been forwarded to DOE for review and consideration; and, further, notwithstanding the fact that DOE’s technical analysis of NRT’s proposals has confirmed the technological viability of the solution we have proposed; and, finally, regardless of the fact that the technologies integrated to provide the NRT solution have all been awarded Letters Patent by the USPTO, nevertheless
all the requests for funding submitted to develop working prototypes under the review and control of DOE’s own accredited laboratories have all been rejected.

In November 2004, Dr. Frank Goldner, Director of the Division of Radioactive Remediation Technologies, was directed by DOE Secretary Abraham to demand that we cease and desist sending further documentation and proposals to DOE and, further, to advise us that the Department of Energy’s prime directive is to encapsulate and bury radioactive nuclear waste materials at Yucca Mountain. As a matter of policy, despite its public pronouncements to the contrary notwithstanding, Mr. Goldner informed NRT that the U.S. Department of Energy will no longer support efforts to treat radioactive wastes by any means other than encapsulation and burial.

Recent estimates by the DOE suggest that after the Department has expended in excess of $40 billion to operationalize the Yucca Mountain nuclear waste repository, more than $12 billion will be expended each year to encapsulate, transport, deposit, store, secure and manage the accumulated solid and liquid waste materials buried beneath the ground in Western Nevada. In contrast, NRT’s estimates suggest that five (5) working prototypes, ready for field testing in their beta configuration, can be prototyped, tested, and deployed over a period of no more than 36 months at a cost of less than $10 million. The background material attached to this correspondence identifies the timelines, milestones, budgetary requirements and control mechanisms developed by NRT and its affiliates for this project, as incorporated into the testing and development regimen previously submitted to DOE.

The principal advantages provided by NRT’s solution include the following:

- On-site remediation and treatment capability at each nuclear fuel plant [e.g., the US Navy’s nuclear fleet, local and regional electrical power generation plants, etc.] The process is specifically responsive to DOE’s call for a technology solution which transmutes radioactive materials into other, more benign alternatives.
- Elimination of the need to transport high-level nuclear waste materials by road and rail, through highly populated urban areas.
- Provides for a transportable solution which can be moved on demand from site to site to treat radioactive emissions resulting from Naturally Occurring Radioactive Material (NORM), tar sands, current low-level radioactive storage sites [e.g., Energy Solutions, etc.], as well as high-level solid and liquid wastes already stored at more than 140 US sites.
- Eliminates the need to handle liquid nuclear waste materials for the purpose of separating solid actinides [for example] via centrifuge and other particulate separation techniques [e.g., Westinghouse at Savannah River, etc.].
- Elimination of the dangers arising from neutron embrittlement. This phenomenon has been shown by NIST, DOD and DOE independent scientific analysis to reduce containment vessel viability to less than 100 years, in all ‘best case’ scenarios developed by DOE using the most advanced ceramic encapsulation materials yet devised by modern science.
- Extraction of at least as much usable energy from the nuclear waste materials as provided in their original enriched condition. This will (a) reduce the demand for additional fuel rods until existing fuel rod stocks have been rendered radioactively inert by remediation, and (b) substantially reduce the cost of operations associated with storing, managing and securing waste materials on-site.
- Eliminates the opportunity for conversion of expended uranium and thorium to weapons-grade plutonium isotopes. The availability of this technology could significantly alter the level of imminent danger imposed by the lawless development of nuclear weapons by rogue nations [e.g., North Korea and Iran].
- Provides follow-on technologies providing the enhanced capacity for atomic and materials engineering.
Please take a moment out of your busy schedule to review this document. We are convinced that it represents one of the most important greatest technological break-throughs of our time. Political considerations need not limit its development or deployment. Please feel free to contact us at your earliest convenience. We are eager to move forward with the development, testing and eventual deployment of this technology and will be most appreciative of any consideration or support you are able and willing to provide.

Respectfully yours,

Richard M. Shamp
Chairman and President

David Yurth
Director: Science and Technology

U.S. Government’s Vicious Suppression of Recycling Nuclear Waste

The Problem of Recycling Nuclear Waste

A view of the Hope Creek nuclear power plant near Hancocks Bridge, New Jersey. Salem, in the foreground, has 2 Westinghouse 4 Loop PWR units. In the background is the single General Electric BWR-4 Hope Creek unit.

NOTE ADDED ON DECEMBER 11, 2008.

The content below of this webpage (http://www.nuclearwasterecycling.com/) was written in July 2000 (and it has been left unchanged) following the failure to conduct the World Congress on Recycling Nuclear Waste in both the U.S.A. and Europe because of obstructions by responsible governmental offices in both countries so incredible that cannot be reported here for fear of losing credibility. We merely leave the reader with the evidence that such an important conference could not be conducted in both the U.S.A. and Europe despite the world caliber of the organizers and documented repeated attempts. The announcement has been left in the website of the Institute for Basic Research (IBR) as a memento for these incredible occurrences.
The evident reason for said obstructions was the primary objective of the meeting, that of gathering the best scientific minds in the world to initiate in depth mathematical, theoretical, experimental and industrial studies on the recycling of nuclear waste via its stimulated decay in the pools of nuclear power plants. The main argument is that, since the nuclei here referred to are very large and naturally unstable, it is quite plausible to expect the existence of various mechanisms that would stimulate their decay, from mean lives of thousands of years down to practically valuable mean life of the order of seconds, minutes or days, depending on the case. In fact, several mechanisms have been identified, and some of them even patented, by their authors have received life threats and had to abandon their studies. This web site is dedicated to the privately funded research in the field by the Italian-American scientist Prof. Ruggero Maria Santilli (Curriculum).

The origin of life threats is that the stimulated decay of nuclear waste would avoid the transportation and storage of nuclear waste in the Yucca Mountain and other depositories. The evident problem is that such a solution would prevent the dispersal of billions of dollars in taxpayers money by the US and European governments, with evident loss by governmental officers and their affiliated corporations of notorious gains resulting from the dispersal of billions of dollars in public funds.

Due to threats received by researchers in nuclear waste recycling not aligned with governmental regimes in the U.S.A. and Europe, Prof. Santilli and all members of the IBR have abandoned all research in the field in the year 2000 with the commitment never to resume them again. To our knowledge, the action by institutionalized cartels so clearly against the interest of society has been so effective, that no serious research has been done in the field, except for orchestrated work intended to provide the perception of serious research in the field, while studiously avoiding the addressing of the main issues.

A number of courageous authoritative condemnations of clear governmental oppositions to basic societal needs for personal gains by governmental officers and their affiliates, have been voiced around the world. We here indicate the book and references quoted therein Exploding a Myth, by Prof. J. Dunning-Davies,, University of Hull, England, Horwood Publishing (2007).

Nevertheless, out a sense of social duty, we would like to indicate for interested scientists and observers the following main advances occurring since the year 2000, because potentially relevant for the recycling of nuclear waste by the nuclear power plants themselves in their own pools. The hope is that, perhaps, one day, society will understand the necessity of preventing the political control of science by governmental, corporate and academic complex, and only thereafter be in a position of seriously addressing major environmental problems, such as the recycling of nuclear waste.

The most salient scientific event in the field known to us since the year 2000, has been the completion of systematic mathematical, theoretical and experimental studies by Prof. Santilli on the structure of the neutron and its synthesis from a proton and an electron as occurring in stars. A comprehensive review of these studies is now available in the website under construction The R. M. Santilli Foundation that contains original scientific works in free pdf downloads (when copyrighted), including most of the literature quoted at the end of this website.

The technical presentation of the studies is available in five volumes recently written by Prof. Santilli and available as free download from the website Hadronic Mathematics, Mechanics and Chemistry, Volumes I, II, III, IV and V.

A short review of these studies, readable by the general, well educated public, is that by Prof. J. Kadeisvili available in the website The Rutherford-Santilli neutron.
Prof. Santilli has conducted extensive experimental verifications on the laboratory the synthesis of neutrons from protons and electrons via electric arcs within a hydrogen gas. This experimental work is available in free pdf download from the website http://www.i-b-r.org/NeutronSynthesis.pdf. Pictures and scans of the tests are available from the website http://www.neutronstructure.org/neutron-synthesis.htm

Hoping not to receive additional threats, Prof. Santilli has applied the results of the fundamental synthesis of the neutron to nuclear syntheses under his novel, industrially funded, Intermediate Controlled Nuclear Fusions, called intermediate because occurring at threshold energies intermediate between those of the failed "cold" and "hot" fusions, and controlled because nuclear fusions are truly controlled via the control of power, pressure, currents, temperature, polarizations, riggers, and other means. A report dated early 2008 is available in free pdf download from the website Intermediate Controlled Nuclear Fusion.

As one can see, the industrial (and certainly not governmental-academic) funding is devoted to the synthesis of nitrogen from carbon and two hydrogen atoms via the intermediate synthesis of the neutron. The mechanism is that of electric arcs patterned along the nitrogen synthesis expected in lighting. A point important for society is that the synthesis of the nitrogen can occur if and only there is NO release of neutrons or other massive radiations, because of unavailable energies at threshold, absence of instabilities and other reasons. Hence, Santilli's synthesis of nitrogen is truly clean because it does not release harmful radiations, and it does not leave radioactive waste (since it turns light, stable natural elements into light, stable, natural elements).

As well documented, Prof. Santilli (a theoretician) requested for some thirty years to all major physics laboratories around the world to test the most fundamental synthesis in nature, that of neutrons from protons and electrons as occurring stars, because evidently necessary for any serious study of subsequent nuclear syntheses as currently attempted with the "cold" and "hot" fusions.

As equally documented, Prof. Santilli received in return "discreditations" for just proposing the test, because known to be contrary to Einsteinian and quantum doctrines (see the above quoted literature for the technical reasons). Hence, in 2006 he decides to conduct the tests himself at the IBR laboratory in Florida with the assistance of the Institute technicians Terry Allen, John T. Judy, Eugene West, Ray Jones and Jim Allen. Following over one year of running the tests, the collaboration of three U. S. companies supplying various neutron detectors, and numerous verifications (including the evacuation of the laboratory twice because of excessive sonic and vibrational alarms by all neutron counters), the tests were indeed successful, as reported in the above quoted experimental paper and related web site.

Subsequently, Prof. Santilli has contacted again various physics laboratories around the world requesting, this time, to verify or deny the results achieved by his group, again, due to their transparent fundamental relevance and their very limited cost (a hydrogen chamber traversed by a DC arc), which cost is lilliputian compared to the extremely high costs of other experiments preferred by academia these days, even those of immensely smaller scientific relevance and no value whatsoever for society.

Again, rather than collaborating, all contacted physics conduits disqualified Prof. Santilli's work on ground that it is "fringe science" (Wikipedia), "fraudulent," and the like, under the full knowledge, particularly by qualified academicians, that experimental results can only be dismissed with counter-experiments, and absolutely not via theoretical theologies proffered in dirty academic corridors.

According to qualified informers whose names cannot be disclosed here to prevent their lives from being disrupted, at least two physics laboratories have repeated Prof. Santilli synthesis of the neutron, but have received orders not to disclose the results. It is evident that, had these departments achieved negative results, they would have propagated the dismissal of Prof. Santilli's neutron synthesis all over the scientific

Radioactivity Neutralization Methods -40- May 30, 2014
world. Since the results of the reruns are positive, they cannot be released because establishing incontrovertible limits of applicability of Einsteinian and quantum doctrines, not for conditions they were conceived for (atomic structure), but for conditions beyond those of their original conception.

At any rate, Einsteinian and quantum doctrines are fully reversible over time because reflecting the time invariance of the systems intended to be described, electron orbits around nuclei that are indeed time reversal invariant, in which case Einsteinian doctrines and quantum mechanics are indeed exactly valid. However, whether stimulated or natural, nuclear waste decays, as well as all energy releasing processes, are manifestly irreversible over time (their time reversal image violates causality). Therefore, any belief that the time reversal invariant, Einsteinian and quantum doctrines are exactly valid for irreversible processes, such as nuclear waste decays, is clear scientific corruption because the selection of the appropriate generalization of Einsteinian and quantum theories should indeed be subject to scientific debates, but not their need.

Due to the above unreassuring condition of academic "pseudo-science" popularly perceived as being "serious science," and in view of past threats, Prof. Santilli elected NOT to conduct the last and most important test for nuclear waste recycling, *the stimulated decay of the neutron via resonating photons and other triggers*, and no plan for such a test exists at the IBR to our knowledge at this time.

It is time for society to wake up, admit the incontrovertible collapse of scientific ethics in governments and academia alike, prevent the control of science by political regimes, and only thereafter resume the control of its own destiny.

**William Pound**  
Chairman  
*International Committee on Scientific Ethics and Accountability*  
Clearwater, Florida

*SUGGESTED LINKS*  
The R. M. Santilli Foundation  
Institute for Basic Research  
Magnegas Technology  
Typescope

*Additional links are invited. Please contact "ibr(at)verizon(dot)net".*

July 25, 2000

**SCIENTIFIC AND POLITICAL ISSUES ON THE RECYCLING OF NUCLEAR WASTE**  
William F. Pound  
Chairman, Grant Committee  
Institute for Basic Research  
P.O.Box 1577, Palm Harbor, FL 34682, U.S.A.  
e-address ibr@gte.net

1. INTRODUCTION
The recycling of nuclear waste constitutes one of the largest problems of contemporary society all over the world. The problem requires a rapid solution since nuclear power plants have already passed the limit of safe storage of said waste. Politicians in the U.S.A., Europe and other countries favor the transportation and storage of said highly radioactive nuclear waste to a common dump at an estimated cost of hundreds of billions of dollars (as per official DOE estimates). Such a possible solution is strongly opposed by environmentalists since the waste will remain radioactive for tens of thousands of years, thus causing potentially lethal damages to the environment of future generations, e.g., in case of cataclysmic events.

In view of these aspects, the Italian-American physicist Prof. Ruggero Maria Santilli, President of the Institute for Basic Research in Florida (for a summary of his curriculum, see http://www.magnegas.com/ir00021.htm), as well as other physicists, have proposed various new means for the recycling of nuclear waste. Santilli’s method consists of certain resonating means which stimulate the decay of nuclei which are naturally unstable. Once decayed in a radiation protective environment (such as the pools of current nuclear power plants), the resulting debris are constituted by light, natural and stable elements, which, as such, do not constitute a threat to society. In this way, radioactive waste with mean lives of tens of thousands of years can be stimulated to decay into stable elements in short periods of time depending on the intensity of the resonating means, and can be of the order of minutes per pellet of radioactive waste. Santilli’s equipment is sufficiently small to be used by nuclear power plants, thus avoiding completely the transportation to a common dump. In particular, while the latter transportation would cost hundreds of billions of dollars to taxpayers, Santilli’s equipment is expected to be purchased by the nuclear power plants for future operations, thus avoiding a massive public expenditure.

Santilli’s recycling method has an unquestionable credibility, since the studies were initiated in 1978 at Harvard University under DOE financial support; the studies were then published in major refereed journals quoted in the references below; and the method has been confirmed by direct experiments also outlined below.

Despite that, according to documentation available to qualified observers, Santilli’s method for the recycling of radioactive nuclear waste via its stimulated decay has been STRONGLY OPPOSED by politicians and scientists alike. The strongest documented opposition has been that in the U.S.A. and the DGXII Division of the European Community in Bruxelles, which went to the extreme of opposing first, and then disrupting an international conference in the field under organization by the Institute for Basic Research which was intended to be attended by the best minds in the field from all over the world. As of today, it has been impossible to organize such a conference, while thousands of other, comparatively irrelevant international conferences are fully supported in the U.S.A. and Europe. Oppositions to Santilli’s method of waste recycling also exist in the politics of many other countries.

The reason for this incredible opposition by politicians is evident to all, and it is given by the loss of the immense political gains originating from the granting of the various contracts for hundreds of billions of dollars for the transportation and storage of the waste. All these huge political gains would evidently be eliminated by Santilli’s recycling method since its equipment would be purchased by the nuclear power plants, and the recycling would be done in the pools of current nuclear reactors.

As concrete examples, it is documented that the U.S. Vice President A. Gore was planning on these political gains to win the U.S. Presidency and that is the expected reason for his opposition to Santilli’s recycling method. Similarly, Mister Routti, Director of the DGXII Division of the European Community, whose primary duty is precisely that of solving the problem of nuclear waste, OPPOSED and DISRUPTED its collegial study by Professor Santilli and his associates also for personal gains, and no scientific study has been possible in Europe to date, specifically and solely, for recycling methods directly usable by nuclear power plants.
The situation in Russia is similar, e.g., the largest nuclear laboratory in Russia, the Joint Institute for Nuclear Research in Dubna refused in 1994 to conduct the basic experiments needed at that time for the verification of Santilli’s recycling (the possibility to stimulate the decay of the neutron), despite the offer in writing of complete financial support from the Institute for Basic Research!!! Similar political oppositions can be found in other countries, such as Brazil, where individual scientists such as Dr. Wladimir Guglinski and his associates are considering the filing of lawsuits against the Brazilian government to achieve an injunctive court order FORCING the Brazilian Government to conduct the necessary research and development.

This author strongly supports the action by Dr. Guglinski and actually considers such action the only possible solution. More specifically, after consultation with environmentalists and attorneys, this author supports the creation of groups of scientists and individuals in the various countries, such as U.S.A., Europe, Russia, Brazil, etc., and then the filing of class actions against the local governments. The power of politicians currently in control, or their successors, is such that only a court order can force local governments to conduct the necessary research for the recycling of radioactive nuclear waste in loco, where they are now.

Orthodox scientists all over the world are even more opposed than politicians to Santilli’s as well as any other method which would permit the recycling in loco of nuclear waste via its stimulated decay. This is due to the fact that the alteration of the meanlife of nuclear waste would constitute direct and incontrovertible evidence of a violation of Einstein’s special relativity and quantum mechanics. In this way, for different reasons, politicians and academicians have a strong bond for opposing qualified scientific studies in this huge societal problem.

In fact, the pillar of special relativity, the Poincare symmetry, predicts that composite systems such as nuclei have unchangeable and immutable characteristics. Moreover, Santilli’s recycling of nuclear waste is based on certain resonating effects acting on nonpotential and nonhamiltonian forces, that is, forces of contact, zero-range type which are dramatically outside Einsteinian doctrines, the latter being solely potential-hamiltonian as well known since first-year graduate studies in physics. Therefore, the sole consideration of Santilli’s resonating mechanisms to stimulate the decay of nuclear waste is pure anathema for orthodox academicians, since it implies the admission of limitations of these beloved doctrines, with evident huge damage to the academic, financial and ethnic interests that have been organized on Einsteinian doctrine during the 20th century.

As despicable examples of academic opposition, this author feels obliged to report the organized opposition to Santilli’s research at Harvard University, particularly due to Harvard’s physicists Misters S. Coleman, S. Weinberg and S. Glashow. It is well known, amply documented and internationally denounced that these guys forced the termination at Harvard of Professor Santilli’s research, despite the availability at that time of large grants from the U.S. Department of Energy.

As other gems of human, let alone scientific misbehavior, Mister Griffits, Director of the Institute for Advanced Studies in Princeton, New Jersey, U.S.A., PROHIBITED Professor Santilli to visit the IAS at his own expenses for the presentation of the basic theories underlying the new recycling, even though the theories had been just published in the prestigious Foundations of Physics Letters (see the references below), and had been invited for presentation at the VIII Marcel Grossmann Meeting on General Relativity in Jerusalem in June 1997!!! To understand the hysteria underlying the case, one should note that, in his capacity as Director of the Institute for Advanced Studies, Mister Griffits was fully aware that, in prohibiting Prof. Santilli to visit the Institute at his own cost, HE VIOLATED THE US LAW, because of evident discrimination in operations under public financial support. In fact, Mister Griffits knows well that he prohibited the visit by a scientist who has been recommended for the Nobel Prize since 1985 for his
achievements, while he readily permitted the visit of other scientists with comparatively insignificant achievements, which is a vulgar violation of U.S. Laws by the Institute for Advanced Studies, let alone scientific corruption.

Similarly, in 1992 Mister Renato Angelo Ricci, President of the Italian Physical Society, in his additional capacity of Director of the Italian Laboratory in Legnaro, PROHIBITED IN WRITING Professor Santilli to visit at his own expenses the Legnaro laboratory, Italy, to recommend the basic experiment underlying his recycling (the possibility to stimulate the decay of the neutron), even though Prof. Santilli was on his way back from an invited presentation of the background theory at CERN, Geneva, Switzerland. Along similar lines, Mister Iarocci, then Director of the Italian National Laboratories in Frascati, Italy (and now Director of the Italian money line for research, the Istituto Nazionale Fisica Nucleare), also PROHIBITED Professor Santilli to present the same basic experiment to the leading Italian laboratory, in full, documented knowledge that the recycling of nuclear waste is one of the biggest duties of that laboratory. Along similar lines, thanks to full cooperation by corrupt local politicians, equivocal figures of the academic community in Rome, Italy, forced the closure of a division of the Institute for Basic Research at the Castle Prince Pignatelli in the region Molise, Italy, which division had been organized precisely for the study of the recycling of nuclear and other waste. The list of documented academic opposition against democracy of qualified scientific inquiries is so huge to be a real shame for contemporary society.

However, unlike other walks of life, quantitative scientific studies have their revenge against corruption. In fact, nowadays Santilli’s methods for the recycling of liquid waste (see http://www.santillimagnegas.com) are now under industrial production and sale, let alone development, while the corresponding methods for the recycling of nuclear waste, which are based on the same nonpotential principles, have already received a direct experimental verification.

2. THE BASIC EXPERIMENT UNDERLYING SANTILLI’S STIMULATED DECAY OF RADIOACTIVE NUCLEI

The main principle of Santilli's recycling of nuclear waste is the capability to stimulate the decay of the neutron via a photon with the particular resonating frequency (or energy) of 1.294 MeV, according to the reaction

\[(1) \text{Photon-resonating + neutron} \rightarrow \text{proton + electron + antineutrino.}\]

The above possibility has been confirmed by experiments conducted by Prof. N. Tsagas at the Nuclear Physics Laboratory of the University of Thrace, Xhanti, Greece, as well as by additional tests conducted in utmost secrecy owing to the organized opposition by politicians and academicians indicated in Section 1. Santilli’s test (1) is quite simple and can be repeated at any physics laboratory. It consists in the use of a disk of Eu(52) or other sources of resonating photons with 1.294 MeV energy. This europa disk is matched with a disk of an isotope admitting said stimulated decay of the neutron, most notably Zn(30, 70), Mo(42, 100), and various other isotopes (note that STABLE nuclei in general DO NOT admit Santilli’s stimulated decay, because numerous conservation and other laws have to be met, although the stimulated decay is admitted by all UNSTABLE nuclei – see the technical literature). The pair of Eu-Mo disks is then exposed to a detector capable of measuring the ENERGY of emitted electrons, such as a scintillator. This very simple experimental apparatus is then shielded from primary sources of radiations.
A schematic view of Santilli’s stimulated decay of the Mo(100, 42).

Three measurements of the energy of the emitted electrons are generally conducted: 1) Measurements of the background in the absence of the europa and other sources; 2) Measurements in the presence of the europa source alone; and 3) Measurements for the coupled europa-molybdenum pair. These comparative measurements have established the emission by the coupled Eu-Mo disks of electrons with well over 2 MeV energy which can ONLY be explained as originating from the stimulated decay of the peripheral neutron of the molybdenum. In fact, electrons originating from Compton scattering between the resonating photon and peripheral atomic electrons can at most have 1 MeV energy, as established by quantum electrodynamics. Electrons with energy above 2 MeV can, therefore, safely be assumed to originate from the decay of neutrons according to Santilli’s law (1).

Once law (1) is proved for natural light, stable elements such as molybdenum or zinc, its validity for unstable elements such as those of nuclear waste is so obvious as to require no comment.

It should be indicated that the basic law (1) is indeed admitted by conventional quantum mechanics. However, its cross section is claimed to be very small for all energies, thus having no industrial or practical value. The reader should be aware of the politics here. Absolutely, positively, the cross section of reaction (1) has NOT been measured at ALL energies. It is CLAIMED so for scientific corruption. In reality, reaction (1) has been only measured for a few energies and positively NOT for 1.294 MeV.

The generalized scattering theory underlying Santilli’s recycling of nuclear waste (which can be constructed via a nonunitary transform of the conventional scattering theory according to a method provided below) confirms that the cross section of reaction (1) is indeed very small at all energies, EXCEPT FOR A LARGE RESONATING PEAK AT 1.294 MeV. The case is reminiscent of the large peak in the cross section which predicted in the 1960s the existence of the Omega-Minus particle.
The setup of Tsagas experiment on Santilli's stimulated decay of the neutron

3. MAIN LINES OF SANTILLI'S EQUIPMENT FOR THE RECYCLING OF NUCLEAR WASTE

Santilli’s recycling equipment is under international patent pending. Research on this equipment is permitted without any payment, and is actually solicited due to the societal importance of the issue, PROVIDED that such research is fully disclosed to Prof. Santilli and his paternity fully acknowledged.

Santilli’s recycling equipment is constituted by a coherent beam of the indicated resonating photons which can today be achieved via a small electron-positron synchrotron of about 2 meters in diameter, and other means. The exposure of UNSTABLE nuclei to such a beam implies the decay of a number of its peripheral neutrons, the disruption of the strong component of the nuclear force and other effects which cannot be disclose prior to the achievement of said patents.

Each of the above effects, alone, is sufficient to cause the instantaneous decay of unstable heavy nuclei which, when left isolated, would otherwise have a mean life of tens of thousands of years. Said stimulated decay has to occur within a radiation absorbing environment such as the pool of current nuclear reactors. Once these heavy nuclei decay, their end products are stable and consist of light natural stable elements, including helium and hydrogen.

In more specific terms, Santilli’s equipment consists of the following: 1) The source of coherent photons with said resonating frequency; 2) Pellets of radioactive waste as currently used in nuclear power plants placed directly in front of said source with the cylindrical symmetry axis along the direction of said beam; and 3) Automatic-electronic means moving the radioactive pellet under said beam in such a way to cover its entire sectional area via subsequent passes.

To understand the process, one should remember that the nuclei of nuclear waste "are not" stable. On the contrary, said nuclei are "quite large and naturally unstable". Therefore, there must exist means for stimulating their decay. If Santilli’s process does not work, there will be others. Thus, on scientific ground the only topic which is open for scientific debate is the appropriate MEANS to simulate the decay of radioactive waste. However, questioning a priori the EXISTENCE of such means is sheer scientific corruption.
A view of the detection by Tsagas of the background (top), the europa isotope alone (middle), and the europa-molybdenum pad (below) showing the detection of emission over 1 MeV that can solely be of nuclear origin, thus confirming, although in a preliminary way, Santilli’s prediction [43].

4. HADRONIC MECHANICS

As indicated in Section 1, Santilli’s process of stimulated decay "is not" compatible with quantum mechanics. Its quantitative study requires a covering of quantum mechanics which is known under the name of “hadronic mechanics”.

In a lifelong research Prof. Santilli has built a step-by-step structural generalization of Einstein's special relativity, the Minkowskian geometry, the Poincare' symmetry, the Hilbert spaces, and related quantum laws which have been specifically conceived for composite systems of constituents in "contact" with each others, such as hadrons, nuclei and stars.

These generalizations were called by Prof. Santilli "isotopic" because "axiom preserving". In fact, the generalizations here are considered essentially consisting of broader "realizations" of conventional abstract axioms.
The main feature of Santilli’s theories is that of admitting an "invariant" representation of "contact" effect which do not admit any potential or a Hamiltonian, thus being dramatically outside the descriptive capabilities of quantum mechanics.

In the now historic original proposal made at Harvard University in 1978 under DOE support (see Santilli’s three articles in the first volume of the Hadronic Journal, 1978) Santilli proposed that, since they cannot be represented with a hamiltonian by assumption, these nonpotential effects should be represented via a generalization of the trivial unit 1 of quantum mechanics into a nonsingular, positive-definite, integrodifferential $n \times n$ matrix or operator

$$E(t, r, \psi, \delta \psi, ...) = 1 / T(t, r, p, ..., ) > 0.$$  

Jointly, Santilli suggested the necessary compatible generalization of the trivial associative product $A \times B$ of matrices as used in quantum mechanics into a generalized product $A \ast B$ which is still associative (as a necessary condition for an isotopy),

$$A \times B \ast A = A \ast (B \times C) = (A \ast B) \ast C,$$

yet admits $E$, rather than 1, as the correct left and right unit

$$E \ast A = E \times T \times A = (1/T) \times T \times A = A \ast E = A.$$  

In subsequent decades, Santilli reconstructed the entire mathematics of quantum mechanics into a form admitting of $E$, rather than 1, as the correct unit, resulting in what are today called Santilli’s isonumbers, isofields, isospaces, isominkowskian geometry, isopoincare' symmetry, isospecial relativity, etc.

Jointly, Santilli generalized the basic laws of quantum mechanics, by presenting since the original proposal of 1978 the isoheisenberg equations in their finite and infinitesimal form

$$A(t) = [\exp(iHxTnT)] \times A(0) \times [\exp(-iHTnTnH)],$$

$$i \frac{dA}{dt} = [A, \ast H] = A \ast H - H \ast T = A \times T \times H - H \times T \times A,$$

$$[r, \ast p] = ixE, \ [r, \ast r] = [p, \ast p] = 0.$$  

In a paper of 1979, Santilli then proposed the corresponding compatible generalization of Schroedinger's equation which was subsequently also studied by various other physicists and mathematicians

$$i D|\psi> = H \ast |\psi> = H \times T \times |\psi> = E \times |\psi>$$

where $D$ is partial derivative.

5. INVARIANCE AND UNIVERSALITY OF HADRONIC MECHANICS

The reason why Prof. Santilli suggested the representation of nonpotential-nonhamiltonian effects via a generalization of the unit is that the unit is the basic invariant of any theory, whether conventional or generalized. Therefore, at this writing HADRONIC MECHANICS IS THE ONLY GENERALIZATION OF QUANTUM MECHANICS WHICH IS INVARIANT. It is easy to prove that hadronic mechanics
preserves the basic units of measurements, predicts the same numerical value for the same quantity under the same conditions at different times, admits a notion of hermiticity-observability which is invariant in time, and possesses ALL the same axiomatic properties of quantum mechanics. By comparison, it is easy to prove that other generalizations, such as those studies by E. Conte and various other studies, VIOLATE these basic conditions, thus having no known physical value of any type.

Similarly, it is easy to prove that HADRONIC MECHANICS IS "DIRECTLY UNIVERSAL", that is, it includes ALL possible generalizations of quantum mechanics (universality), directly in the frame of the observer and without any need of coordinate transformations (direct universality). This is due to the fact that the most general conceivable, nonlinear, nonlocal and nonpotential eigenvalue equation can always be written in Santilli’s form \( H(r, p) x T(t, r, p, |\rangle, ...) \), \( H x T =/= (H x T)^{\dagger} \).

6. SIMPLE CONSTRUCTION OF HADRONIC MECHANICS AND ITS INVARINACE

Today, hadronic mechanics is taught at various first-year graduate courses. Explicit and concrete applications of Santilli’s hadronic mechanics can be easily constructed by everybody via a "nonunitary" transform of any given quantum model, i.e.:

(7) \( 1 -> U x U^{\dagger} = E = 1/T =/= 1 \),

\( n \) (number) -> \( U x n x U^{\dagger} = n x (U x U^{\dagger}) = n x E \) (isonumber),

\( A x B -> U x (A x B) x U^{\dagger} = (U x A x U^{\dagger}) x (U x U^{\dagger}) \)

\( \{ -1 \} x (U x B x U^{\dagger} = A' x T x B' = A' * B' \),


\( U x (|\rangle > = (U x U^{\dagger}) x (U x U^{\dagger}) \)

\( \{ -1 \} x (U x |\rangle > = H' x T x |\rangle > = H' * |\rangle >, < | x > x 1 -> U x (\langle x | x > x 1) x U^{\dagger} = \langle x | x > x E, \)

eetc. etc.

Note that the TOTALITY of quantum mechanics formalism must be lifted in Santilli’s form. This includes functions, such as exponential and logarithm, and transforms such as Fourier or Laplace, differential calculus, etc. If only SOME of the formalism of quantum mechanics is lifted while the other is not, one ends up in a minestrone with no known physical or mathematical meaning or value.

An additional non-unitary transform must also be reformulated in the new isomathematics, yielding the “isounitary law”

(8) \( W x W^{\dagger} = E =/= I \),

\( W = W' x T^{\{1/2\}} \),

\( W x W^{\dagger} = W' * W'^{*} = W'^{\dagger} * W' = E. \)

The invariance of hadronic mechanics is then evident, e.g.,

(9) \( W'^{*} E * W'^{\dagger} = E, \)
\[ W^*(A*B)*W'^+ = A' x T x B' = A' * B', \]

etc, etc.

Note the NUMERICAL INVARIANCE OF THE ISOUNIT E AND THE ISOTOPIC ELEMENT T IN THE PRODUCT. Invariant units of measurements, invariant numerical results, invariant hermiticity-observability can then be proved by a first-year graduate student in physics.

By comparison, it is easy to prove that any other nonunitary theory, when formulated on CONVENTIONAL MATHEMATICS (THAT IS, EXPRESSED ON CONVENTIONAL SPACES OVER CONVENTIONAL FIELDS, ETC.) IS AFFLICTED BY CATASTROPHIC INCONSISTENCIES. Consider one such nonunitary theory, e.g., that by E. Conte. It is then easy to see then following catastrophic inconsistencies:

1) The basic units of measurements, say, m, are not preserved by the theory, trivially because its time evolution is nonunitary,

\[ (1) \ m \rightarrow m' = UmxU'^+ \neq m. \]

The theory then has no known application to experiments.

2) Quantities which are hermitean at the initial time, are no longer hermitean at subsequent times because the Hermiticity law now becomes

\[ (11) \ H^+ = T^{-1}xH^+xT \neq H^+ \]

which is different than \( H^+ \) because \( H \) and \( T \) do not necessarily commute. This implies that Conte’s theory has no known observables of any type.

3) The theory does not possess invariant numerical predictions. This occurrence can be easily proved for the simple case

\[ (12) \ UxU^+ \ (t = 0) = -1, \text{ and } UxU^+ \ (t = 15 \text{ sec.}) = 5. \]

Suppose that such a theory predicts, say, the value 5 eV at the time \( t = 0 \),

\[ (13) \ H x |> = 5 \text{ eV} x |>. \]

Then, the same theory at time \( t = 15 \text{ sec.} \) predicts the following DIFFERENT value

\[ (14) \ (UxHxU^+)^{-1} x (UxU^+) x (U|x>) = H x (1/E) x |> = 5 \text{ eV} x (Ux|x>) = 5 \text{ eV}|>, \]

\[ H x |> = 5 \text{ eV} x (UxU^+)|> = 25 \text{ eV} x |> \]

thus having no known value of any type.
Relativistic quantum mechanics and Einstein's special relativity have indeed permitted a good approximation of nuclear structures, as proved by the construction of nuclear power plants themselves which are based on these theories. However, the claim that these theories provide the final and ultimate, "exact" representation of nuclear structures is vulgar scientific corruption perpetrated for personal gains.

Among a river of evidence supporting the impossibility for Einstein's doctrines to be "exactly" valid for nuclear structure discussed in the literature of the 20th century (but ignored by academia) is the following argument repeatedly presented by Santilli. A NECESSARY condition for the EXACT validity of the Poincare' symmetry is that the systems represented have a KEPLERIAN STRUCTURE, namely, THE SYSTEMS ADMIT THE HEAVIEST PARTICLE AT THE CENTER and all remaining particles are in orbit around such a Keplerian center WITHOUT COLLISIONS. This is the case for all bound systems at large mutual distances, such as the ATOMIC or PLANETARY structures. In these cases we only have action-at-a-distance, potential force in which case Santilli's theory recover all conventional doctrines identically with $E = 1$.

Consider now nuclei. It is evident to all that NUCLEI DO NOT HAVE NUCLEI, namely, NUCLEI ARE NOT KEPLERIAN SYSTEMS. In fact, an arbitrary individual constituent (such as one proton or one neutron) can be the center of nuclei. Under this incontrovertible evidence a first-year graduate student can prove the following:

THEOREM 1: EINSTEINIAN DOCTRINES AND RELATIVISTIC QUANTUM MECHANICS "CANNOT" BE EXACT FOR NUCLEAR STRUCTURE BECAUSE NUCLEI DO NOT ADMIT KEPLERIAN NUCLEI. PERIOD.

This proves that, again, Einsteinian doctrines can indeed provide a first approximation of nuclear structures, but the claims that they are "exactly" valid in a final form is vulgar corruption. We may debate which GENERALIZATION of Einsteinian doctrines is applicable to nuclei, but NOT its need.

Prof. Santilli isospecial relativity, isopoincare' symmetry and relativistic hadronic mechanics have been constructed precisely to represent bound states of particles under CONTACT NONPOTENTIAL INTERACTIONS characterized by the isounit E or, equivalently, the isotopic element T in the isoscroedinger's equation $HxTx|\psi\rangle = Ex|\psi\rangle$. Therefore, a first-year graduate student can prove the following:

THEOREM 2: THE SYSTEMS REPRESENTED BY SANTILLI'S ISOSPECIAL RELATIVITY AND RELATIVISTIC HADRONIC MECHANICS "CANNOT" BE KEPLERIAN, BECAUSE THE CONSTITUENTS ARE IN CONTACT WITH EACH OTHER BY CONSTRUCTION.

Once these basic notions are technically understood, it is easy to see the basic mechanisms of Santilli's stimulated decay of radiative nuclei. This decay has nothing to do with the hamiltonian $H = p^2/2m + V(r)$ in the basic equations because this hamiltonian can ONLY represent action-at-a-distance POTENTIAL interactions for which indeed no change of the lifetime of nuclei is possible. Santilli’s mechanisms of stimulated decay solely act on the NONPOTENTIAL EFFECTS represented by E or T. That is the BIG difference and novelty.

It happens that these nonpotential effects are fundamental to achieving an attraction among constituents in contact with each other, as proved at the hadronic, nuclear and molecular levels (see the technical literature for this crucial point). As a result, mechanisms which resonate NONPOTENTIAL contributions disrupt the
entire nuclear structure, let alone the structure of the individual neutrons. Instantaneous decay of unstable nuclei is then consequential. A graduate student can then prove the following:

THEOREM 3: RESONATING MECHANISMS ON THE STRONG NUCLEAR FORCE OF RADIOACTIVE NUCLEI CAUSE THEIR DECAY.

In fact, said resonating mechanisms imply that, locally, Santilli’s isounit recovers the conventional value, $E \rightarrow 1$, in which case, particles are no longer in CONTACT, thus implying the separation of the system.

8. CONCLUSION

While in the past century Einsteinian doctrines and quantum mechanics did permit historical achievements, today, the same doctrines are the real enemy of society because the surpressing of said doctrines is now mandatory to resolve large societal problems, such as the recycling of nuclear waste or the achievement of new clean energies and fuels.

As a consequence, any scientist or individual who supports the final character of Einsteinian doctrines and quantum mechanics for the representation of nature is a real enemy of society.

9. REFERENCES

SUMMARY OF CURRICULUM VITAE OF PROF. SANTILLI

(http://www.magnegas.com/ir00021.htm)

DENUNCIATION OF POLITICAL CORRUPTION


http://home1.gte.net/science2

TECHNICAL REFERENCES

Santilli’s original refereed publication on the recycling of nuclear waste under patent pending:

Patents on other methods which could be added to Santilli’s recycling


The first known reference on (p, q)-deformations of Lie’s theory and Heisenberg’s equation sin the literature (which dates to 1967, but it is not quoted in the river of papers in the field)

Mathematical Foundations of Santilli’s recycling.

P. Vetro, Editor, Rendiconti Circolo Matematico Palermo, Suppl. Vol. 42, 1996, special issue entirely dedicated to Santilli’s iso-, geno- and hyper mathematics and their isoduals

Main references on hadronic mechanics


Main references on Santilli’s isospecial relativity


Grand unification including gravitation permitted by isomathematics admitting all recycling of Santilli’s type as a particular case:


Main references on hadronic superconductivity


Main references on hadronic chemistry and its new model of molecular structure:


Main references on Santilli’s isodual theory of antimatter


Systematic review of the new structure models of hadrons, nuclei and molecules permitted by hadronic mechanics and their vast experimental verifications


Main reference on the catastrophic mathematical and physical inconsistencies of non-unitary theories formulated over conventional mathematics


Some mathematical studies in the field by other authors are given by
Same physical studies by other authors are given by:


Hadronic mechanics is also treated by some 15 post Ph.D. monographs and about 50 volumes of Proceedings of international conferences held in the USA, Europe and Asia which cannot be listed here for brevity (see the references of the above quoted primary literature).

Las Vegas energy expert Robert Nelson (see his www.rexresearch.com) has found and emailed to Gary Vesperman this patent by Santilli:

US2003016774 Method and apparatus for stimulated beta decays
R. Santilli

Abstract -- Method for the synthesis of neutrons from protons and electrons comprising apparatus for said protons and electrons to have a threshold relative energy of about 0.80 MeV, for said protons and electrons to be in anti-parallel coupling, and for forcing said protons and electrons in anti-parallel coupling to be at a mutual distance essentially of one Fermi. Another embodiment includes a method for the stimulated decay of a peripheral neutron in a nucleus. Another embodiment includes apparatus for the stimulated beta decay of a natural isotope into another natural isotope, the latter having the same number of nucleons of the former and one additional proton, wherein the conservation of total energy, angular momentum and parity are satisfied. Another embodiment includes apparatus for the stimulated beta decay of radioactive waste.

Energy and Radioactivity Neutralization Invention Suppression Cases

More cases of viciously thorough suppression of energy inventions as well as radioactive waste neutralization methods are available at www.energysuppression.com which is maintained by Sterling Allan and his friends. Gary Vesperman’s 123-page compilation of 95 energy invention suppression cases is accessible at www.padrak.com/vesperman and also at www.byronwine.com (do Find for Vesperman). Other sites can be found by entering in google.com Vesperman suppression and energy suppression.

President Obama’s federal stimulus program, the American Recovery and Reinvestment Act, was designed to help the U.S. economy recover from the 2008 financial crisis and subsequent recession. One of its missions was to increase alternative energy production by funding bland energy projects such as spending $17 billion in renewable energy tax cuts and $5 billion to weatherize homes. These funds were distributed to and administered by the 50 states.

Due to corruption within the U.S. Department of Energy funding of new energy inventions was specifically banned. If each of the 50 states had instead been directed to allocate a very small percentage such as 3% of their energy money to proactively finding and investing in new energy inventions, a creative mixture of new energy inventions may well have started entering the commercial marketplace by now. Also, a cadre of scientists, engineers, and technical support people would have been provided interesting high-paying jobs learning about and implementing new energy inventions.

This compilation of “Radioactivity Neutralization Methods” includes the following incidents of suppression:

Do not be surprised if you learn that the nuclear industry makes billions of dollars by being a part of government’s policy of burial of nuclear wastes. It is not in their financial interest to try any other process. They are not idealists.” (Radha R. Roy, Ph.D., Professor Emeritus Nuclear Physics)

Dr. Radha Roy was offered $5 million dollars for his transmutation process by a group of lawyers representing a large company. Dr. Roy was about to sign contracts and told these lawyers he would be available to their company as consultant. Then these lawyers told Dr. Roy, "It is not going to be developed." They wanted to buy it....to kill it! Dr. Roy expelled these lawyers and began getting death threats!

David Yurth reported above:

After being finessed into providing all the definitive laboratory data to Dr. Frank Goldner of DOE’s nuclear remediation division, then Secretary of DOE Spencer Abraham attempted to confiscate, classify and impound NRT’s technology while at the same time pretending to be considering providing grant money to support its continued development.

The fact that the technology in question had already been awarded six patents [K. Shoulders et al] was the only thing that prevented him from succeeding. Instead of providing grant funding, Dr. Goldner was instructed to put an end to NRT’s pursuit of DOE funding for the development and deployment of its technologies. And that is precisely what he did.

During a conference call held on November 15, 2003, I was informed by Goldner that not only did DOE not intend to ever provide any funding to anyone for the purpose of remediating radioactive emissions in spent nuclear fuels, he insisted that it is and will continue to be DOE’s policy for the next 40 years to encapsulate and bury every ounce of high-grade nuclear waste material stored in the US underground at Yucca Mountain.
Further, he told us that any attempt to obtain any high-level nuclear waste materials for testing by anyone, including government funded laboratories, would be arrested and jailed without access to legal counsel under the Export Administration Act. I still don’t know what the EAA has to do with remediating radioactive emissions, but that is what he said.

In 1999, while Elliott Richardson was Secretary of DOE, NRT was awarded a discretionary grant of $2,000,000 for the purpose of advancing its test schedule. The work was to have been undertaken in concert with Dr. George Miley, physicist in residence at the University of Illinois at Champaign-Urbana. Dr. Miley’s laboratory at the Champaign-Urbana campus was level 2 accredited by DOE, and was therefore acceptable as a test and development site. However, within less than 90 days after the announcement of the grant had been published, pressure from within the Department rose to such extraordinary levels that Secretary Richardson was forced to withdraw the grant, albeit grudgingly.

The only similar technology ever contemporaneously developed in the US for the remediation of radioactive emissions in high-grade nuclear waste materials was developed in the late 1990’s by Dr. Paul Brown and his colleagues at World Atomics in Colorado Springs, Colorado. After being granted several patents for the ‘Nuclear Spallation Device’ he designed, Brown contracted with several Japanese contractors to build three successively powerful prototype versions of his device.

He had them built in Japan because DOE actively intervened more than a dozen times to prevent US companies from building it. The problem with Brown’s device was that it was little more than a small, semi-controlled nuclear fission-powered device designed to continuously bombard nuclear waste material targets with a highly charged gamma ray field. Because it was so dangerous to operate, Brown was never able to obtain the necessary State Department or UN transport clearances to have it shipped across international waters into the US for further testing and development.

As you may recall, Dr. Brown was killed shortly thereafter under the most questionable of circumstances, just as the utility of his nuclear spallation technique was about to be publicly demonstrated in Japan.

(End of excerpt)

The following is excerpted from Gary Vesperman’s compilation of “Energy Invention Suppression Cases”, p 87, www.padrak.com/vesperman.

Paul Brown: Hyper-Cap E-Converter

Paul Brown, Ph.D., had invented this device which Gary Vesperman wrote up for his "Advanced Technologies for Foreign Resort Project" (www.padrak.com/vesperman and http://www.icestuff.com/~energy21/advantech.htm).

"Perpetual Battery. The hyper-cap E-converter is a thick quarter-sized battery which would put out .001 watt “forever” for such applications as critical components inside fail-safe computers, cellular telephones, etc. The energy comes from tapping ether fluctuations."

Brown had invented a novel method for converting natural radioactive decay material into electricity in the form of a battery. In February 1987 the proud inventor and his associates at a private research company in Boise, Idaho, decided it was time to make a public announcement of his discovery.

A series of traumatic events followed. The Idaho state departments of health and finance filed complaints against both the company and Brown. His license for handling radioactive materials was suspended. He began to receive anonymous threats, such as “We will bulldoze your home with your family in it.”

Relocating the company to Portland, Oregon, did not stop the troubles. Despite the fact that a 1988 Fortune magazine article commented favorably on the nuclear battery venture, securities fraud charges were filed against Brown and his company. Oregon’s finance department investigated, as did the Internal Revenue Service and the Securities and Exchange Commission.

After meeting each challenge, Brown redoubled his efforts to develop his technology, but events worsened. His young wife was assaulted. Even in their home they did not feel safe; it was robbed three times and vandalized on four other occasions. Brown was accused of drug manufacturing and eventually lost control of his company. The Browns’ also lost their home. Finally, the pipe bombing of his mother’s car in the early 1990s drove Brown to become a recluse.

“I understand now why inventors drop out of society.” he said in a 1991 open letter to other new-energy researchers. His advice to them! “Keep a low profile until you have completed your endeavor, be selective in choosing your business partners, protect yourself and your family, and know that the nightmare stories are true.” Brown eventually died in a suspicious car accident in April 2002.

Re: Alternative Science: Jim Humble is talking about burning NUCLEAR waste

Quote Posted by Kimberley (here)
You on this tread may find this of interest....
Check out the work of Dr. Paul M. Brown

Paul Brown invented a radioisotope electric power system which is a scientific breakthrough in nuclear power. The battery utilizes the energy given off by decaying radioactive material – converting it directly into a continuous AC electrical current. Unlike conventional nuclear generating devices, the power cell does not rely on a nuclear reaction or chemical process and does not produce radioactive waste products. It uses relatively inert radioactive waste (the same stuff used to irradiate produce) to create a power cell that lasts for the half-life of the material inside (75 years)... thus a 400-volt, 24-amp battery that lasts 75 years and is the size of a soda can. Paul died in a suspicious auto accident in 2001 – quite a convenient death if you ask me. I’d love a battery that lasts 75 years :-), but of course the top of the pyramid does not. Nevertheless, the snowball has already began, and cannot be stopped. I’d still be concerned with the whole issue of nuclear energy being used. It’s not clean energy.

http://www.rexresearch.com/nucell/nucell.htm
http://www.spiritofmaat.com/archive/feb2/nuclear.htm
http://www.nuclearsolutions.com/


Professor Santilli reported above in “U.S. Government’s Vicious Suppression of Recycling Nuclear Waste”: 

Radioactivity Neutralization Methods -57- May 30, 2014
The content below of this webpage (http://www.nuclearwasterecycling.com/) was written in July 2000 (and it has been left unchanged) following the failure to conduct the *World Congress on Recycling Nuclear Waste* in both the U.S.A. and Europe because of obstructions by responsible governmental offices in both countries so incredible that cannot be reported here for fear of losing credibility. We merely leave the reader with the evidence that such an important conference could not be conducted in both the U.S.A. and Europe despite the world caliber of the organizers and documented repeated attempts. The announcement has been left in the website of the *Institute for Basic Research* (IBR) as a memento for these incredible occurrences.

The evident reason for said obstructions was the primary objective of the meeting, that of gathering the best scientific minds in the world to initiate in depth mathematical, theoretical, experimental and industrial studies on the recycling of nuclear waste via its stimulated decay in the pools of nuclear power plants. The main argument is that, since the nuclei here referred to are very large and naturally unstable, it is quite plausible to expect the existence of various mechanisms that would stimulate their decay, from mean lives of thousands of years down to practically valuable mean life of the order of seconds, minutes or days, depending on the case. In fact, several mechanisms have been identified, and some of them even patented, by their authors have received life threats and had to abandon their studies. This web site is dedicated to the privately funded research in the field by the Italian-American scientist Prof. Ruggero Maria Santilli (*Curriculum*).

The origin of life threats is that the stimulated decay of nuclear waste would avoid the transportation and storage of nuclear waste in the Yucca Mountain and other depositories. The evident problem is that such a solution would prevent the dispersal of billions of dollars in taxpayers money by the US and European governments, with evident loss by governmental officers and their affiliated corporations of notorious gains resulting from the dispersal of billions of dollars in public funds.

Due to threats received by researchers in nuclear waste recycling not aligned with governmental regimes in the U.S.A. and Europe, Prof. Santilli and all members of the IBR have abandoned all research in the field in the year 2000 with the commitment never to resume them again. To our knowledge, the action by institutionalized cartels so clearly against the interest of society has been so effective, that no serious research has been done in the field, except for orchestrated work intended to provide the *perception* of serious research in the field, while studiously avoiding the addressing of the main issues.

(End of excerpt)

The below chapter titled “DOE in 1992 Witnessed 96% Reduction of Radioactivity of Cobalt-60 with Brown’s Gas” includes this report:

An experiment involved the treatment with Brown’s gas of a sample of the radioactive isotope cobalt-60. A Geiger counter’s reading dropped from 1000 counts per minute to 40 counts per minute – a reduction in radioactivity of 96% that was witnessed by some Department of Energy officials. Their clumsy explanation of their denial that the reduction of radioactivity was due to Brown’s gas was found to be ludicrous.

(End of excerpt)

Then there is the most interesting question of who really are the people behind invention suppression?

One clue is offered in this excerpt from Gary Vesperman’s compilation of “Energy Invention Suppression Cases” www.padrak.com/vesperman:
Adam Trombly has had a total of 54 attempts on his life. One of the latest occurred early in 2006. Also, a suspicious incident occurred July 4, 2006 when Trombly was visited at his Aspen, Colorado home by a man of Middle East origin from Las Vegas who knocked on his door and earnestly tried to give him ten free cases of meat. Having been previously forewarned, Trombly refused, even after an additional offer of a free freezer, fearing the meat had been poisoned. This incident indicates that an energy invention suppression hit squad might be based in Las Vegas.

(End of excerpt)

Here’s another clue:

I had posted the 123-page fourth edition of my compilation of energy invention suppression cases on the Internet Sept 3, 2007 by simply emailing a copy to nearly everybody on my list of at that time of over 200 email addresses. For a copy see www.padrak.com/vesperman. I also sent copies to numerous environmental organizations and others.

Since then I have been provided corrections and changes to a few of the stories. I would like to update it, but it is simply not practical to go back and track down every copy floating around out there. My basic message remains the same anyway.

Enough time has gone by that it seems safe to relate two incidents that fall of 2007. Note that one of the energy invention suppression stories is about my car being torched July 3, 2006 approximately three weeks after I had posted on the Internet an earlier much shorter version of my suppression book. See http://www.rense.com/general72/oinvent.htm. I have had people tell me that the torching was probably by local kids. I feel that the two incidents lend credence to something more than a kid opening an unlocked door and throwing a small flare/fireworks into my car late in the evening July 3, 2006.

At that time I was sharing with John D. Martens a three-bedroom two-bath rented house in the 3000 block of La Mesa Drive, Henderson, Nevada.

Like I wrote above, I had posted the suppression book on the Internet Sept 3, 2007. About three weeks later, John was sitting in the living room. There was a routine telephone call. Except that when the other party had hung up, John was still holding the phone to his ear. The dial tone hadn't come on yet. I happened to be in the kitchen running water out of the faucet. He could hear the water running on the phone!!! He quickly realized that something wasn't right about this. He left the phone off the hook and motioned me to walk over so I could hear the water running for myself.

We realized that the house may have been bugged. Leaving the telephone off the hook, I picked up a spoon and starting banging on walls, doors, etc. He would show a thumb up if he heard the banging on the telephone, or thumb down if not.

That was an impressive high-quality audio surveillance system that had been installed around our house. All corners of the backyard had been bugged. Every room in the house had been bugged. I don't remember the garage being bugged also. The front yard was not bugged anywhere. My guess is that the system was set up to trigger recording when sound was present, which would have been made useless by traffic on the street in front of the house.

John had a dog named Coyote – a sweet-tempered black female Australian shepherd. When we were out of the house, we left the the back patio door open a little so she could fertilize the back yard when she needed to. Anybody could walk around to the back and enter the house.
I did not move out of that house until I moved to Boulder City March 2009. During all that time when John and I had sensitive business to discuss, we would motion to each other and either drive to a nearby park to walk the dog or walk a couple blocks away.

It wasn't fun living with the proverbial Big Brother of George Orwell's famous science fiction novel 1984. We tried to find the microphones more than once. Never could find any. And how they were connected to the telephone remains another mystery.

The other incident happened right after Thanksgiving that fall of 2007. I don't remember what it was, but I had received an email describing a really hot energy invention. A few days later I got a telephone call from a man who said he was a truck driver passing through. He claimed he owns a place out in the country in northeast Texas. He wanted to meet me and learn about how he could get off the power grid. He offered to pay for my lunch if I would meet him in the Iron Horse Cafe in Sunset Station Casino in Henderson. There was something about this that made John and me suspicious.

John and I drove over to Sunset Station to meet the man who was standing in front of the restaurant. After the usual greetings and handshakes we sat down in a booth.

He explained that he wanted to keep in touch with his wife with a pair of earpieces, a microphone in his hand, and a cell phone. Every so often during our conversation he would interrupt and listen to his "wife". At the end of our meal John wanted to leave right away and not wait for dessert.

Out in the parking garage John explained he had spotted a man in another booth also with a pair of earpieces and a microphone. When the truckdriver was listening, John saw the other man talking. When the truckdriver or us were talking, John saw the other man listening.

We drove back to the house. While we were gone, there had been a call on our telephone. John called back the number shown by the Caller ID. The person who answered said the company is Global Intelligence. I immediately googled “Global Intelligence”. Their office turned out to be located only a few blocks north of our house. They handle secret shopping for retailers. They also investigate people that the casinos are thinking about hiring.

Fair enough, except for one thing: Their President is Peter Maheu. Peter's father is the famous Robert Maheu who handled the affairs of Howard Hughes for so many years.

And what did Robert Maheu used to do for a living? He was a very top agent for Middle Eastern oil companies. Look him up. BTW, he passed away a few months later.

One more crazy thing that had happened: I had entered myself as a stud in the plentyoffish.com dating site. Later that fall of 2007 I met a woman through the dating site.

Note that I had contacted her, not the other way around. We had a couple of dates, and she even took me on a secret shoppers expedition to the Palazzo casino/hotel on the Las Vegas Strip where we passed myself off as a professor or something like that and bought some nice clothes for me (later returned to the store). Shortly after the aforementioned truckdriver episode, she and I had lunch in a restaurant.

Out of curiosity, I asked her about this company she was working for as a secret shopper – Global Intelligence!!! I immediately felt sick at the table.
I then told her about the truckdriver. She had only been working for Global Intelligence Network for about three months as a bookkeeper, etc. It's a small office on Russell Road. She said she never saw a hint of any funny James Bond business. She then drove me home and we split. We met again about a year later, and she told me that she left Global Intelligence Network only a short time after. She did meet Robert Maheu himself at a company Christmas party. “A very nice man”, she said of him.

The truckdriver called back a couple times during the next few weeks asking for more information about energy inventions. I would politely mumble something about sending some stuff just to get him off the telephone. I never gave him any more information.

Global Intelligence Network is the closest I have ever been to identifying the invention suppression perpetrators, MIBs, black helicopter people, etc. I am not impressed with their clumsy spying, etc. Apparently it didn’t dawn on them that telephones nowadays have Caller ID features. Their website is http://www.globalintelligence.net/about/. The full name of the company is “Global Intelligence Network”.

I see they have since moved their office to the west side of Las Vegas. Their President Peter Maheu is listed with the Nevada Secretary of State at http://nvsos.gov/sosentitysearch/CorpSearch.aspx as an officer of half a dozen Nevada corporations and LLCs. They all seem to be legitimate businesses and probably do provide essential investigative services to the gambling companies and others.

Global Intelligence Network’s apparent involvement with viciously suppressing energy and radioactivity neutralizing inventions as a secret sideline business is obviously traceable to Robert Maheu’s connections with the very highest management levels of giant Middle Eastern oil companies. The Middle Eastern countries such as Saudi Arabia certainly wouldn’t allow obscure energy inventors to spoil their gravy train of stupendous oil revenues.

As reported in my compilation of energy invention suppression cases in www.padrak.com/vesperman, their tactics would even include murdering energy inventors if necessary to stop their energy inventions from entering the commercial marketplace. Note as reported above that Adam Trombly has escaped an apparent poisoning attempt by a man of Middle Eastern origin from Las Vegas.

Getting back to the question of how the house was bugged, it is obvious the microphones were very, very small and cleverly hidden. It may be that the signals from the microphones were transmitted to something connected to the house wiring; then retransmitted to wherever.

If anybody would like to suggest to me how the house was bugged, the landline telephone’s model designation is UNIDEN’s 5.8 Gigahertz CXAI5698 with one cored remote handset and one wireless remote handset. BTW, when I moved to Boulder City, Nevada in March 2009, I took the phone with me. Since then I haven’t noticed any indication of bugging around the new house. Thank goodness, no more living with Big Brother!!!

In response to how the house had been bugged, an energy researcher friend has emailed his explanation:

“Gary, it's very easy to bug the residence of an unsuspecting person. It's not difficult to tag small transceiver units to the electrical outlet circuit – older phone systems used this technique instead of stringing additional phone lines around the house. If your phone was connected in this way and a small bug was planted in other rooms, that would explain how you heard water running in the kitchen sink just by picking up the phone.”
Well, I hope Global Intelligence Network (Who else would have been bugging our house?) found it worthwhile spending hours and hours over many months listening to John and I talk around our house.

Invention suppression activities sometimes seem to be more reminiscent of the comedic antics of the fictional incompetent policemen Keystone Cops than the methodical sophisticated James Bond character.

**Ex-CIA Agent Confesses to Suppressing Energy and Medical Inventions**

Bruce Meland is Publisher and Editor in Chief of *Electrifying Times*, an electric vehicles newspaper published every four months. The website is [www.electrifyingtimes.com](http://www.electrifyingtimes.com).

From: "BRUCE MELAND" <etimescteleport.com>
To: "Bruce McBurney" <bmcburnecbecon.org>
Cc: <etimescteleport.com>; <norsky666yahoo.com>
Sent: Tuesday, July 17, 2007 7:11 AM
Subject: Confessions of an ex-CIA Agent

The following story comes from an individual, Bruce McBurney, who has been involved in networking with high-mileage carburetor inventors for the last 10 years. High-mileage carburetors are perhaps one of the most highly suppressed technologies in North America where we are blessed with the most talented tinkerers and inventors.

Bruce McBurney of Niagara Falls, Ontario, Canada has for many years been printing and selling manuals on high-mileage carburetors and other technologies such as revolutionary hydrogen generating systems such as for example the late Stanley Meyer's hydrogen on-demand system which was thwarted by his untimely death 10 years ago. (For a story of Stanley Meyer see Gary Vesperman’s compilation of 95 cases of energy invention suppression in [www.padtrak.com/vesperman](http://www.padtrak.com/vesperman).) Here are a few of Bruce’s interesting experiences in the world of suppressed inventions and inventors:

With having my web site explaining the secrets behind the suppressed 100-mpg fuel saving systems I have received many phone calls from supporters and curious folks and other inventors and tinkerers involved one way or another with this technology. One of the most interesting calls happened rather recently and out of the blue.

This guy called and asked me, "Are you the Bruce McBurney that has shared all this information on the internet and by printing and selling how-to-do-it manuals about 100 miles per gallon carburetors?" I said "Yes I am.", and he said "What you did saved your life." I am a bit of a joker especially when people say strange things and not sure who they are so I came back and said "So big deal." He came back with “I am not joking. I used to work for the CIA suppressing guys like you.” I picked up on the “used to” and just replied "Used to?" I thought if he is not doing it now, it is OK.

He replied “I could not live with myself. You do not need to know my name, and I will never call you again, I just want to explain to you why you need to share the information like you did.” So I sat back and listened. He indicated he worked for the CIA and posed as a patent examiner.

When someone would file a patent on a sensitive technology they did not want the public to know about, he and a partner would go pay the inventor a visit, explaining they were from the patent office and wanted to qualify the patent as far as prior art was concerned. There would be no point pursuing their patent if prior art would render it useless; so they were here to find out who the inventor told and when about his patent.
They would sit down and list the people that knew about the invention and when the inventor told them. When this approach was used, and the scared inventor was sure he would lose the patent if he did not expose all he told about his invention, the CIA agents were sure they knew about all the people involved.

On numerous occasions they would place a gag order on the patent and state as a matter of national security the invention could not be marketed to the public. This ‘gag’ order (a copy can be found in Jeanne Manning’s book *The Coming Energy Revolution* and Gary Vesperman’s compilation of 95 cases of energy invention suppression www.padrak.com/vesperman) would bind them to secrecy, and the agents would state that the inventor and all associates involved would be placed under 24-hour surveillance. If they breathed a word about this to anyone, and if they in turn told anyone they would find themselves in jail, and it would be years before they saw the inside of a court room. There were many BS reasons they gave for gag orders like city real estate values would plummet if everyone got 100 mpg with their cars, they all would want to move to the suburbs.

The economy is based on oil, and less money spent on gasoline for their cars would cause economic devastation. (No one seems to care about the environmental devastation though, at least not until now when global warming and global climate change (extreme weather) are upon Planet Earth.)

He explained that after they warned the inventor and served the gag order, and the inventor was sufficiently afraid of the situation, they did not even bother to put them under surveillance because they knew the inventor was scared and would do nothing, especially if he thought his phone was tapped. The ex-CIA agent said only about 5% are actually under surveillance – the ones that did not scare easily. He said they could not listen to them all because they did not have the manpower. If sufficiently scared, it was not necessary.

Then he went on to say that the high-mileage carburetor people were not as bad as the free energy/antigravity people and their devices. He mentioned individuals with UFO sightings or related experiences were also warned to keep quiet. They were to become aware of hassle that has been given to any that do report UFO's. The rest just learn to shut up. This harassment keeps things quiet.

He said the medical inventions kept him the busiest. There were so many new medical technologies out there it was overwhelming.

At first he thought he was doing a good service to his country. But after many years of seeing the similar technology coming up again and again he knew it was real, and he was the bad guy. He said “You know what the CIA does when you get a conscience? They put you in a hospital and feed you enough drugs until the conscience goes away.” He said he was lucky an old friend was an orderly that would not destroy his friend’s mmd. So they faked the drugs. He played the part of the vegetable, was released from the hospital, and retired from CIA.

He just wanted to call me and encourage me to keep sharing my info and then they would not bother me to avoid bringing attention to me. If I died mysteriously people would look at what I was doing so they wanted to ignore me and hope I give up eventually as many did before me. He explained the Raymond Rife technology and that the resonant frequency is used in many different medical devices he stopped. He felt bad for what he had done, but he thought he was serving his country. Now he knows he was serving the corporations, not the people. He hoped I believed him, and he would not call again. But he felt he had to let me know this.
I wished I had recorded the conversation because it was unbelievable. But I do believe he was for real. So a word to the wise – if you want it to survive so we all can survive, share it or lose it anyways. Patents are for the big boys to control their inventions and steal from the little guys.

We talked about 30 to 45 minutes, and he said some things that left me dazed. He said Flight TWA 800 was taken out by a Navy missile that missed its target. They had to keep that quiet because the passengers’ families could have sued the Navy into bankruptcy – national security issue there.

Years ago an official from the Canadian research council told me in my dining room "Look it has been suppressed and will be suppressed. There is nothing you can do about it. Well, I have done a lot already and so have many others out there who are doing more. People with more time, talent and money that are getting 100 mpg including Toyota, and I know one day it will have to surface and come to all because of the reality of our environmental situation.

In the scientific academic world the saying is ‘publish or die’. We need to adopt that for the inventors’ world.

I am still searching for intelligent caring people with money, guts and integrity who actually care for the future children to help me get this done.

The technology for a heaven on earth is out there, it is just being suppressed.

If half the technology I have learned in the last 10 years were implemented we could work 24 hours a week with 10 weeks a year, holidays, no welfare, no unemployment and all would be well fed, healthy and happy world wide. Time to end suppression before it ends us all.

Bruce McBurney
HIMAC Research
6665 McLeod Road
Niagara Falls Ont. L2G 3G3
905 358-8541 fax aux 905 358-9439
http://www.imacresearch.com

We share the TRUTH, and YOU have the RIGHT to know about SUPER-EFl This is the ‘Air Pollution Solution’. Our future depends on it. GET INVOLVED NOW!

(End of email)

Evidence continues to accumulate of massive corruption within the Departments of Energy and Defense to protect the status quo of the energy industry from disruptive inventions and to protect sources of bomb-grade uranium and plutonium from proven techniques of neutralizing radioactivity. The phrase ‘revolving door’ refers to highly paid executives of oil companies and military contractors entering government service where they can influence the U.S. Government to award multi-billion-dollar subsidies to nuclear power plants and oil companies. U.S. Government employees are also frequently rewarded with high-paying jobs in the energy industries if they had been kowtowing to the demands of energy companies. These same former executives incidentally ignore and even suppress well-intentioned but usually financially strapped inventors of new energy sources and methods of neutralizing radioactivity.
That the ‘ex-CIA agent’ also claims to have helped suppress new medical technologies and in particular proven alternative cancer treatments such as Raymond Rife’s resonant frequency technology should not be surprising. (Rife had measured the exact radio frequency that would shatter the crystalline structure of cancer cells which he had visually observed with an extremely high-powered microscope that he had also invented.) Cancer is one of the world’s largest and most profitable industries. The Food and Drug Administration has also been massively corrupted by the pharmaceutical companies, radiation equipment manufacturers, etc.

I, Gary Vesperman, have personally seen positive results with three alternative cancer treatments. I have heard also an anecdotal report from a friend’s friend in Minnesota whose brother had bladder cancer – a tumor the size of a lemon in his bladder. He took the bad-tasting maple syrup and aluminum-free baking soda doses for 1 month and then went for a check up. His blood work was very alkaline, the tumor was gone – just a little irritation up in the bladder where the tumor used to be. This man was scheduled for a colostomy the following next week. It was canceled. The theory is simple – cancer thrives in acidic tissue, but not alkaline tissue.

However, cancer has so many complicated variations that what may work for one type of cancer may actually aggravate another type. So cancer patients should still first consult with their licensed oncologists before trying alternatives to painful but profitable ‘cut, burn and poison’ cancer treatments.

An energy researcher has a friend who wants to honor a close friend who had died of cancer by writing a book on alternative cancer treatments. She was referred to me last fall. Since then I have sent her well over a hundred cancer articles, alternative treatments, etc.

The Nuclear Power Industry Doesn’t Make Mistakes, Right?

From: Gary Vesperman <vman@skylink.net>
To: downwinders@egroups.com <downwinders@egroups.com>
Date: Wednesday, May 17, 2000
Subject: The nuclear power industry doesn't make mistakes, right?

Hello Downwinders!

In the past two weeks, I found the Downwinder group’s emails interesting, informative, and sometimes sad reading. My heart goes out to all you victims. Back in the early 1970’s, after reading several thousand pages and months of investigation, including consulting with engineering friends who were working at General Electric’s Nuclear Energy Division in San Jose, California, I had concluded that nuclear power was a terrible mistake. In fact I understand that nuclear power plants are now being decommissioned, at great cost due to laboriously dismantling highly radioactive pipes, etc, faster than they are being built.

For example, the San Onofre Nuclear Generating Station in San Clemente, California is reportedly slated to be closed down, I believe, in 2002. All of the spent fuel it ever used is stored on-site. One of their control rooms was built on the wrong side of the reactor vessel. The vessel was too heavy to turn around. So the control room was expensively torn down and rebuilt on the other side. The nuclear power industry is very careful not to make stupid mistakes, right? Wrong!
The Hiroshima bomb killed, and is still killing, about 300,000 people. Chernobyl released the radioactive equivalent of several hundred Hiroshima bombs and caused about $300,000,000,000 worth of damage in the old Soviet Union and Europe. I remember reading that Italy alone had to dispose of $750,000,000 worth of radioactivity-contaminated food. I still try not to buy food imported from Europe.

Some time ago, I figured out that the proposed Yucca Mountain dump would ultimately contain the radioactive equivalent of roughly 50,000,000 Hiroshima atomic bombs. And then there was the Three Mile Island nuclear power plant accident in 1979. The nuclear industry is very careful not to make mistakes, right? Wrong!

A typically sized 1000-megawatt-electric nuclear power plant operating at full power for two years before it is shut down for refueling accumulates the radioactive equivalent of 4,600 Hiroshima atomic bombs. (For comparison, the total nameplate capacity of Hoover Dam’s 17 generators is 2080 megawatts.) One third of the spent fuel is replaced, and about 3,000 Hiroshima bombs of radioactive fuel is left behind. Until recently I wasn't aware that ALL of the waste nuclear fuel that ever was produced by the San Onofre nukes are still stored on site. I remember one is 200 megawatts, one is 800 megawatts, and isn't there a third nuke? Let's try multiplying 30 years times 2,300 Hiroshima bombs per year to equal approximately 70,000 Hiroshima bombs of radioactive materials.

When the Dairyland nuke near La Crosse, Wisconsin was being built, a drinking water fountain was mistakenly connected to a pipe of radioactive water. The nuclear industry is very careful not to make stupid mistakes, right? Wrong!

Every time another nuke is shut down, and they are only operable for about 20 to 40 years, we can be a little more relieved. The biggest nuclear power plant complex in the world also happens to have the nuclear power plants closest to Las Vegas. Palo Verde is about 50 miles west of Phoenix and has three 1270-megawatt reactors. They are cooled with treated sewage water from Phoenix which is just wonderful for corroding pipes, circulating pumps, etc. They probably have accumulated between the three reactors and spent fuel storage pools I would guess in the neighborhood of around 100,000 Hiroshima bombs of radioactivity.

The winds in Phoenix often blow northeast or east. Palo Verde would be a dandy target for Hamas, Hezbollah, al-Qaeda or the Taliban to blow up with a smuggled suitcase fission bomb, right? The best targets though are facilities for reprocessing waste nuclear fuel rods from dozens and dozens of nukes. Not to worry though. The nuclear industry has fool proof plans in place to protect their facilities from attack, right?

Back in the 1970's, I wrote a short fictional piece (unpublished) about a terrorist attack on the Rancho Seco nuclear power plant east of Sacramento, California (since then closed for several years). It was a chilling story. My point was that nuclear power plant safety regulations, the 1970's Rasmussen study of accident probabilities, and security safeguards don't mean a thing in case of a bombing attack. Yet the over 300 nuclear power plants worldwide will ALWAYS AND FOREVER be able to prevent catastrophic terrorist or military attacks, right Mr. bin Laden?

For a while, the Big Rock Point nuke on Lake Michigan’s northeastern shore was a target for simulated B-52 bombing runs. That is, until a 390,000-pound B-52 fell in Lake Michigan – barely missing the reactor! See http://www.nirs.org/radwaste/hlwtransport/nukewatch122003.htm for a report on the misadventures of the radioactive reactor vessel’s trip to an unlined hole in Barnwell, South Carolina.
The old Atomic Energy Commission back in the 1960's had a $40,000 contract to build a truck for transporting radioactive materials strong enough to withstand an "insignificant armed attack or a significant unarmed attack, but not a significant armed attack". The nuclear power industry is very careful and confident about being able to stop terrorist attacks when transporting radioactive materials, right?

A nuclear reactor goes critical when enough uranium-235 atoms are present in a small volume to sustain a chain reaction of neutrons striking other U-235 atoms. Ultimately about 200 heat-producing isotopes result with half-lives ranging from seconds to minutes to hours to days up to millions of years.

A reactor is shut down by jamming neutron-absorbing control rods back into the rack of uranium fuel rods. Enough neutrons from fissioning uranium atoms are absorbed by the control rods rather than striking uranium nuclei that the reactor can no longer sustain a chain reaction. The heat from the fuel's passive radioactivity alone contributes about 7 per cent of the total thermal output of 3000 megawatts – a still massive 210 megawatts of heat. For a General Electric boiling water reactor, after it is shut down, the cooling system MUST operate AT ALL COSTS for at least 40 hours until short-term radioactive isotopes have had time to decay to less heat-producing isotopes with longer half-lives. (The Fukushima reactors are GE boiling water reactors.)

Operating nuclear power plants need reliable power to operate cooling pumps, etc. Each nuke is supposed to have two diesel fuel-operated generators to provide backup power in case of widespread power failure caused by, for example, the peak solar flare activity due to start March 2000. There have been cases recorded where neither diesel generator was able to start upon test because of sloppy negligence such as failure to add lubricating oil. There also has been a recorded instance where the same tornado took out four of the five power lines into a nuclear power plant, thought to be statistically impossible. However, the nuclear industry is highly regulated and is very careful not to make mistakes, right? Wrong!

There are two other paths to disaster besides the infamous loss-of-coolant accident. One is the power mismatch, of which I am unable to remember how it proceeds. The other is the power excursion accident where the control rods can't be jammed back into the fuel to absorb neutrons and shut down the reaction. I do remember that the tons of water in the reactor vessel would flash into steam. The sudden overpressurization would blow up the reactor with an explosive force of several hundred tons of TNT. We shouldn't worry, however. The nuclear industry is very careful not to make mistakes, right?

I have or had a DOE document which projects the Yucca Mountain dump's life-cycle cost at $150,000,000,000. In spite of this cost to present and future generations, nuclear power is justified by some people as offering a cheap source of electricity, right? Wrong!

At least twice in Las Vegas I have presented testimony at Yucca Mountain hearings describing a variety of proposed methods of reducing radioactivity. (They were included in my recent email comparing my informal personal list of 27 methods with varying degrees of credibility with a private list from a Canadian clean energy association of 9 methods.) The DOE did contact me afterwards for more information in an effort to honestly and thoroughly review all possible methods of neutralizing nuclear waste as part of a sincere effort to find a safer, cheaper alternative to geologic storage inside Yucca Mountain, right? Wrong!

Steve Hodapp and I were technical writers with Control Data Corporation in Silicon Valley back in the early 1970's. We both left Control Data about the same time. We kept in touch for a time. During the mid-1970's Mr. Hodapp worked for a while for Stern and Rogers in Denver. He worked on his company's contract with the old Atomic Energy Commission to evaluate various methods of disposing nuclear waste including geologic storage. After a few months, I called up Steve and asked him how were they doing? They did find and recommended at least one workable method without any defects, didn't they? Wrong!
Over the past few years, I have corresponded with several nuclear experts on the subject of neutralizing radioactive waste. One of my email correspondents, Roy MacMillan (deceased), owned a company Containment Systems, Inc., which in turn owns a patent on a new type of waste nuclear fuel container. As of 1998 casks were selling for north of $650,000 apiece. The company’s casks would sell for $450,000 apiece with a 75% profit margin. They were supposed to be much safer and stronger than the casks the DOE were using. Since the nuclear power industry should be studying the most advanced technologies for safely transporting waste nuclear fuel, they vigorously supported his company's research, right? Wrong!

MacMillan’s company also had worked out the engineering of safely handling the fuel rods. The plan was to build a portable fuel rod neutralizer which could be trucked around to various nuclear power plants, naval nuclear facilities, etc. But Mr. MacMillan didn't know of any methods of actually neutralizing the waste fuel until he was introduced to me.

The Department of Energy spends billions of dollars on research and development of hot fusion. Does it reasonably expect a commercially practical hot fusion-based electrical generator by 2010? After all, just like it has been doing with nuclear power plants, the DOE doesn't make mistakes, right? Wrong!

I have written a compilation of “Advanced Technologies for Foreign Resort Project” which is in http://www.icestuff.com/~energy21/advantech.htm. It includes over three dozen new energy-related technologies and a discussion of candidate technologies for an advanced self-powered electric vehicle. Is the Department of Energy spending millions of dollars on developing them since it ought to be proactively supporting commercialization of a variety of clean, cheaper new sources of energy as quickly as possible? Wrong!

The nuclear power industry and its overseers in the federal government have been fair and quick to compensate workers who have been injured and even died from exposure to radiation and toxic materials, right? Dead wrong!

Gary Vesperman
Boulder City, Nevada

Nuclear reactors generate steam at a lower temperature than fossil-fueled boilers. Their electricity generating efficiency is only 33% compared with the 40% efficiency of fossil-fueled boilers. Thus a typical 1000-megawatt-electric nuclear power plant produces 2000 megawatts of excess thermal power which must be drawn off with massive quantities of cooling water.

TEPCO is the Japanese utility that owns the Fukushima Daiichi nuclear power reactors. The Fukushima site is alongside the Pacific Ocean – a convenient source of reactor cooling water. When they were considering Fukushima for nuclear power reactors TEPCO admits they were advised that a tsunami could inundate the plant, and they went shopping for another opinion!!! (See “Is Our Understanding of Fukushima Backwards?” below.)

**Energy Subsidy Lessons from the Nuclear Industry**

I want to expand on a point made by Lydia Ball of the Clean Energy Project Nevada at the University of Nevada, Las Vegas—and in our newsletter—two weeks ago: “The renewable people I know would rather get rid of all subsidies [for all energy industries].”
Easier said than done. But those who doubt that renewables can compete in the electricity market must learn a history lesson about subsidies in the nuclear industry.

Nuclear power, which provides 20 percent of U.S. electricity, owns an excellent record of reliability and plant safety. But when nuclear advocates quote an electricity price under $0.05 per kWh, that price is far from the full price borne by taxpayers:

- The Price-Anderson Act of 1957 limits company liability in the event of an accident—taxpayers cover the balance. “Unwilling to risk huge financial liability,” wrote Congress’s General Accounting Office, “private companies viewed even the remote specter of a serious accident as a roadblock to their participating in the development and use of nuclear power.”

Price-Anderson was intended as a temporary safety net until the insurance market could accurately price the risk. That never happened, so the act has been extended continuously, most recently until 2017. And the liability cap has grown to $375 million per plant. But if a Fukushima-scale catastrophe—estimated to cost anywhere from $77 billion to $257 billion—occurred at one of the 103 U.S. nuclear power plants due to accident or terrorism, the U.S. taxpayer would be on the hook for nearly all of it.

To be fair, Price-Anderson has paid out only $65 million since inception; however, the taxpayer-subsidized value of the act’s insurance coverage has been estimated at anywhere from $60 million to $237 million per year, 55 years and counting.

- To stimulate mining, the federal government directly and massively subsidized uranium prices and road building in the Southwest from 1955 to 1970. Results: abundant uranium supply for warheads and power plants, greatly expanded tourism to national parks in the Four Corners—and a tragic legacy of radioactive tailings and cancer clusters. The economic costs were high, the human costs incalculable—and all were borne by the victims and taxpayers (as was the fallout from nuclear testing at the Nevada Test Site and downwind).

- Radioactive waste storage and disposal costs: Cost estimates for Yucca Mountain ran at $96 billion and climbing. Since 1983, nuclear operators have paid about $24 billion total toward these disposal costs, but sued to stop that after the Obama administration ruled out Yucca Mountain. As of now, the taxpayer is on the hook for the balance of the ultimate storage/disposal costs—and with radioactivity lasting over a million years, the only certainty is that the risks far outlast the industry.

- Nuclear power plant construction is legendary for cost over-runs averaging 250 percent, according to Time—costs passed on to ratepayers and sometimes taxpayers through tax incentives and loan guarantees with an average 50 percent default rate.

We would not have a nuclear industry—either now or at its inception—without Price-Anderson, and nuclear would be far more expensive if these other costs were included. The actual bill for new generation runs anywhere over $0.15 per kWh, according to Time — or much more when including these “externalities.”

Solar, wind and geothermal plants all have their downside risks, but nothing remotely close to nuclear. Geothermal can run under $0.04 per kWh and wind as low as $0.06 per intermittent kWh where available. Solar costs vary widely by site, type and system size, but average $0.16 per kWh in sunny states like Nevada, including subsidies. But, unlike nuclear, costs for solar are dropping quickly.
I'm not using hindsight to judge the past wisdom of subsidizing the nuclear industry; but, when it comes to incentives for future generation, renewables— even with their intermittency—appear a much smarter long-term investment than nuclear, especially for western states like Nevada and California.

JIM ROSSI is currently a graduate student studying history and renewable energy at UNLV, and has written for the Los Angeles Times, Bike and many other publications.


Is Our Understanding of Fukushima Backwards?

Is Our Understanding of Fukushima Backwards?

Posted by Herschel Specter
President

The meltdowns at three nuclear plants at Fukushima, Japan almost three years ago were an economic disaster, but were these plants inherently unsafe? Did the Fukushima designs provide adequate safety during extreme circumstances?

The magnitude 9 earthquake that hit Japan in 2011 was its largest ever. However it was the enormous tsunamis that led to meltdowns. At Fukushima the spent fuel pools never leaked water in spite of the earthquake, its aftershocks, and tsunamis. Even Fukushima’s emergency power systems initially survived the earthquake, only to be soon destroyed by the tsunamis.

The nuclear plants at Fukushima were in an extreme situation. The electric grid and the emergency power systems were knocked out, leaving operators in a blackout condition. Tsunamis flooded various areas and buildings. Hydrogen generated by the meltdowns was not harmlessly vented. The containment venting systems could not be quickly opened because they lacked electric power. Reactor buildings were destroyed when the hydrogen that collected there exploded, sending debris flying and further impeding plant access. Post-accident plant improvements will prevent a recurrence of this venting issue.

The earliest environmental release of radioactive material started at 13 hours and was a small percentage of the total radioactive inventory. Small and delayed releases are consistent with previous blackout studies by the Sandia Laboratory on a similar plant, where no near term radiological health effects were calculated. This was confirmed by the World Health Organization which concluded that there were no early radiological health effects and long term health effects would be too small to be detectable statistically.

Beyond the economic losses, the major losses from Fukushima were fear, not fact, driven. More than 1,100 needless excess deaths came from over-evacuating and long term sheltering. Japan, Germany, and California, all with reductions in nuclear electricity, are burning more fossil fuels. Meanwhile, China, Russia, and South Korea strengthen their economic futures selling and servicing new nuclear plants worldwide. Misunderstanding the full story of Fukushima is a profound mistake.

Did the Fukushima designs provide adequate safety during extreme circumstances? How should our understanding, or misunderstanding, of Fukushima impact our approach to nuclear power?
Scott Sklar President, The Stella Group, LTD
January 31, 2014 at 11:56 AM

That’s a nice re-invention of the situation, but sadly not true.

Aside from billions of dollars worth of property losses and loss of future economic activity, the health issue is far from over. According to the October 2013 statement from Physicians for Social Responsibility, “As physicians concerned with the effects of radioactive fallout on human health and the ecosystem, we have reviewed the upcoming United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) report to the UN General Assembly. We appreciate the effort made by UNSCEAR committee members to evaluate the extensive and complex data concerning the Fukushima nuclear catastrophe. While parts of the UNSCEAR report will be useful in the future to assess the consequences of the nuclear meltdowns on public health and the environment, we believe the 2013 UNSCEAR report systematically underestimates the true extent of the catastrophe. Many of the assumptions are based on the two WHO/IAEA reports published in May 2012 and February 2013, which did not accurately portray the true extent of radiation exposure, followed faulty assumptions, ignored the ongoing radioactive emissions over the past 2½ years and excluded non-cancer effects of radiation”. The impacts of continued radioactive leakage into the Pacific Ocean are still being understood. According to one report, “Every single day, 300 tons of radioactive water from Fukushima enters the Pacific Ocean,” writes Snyder about this one major sign. “That means that the total amount of radioactive material released from Fukushima is constantly increasing, and it is steadily building up in our food chain.”

According to a 2014 NBC report, they state, “Another obvious sign is the recent mass migration of radioactive debris the size of California across the Pacific Ocean”. BBC News in the U.K. reported last year that literally millions of tons of radioactive debris had begun traveling across the Pacific Ocean, and that some of it had already impacted Hawaii and even the West Coast. There has also been a series of strange animal deaths recently, including masses of sea lions, sockeye salmon and other sea creatures washing up on the shore. Many of the polar bears, seals and walruses observed along the Alaska coastline have also been found to have major fur loss and open sores, both of which are indicative of radiation poisoning.” So anyone saying these economic losses and potential ocean impacts in the food chain have no meaning are seriously mistaken. It will be decades before we know the impacts, and the units are still leaking radioactive water into the ocean. The WHO report cited only stated “there were no early signs” but did not conclude there was no health impact. Most radiation impacts occur over longer cycles and it is disingenuous to make people believe what happened is comparable to a wind turbine falling over. Just not so.

Robert Brecha Professor, Physics Dept., Renewable and Clean Energy Program, University of Dayton
January 31, 2014 at 1:23 PM

The direct questions posed here are whether the designs of the reactors at Fukushima were adequate, and how our approach to nuclear power is impacted by a correct or incorrect understanding of the technical issues. However, the implicit question is whether irrational fear drove policy choices in other countries in the aftermath of Fukushima. I would only like to make two points, one a correction and one of a more philosophical nature.
First, the German decision to eliminate nuclear power by 2022 was a long-standing wish of the majority of the country that had been briefly overturned by the governing coalition at the time. Fukushima in some ways finally resolved one of the key divisions in German politics and re-asserted a decade-old decision. Along the way, Germany increased its share of renewable energy in the electricity mix to the point where nuclear power is essentially superfluous. Having said that, the reason that coal-fired generation has increased is completely unrelated to Fukushima, having to do more with the carbon prices that are too low in the European Trading System, which in turn comes from reduced economic activity since the beginning of the recession and an over-indulgence in granting initial permit allocations. In the longer-term, the large-scale move to renewables will likely prove to be the key opening to a sustainable future energy system.

The more philosophical point concerns the fear factor. Put simply, is there another energy source about which we would be even remotely justified in having so much fear? Even if the relatively harmless numbers stated by the author were exactly true in this case, there is no guarantee that would be the case for the next accident, or the one after that. With proper political will, we would be able to deal with the large number of excess deaths due to coal-fired power plants, as we know precisely where these come from on a continuing basis. In the case of nuclear power there is always a small probability of large catastrophic events. Over time, the recognition of the need for increased efforts to guard against these unlikely events has led to the situation in which nuclear power becomes increasingly expensive (Grubler, Energy Policy v. 38 2010).

In the end, it appears to me that an energy source capable of generating such a large amount of “irrational” fear might not be worth pursuing for that reason alone, putting aside high and externalized costs of electricity and unresolved problems with waste storage.

Jack Shortt Engineering Consultant, JHS Consulting
February 2, 2014 at 2:08 AM

Robert,
Good comments.

Just one question. Germany’s plan to build more coal plants. I agree the closure of nuclear probably did not justify the return of coal. I have been led to believe that much of the need is to back up unreliable wind and solar. Can you clarify for me?

Thank You.
Jack Shortt

Robert Brecha Professor, Physics Dept., Renewable and Clean Energy Program, University of Dayton
February 2, 2014 at 11:49 AM

Jack,
My take on the German situation is that there is now a struggle to determine the exact future path of the electricity system. The large utilities see themselves losing market share, first because of the nuclear plant shutdowns and then the increasing share of wind and solar. There are plans to build coal plants, but at the same time, this past year utilities were threatening to take capacity from conventional thermal plants offline (which they are not allowed to do unilaterally) because the spot market price for electricity have
dropped so significantly that it often does not allow them to make money. The price has dropped mainly because of large shares of renewables – a savings that has in general not been passed on to consumers. Although I spend time in Germany each year working on some climate mitigation research, I would not claim to be an expert in their electrical markets. However, I do see that there is a great deal of work on storage options, some demand-side management, smart grids, electrification of transportation (minor as of now), etc. In general, however, I would say that as soon as some of the market distortions currently seen in the ETS carbon market are removed, bringing prices back up to rough expected targets of 20-30 Euros per tonne, coal will no longer be a viable option. That does not mean that Germany does not have challenges that arise from high penetration of variable renewables, but thus far they have actually been exporting more electricity each year than before Fukushima and their partial shutdown of nuclear plants.

W. Scott Smith Developer, Alternative Propulsion & Energy Research
January 31, 2014

When nuclear power plants are evaluated for safety they are only evaluated from a mechanical risk and site risk standpoint. We have been assured that this process should allow accidents to occur thousands of years apart.

To simplify the discussion, let’s assume this is really true. Since we clearly have more accidents than these assumptions allow for, we must attribute these accidents to human error and/or malfeasance.

So the real question is this. What is the likelihood that one or more people somewhere in the process of siting, designing, building and running these plants, will commit errors or willful disregards of safety that lead to catastrophic results?

Fukushima Daiichi can only teach us if we are willing to learn. If people had just done everything they should have done according the standards and regulations, none of this would have happened. As long as saving money trumps good engineering judgment, then the problem is intractable.

In reality, there are any number of good solutions for nuclear waste. But again, it is not profitable enough to be responsible.

Fukushima is just getting started – with three corium in the ground that will contaminate ground water for thousands of years.

So the radioactivity of the Pacific Ocean is low—So what? The molar ration of cesium-137 to potassium is very worrisome, especially when we start projecting the ongoing contamination from the rogue cores. That is the critical number for living organisms. For example the concentration of K+ in the nucleus of cells can be more than a hundred times greater than the average for the entire organism.

The most telling thing of all of this is the stone high-water monuments on the hillsides behind some of these villages that washed away. They read:

DON’T BUILD BELOW THIS. . . THE WATER CAME THIS HIGH!

The new seawall standards will only save them from the next tsunami as long as it is nowhere near as high as these monuments.
Besides, TEPCO admits they were advised that a tsunami could inundate the plant and they went shopping for another opinion!!!

Fuel Pond Numbers 3 & 4 could fall at any minute. This could lead to evacuation of central Japan. Have we moved spent fuel storage from high in the buildings of all the GE Mark IV reactors in this country? Have we shut down any power plants that are downstream of any derated earthen dams? We nearly had a Fukushima replay during Hurricane Sandy.

Sadly, even recent history only teaches that we do not learn from history. The moral of the story is that people should not make things that are too dangerous to fail. (Maybe that goes for Banks too!)

To fail is human, but it takes a Nuclear Reactor to really screw things up!!!

Roger Arnold Systems Architect, Silverthorn Engineering
February 3, 2014

One could make a case that the Fukushima meltdowns would never have occurred were it not for the fear and safety paranoia that were allowed to develop around the subject of nuclear power.

The Fukushima reactor and plant designs were instances of a licensed and certified design that had taken many years and billions of dollars to get to. Getting approval to change that design in any way would likely have taken more years and hundreds of millions of dollars in new studies, and studies of the studies, before an official with little to gain and a lot to lose by going out on a limb would authorize the changes.

When some engineer happened to observe that it was probably not a good idea to have all the backup generators together in a place that would be flooded if a really, really big tsunami happened to top the protective berms — well, what would you expect the reaction to be? Of course nobody acted on it. There had never been a tsunami that large in the hundreds of years that such things had been recorded in Japan. The approval process for any deviation from a design that was already certified made the idea of requesting a change, based on such an unlikely contingency, unthinkable.

A high degree of concern for safety is laudable, but there’s a point at which it becomes counterproductive and even self-defeating. No book of rules and procedures can substitute for applied common sense.

Jack Shortt Engineering Consultant, JHS Consulting
February 2, 2014

Mr. Smith,
A few comments in response to your discussion re Fukushima, and nuclear plant safety evaluation in general.

First of all, I would like to know who told you that accidents would be thousands of years apart, and if anyone believed it. I am unaware of any such assurances by responsible nuclear managers, and I have been active in the industry since the late 1960’s.

As one who has dedicated much of my professional career to nuclear power plant engineering and safety review, I offer the following comments for consideration:
The Fukushima plants are American (GE) designed boiling water reactors. We have many of them operating safely and successfully in the USA and elsewhere in the world. We should be aware that nuclear plant safety evaluations go well beyond mechanical and site risks, although I am not sure what you mean by “risk”. The safety evaluations we did back in the 1970-80’s were considered adequate, and thus far have proven to be adequate; although you may consider that the human operator error(s) at TMI were an un-evaluated safety issue, as was the particular sequence of events that occurred. In any event US nuclear operations have proven quite safe in comparison with the Fukushima accidents, TMI being far less serious.

Let’s see how a safety analysis is done:

First the design basis accident has to be established. This is a definition of the specific worst conditions; hurricane, earthquake, flood, tsunami, Airplane crash, etc. and the resulting loads and forces that could impact the plant site. The postulated events are based on worst case historical records.

In addition to natural events, the worst credible system or equipment failure must be postulated; including multiple failures from a single incident, and consequential failures resulting from initial failures. In short, a rigorous failure effects analysis is undertaken. This analysis addresses site risks as well as mechanical, electrical, structures, systems and equipment.

The Japanese to their credit have had an excellent program. They have adopted many (probably most) US best practices as well as US designs.

We all know that Fukushima’s design basis did not anticipate the magnitude of the earthquake or the tsunami that occurred. That is why the accident happened; it is the root cause of the disaster. Every other failure was caused (directly or indirectly) by, or magnified by, the intensity of the tsunami / flood.

It seems to me that nothing at all, no structures in the Fukushima area were designed for the earthquake or tsunami they experienced.

The nuclear disaster, after all is said and done, may not have been the worst thing that happened, depending on what you believe about the long term effects of the radiation release. There was plenty of devastation to go around. Yes, if the Fukushima plants were fuelled with coal there may have been less damage. If gas or oil fuel, it could have been worse.

This introduces questions about risk assessment in general, and the probabilities that may justify spending our limited resources.

To name a few favorites:

Rising sea levels and storm floods. CO₂ limits are not likely to fix this problem, if it is a continuing problem.

Tsunami, many possible catastrophes. The worst may be the collapse of a Canary Island mountainside into the Atlantic ocean which could hit the east coast with a 100-foot high tidal wave. This, scientists tell us, will happen. We just don’t know when.

Super Volcanoes: Yellowstone, Krakatoa, others? Science tells us they will erupt, just can’t tell when. Incidentally, Krakatoa (Indonesia) last blew about 200 years ago. It caused a decade of extremely
cold worldwide weather. Ordinary volcano eruptions may be more likely to “fix” global warming than the US “War on Coal.”

If we are to be overwhelmed with worry about nuclear risks, we should try to keep it in perspective. The probability of occurrence as well as the probability must be considered.

In my opinion, the risk presented by poverty in the world is the most serious issue we face. I have seen it, and I know its effects.

PS: I missed the news about hurricane Sandy and the near miss at a nuclear plant. Do you have a reference?

Jack Shortt

Roger Arnold Systems Architect, Silverthorn Engineering
February 2, 2014 at 9:16 PM

I can’t claim to be an authority on nuclear reactor safety or the health effects of various levels of radiation exposure. I do follow those issues as they surface in science magazines and popular web sites. I’m also still enough of a physicist to be able to dive into the professional literature on occasion and sort what does and doesn’t make sense.

On that basis, I’m inclined to credit the studies that disprove the “linear, no threshold” model for radiation effects. The model never did make any sense to me in the context of the evolutionary environment.

Background radiation has been present since before life on earth got started. Given that, it’s to be expected that terrestrial lifeforms have at least evolved various means to cope with it, and likely even depend on it. It makes no sense at all that variations in exposure levels that are small in comparison to natural variations from one locale to another would have major adverse effects. Yet that’s the scale we’re looking at for exposure levels beyond the near vicinity of the melted Fukushima reactors themselves.

The bottom line is that I’m inclined to agree with Herschel; the lesson we should be taking from Fukushima is that “Wow, the worst case meltdown scenario actually happened, and not only has the world not ended, but nobody has died of radiation effects.”

Unfortunately, the truly cataclysmic effects of the super-tsunami itself get conflated with the cataclysmic effects we’ve been led to fear from a nuclear meltdown. The association leaves most people with the takeaway that “nuclear power is unsafe”.

W. Scott Smith Developer, Alternative Propulsion & Energy Research
February 3, 2014 at 11:04 PM

Please refer to the chart in http://z-pec2012.yolasite.com/resources/Consequences%20of%2010%20Bq%20per%20m%5E3.pdf

Part of the problem is that the nuclear industry has influenced the Government to ignore well-known data in other fields. For example consider the following excerpt from a paper I am writing:
Check out the bio-magnification of cesium-137 at a level of only 10 Bq/m³ of seawater – that is expected off of California, any time this year. Yes, the ocean is not that radioactive, but this is not what matters. What matters is the bequerals per Mol of potassium in one m³ of seawater. When living cells scavenge for potassium, it picks up whatever cesium-137 is in the water according to their molar ratio.

Key parts of living organisms collect cesium-137 to a level that is hundreds of times higher than what is found in the sea water. Compare 10 Bq/m³ in seawater to the concentration inside of the smallest, but most important, yet most vulnerable parts of our bodies. Comparing average internal radiation to the same amount of external radiation doesn’t even begin to paint a true picture. Even taking average tissue concentrations such as in the thyroid does not tell the true story of damage to our neurons and our genetic and control structures in the nuclei of cells.

There is an enormous eco-collapse going on right now in the Pacific. Everything about it looks like radiation sicknesses. However, they just keep repeating the nonsense about the low average radiation in the water. They never discuss the fact that the molar ratio of cesium-137 and potassium is the key insight. By the way, cesium-137 is about 800 times more radioactive than plutonium, and cesium dissolves in water and stays there as persistently as salt.

W. Scott Smith Developer, Alternative Propulsion & Energy Research
February 4, 2014 at 12:11 AM

Suppose we say that the risk of operating one plant would be expected to be one in ten-thousand years.

That sounds pretty good until you remember that we have more than four hundred of these things operating at any time. So now you must expect a major accident once every twenty-five year.

As I said in the previous post, you can’t compare average rates of radiation. Ingestion is far worse. They used to put 1000 Bq/liter water as low-level waste. Now that is our food and water maximum.

Are all of these researchers anti-nuke wackos???

4. Bandazhevsky GS. Functional modifications of myocardium in postnatal ontogenesis under the influence of incorporated radionuclides.

Source: http://www.ourenergypolicy.org/is-our-understanding-of-fukushima-backwards/

**Stunning New Report on USS Reagan Radiation**

by JusticeSeeker68Follow

*Harvey Wasserman, Common Dreams . . .

Radioactivity Neutralization Methods -77- May 30, 2014
A stunning new report indicates the U.S. Navy knew that sailors from the nuclear-powered USS Ronald Reagan took major radiation hits from the Fukushima atomic power plant after its meltdowns and explosions nearly three years ago. Many of the sailors are already suffering devastating health impacts, but are being stonewalled by Tepco and the Navy.

The $4.3 billion carrier is now docked in San Diego. Critics question whether it belongs there at all. Attempts to decontaminate U.S. ships irradiated during the Pacific nuclear bombs tests from 1946-1963 proved fruitless.

Stars and Stripes . . .

When the March 11, 2011 disaster struck, the Reagan was on its way to Korea, according to Reagan sailors who participated in Operation Tomodachi. They turned around and immediately made their way for the Japanese mainland, passing through a sea of debris.

Sailors told Stars and Stripes that they believe they were as close as five miles off the coast of the stricken plant that spewed radiation into the air and sea.

Sailors who were onboard the Reagan have claimed that they were drinking contaminated desalinated seawater and bathing in it until the ship’s leadership came over the public address system and told them to stop because it was contaminated. They claim the ventilation system was also contaminated. Furthermore, some claim they were pressured into signing forms confirming they had been given iodine pills when none had been provided.

The ship's ventilation system might have been contaminated? What other systems might have been contaminated?

The US Navy's "investigation" of the turret explosion on the USS Iowa doesn't give me much confidence that we'll be told the truth about conditions aboard the USS Reagan during its exposure to Fukushima radiation, or about what action has been taken to decontaminate the $4.3 billion dollar carrier.

Wasserman . . .

In the midst of a snow storm, deck hands were enveloped in a warm cloud that came with a metallic taste. Sailors testify that the Reagan’s 5,500-member crew was told over the ship’s intercom to avoid drinking or bathing in desalinized water drawn from a radioactive sea. The huge carrier quickly ceased its humanitarian efforts and sailed 100 miles out to sea, where newly published internal Navy communications confirm it was still taking serious doses of radioactive fallout.

Still taking serious doses of radioactive fallout.

For how long?

Wasserman . . .

Tepco and the Navy contend the Reagan did not receive a high enough dose to warrant serious concern. But Japan, South Korea and Guam deemed the carrier too radioactive to enter their ports.
Tepco and the Navy are insisting that all is well.


**Government Plan to Ship, Store Nuclear Waste is Insane**

Now we all know that the Department of Energy has been conscientiously trying to verify that Yucca Mountain would be a suitable site for storing nuclear waste for eons of time, right? Mr. Yurth explains a very serious reason, naturally not publicized by the DOE, why the Yucca Mountain nuclear waste dump would be "suicidal"!

Government Plan to Ship, Store Nuclear Waste Is Insane
*Salt Lake Tribune*, Sunday, June 30, 2002
BY DAVID G. YURTH

The final decision to store nuclear waste under Yucca Mountain and on the Goshute Indian Reservation in western Utah has apparently been made despite negative recommendations provided by a variety of governmental agencies, commissions, the General Accounting Office, private companies, and many qualified scientists and environmental groups. The governors of Nevada and Utah have voiced very strong opposition to the storage of waste in their respective states.

The problems discussed in the media thus far include such issues as the costs associated with building the Yucca facility, the costs and dangers associated with transporting the waste across state lines, the dangers associated with terrorist attacks on such shipments and so on.

All of this notwithstanding, there is another, much more serious problem, which has not been addressed or adequately debated, either in Congress or in the public forum. At the heart of the issue lies the unresolved set of problems associated with the catastrophic failure of the materials used to contain the deadly heavy ion nuclear waste materials. The issues related to the process known as "neutron embrittlement" of the containers are not addressed in any government information releases and are seldom referred to in any public discussions of this matter.

The half-life of many of the most potent and therefore most dangerous materials – such as cesium, strontium and plutonium – is estimated by Argonne National Laboratories to be in excess of 1.5 billion years. Other materials have been shown to demonstrate varying rates of half-life decay ranging from 250,000 to 10,000 years. The press releases and pronouncements issued by DOE and NRC almost always focus on the shortest half-life cycles during debates related to encapsulation of such materials. We have seen no references in the press to the longer half-life cycles of the most potent waste materials in any recent articles related to the advisability of burying them at Yucca Mountain and storing them on the Goshute Indian Reservation.

The process of neutron embrittlement is not conceptually difficult to describe or understand. When highly reactive nuclear fuel materials are enclosed in zirconium fuel rods, the principal nuclear material emitted to produce heat, light and other related effects are neutrons. Neutrons are heavy ions which are emitted at very high velocities. The materials used to drive nuclear fission reactors are packed into zirconium fuel rods because zirconium demonstrates a unique characteristic among all metals. Zirconium, in its pristine state, is
essentially transparent to neutron emissions. This means that the neutrons emitted by the encapsulated fuel rods pass through the zirconium unabated.

The reason the fuel rods have to be taken out of circulation and replaced with new ones is not because the fuel material gets used up, in the conventional sense. Instead, the transparency of the zirconium to neutron emissions eventually becomes hampered. This happens because the continuous bombardment of the zirconium by high-velocity neutrons atomically alters the crystalline structure of the fuel rods themselves. Eventually, instead of allowing the neutrons to pass unimpeded through the containment rod materials, the fuel rods themselves become very unstable and dangerous. When the fuel rods can no longer allow neutrons to pass to the outside environment, the danger of uncontrollable fission becomes sufficiently compelling to require that the fuel rods be removed from the nuclear pile and stored in water.

The process of neutron embrittlement has been conclusively shown to be irreversible. No material yet devised by human ingenuity is immune to this phenomenon. At Argonne National Laboratories, the most advanced ceramic "glassine" encapsulation materials have been shown to have a viable life as containment barriers of much less than 1,000 years, in the presence of the kind of heavy ion nuclear waste materials stored at sites such as DOE's Savannah River nuclear waste dump. The results of the studies funded by DOE related to this phenomenon have not been released to the general public.

They suggest that our worst fears are probably well founded.

Even in the case of low-grade materials with a half-life of 10,000 years, it is likely that catastrophic containment failure can be reasonably expected before less than 10 percent of the material's half-life decay cycle has been completed. It has been estimated that the best of the current containers may last between 50 and 100 years, assuming they are sited in a pristine environment. There is considerable question about the extent to which the Yucca Mountain site can remain pristine for any length of time. The degree of contamination which could be reasonably expected in the event of a catastrophic failure of the highly compactified field of nuclear waste storage containers, such as the one proposed for Yucca Mountain, surpasses even the most malignant assessments. It is simply suicidal to even consider the option.

(End of article)

Source:  http://www.sltrib.com/2002/jun/06302002/commenta/749573.htm  To retrieve this article, go to www.archive.org and enter the site.

**Entombment of the Fukushima Reactors**

Here's how to fix Fukushima:  Summary – use 3D/4D printing to build the entombment in layers of hemp concrete, lead, and tungsten with a rounded edges hemp plastic exterior. Plant hemp and the radiation eating mushrooms identified by the Albert Einstein Institute. Stop the drug war so folks can use medical marijuana to deal with the sickness that comes from increased radiation exposure, i.e.. Rick Simpson's cancer cure oil. Reinforce existing structures to reduce indoor radiation exposure, i.e.. (as suggested by David Crockett Williams) by adding some borates to the filament mixture as we print radiation shielding on our homes, businesses, decommissioned nuclear power plants, etc. More information on this is posted on J. Nayer Hardin’s blog.  http://hempnayer.blogspot.com/2013/10/how-to-fix-fukushima.html.

Here's the article's introduction with some of the links listed below.  We can fix Fukushima, and we must do it now.

Radioactivity Neutralization Methods  -80-  May 30, 2014
1. ENTOMB! Construct a sarcophagus around Fukushima’s buildings and water pools/tanks to effectively contain this triple nuclear meltdown. Use the construction technology of 3D/4D printing to build the object shelters by printing layers of radiation shields. Behorkh Khoshnevis of the University of Southern California has a great design for the application of what he calls Contour Crafting.

2. This construction technique builds on large/huge mobile construction gantries with suspended 3D / 4D printers that build/print around the areas that are radiating...the buildings and the tanks too. Enclose the pools used to hold the contaminated cooling waters too. Printed encasement layers could include:

Layers B and B1 – Lead and tungsten, blend or separate layers, whatever works best.
Layer C – Steel which is being developed as a material for Chernobyl’s entombment. (May not be needed. But since it was part of Chernobyl's strategy and the printers can print metals too, why not. The problem will be here way after we're gone.
Layer D – Hemp plastic. It is waterproof and 10x stronger than steel.

Print the entombment in scientifically calculated and configured depths with rounded edges to allow winds and water to go around the structure rather than leave it vulnerable to wear and tear, especially from extreme weather, earthquake and flood conditions.

Since 3D printing prints with mass, it is possible for us to add other things and concepts to the printing recipe.

For example, I asked the noted scientist, activist and friend David Crockett Williams “Is there a way to re-design a Faraday cage to contain the radiation like the cage does with electricity? And what could we add to the entombment mixture to make it more radiation absorbent?

Williams responded:

"Well, as far as I know the properties of the radioactivity radiation are such that the radiation is not effected by electromagnetism to where the Faraday cage can shield such radiation electromagnetically.

But there is some property of boron or borates like tetrasodium borate like they use for air drops of fire repellent, but that ‘quenches’ radioactivity.

Like if you added borate to cement to increase its effectiveness in shielding radiation. Radioactivity radiation needs a thicker medium than a layer of wires like the Faraday cage.

Water actually absorbs such radiation pretty well, and they use that in the fuel pools not only to cool the fuel rods but to absorb their radiation by the water molecules.

I suspect it would only take about 10-20 feet of some kind of borate jello to absorb all the radioactivity from being transmitted, but never really studied the best options, or what they finally did and are still doing to maintain safeguards at Chernobyl."

This is why the world needs to work together, to come up with the best ideas and implement them. With the web it's not that difficult to do. We just need the will. [Asking Williams to chair a team of scientists to kick around online how to fix Fukushima].

Radioactivity Neutralization Methods -81- May 30, 2014
Energy: Power the plant, water pools construction and maintenance with dual free energy systems, e.g. magnetic, solar and/or hydro. Use shielded, wire commanded and power delivered systems for heavy earth moving equipment and robots for maintenance tasks. For additional power sources see Gary Vesperman’s “130 Electrical Energy Innovations”, “Space Travel Innovations”, and “Ten Possible Technical Solutions to the Lake Mead Water Shortage” in www.padrak.com/vesperman.

Structural Note: Tunneling under the plant is necessary to build a 360-degree sarcophagus where the entire structure is in place to keep the excess radiation from leaking further into the air and ocean. Should the land under the plant be washed/eroded away, the structure may have to float on its own. Let science calculate the structure and tunneling depths while planning for all possible contingencies.

tropical nuclear meltdown
Japan’s Triple Nuclear Meltdown Tour of Fukushima Daiichi Nuclear Power Plant

Contour Crafting: 3D House Printer
Behorkh Khoshnnevis of the University of Southern California

3D/4D printers
Contour Crafting
Contour Crafting Home site
http://www.contourcrafting.org/

The ‘contour crafting’ construction technique builds on large/huge mobile construction gantries with suspended 3D/4D printers that build/print around the areas that are radiating...the buildings and the tanks too. Enclose the pools used to hold the contaminated cooling waters too. Printed encasement layers could include:

3D Systems – Architecture, Engineering and Construction

Layer A – Hempcrete – a strong hemp-based concrete.
Layers B and B1 – Lead and tungsten, blend or separate layers, whatever works best.
Layer C – Steel which is being developed as a material for Chernobyl’s entombment. (May not be needed. But since it was part of Chernobyl’s strategy and the printers can print metals too, why not. The problem will be here way after we're gone.
Layer D – Hemp plastic. It is waterproof and 10x stronger than steel.

Hempcrete
Hempcrete – The World’s Strongest Building Material
http://www.collective-evolution.com/2013/02/03/hempcrete-worlds-strongest-building-material/

hemp based concrete
Building with Hemp – Spray Applied Hempcrete
http://www.youtube.com/watch?v=FSUIxGMOwc

Lead
Radiation Shielding – Lead
http://innovativebiomedical.com/wp-content/uploads/2012/03/radiation_shielding-lead-etc..pdf

Tungsten
Tungsten Radiation Shielding
http://www.thirdwave.de/3w/tech/armor/tungstenrayshield.pdf

Steel
Metal Shield To Encase Chernobyl Nuclear Disaster
http://planetearthherald.com/metal-shield-to-encase-chernobyl-nuclear-disaster/

Hemp plastic
http://www.hempplastic.com/

waterproof
https://www.youtube.com/watch?v=Yfg4tbRcC7I

10x stronger than steel
Henry Ford’s Hemp Plastic Car
https://www.youtube.com/watch?v=ryO2JLzFPTY

Source: February 3, 2014 email from J. Nayer Hardin jnayer@yahoo.com to garyvesperman@yahoo.com and David Crockett Williams gear2000@lightspeed.net. Subject was “How To Fix Fukushima”.


David Crockett Williams’ website is http://www.angelfire.com/on/GEAR2000/.

David Crockett Williams has suggested these two links:


Reprocessing and Transmutation of High-Level Nuclear Waste

Composition of reprocessing wastes per 1,000 kg of spent nuclear fuel:
(Murray, 2003)

Fission products 28.8 kg
U 4.8
Radioactivity Neutralization Methods

Pu 0.04
Np 0.48
Am 0.14
Cm 0.04

Reprocessing chemicals 68.5

Reprocessing wastes

The weight of reprocessing waste is about one-tenth of the weight of spent nuclear fuel. Sr-90 and Cs-137 are the major problems during the first few centuries of waste storage. Can they be eliminated from high-level waste? This will be discussed later. For now by definition, reprocessing wastes are high-level waste.

Reprocessing wastes include aqueous/nitric acid solutions that contain fission products such as Cs, Sr, Zr, Ni, La and others which are derived from spent nuclear fuel from military applications in the US. Because the US does not reprocess spent nuclear fuel, high-level waste treatment research has not been a major priority in the US. In general, these are high-level liquid wastes that are stored in underground tanks.

https://wiki.engr.illinois.edu/download/attachments/194283148/Waste+treatment.pdf?version=1&modificationDate=1330551702000 is a colorfully illustrated primer on radioactive waste treatment. It includes more on calcination, immobilizing, vitrifying and synthetic rocks. Once high-level waste is fixed into some type of wasteform, it may still leach into water of various temperatures, acidity or alkalinity, and with enough time.

Basic concepts of transmutation

Transmutation is defined as transformation of one isotope into another by neutron absorption. The products are either the next heavier isotope or two or more fission products.

Fissile is defined as fissionable by thermal neutrons. $^{235}\text{U}$ is fissile whereas $^{238}\text{U}$ is not. Energy production results in transmutation

$^{235}\text{U} + \eta \rightarrow ^{236}\text{U}^{*} \rightarrow$ fission products $+ \eta + \beta + \gamma$

The fission products include $^{90}\text{Sr}$ with a half-life of 28.8 years and $^{137}\text{Cs}$ with a half-life of 30.1 years. And by neutron capture

$^{238}\text{U} + \eta \rightarrow ^{239}\text{U}^{*} \rightarrow ^{239}\text{Np} + \beta^{-} \rightarrow ^{239}\text{Pu} + \beta^{-}$

(23.5 min) (2.35 d) (24,400 y)

Transmutation as a curse and cure?

Transmutation creates waste management issues with respect to either once-through spent nuclear fuel or in reprocessing spent nuclear fuel. Can transmutation be applied to spent nuclear fuel to reduce its radiotoxicity by converting radionuclides with long half-lives to ones that decay more quickly?

The Roy Process

Radioactivity Neutralization Methods -84- May 30, 2014
Some people think so. Several transmutation processes have been proposed. Take for example “The Roy Process.” In 1979, the late Dr. Radha Roy announced he “had invented a new method to render all radioactive waste elements, including plutonium, into non-radioactive elements.”

“With the Roy Process, high-level nuclear waste can be neutralized and totally eliminated at each reactor site, where the waste is now stored in cooling ponds. When treated with the Roy Process, these unstable radioactive isotopes rapidly decay into stable, non-radioactive elements . . .”

http://www.youtube.com/watch?v=vEyMUBBGePQ

**Realities of Transmutation as a Waste-Treatment Technology**

Transmutation of persistent fission products:

\[ ^{99}\text{Tc} + \eta \rightarrow ^{100}\text{Tc} \rightarrow ^{100}\text{Ru} \]
(2.12 x 10^5 y) (16 sec) (Stable)

\[ ^{129}\text{I} + \eta \rightarrow ^{130}\text{I} \rightarrow ^{130}\text{I} \rightarrow ^{130}\text{Xe} \]
(1.6 x 10^7 y) (9 min) (12 hours) (Stable)

These are examples of desirable reactions.

The process of transmutation can also initiate undesirable side reactions that produce new radionuclides with long half-lives. For example,

\[ ^{133}\text{Cs} + \eta \rightarrow ^{135}\text{Cs} \]
(stable) (2.3 x 10^6 y)

\[ ^{241}\text{Pu} + \eta \rightarrow ^{242}\text{Pu} \]
(13.2 y) (389,000 y)

\[ ^{35}\text{Cl} + \eta \rightarrow ^{36}\text{Cl} \]
(stable) (3.1 x 10^5 y)

Some fission and activation products do not transmute significantly because their cross section for capturing thermal neutrons is too small. The term “cross section” is the probability of a nuclear reaction resulting in transmutation. Some of these products include \(^{79}\text{Se}\), \(^{126}\text{Sn}\), \(^{36}\text{Cl}\), and \(^{14}\text{C}\). This also includes \(^{90}\text{Sr}\) (1.34 barns) and \(^{137}\text{Cs}\) (0.176 barns).

Transmutation cannot be applied to solid spent nuclear fuel. Because spent nuclear fuel contains \(^{235}\text{U}\) and \(^{238}\text{U}\), the addition of thermal or fast neutrons would produce more Pu which is not the goal. Transmutation must be coupled with chemical separation of the radionuclides into different wastes streams.

**Separation and Transmutation**

Under study:

Aqueous chemical separation (PUREX, UREX, TRUEX, etc.) followed by transmutation in light water reactors or fast breeder reactors.
Pyroprocessing separation followed by transmutation in light water reactors of fast breeder reactors.

**Current research results**

“SNF is placed into a cathode basket that is then immersed in a pool of molten LiCl-Li₂O. When a sufficiently high electrical potential is applied, oxygen gas bubbles are evolved at the anode, and actinide oxides are reduced to metals at the cathode. Rare earth fission products appear to remain unreduced in the basket. Alkali and alkaline earth fission products (Cs, Sr, Rb, and Ba) partition into the salt, presumably as chlorides.” (Simpson, 2006)

Still have waste issues . . .

![Pyroprocessing schematic image](image)

**Barriers to Separation and Transmutation**

Separation requirements for transmutation:

U and Pu must be separated (PUREX).

Cs and Sr must be separated (under study).

Methods for separating Am, Cm, Np, and turning them into targets for transmutation are still at the experimental stage.

All extractions need to be optimized to extract nearly all of each radionuclide.

Any separation and transmutation approach would increase the volume of low-level radioactive waste.

Source: https://wiki.engr.illinois.edu/download/attachments/194283148/Waste+treatment.pdf?version=1&modificationDate=1330551702000 is a colorfully illustrated primer on radioactive waste treatment. Its topics include:

- Composition of spent nuclear fuel and reprocessed nuclear waste
- High-level liquid radioactive waste
- French vitrification program
- Ceramic wasteforms – ’synthetic rock’
- Realities of transmutation of radioactive waste

**Environmental Heat Engines for Emergency Nuclear Fuel Cooling**

Problem: Every century or two the sun aims towards the earth a huge coronal mass ejection causing an electromagnetic storm intense enough to blow out numerous inductive transformers. Power grids could go down for months or even over a year. But nuclear reactor cooling pumps can only rely on diesel generators for at most a few days or weeks. Blackout-crippled refineries would not be able to supply diesel fuel for several months. Without cooling pumps, nuclear reactors and spent fuel storage pools would overheat – releasing catastrophic radiation ala Chernobyl and Fukushima.

See for example “Concern Grows Over Possibility of a Massive Power Surge” http://articles.latimes.com/2014/feb/01/nation/la-na-power-surge-20140202

Solution: Efficient and pollution-free environmental heat engines absorb ambient heat to expand a working fluid such as Freon or ammonia which pushes pistons through sealed chambers. An environmental heat engine can utilize a nuclear reactor’s own natural low-grade heat to drive an auxiliary generator. The reactor’s cooling pumps can then be powered with the generator’s electricity until the local power grid is eventually restored.


Below is the text of Ken Rauen’s December 5, 2013 email to Gary Vesperman. Rauen's Rauen cycle and Supercritical cycle engines expand working fluids with environmental heat to provide useful net mechanical power.

Hi Gary,

I like the air well idea. When energy to make electricity is free, heat pumps can refrigerate the atmosphere
and condense water from low humidity air easily, an air well.

You may want to know that my current work in environmentally heated engines are two projects being promoted by Mark Goldes' group, Aesop Institute. See www.aesopinstitute.org. The home page says something about the piston engine, and the topics on top refer to the piston engine as one project and the turbine engine as the other project. In both cases, other men invented these engine concepts. I just took the ideas to a better design, understanding how they work. One patent application has been made for Wainwright's piston engine concept, and the Kondrashov turbine idea has spawned another related invention.

Our potential investors are not delivering much yet – survival money – and we are still looking for more support. Your exposure of this work could be helpful. Unlike other free energy possibilities, I can go "nose to nose" with any university physics professor about the science behind these projects. The science is solid. The technology is identified. It just needs resources to acquire facilities, tools, and materials.

Have Fun,

Ken Rauen

**Capacitive Step-Down Transformer**

The capacitive step-down transformer is a simpler, cheaper, lighter, smaller, nearly 100% efficient alternative to inductive transformers. Capacitive step-down transformers do not have the inductive, noise, heat and sound losses of inductive transformers.

Capacitive step-down transformers can be used anywhere that is stepping down high voltages, low amperes into lower voltages, higher amperes – industry, commercial, residential and appliances. Not using capacitive step-down transformers has resulted in lower efficiency of transmission and distribution with enormous waste of electricity.

Capacitive power supplies (CPS) are inherently capacitive amperage limiting. So therefore short circuits do not damage them. A brownout or blackout in one area of the grid will not take down any generators that are protected with CPS technology. There is no need for electronic controls or a grid infrastructure upgrade – the amperage control is automatic and instantaneous. If a solar flare blows out many inductive transformers, capacitive step-down transformers can be fast, effective replacements.

Capacitive step-down transformers can also be reconfigured quickly and easily onsite to handle more or less wattage or to change voltage and amperage ratios. All applications that use step-down transformers can be converted.

Inventor: George Wiseman, Oroville, Washington, USA
Author of “Capacitive Battery Charger” www.eagle-research.com

**From Russian Warheads to Cheap American Nuclear Electricity**
As the Cold War ended in the late 1980s and early '90s, a new fear arose amid the rejoicing and relief: that atomic security might fail in the disintegrating Soviet Union, allowing its huge stockpile of nuclear warheads to fall into unfriendly hands.

The jitters intensified in late 1991, as Moscow announced plans to store thousands of weapons from missiles and bombers in what experts viewed as decrepit bunkers, policed by impoverished guards of dubious reliability.

Many officials and scientists worried. Few knew what to do.

That is when Thomas L. Neff, a physicist at the Massachusetts Institute of Technology, hit on his improbable idea: Why not let Moscow sell the uranium from its retired weapons and dilute it into fuel for electric utilities in the United States, giving Russians desperately needed cash and Americans a cheap source of power?

Last month, Dr. Neff’s idea came to a happy conclusion as the last shipment of uranium from Russia arrived in the United States. In all, over two decades, the program known as Megatons to Megawatts turned 20,000 Russian warheads into electricity that has illuminated one in 10 American light bulbs.

Dr. Neff fathered the atomic recycling program in spite (or perhaps because) of his lack of name recognition, his inexperience on the world stage and his modest credentials in arms control. Moreover, he not only came up with the original plan but shepherded it for decades.

“I was naïve,” Dr. Neff, 70, recalled in a recent interview. “I thought the idea would take care of itself.”

In fact, it required sheer doggedness and considerable skill in applying nuclear science to a global deal freighted with technical complexities and political uncertainties. Yet in the end, Dr. Neff noted, the mission was accomplished: Uranium once meant to obliterate American cities ended up endowing them with energy.

Nuclear experts hail it as a remarkable if poorly known chapter of atomic history. The two decades of bomb recycling, they say, not only reduced the threat of atomic terrorism and helped stabilize the former Soviet Union but achieved a major feat of nuclear disarmament — a popular goal that is seldom achieved.

“It’s an amazing thing,” said Frank N. von Hippel, a physicist who advised the Clinton White House and now teaches at Princeton. The wave of arms destruction, he said, eliminated up to a third of the planet’s atomic bomb fuel, making it “the biggest single step” in the history of nuclear arms reduction.

He called Dr. Neff an underappreciated hero, adding that in a time of governmental muddle and paralysis, his success was a striking example “of what one person can do.”

Thomas Lee Neff was born in 1943 in Oregon, the older of two boys; his family raised chickens and grew most of its own food. He studied math and physics at Lewis & Clark College in Portland, graduating with highest honors, and received his Ph.D. in physics from Stanford. As a senior M.I.T. researcher, he specialized in energy studies, writing books on nuclear power, solar energy and, in 1984, the global uranium market. His timing was propitious.

In the nuclear age, the rare isotope uranium 235 has played starring roles in war and peace. When highly purified, to a level of 90 percent, it fuels atom bombs; at 5 percent, it powers nuclear reactors for electric
As the Cold War ended, Dr. Neff wondered whether these disparate worlds might be able to do business together. When Washington and Moscow announced major unilateral arms reductions in late 1991, he recalled, “I said: ‘Wow. What’s going to happen to all these weapons?’ ”

Dr. Neff, like many experts of the day, worried that the Soviet Union was ill equipped to deal with thousands of discarded bombs. The treaties and independent actions of the Cold War allowed nuclear arms taken from bombers and missiles to be kept in storage, raising the possibility of reuse, diversion and theft.

The beleaguered communist state, he feared, was already cutting back on nuclear upkeep, workers’ pay and dozens of measures meant to keep weapons safe. He also suspected that newly impoverished Russian nuclear scientists, once a pampered elite, might seek work elsewhere.

“It all sounded dangerous,” he said.

His solution was atomic recycling. The question was how to float the idea.

On Oct. 19, 1991, nuclear experts filed into the Diplomat Room of the State Plaza Hotel in Washington. The agenda of the nongovernmental meeting was demilitarization. A Soviet delegation attended, as did Dr. Neff.

Outside the conference room during a break, he approached a leader of the Soviet bomb complex, Viktor N. Mikhailov, a canny apparatchik known for his love of Western cigarettes.

Dr. Neff asked whether he would consider selling the uranium in Soviet weapons.

“Interesting,” he said Dr. Mikhailov replied, puffing away. “How much?”

Five hundred metric tons, Dr. Neff said, giving what he considered a high estimate for the quantity of Soviet bomb fuel soon to become surplus. “If I had known how much they really had,” he recalled, “I would have said 700 tons.”

Even so, 500 metric tons was a lot: 1.1 million pounds, heavier than a fully loaded 747 jetliner.

Five days later, Dr. Neff made his idea public in an Op-Ed article in The New York Times, “A Grand Uranium Bargain.” The illustration showed a kitchen pot and spoon floating eerily above a countertop and just behind an open window. Outside was a bomber.

“If we do not obtain the material,” he warned, shadowy agents in the former Soviet Union, perhaps uncontrolled by central authority, might seek to “sell weapons-grade materials to the highest bidders.”

The idea gained support in both Washington and Moscow. Carrying it out, through a tangle of conflicting state and commercial interests, was another matter. Dr. Neff was there to prod it along at almost every turn. In late December 1991, he was among the last Westerners to see the Soviet hammer and sickle flying over the Kremlin.
The first shipment of uranium arrived in 1995; 250 more followed over the next 18 years. Last month, a freighter sailing from St. Petersburg to Baltimore delivered the last shipment. Strapped into transport pallets were giant steel drums, each holding about two bombs’ worth of diluted uranium.

Dr. Neff estimates that he flew 20 times to Russia and other former Soviet states to work on the original deal and its amendments. He says a book he is writing draws on thousands of documents.

Thomas B. Cochran — a senior scientist at the Natural Resources Defense Council in Washington who helped organize East-West interactions at the Cold War’s end, including the gathering where Dr. Neff met the Soviet official — said the American physicist deserved “99 percent of the credit” for the uranium deal. Its most important result, he added, was simply improving the relationship between the United States and Russia at a critical moment in history.

Last month, the Russian Embassy in Washington held a reception to mark the end of the Megatons to Megawatts program. Dr. Neff was an honored guest.

A brochure handed out at the reception reprinted his Op-Ed article, praising the commercial deal as a first for nuclear disarmament. It put the overall cost of the transaction at $17 billion.

Uranium from the dismantled weapons, it said, was diluted into 15,432 tons of low enriched uranium. The resulting reactor fuel supplied half of all American nuclear power plants.

The total electric power, it said, could illuminate the whole of the United States (roughly 20,000 cities and 115 million households) for about two years — or Washington, D.C., for 185 years.

The atomic sale, the brochure said, “is widely held to symbolize the end of the era of confrontation between the two major nuclear powers.”

In an interview, Ernest Moniz, the federal secretary of energy and a former colleague of Dr. Neff’s at M.I.T., praised him for not only proposing the plan but helping guide it for more than two decades.

“If he hadn’t stuck with it,” Dr. Moniz said, “it could have very easily been one of these great ideas that ends up just spinning its wheels.”

Millions of idealists, from President Obama on down, have sought a world without nuclear weapons. Dr. Neff, despite doing more than almost anyone to advance that goal, is circumspect about what he accomplished.

He made no mention of energy windfalls, geopolitical realignments or the biblical injunction to turn swords into plowshares.

The lesson of the story, he remarked in an interview, “is that private citizens can actually do something.”


United Kingdom Nuclear Industry’s Financial and Safety Nightmare

Radioactivity Neutralization Methods

May 30, 2014
Institute of Science in Society Report 22/09/08

A devastating new report exposes UK’s unfolding nuclear catastrophe – Dr. Mae-Wan Ho

Voodoo economics dooms nuclear renaissance

Paul Brown, environmental correspondent of The Guardian newspaper in Britain, has produced a detailed report documenting why it is not possible to achieve what the UK Government says it will do, build a new generation of nuclear stations without public subsidy.\(^{14}\)

New build will not be possible without large sums of taxpayers’ money being pledged, and extending the unlimited guarantees to underwrite all the debts of the existing and future nuclear industry.”

One should point out here that it appears impossible to have new nuclear build in the United States even with extremely generous public subsidy\(^{15}\) (Nuclear Renaissance Runs Aground, SiS 40). In the UK, there is already an extensive hidden subsidy to the industry.

Brown’s report exposes how badly the nuclear industry has performed over the entire 50 years of unfulfilled promises, and the escalating bill to the taxpayer.

The UK nuclear industry, like that in the US\(^{16}\), has never completed any project on time or on budget and has saddled the nation with a mammoth nuclear fuel reprocessing complex at Sellafield that’s a financial as well as safety nightmare.

British Energy, the commercial company privatized in 1996, soon ran into serious financial trouble\(^{17}\) (see Box 1), and had to be taken over by the government. That meant the taxpayer has essentially underwritten all its debts and liabilities so the company can never go bankrupt. Brown remarks: “This commitment dwarfs the risk to the taxpayer of the Northern Rock nationalization.” It means paying for the maintenance and decommissioning of ageing nuclear power stations, and worst of all, the upkeep of the Sellafield nuclear reprocessing complex.

British Energy

British Energy is UK’s largest electricity provider established and registered in Scotland in 1995 to operate the 8 most modern nuclear stations, two advanced gas-cooled reactors (AGRs) from Scottish Nuclear and five AGRs and one pressurized water reactor (PWR) from Nuclear Electric. The remaining Magnox power stations from these two companies were transferred to Magnox Electric which later became the generation division of British Nuclear Fuels (BNFL). British Energy was privatized in 1996 and bought the 2 GW Eggborough coal fired station from National Power in 2000.

The company ran into financial trouble in 2002, when it first approached the British government for financial aid. In September 2004, the government bailed out the company with over £3 billion investment, and took over all its liabilities.

---


\(^{15}\) Ho, Mae-Wan. Nuclear renaissance runs aground. Science in Society 40 (to appear).\(^{16}\)

So why is the UK government so keen to build new nuclear stations? Its own figures show that a new nuclear power program will cut gas imports by only seven percent and carbon emissions by four percent. Yet the program for four gigantic new stations will get policy encouragement and public subsidy on the false claim that Britain needs them for energy security and reducing carbon emissions.

It will take 10 to 20 years before the first new nuclear stations can be built and producing power in Britain. By that time, the liabilities will be so great that the Government will have to renationalize British Energy, Brown says.

The crisis may come much sooner, and British Energy may have to start closing some of its nuclear stations permanently because the only remaining storage space for spent fuel at the Sellafield complex in Cumbria is running out.

Three of the four new reactor designs being put forward for UK construction have never been built. The only proposed “Generation III” plant under construction is Areva’s EPR, an advanced pressurized water reactor (also under consideration in Ontario) in Finland. It was due to generate electricity in 2009. Delays have dogged the construction from the outset and its completion date has been repeatedly put back, currently to 2011, with additional cost of €1 billion to the €3 billion originally agreed.

Nightmare at Sellafield

Sellafield’s nuclear complex consists of five important operations: two reprocessing plants, the MOX (mixed oxide fuel) plant, the evaporators, and the vitrification plant (that turns highly dangerous radioactive liquid waste into safer glass). With more than 10,000 employees, the massive complex is in crisis. Its reprocessing works and plutonium fuel plant are all failing, costing the taxpayer £3 billion a year and rising.

The taxpayer already faces £73 billion clean-up bill for decommissioning existing nuclear plants, most of that will be spent in Sellafield.

Reporting for the BBC, David Shukman wrote of his visit to Sellafield18: “I saw for myself one of the “ponds” in which an unknown mass of radioactive material was dumped in the 1950s... Beneath the unruffled surface of the water lies an unrecorded collection of rusting metal containers holding radioactive waste, including spent fuel rods... Beside it, workers are constructing a vast new building to handle the materials when a retrieval operation eventually gets under way."

Jim Morse, a senior director at Sellafield sums up the sorry state of affairs in record keeping: “We still have a lot to discover, we haven’t started waste retrieval in those parts of the estate where the degradation and radioactive decay has been at its greatest.” Morse also said the cost of cleanup could go up even further by “some billions”. That’s not the only problem.

The flagship Thorp reprocessing plant, built to extract plutonium and unused uranium from spent nuclear fuel19 (see Energy Strategies in Global Warming: Is Nuclear Energy the Answer? SiS 27) was closed for three years from 2005, and remains under severe operating restrictions and cannot complete its long-overdue contracts to process spent foreign fuel into MOX fuel20. The closure of the elderly Magnox

---

reprocessing plant has been postponed, leaving the UK unable to meet its international commitments to cut radioactive discharges into the Irish Sea. The plants for dealing with the residue of reprocessing – the volatile and dangerous heat-producing high-level liquid waste – fail to work as designed, causing the whole Sellafield production line to seize up. The MOX plant is supposed to make money by turning plutonium and uranium into new fuel, but has been a technical and financial disaster. The fuel was supposed to be the safe way of returning tons of plutonium recovered during reprocessing to its country of origin. This plan has failed, but the Government has no policy for dealing with the ensuing economic and political crisis. As a result, Sellafield is becoming the world’s nuclear dustbin, because foreign nuclear wastes are not being repatriated.

As Peter Bunyard wrote in 2005 (SiS 27)\(^21\), many critics of MOX within and outside the nuclear industry have repeatedly pointed out that the gains are far outweighed by economic and environmental problems.

“In France, reprocessing spent fuel to extract plutonium for MOX fuel manufacture will save no more than 5 to 8 per cent on the need for fresh uranium. Meanwhile, as experience in both France and Britain has shown, reprocessing spent reactor fuel leads to a hundredfold or more increase in the volume of radioactive wastes. In the end, all the materials used, including tools, equipment and even the buildings become radioactive and have to be treated as a radioactive hazard.”

It is highly questionable whether the use of MOX fuel will actually reduce the amount of plutonium. Reactors have to be modified to take MOX fuel, and it is estimated that supply exceeds demand by a factor of two. Meanwhile MOX fuel contains up to 5 percent plutonium and is ideal for terrorists, as the plutonium can be easily extracted to make bombs.

The world’s nuclear waste dump with no end in sight

While Britain piles up its own and foreign nuclear waste, there are currently no plans or sites for a repository to store or dispose of it\(^22\). The earliest dates for a deep underground intermediate waste repository are notionally 2045 and high-level waste 2075. In reality there are no plans for either. Storage space for spent fuel is also running out at Sellafield. Spent fuel assemblies are stacked three deep at the reception ponds and is already a major source of hazard\(^23\) (see Close-up on Nuclear Safety, SiS 40). If Sellafield cannot take any more spent fuel, then British Energy’s reactors will have to shut down.

In the meantime, an average of 300 tons of spent fuel has continued to be delivered to Sellafield each year and none has been cleared through reprocessing in order to free storage space for those continued deliveries. There is an increasing backlog of both spent fuel and all forms of waste. UK’s Nuclear Decommissioning Authority reveals in June 2007 that there are 30,000 tons of uranium and 100 tons of plutonium in store, but no policy for managing the material in the long term.

In the context of a massive new nuclear building program, Sellafield is not just a huge embarrassment but a graphic demonstration of how expensive mistakes can be. The National Audit Office says in 2008 that it is creating an “apparently ever escalating bill” for the taxpayer.

Massive nuclear liabilities discounted by the government

In April 2007, a cost benefit analysis by the Department for Business, Enterprise and Regulatory Reform (BERR) concludes that nuclear power is likely to cost 4.8 pence per kilowatt-hour to produce, provided all future nuclear waste costs are discounted. British Energy’s undiscounted liabilities in 2007 were £14.5 billion, more than double the amount in the liabilities fund designed to pay decommissioning costs\(^{24}\). The nuclear liabilities fund is invested in a supposedly ring-fenced fund, like a pension fund for nuclear facilities. But in the past those funds have been raidied by the nuclear industry to build new nuclear facilities, such as Sizewell B, and the money has evaporated.

The government has pledged this will not happen again, and the discount rate of 3 percent is based on the assumption that the liabilities fund will grow at the rate of 3 percent. The theory is that by the time decommissioning is necessary the fund will neatly pay for everything. The National Audit office and the House of Commons Committee on Public Accounts concluded: “the taxpayer is still exposed.”

Liabilities could easily exceed assets when prices are volatile. In particular, the price of uranium is rising, and experts all say that the supply of good quality uranium is finite, which is also one major reason nuclear power is unsustainable\(^{25}\) (see The Nuclear Black Hole, SiS 40). A shortage of suitable uranium would do to nuclear fuel what the price of oil has done to the cost of running the family car.

In January 2008, the cost of uranium had gone up to US$95 a pound, compared with $85 a pound in March 2007. This would drive up nuclear fuel costs by £146 million a year.

It is quite clear that the British government has been doing everything to make nuclear power look economically competitive, and will give all the overt and covert subsidies to make it happen. The new breed of nuclear power stations are going to be among the biggest power plants in Britain and will be located far away from where most of their electricity will be used. This will require a large investment in the national grid adding further to the financial drain and the inefficiency of the nuclear option.

Source: http://www.i-sis.org.uk/NuclearFinancialandSafetyNightmare.php

**Energy Strategies in Global Warming: Is Nuclear Energy the Answer?**

Institute of Science in Society Report 08/07/05

*Nuclear energy makes economic nonsense and ecological disaster and provides great opportunities for terrorists. Peter Bunyard*

Peter Bunyard will be speaking at Sustainable World Conference, 14-15 July 2005, Details on ISIS website http://www.i-sis.org.uk/SWCFA.php

The complete article with references is posted on ISIS members’ website. The diagrams will only appear in the printed version in the next issue of Science in Society.

Global warming is now and set to get much worse

---


Human-induced global warming is already upon us. The trends in fossil fuel use and the release of greenhouse gases from all human activities, including agriculture, indicate that worldwide we will be hard pressed to achieve the 60 to 80 per cent reduction in greenhouse gases necessary to stabilise greenhouse gas levels in the atmosphere at 550 parts per million (ppm) before the century is out. That’s the upper limit before climate change events become extreme and devastating, according to climatologists [1].

The carbon dioxide level is currently close to 380 ppm in the atmosphere, more than 30 per cent up on the pre-industrial level of 280 ppm. Even at 400 parts per million, which will be reached within 10 years at the current rate of increase of 2 ppm per year, average global temperatures will rise by 2 degrees C [2]. In its scientific review, Climate Change 2001, the Intergovernmental Panel on Climate Change (IPCC) predicts that business-as-usual (BAU) activities across the planet could lead to an average temperature rise of as much as 5.8 degrees C within the century. But such predictions, disturbing as they are, do not take into account the impact of global warming on terrestrial vegetation, including the world’s tropical rainforests. Peter Cox and his colleagues at the Hadley Centre of UK Met Office have elaborated climate models that incorporate a dynamic carbon cycle. They predict that, within half a century, the BAU scenario will cause soils and vegetation to switch abruptly from a sink for atmospheric carbon to a source. That would mean not only the loss of the current capacity to withhold and remove carbon dioxide from the atmosphere, but in addition, the release of carbon from soils and vegetation that has accumulated over the past 150 years.

The net result could be a doubling of current concentrations of greenhouse gases within a matter of years. Adding in the fossil fuel emissions could take the levels of carbon dioxide to four times pre-industrial levels, i.e., 1 000 ppm. The positive feedback from the loss of terrestrial carbon further heats up the earth’s surface, and the average surface terrestrial temperature could rise by as much as 9 degrees C instead of the predicted 5.8 degrees C; temperatures as high have not been experienced for more than 40 million years [3].

The soil/vegetation feedback on global warming is not the only one; we face other powerful positive feedbacks, including the change in albedo (the fraction of solar energy reflected back into space) as ice vanishes from the Arctic Circle and from parts of Antarctica where grass is establishing itself for the first time in millions of years [4]. In addition, the potential release of methane from the oceans overlying the vast sediments of the Amazon Fan, or in the permafrost regions of the Northern Hemisphere, could lead to the large changes in climate that were responsible for the mass extinctions of the Permian more than two hundred million years ago.

It has emerged that the Greenland ice sheet is less stable than previously thought. Its rapid melting would raise sea levels by several metres. Moreover, the Gulf Stream is diminishing in strength because of the influx of fresh water into the Arctic Circle [5].

In short, the climate system as we know it is poised on the edge of a profound transition. Once past a point of no return, terrestrial organisms including human beings will have little or no time to adjust and their future on this planet could well be jeopardized.

The UK position

The UK government, spearheaded by the Prime Minister Tony Blair, has declared its intention to reduce greenhouse gas emissions from Britain by as much as 20 per cent of the baseline year of 1990 by the end of the First Commitment Period of the Kyoto Protocol. That 20 per cent will incorporate carbon trading, allowing industry to purchase carbon credits from elsewhere to offset its emissions, including reforestation projects in developing countries. It will also take on board ‘clean development mechanism’ projects.
(CDMs) in developing countries, whereby a donor industrialized country can share the equivalent of greenhouse gas emissions foregone through investing in a ‘cleaner’ project than would have been deployed had the additional investment and technical expertise not been available.

Despite a host of different projects, including wind-farms, it is becoming clear that the UK will have difficulty achieving that target. Energy demands in the UK are rising and emission cuts are stagnating. Indeed, over the past 40 years, the mean rate of energy demand has been increasing at 0.5 percent a year, mostly provided through burning fossil fuels. Moreover, recent figures supplied by the Department of Trade and Industry (DTI) show that carbon dioxide emissions from the UK, rather than falling as planned, are rising rapidly, by 2.2 per cent in 2003 and 1.5 per cent in 2004. And that despite the UK’s commitment to a legally binding 12.5 percent cut in greenhouse gas emissions compared to 1990, let alone the 20 per cent called for. Currently, the UK’s emissions are no more than 4 per cent below 1990 levels [6, 7].

The reality is that recent energy demand in the UK is growing at almost double the rate of the past half century; the DTI is predicting that the current per annum increase of 0.9 per cent will continue at least until 2010. Energy demand is up in all sectors of the UK economy, in transport, electricity and space-heating. Blair’s government is now reviewing a number of options for reducing emissions [8], including wind power and the renewables; investment in tidal, wave and solar systems; a new nuclear power programme; subsidies for energy efficient household appliances; new building regulations that will incorporate energy efficient designs; carbon taxes including a rise in fuel duties; and a reduction in the prices of alternative fuels such as bio-diesel.

The International Energy Agency (IEA) projects that as much as 1400 GW (gigawatts = 10^9 watts) of coal-fired plants will be in operation by 2030 in the world, a considerable proportion in India and China. At a meeting of the IEA and World Coal Institute in Beijing (23 April, 2004), Wu Yin, Deputy Director-General of Energy Department, National Development & Reform Commission, China, stated that in 20 years’ time, China anticipated that coal would feature as the main fuel for a significantly enlarged electricity supply system. Vijay Sethu, Executive Director, Project & Structured Finance, Asia, ANZ Investment Bank, Singapore, confirmed that a similar situation would prevail for India. Both countries would also resort to nuclear power [9, 10]

During their lifetimes the coal-fired plants of China and Indian could emit some 500 Gt (gigatonnes) of carbon dioxide, equal to half of anthropogenic (human-source) emissions in the last 250 years.

Forecasts of energy requirements

In their 22nd report on Environmental Pollution of 2000, the Royal Commission set out four different scenarios for the UK to reduce its greenhouse gas emissions by mid century. How such reductions were to be achieved was markedly different in each case; however, all four scenarios anticipated that fossil fuels would continue to be used for transport, perhaps through fuel cells, but with the hydrogen originating from fossil fuels [11].

Scenario 1 is based on the notion that the UK would have a BAU economy, but with final energy demand kept down to 1998 levels. A 57 percent reduction in greenhouse gas emissions would be obtained through the deployment of at least 52 GW of nuclear power — four times today’s capacity— or as suggested, through using fossil fuel for electricity generation in which the carbon dioxide is recovered and buried in oil wells. Electricity would also be derived from renewable energy sources, including 200 offshore wind farms, each with 100 large turbines, as well as wave and tidal machines. The Severn Estuary barrage would be up and running and photovoltaic solar panels installed on the roofs of buildings. In recent years, efficient
Solar water heating systems have been developed that, even in the UK climate, make an effective contribution in reducing fossil fuel energy demands.

Scenarios 2 and 3 involve a reduction in energy use of more than a third while Scenario 4 requires an energy reduction of nearly one half compared to energy demands in 1998. Through reductions in transport, in electricity and in low- and high-grade heat, Scenarios 2 and 4 avoid the use both of nuclear power and fossil fuel stations with carbon dioxide recovery. Their demands for renewable energy resources are also reduced compared to Scenario 1. Meanwhile, Scenario 3 makes up for a reduced use of renewable energy sources by resorting to nuclear power although far less, at 19 GW, than the requirement for 56 GW in Scenario 1.

On the assumption that people and businesses are not going to pay silly prices for their energy, the Royal Commission has suggested a cut-off price of 7p/kWh for renewable energy supply, thereby imposing limits on the quantity of energy from such sources that could be available by 2025.

What can the nuclear industry do for us?

The nuclear industry has always seen itself as the saviour of industrialised society. The slogan of the 1960s, especially in the United States, was that nuclear power would deliver unlimited energy cheaply and safely, and that it would step into the breech when fossil fuel supplies became scarce. At the time, no one was thinking of the problem of greenhouse gases [12].

In its 1981 report on nuclear costs, the Committee for the Study of Nuclear Economics showed that a station such as Sizewell B would cost some £2 billion more (1980’s money) over its lifetime than a comparable-sized conventional thermal power station such as Drax B in Yorkshire [13], which would put nuclear power beyond the reach of privatization.

In 1996, for £1.5 billion, the newly created British Energy acquired seven Advanced Gas Reactor (AGR) stations and the country’s only commercial Pressurized Water Reactor (PWR). The actual cost of construction had amounted to over £50 billion, of which more than £3 billion had recently been spent on the Sizewell B PWR, newly commissioned in the mid 1990s.

The government sell-off in 1996 of what was to become the UK’s largest electricity producer might have seemed a give-away at the time, but in 2002, on account of having to compete for electricity sales against other non-nuclear generators, British Energy found its losses piling up with every unit of electricity sold. In less than a year, and in the biggest write-off of capital in the UK, the company’s market value plummeted to little more than £100 million. Basically, British Energy could not go on trading and had to call on the government to salvage it.

Despite complaints of favouritism from non-nuclear companies, the government agreed a loan of £410 million to British Energy, and a month later, upped it to £650 million. Meanwhile, as Energy Minister Brian Wilson reiterated in parliament on 27 January 2002, the government would provide the £200 million required to go into the fund for decommissioning.

Dale Vince, the managing director of Ecotricity, regards such support for the nuclear industry as economic nonsense. He said in an interview published in The Guardian [14], “If we were given £410 million instead of British Energy, we could have built enough onshore wind energy to power 10 per cent of the country’s electricity needs.”

Unfortunately, you cannot just shut down nuclear stations and walk away. You have to keep the safety
systems, including core-cooling, up and running for as long as the fuel is in the core (see Box 1).

And then, when the spent fuel is extracted, you have to make multi-billion dollar decisions what to do with it [15] (see Box 2).
Radioactivity Neutralization Methods

Box 1

How nuclear power is generated

Uranium-235, which comprises on average just 0.7 percent of natural uranium, is a fissile (capable of atomic fission) isotope that splits into more or less two radioactive halves when struck by a neutron. The bulk of natural uranium is made up of uranium-238, which, in contrast to the rarer isotope, does not split on being struck by a neutron but tends to absorb a neutron and, through a process of radioactive transformation (with the emission of an electron), jump up to the next element – plutonium. Plutonium is also fissile, and can be ‘bred’ from uranium fuel when a reactor is up and running.

A reactor, as distinct from the uncontrolled fission that makes an atomic bomb, needs the process of fission to be kept at a steady operating level. That is achieved through inserting or withdrawing control rods made of a material that will absorb neutrons and so prevent them from causing a runaway chain reaction (see Fig. 1).

With the exception of fast breeder reactors, which use plutonium to ‘enrich’ the fuel, the majority of reactor systems use a ‘moderator’ such as graphite or heavy water to slow down the neutrons so that they will be more effective in bringing about a chain reaction. The moderator therefore allows the use of uranium with a relatively low content of uranium-235. The majority of reactors in use today will use uranium fuel that has been enriched to around 4 percent.

Figure 1. Controlled chain reaction in a nuclear plant as opposed to divergent chain reaction that makes an atom bomb

(End of Box 1)

Box 2

The nuclear fuel cycle

The nuclear fuel cycle begins with the mining of uranium, followed by extracting it from the ore. The uranium is then enriched by centrifuging gaseous uranium hexafluoride, so that the heavier uranium-238 leaves behind an increasing concentration of uranium-235, the fissile material. The enriched uranium is then manufactured into ceramic fuel and encased in ‘cladding’, usually of zirconium alloy or stainless steel, as used in Britain’s Advanced Gas Reactors (graphite moderator and carbon dioxide gas for transporting heat to a steam generator).

Spent fuel from the power plant is highly radioactive and must be handled remotely. Initially, it is placed in cooling ponds to allow short-lived radioactive isotopes to decay. Then, there are two options: One to dispose of the intact, radioactive fuel, with its cladding, in long-term repositories, where continual cooling can be provided; two to reprocess the fuel so as to extract any unused uranium as well as plutonium. Reprocessing leads to the production of various waste streams of virulently radioactive material. Various attempts have been made to vitrify (turning to glass) high-level radioactive waste, so that it can be deposited as a glass block. The UK still has to decide how and where to dispose of that waste.

Meanwhile, the extracted plutonium can be made into fresh fuel, such as Mixed Oxide Fuel, which also contains uranium. Reactors need to be adapted to take MOX fuel because its fission characteristics are different from using enriched uranium fuel.
Essentially, fossil fuels underpin the use of nuclear power, especially in the mining, extraction and manufacture of uranium fuel. To date fossil fuels have provided the energy and materials for the construction of nuclear installations, quite aside from providing electricity to maintain safety systems.

Figure 2. The nuclear fuel cycle including fossil fuels used in extracting uranium, constructing the nuclear plant, turning the power generated into electricity and decommissioning and reprocessing to get rid of hazardous nuclear wastes.

(End of Box 2)

Do you send it to loss-making British Nuclear Fuels (BNF) for reprocessing, with all that entails in terms of discharges of radioactive waste into the Irish Sea and the atmosphere? That being the case, do you continue sanctioning the production of Mixed Oxide Fuel (MOX), which makes economic nonsense, as well as a dubious saving on uranium and is a security nightmare (see below)? Or do you reduce costs by storing the spent fuel intact?

As to the use of MOX, many critics within and outside the industry have repeatedly pointed out that the gains are far outweighed by economic and environmental problems. In France, reprocessing spent fuel to extract plutonium for MOX fuel manufacture will save no more than 5 to 8 per cent on the need for fresh uranium. Meanwhile, as experience in both France and Britain has shown, reprocessing spent reactor fuel leads to a hundredfold or more increase in the volume of radioactive wastes. In the end, all the materials used, including tools, equipment and even the buildings become radioactive and have to be treated as a radioactive hazard.

It is also highly questionable whether the use of MOX fuel will actually reduce the amount of plutonium that has been generated after half a century of operating reactors, both military and civil. Worldwide, more than 1,500 tons of plutonium have been generated, of which some 250 tons have been extracted for making bombs and another 250 tons extracted as a result of reprocessing the spent fuel from ‘civilian’ reactors. Apart from its military-grade plutonium – plutonium relatively pure in the 239 isotope – Britain now has some 50 tons of lower quality reactor-grade plutonium contaminated with other, less readily-fissionable isotopes such as 241 [16].

Because of the continued reprocessing of spent reactor fuel in commercial reprocessing plants in Britain, France, Russia and Japan, the world will have some 550 tons of separated civil plutonium by the year 2010, enough to produce 110,000 nuclear weapons.

**Mixed oxide fuel ideal for terrorists**

Mixed oxide fuel, containing up to 5 per cent plutonium, is ideal material for terrorists, being no more than mildly radioactive compared with spent reactor fuel, and in a form from which the plutonium can be easily extracted. Just one MOX fuel assembly contains some 25 kilograms of plutonium, enough for two weapons. A reactor, modified to take the plutonium-enriched fuel for up to 30 per cent of the reactor core, has some 48 MOX fuel assemblies.

Currently, 23 light water (ordinary water) reactors – 5 in Germany, 3 in Switzerland, 13 in France and 2 in Belgium – have been converted to use MOX fuel. Five countries, Britain, Belgium, France, Japan and Russia, are manufacturing the fuel. With BNFL’s new MOX plant up and running, supply will exceed demand by a factor of two, at least until 2015.
BNFL claims that the use of MOX fuel will help burn up stocks of plutonium, including those from dismantled weapons. But the very operation of civilian reactors, with their load of the plutonium-generating uranium isotope, the 238 isotope, makes it inevitable that more plutonium is generated than is consumed. A 0.9 gigawatts pressurized water reactor which has been modified to take MOX fuel will burn a little less than one ton of plutonium every ten years, whereas plutonium production will be about 1.17 tons, hence about 120 kilograms more.

Global warming and nuclear power

The new myth is that nuclear power is the only source of energy that can replace fossil fuels in the quantities required to fuel the industrial society, whether in the developed or developing world, while eliminating the emissions of greenhouse gases.

Economies of scale demand that nuclear power stations are large, at least one GW (electrical) in size. Their sudden shutdown can put a considerable strain on the overall electricity supply system. And if their shutdown is the result of a generic problem, that will have major consequences, including the necessity of bringing on stream a large tranche of spare capacity. Furthermore, that capacity is likely to be fossil-fuel based and relatively inefficient.

As reported recently in New Scientist [17], the UK’s advanced gas-cooled reactors (AGRs) are showing signs of unexpected deterioration in the graphite blocks. These blocks serve the double function of moderating the nuclear fission process and of providing structural channels for nuclear fuel and control rods. The potential failure of the graphite compromises safety and in all likelihood the UK’s 14 AGRs, currently supplying nearly one-fifth of the UK’s electricity, will have to be shutdown prematurely, rather than lasting through to 2020 and beyond. Bringing reserve capacity to replace the AGRs will inevitably lead to a surge in greenhouse gas emissions. But that’s not the only problem the UK nuclear industry faces.

Devastating leak

On Sunday 12 June, 2005, the BBC reported that a leak of highly radioactive waste containing enough uranium and plutonium to make several atomic weapons had gone unnoticed for more than 8 months [18]. It appears that a pipe in British Nuclear Fuels’ thermal oxide reprocessing plant at Sellafield in Cumbria had fractured as long ago as last August, spewing nitric acid with its deadly load of radionuclides onto the floor. The leak, containing as much as 20 tons of uranium and 160 kilograms of plutonium, was discovered only in April of this year.

British Nuclear Fuels has justified the use of the reprocessing plant as being essential for the production of mixed oxide fuel from the spent fuel taken from the UK’s Advanced Gas Reactors. As a result of the leak, the nuclear inspectorate has ordered British Nuclear Fuels to shut down THORP, the thermal oxide reprocessing plant. Just how the spilt waste can be removed remains to be seen, but once again the accident reinforces concerns that the nuclear industry, quite aside from its poor economic showing, can never be made safe enough.

In addition, the Environment Agency inspectors told BNF that it had to improve the way it discharged low-level radioactive waste into the Irish Sea, now probably one of the most contaminated waters in the world. Some commentators estimate it will take considerably more than a century to clean up the radioactive waste that the industry has already discharged into the environment, at a cost of well over £50,000 million.

Source: http://www.i-sis.org.uk/ESIGW.php
Geomelting of Radioactive Waste

David Harrison, Environment Correspondent, British Firm Finds The Nuclear Industry's 'Holy Grail'
Sunday Telegraph – September 26, 2004

A British company claims to have found the "holy grail" of the nuclear energy industry – a solution to the problem of radioactive waste disposal.

Amec, the London company that cleaned up Ground Zero in New York and rebuilt the Pentagon after the September 11 attacks, says that its latest process will enable nuclear waste to be stored safely for 200,000 years – longer than the radioactivity will last.

The company says that the method could transform the nuclear energy industry and offer a viable alternative to fossil fuels.

The technique, called geomelting, has been tested successfully by the American government, which is building a $53 million (£30 million) pilot plant in Washington state. It intends to use the method on 300,000 gallons of liquid waste from atom bomb tests in the 1940s.

Amec has already held talks with British Nuclear Fuels, the state-owned nuclear energy company that owns the reprocessing plant at Sellafield in Cumbria and employs 23,000 people in 16 countries. It plans to send a team to America to look at Amec's site in the next few months.

The Department of Trade and Industry will also study the process. Earlier this month an official said that a huge expansion of the nuclear power industry – including the construction of 45 new reactors – was essential if the Government were to meet its Kyoto target of cutting "greenhouse gases". Many environmentalists, including James Lovelock, have embraced nuclear power because it does not generate greenhouse gases.

The Amec process involves mixing nuclear waste with soil or other "glass-formers" in large, lined metal tanks. The mix – 20 per cent waste and 80 per cent soil – is heated through two graphite electrodes at temperatures of up to 3,000C. Gases, mostly carbon dioxide and traces of hydrocarbons, are drawn off and treated separately. The molten substance is then allowed to cool and forms a large glass block that is harder than concrete.

The process, known as vitrification, was devised by the Battelle research institute in Ohio, which also invented the photocopier and the compact disc.

Amec, which has worldwide interests in gas, oil, mining and forestry – and a turnover of £4.7 billion last year – bought the technology from Battelle. It has an international license for the process.

British Nuclear Fuels stores much of its waste in concrete, which lasts up to 200 years. This has prompted widespread concern that radioactive material will leak into the water supply and pose a serious threat to public health and the environment. Some nuclear waste at Sellafield is already vitrified by British Nuclear Fuels, using a "continuous melting" method that stores the waste in 6-foot containers resembling milk churns. The churns are sealed remotely and stored above ground. Last year 341 containers were filled with vitrified waste.
The vitrification does not, however, last as long as the radioactivity and "a certain amount of repackaging" is necessary, a spokesman said.

Amec said that its method produced a higher quality and longer-lasting glass than British Nuclear Fuel's at three-quarters of the cost.

The new form of vitrified waste is more durable than British Nuclear Fuel's because it contains fewer chemicals. Don Fraser, the global director of Amec's GeoMelt projects, said: "The nuclear industry has an image problem and most of the public concern is over the problem of dealing with radioactive waste. We believe that GeoMelt solves that problem and could transform the energy industry. It is more effective than any other process that has been developed so far." Mr Fraser said that the glass would last for "geological times" and almost all the radioactive particles in it "would decay to non-radioactive elements or compounds long before the glass corrodes away to nothing". It would, he said, "pose no danger to the public or whoever else is living there in thousands of years' time".

A spokesman for British Nuclear Fuels said: "We will have a good look at this process. We know that nuclear plants work and are safe, but what to do about nuclear waste remains the biggest issue facing our industry. We are always looking for innovative solutions for cleaning up and reducing nuclear waste and we will look seriously to see if geomelting can play a role in that."

However, Jean McSorley, a nuclear energy specialist at Greenpeace, the environmental campaign group, said that geomelting was not a solution to the problem of nuclear waste, but might be a step in the process of managing it. "There is, as yet, no environmentally acceptable solution to the problem of nuclear waste." she said.

"We have always encouraged vitrification, but only time will tell whether this is more effective than existing methods." Last week Adrian Gault, the strategic development director at the Department of Trade and Industry's energy strategy unit, said that nuclear power would have to provide half of Britain's electricity needs if the Government were to reduce carbon dioxide emissions by 60 per cent by 2050.

Tony Blair, the Prime Minister, described climate change as "the biggest challenge facing the planet" and said it would be high on the agenda when Britain takes over presidency of the G8 summit and the European Union next year. Nuclear power provides a fifth of Britain's electricity, but the nuclear plants – which do not produce carbon dioxide – are due to be closed gradually from 2008, and there are no plans to replace them.

Source: http://www.sovereignty.org.uk/features/eco/future.html

**Areva to Add Uranium Recovery Operation**

By Annette Cary, Herald staff writer August 22, 2008

Areva plans to add newly developed technology to its Richland plant to remove valuable enriched uranium from waste produced there and from waste shipped from other nuclear producers to the plant.

The new technology to recover enriched uranium is a "green process" that relies on a form of carbon dioxide, Areva said.
This week, Areva and the University of Idaho signed an agreement to work together to use a jointly developed process to remove enriched uranium from ash left from reducing the volume of contaminated debris by incineration. The incinerated debris includes items such as gloves and rags from the production of fuel for commercial nuclear power reactors.

Areva plans to add $2.5 million of equipment to its Richland plant this year. Work will be done in-house, and the equipment can be operated with its current staff.

The plant has about 35 tons of ash in Richland that otherwise would need to be disposed of as low-level radioactive waste. Incineration already has reduced the waste volume by a factor of 25 to 1, according to Areva.

Areva calculates that the ash on site now contains more than 2 tons of enriched uranium worth about $5 million in today's market. The recovered uranium can be used at the Richland plant and the ash that remains will have had its radioactive content removed, said Chuck Perkins, the Areva Richland site manager.

The ash at the plant should be processed fairly quickly, Perkins said, and by 2009 the plant will be ready to receive ash from other producers of nuclear fuel, either in the United States or internationally.

"By recovering such a valuable energy resource that otherwise could have been lost to disposal, and by using an environmentally sensitive process to do it, it's a win-win result for our planet and for Areva." said Joe Zwetolitz, an Areva NP vice president, in a statement.

The recovery process was developed after four years of work by Areva engineer Syd Koegler, a University of Idaho alumnus, and Chien Wai, a University of Idaho chemistry professor. They have applied for a joint patent.

Before the new process is added to Areva's Richland plant, Areva will require an amendment to its license issued through the Nuclear Regulatory Commission.

Already, Areva is recycling the hydrofluoric acid that is a byproduct of the material it manufactures into fuel. It sells it for use in the glass industry in the Mid-Columbia.

Read more here:
http://www.tri-cityherald.com/2008/08/22/287447/areva-to-add-uranium-recovery.html#storylink=cpy

**Israel Discovery may Convert Radioactive Waste into Clean Energy**

By Karen Kloosterman – March 18, 2007

Radioactivity Neutralization Methods
A chunk of black, lava-like rock is the result of the process invented by Israeli firm Environmental Energy Resources (EER) to transform radioactive waste into an inert, safe substance. The laws of conservation of energy and mass say that energy or mass cannot be created or destroyed – only change form. With the help of Russian scientists EER has taken the laws of science and turned them into a useful invention for mankind – a reactor that converts radioactive, hazardous and municipal waste into inert byproducts such as glass and clean energy.

The problem of radioactive waste is a global one, and getting increasingly worse. All countries in the industrialized world are waking up to the need for safer hazardous waste disposal methods.

“In the beginning, nobody believed that we could do it,” says Itschak Shrem, chairman of investment company Shrem, Fudim and Keiner representing EER at a press briefing announcing the innovation last week in Tel Aviv.

Shrem, himself an invoker of small miracles through the founding of one of Israel’s most lucrative venture capital funds – Polaris (now Pitango) – points to a chunk of black, lava-like rock sitting on the table in front of everyone’s coffee cups.

The journalists cautiously eye Shrem as he assures them that the shiny dark material, emitted from EER’s pilot waste treatment reactor near Karmiel in the north, is safe to touch.

“It also makes a good recyclable material for building and paving roads,” he assures them. Earlier, Shrem told ISRAEL21c that EER can take low-radioactive, medical and municipal solid waste and produce from it clean energy that “can be used for just about anything”.

Using a system called plasma gasification melting technology developed by scientists from Russia’s Kurchatov Institute research center, the Radon Institute in Russia, and Israel’s Technion Institute – EER combines high temperatures and low-radioactive energy to transform waste.

“We go up to 7,000 degrees centigrade and end at 1,400 centigrade.” says Moshe Stern, founder and president of the Ramat Gan-based company.

Shrem adds that EER’s waste disposal reactor does not harm the environment and leaves no surface water, groundwater, or soil pollution in its wake. The EER reactor combines three processes into one solution: It takes plasma torches to break down the waste; carbon leftovers are gasified, and inorganic components are converted to solid waste. The remaining vitrified material is inert and can be cast into molds to produce tiles, blocks or plates for the construction industry.

EER’s Karmiel facility (and its other installation in the Ukraine) has a capacity to convert 500 to 1,000 kilograms of waste per hour. Other industry solutions, the company claims, can only treat as much as 50 kilograms per hour and are much more costly.

According to the journal Research Studies (Business Communications, Inc.), “The production of nuclear weapons/power in the US has left a 50-year legacy of unprecedented volumes of radioactive waste and contaminated subsurface media and structures… Nuclear waste generators include the national laboratories, industrial research facilities, educational and medical institutions, electrical power utilities, medical diagnostics facilities, and various manufacturing processes.”

In the US alone, Research Studies predicts that this year’s market for radioactive waste-management technologies in America will cap $5.5 billion.
EER was founded in 2000 and has maintained a low profile until revealing its reactor last week.

“We spent our time on R&D and building up the site in Israel which we started constructing in 2003. We realized that nobody was going to believe us unless we started doing the process physically. They always said it sounded too good to be true, so we had to prove it to them.” said Shrem.

Back in 2004, the Ukrainian government put out a tender searching for a solution that would provide safer hazardous waste disposal methods. At that time, the country was looking for a way to treat its low-radioactive waste zones resulting from the Chernobyl explosion. EER sent in their proposal, and their technology won the bid.

According to Stern, the former Soviet Union was the first to build nuclear plants. Over the years they have generated “huge amounts of low-radioactive waste. They came to us looking for a solution.” he said. The Chernobyl nuclear meltdown on April 26, 1986 – was beyond a doubt the largest civil nuclear explosion in the world and one still linked to thousands of deaths. More than 20 years after the explosion, tens of kilometers around the reactor is still highly radioactive; and some 30,000 radioactive homes remain buried along with household appliances, food and clothing, explained Stern.

“The European community is afraid of what is happening there.” notes Stern, warning that it is time for the clean up to begin, even if it means making only a small dent in the massive pile. “The low-radioactive waste is slowly contaminating the water and will continue to do so over the 300 years it takes to break down.”

And since new conventions have been set by The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, first-world countries are no longer permitted to traffic their hazardous waste to third-world nations – forcing Western countries to drum up immediate and responsible solutions.

With a strict eye over its operations by Israel’s Ministry of Environmental Protection, EER revealed its proof-of-concept to Israeli and foreign dignitaries in Aeblin, near Karmiel last week, showing how it can take mountains of municipal waste and reduce it to a pile of black rubble.

“We are not burning. This is the key word.” Shrem said. “When you burn you produce dioxin. Instead, we vacuum out the oxygen to prevent combustion.”

EER then purifies the gas and with it operates turbines to generate electricity. EER produces energy – 70% of which goes back to power the reactor with a 30% excess which can be sold.

“In effect, we are combining two of the most exciting markets in the US – the environment and clean energy.” says Stern, “We also reduce the carbon footprint.”

The cost for treating and burying low-radioactive nuclear waste currently stands at about $30,000 per ton. The EER process will cost $3,000 per ton and produce only a 1% per volume solid byproduct.

In the US, EER is working to treat low-radioactive liquid waste and recently contracted with Energy Solutions, the largest American company in the field with 75% of the US market.

Based on the financial forecasts, EER is certainly giving a fresh meaning to the expression – one man’s garbage is another man’s treasure. But in EER’s case, ones man’s hazardous waste may very well be EER’s goldmine.
Las Vegas energy expert Robert Nelson (see his www.rexresearch.com) has found this patent:

US Patent No: 8,373,087 Plasma torch for use in a waste processing chamber

The invention is a plasma torch for insertion through an opening in the wall of a waste processing chamber. The plasma torch of the invention is characterized by comprising a coaxial sleeve having an upper end and a lower end. The sleeve surrounds at least the portion of the outer surface of the torch that is located in the opening, thereby forming an insulating chamber between the outer surface if the torch and the inner surface of the sleeve. At least a portion of the portion of the coaxial sleeve that surrounds at least the portion of the outer surface of the torch that is located in the opening in the wall of the processing chamber is porous or permeable to a heat exchanging fluid. The torch comprises an inlet for introducing the heat exchanging fluid into the insulating chamber. When the plasma torch is inserted through the opening, a gap exists between the processing chamber wall and the coaxial sleeve. Thus the coaxial sleeve and the insulating chamber shield the outer surface of the plasma torch from a significant amount of the heat that radiates from the processing chamber wall and from inside the processing chamber and the heat exchanging fluid that flows through the inlet exits the insulating chamber into the processing chamber.

Source: http://www.patentbuddy.com/Patent/8373087

Methods to Influence Radioactivity Decay

Mr. Alexander V. Frolov. Russia

The Plan

It is planned to produce experiments to investigate several methods to influence radioactivity decay.

This method uses a new theory of aether activity.

Important for commercial aspect: We have to organize patenting and license sales.

Experiment 1
Rotation of current

Prof. Butusov offered to rotate coil of wire with electric current. It was tested by Mr. Frolov, 2002.
New stage is tests with rotation of electric current created in HTSC material (superconductor disk).

It was tested by Frolov in University of St. Petersburg. It is a cavitation method to influence radioactivity. We have gotten positive results: During 10 hours of cavitation process in a 5-kilowatt cavitator we detected 20% decrease of radioactivity in the liquid material and around the device also.

We have tested effects for the case of rotation of ionized liquid. The method also can be described to be rotation of plasma. In this case also there is rotating electric current of ions of the liquid. It is one more variant of the idea proposed by Prof. Butusov.

Results of Experiments in 2006

Experiment 2

Academican Ignatiev experimented with rotation of ExH field composition to get Pointing vector and propulsion force for aerospace applications. In this case we can get directed aether flow S. Activity of any radioactive material should be changed in area of this S-flow.

Experiment 3
Method invented by Ivanov’s Russian Patent No. 2172865. It is also the method to produce aether flow that is known and named Pointing vector $S=ExH$

How it works?

All methods described above are related with controlled disturbance of aether. The authors offered also the technologies for space propulsion units. Considering **radioactivity of matter can be decreased by means of changes of aether density** we can estimate influence radioactivity decay in the planned experiments.

10% reduction in 10 hours is fact. 100% normalization in 100 hours is estimated effect.

### Financial Plan (Euro)

<table>
<thead>
<tr>
<th></th>
<th>Period</th>
<th>Expenses</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prototype building and experimenting</td>
<td>6 months</td>
<td>60,000</td>
</tr>
<tr>
<td>2</td>
<td>Patent</td>
<td>6 months</td>
<td>40,000</td>
</tr>
<tr>
<td>3</td>
<td>Sales of licenses</td>
<td>2014</td>
<td>-</td>
</tr>
</tbody>
</table>

Proposal for investor

Funds required 100,000 Euro.

Team:

- Investor 51%
- Founder 39%
- Author 5%
- Top managers 5%

Exit strategy is sale of company to hydrogen energy corporation.

Founder is
Alexander V. Frolov Russia, 300053, Tula
7-910-948-2509 7-920-794-4448
http://alexfrolov.narod.ru
a2509@yahoo.com Skype alexfrolov2509

**Tests on Superconductor Gravitational Effects**

Mr. Alexander V. Frolov, Russia

This method can be used to reduce the level of radioactivity of any radioactive material placed in the area of an artificial gravity field.
1. Theoretical background

The high-density fluctuations in Bose condensate is laboratory scale case to confirm theoretical conclusions about gravitational field cut-off frequency. This experimental work was organized to examine if some resonance effects in 10-100 MHz range can be detected as mass (weight) anomalies.

2. Previous experimental data

Basically experimental approach in this area of research was described in Podkletnov:

1. The superconductor material was YBa$_2$Cu$_3$O$_{7-x}$ disk of 145 mm diameter and 6 mm high.
2. The effect is detected as 0.05% - 0.07% mass (weight) changes. It was detected for the case of non-rotating High-Temperature Conductivity Superconductor (HTCS) disk, which is levitating in a 50-106 Hz electromagnetic field.
3. Rotation of the disk increased the effect. Important fact is that during change of rotation velocity of the HTCS disk the effect was about 2-4% – that is maximum data.
4. In the case of constant rotation velocity (about 5,000 RPM) the effect was detected with about 0.3% - 0.5% change of the weight.
5. The effect was detected also for the case of rotation of the HTCS disk after the electromagnetic field of solenoids was off.

Other experiment of 1995 was described by Podkletnov. Two-phase material of the disk: In the operational mode the upper layer of the disk is superconductive; the layer below is not superconductive. So, in this case the area of the phase transition between two layers was created especially.

One more important step in understanding of the effect was made by G. Modanese, who assumed that mechanical rotation of the HTCS disk produces motion of Bose condensate like electric current in HTCS material.

Next experiment by Podkletnov and Modanese was described as ‘impulse gravity generator’. They used 50,000 anperes at 1 megavolts electric discharge onto an HTCS target to create non-dissipative ‘force beam’ or gravity wave. This experiment is a new step in understanding of the process since Podkletnov’s idea of ‘shielding of gravity’ is changed to conception of force action against gravity. This action is possible as a result of artificial gravitational wave or impulse.

Static tests mainly were not effective. But an important example is an experiment by John Schnurer. The effect was detected in the case on non-rotating HTCS disk, which was levitating above a permanent magnet. The effect was detected only during change of HTCS material phase from superconductor to non-superconductor phase (heating above T$_K$). This phase transition usually takes several seconds (2-3 seconds) when the effect can be detected.

---

28 Los Alamos http://xxx.lanl.gov/abs/cond-mat/9701074
29 G. Modanese, Possible theoretical interpretations of the weak gravitational shielding effect by composite YBCO HTC superconductor, 1997. IAF.
31 Antigravity? http://www.businessweek.com/1997/07/b3514118.htm
Experiment with rotating HTCS ring described in\textsuperscript{32} is an example of gravimagnetic field produced by a spinning superconductor. The results were presented at a one-day conference at ESA's European Space and Technology Research Centre (ESTEC) in the Netherlands 21 March 2006. This experiment is the gravitational analogue of Faraday’s electromagnetic induction experiment in 1831.

One more important aspect of experimenting with HTCS materials is their low temperature in a superconductive state. This temperature is much lower than the environmental temperature and by this way the intensive heat transport present in all experiments. For the case of precise measurements flows of air produced by the temperature difference can be screened but there is an aspect named as thermogravitation. For example, in the Dotto ring\textsuperscript{33} experiment it was demonstrated that intensive heat transfer along the ring produce gravimagnetic effects. For the present experimental task it is not a critical aspect since this effect is static, i.e., it produces permanent force.

3. Related theories

Analysis of previous experimental and theoretical data allows assuming that gravity-related effects result from changes of density of the Bose condensate. The maximum effect can be estimated for the case of correct frequency of oscillations of the external field, which resonate with natural high-density fluctuations in Bose condensate. In the case of correct frequency we can estimate full compensation of the natural gravity field. Assume that the natural gravity field is not a single-frequency oscillation process. Complex frequency structure of the natural gravity field requires determining several main resonance frequencies to obtain full compensation.

Single-phase transition in HTCS material\textsuperscript{34} also is the case of change of the Bose condensate density (from maximum value to zero). Since in this case the change of the phase from superconductor to non-superconductor is gradual then the effect is weak and detected during several seconds. The experiment described in\textsuperscript{35} is one of the methods to produce rapid change of the phase in all Bose condensate of the HTCS target to create a short but powerful gravitational pulse.

The nature of this gravitational pulse can be described here as a longitudinal wave in aether. By this approach we can see an analogy with similar Tesla experiments. Also we can see that impulse gravity generator by Podkletnov and Modanese\textsuperscript{36} is development of Morton beam generator\textsuperscript{37}, which used an electric spark between a charged ball and metal plate to produce ‘Morton force beam’. Powerful force effect in HTCS case\textsuperscript{38} can be explained by coherent behavior of Bose condensate that produce ‘laser effect’ since it is similar to coherent photon emission in laser.

Analysis of experimental data allows assuming that:

\textsuperscript{32} Anti-Gravity Effect? Gravitational Equivalent of a Magnetic Field Measured in Lab http://www.sciencedaily.com/releases/2006/03/060325232140.htm
\textsuperscript{33} US Patent # 3,839,771, Method for Constructing a Thermionic Couple, October 8, 1974, Giani A. Dotto
\textsuperscript{34} Antigravity? http://www.businessweek.com/1997/07/b3514118.htm
\textsuperscript{35} Impulse Gravity Generator Based on Charged YBa\textsubscript{2}Cu\textsubscript{3}O\textsubscript{7-γ} Superconductor with Composite Crystal Structure, Evgeny Podkletnov, Giovanni Modanese, http://xxx.lanl.gov/abs/physics/0108005
\textsuperscript{36} Impulse Gravity Generator Based on Charged YBa\textsubscript{2}Cu\textsubscript{3}O\textsubscript{7-γ} Superconductor with Composite Crystal Structure, Evgeny Podkletnov, Giovanni Modanese, http://xxx.lanl.gov/abs/physics/0108005
\textsuperscript{37} Electric Spacecraft, Issue 22, 1997 pp 25-26
\textsuperscript{38} Impulse Gravity Generator Based on Charged YBa\textsubscript{2}Cu\textsubscript{3}O\textsubscript{7-γ} Superconductor with Composite Crystal Structure, Evgeny Podkletnov, Giovanni Modanese, http://xxx.lanl.gov/abs/physics/0108005

Radioactivity Neutralization Methods -112- May 30, 2014
1. Bose condensate currents in stationary HTCS disks involve aether in motion relative to the HTCS disk. This *relative motion* generates a gravimagnetic field, which is responsible for the weight changes.

2. Rotation of the HTCS disk with Bose condensate currents produce more powerful effects due to an *increase of the relative velocity* between Bose condensate and lattice of the matter of the disk.

3. Change of rotation velocity of the HTCS disk (i.e. *deceleration or acceleration*) produce maximum relative velocity between matter lattice and moving Bose condensate due to its inertial properties. Here is clear analogy with electromagnetic induction effects.

4. Phase transition from HTCS condition to non-superconductive phase is the case of maximum change of the Bose condensate density (zero – maximum or maximum – zero) that is responsible for generation of single aether density wave.

5. Special material of the HTCS disk with two-phase layers demonstrated more powerful effects. It can be explained since in such a disk there is a boundary layer between superconductive and non-superconductive areas. External electromagnetic field make this layer produce high-frequency phase transitions that generate high-frequency aether density waves.

6. Impulse gravity generators produce a more powerful effect than a Morton beam generator due to coherent behavior of the Bose condensate. The nature of this effect is the same longitudinal aether wave discovered by Tesla.

7. Experimental data from the ESTEC is confirmation of the above suggestions. Any rotation of mass by Einstein produces a gravimagnetic field that can be explained by aether dynamical theory. A spinning superconductor produces a more powerful effect than non-superconductive matter due to the physical properties of Bose condensate.

4. Conclusions

Considering matter as vortexes in aether it is possible to explain most of gravitational phenomena. For example, the inertial property of mass can be explained by the behavior of aether, which is connected with this mass. Old theory by Fatio (1690) and Le Sage (1700) can be confirmed in modern experiments. So called “gravitational waves” or “gravitational impulses” can be created as aether density waves, which are longitudinal waves. Bose condensate in superconductor can be presented as a special physical state of matter when matter is connected with aether in different extent than usually. Phase transition of matter between superconductive state and non-superconductive state release or connect (join) some amount of aether and thus phase transitions can be organized with high frequencies to generate high frequency aether density waves. In the case of resonance (predicted range of frequencies is 10-100 megahertz) the compensation of natural gravity forces can be obtained experimentally.

---

39 Los Alamos http://xxx.lanl.gov/abs/cond-mat/9701074
41 Anti-Gravity Effect? Gravitational Equivalent of a Magnetic Field Measured in Lab http://www.sciencedaily.com/releases/2006/03/060325232140.htm
5. Organization of tests

An HTCS disk was ordered from a CAN superconductor producer\(^4\). Material is melt textured YBa\(_2\)Cu\(_3\)O\(_{7-x}\) with Y\(_2\)BaCuO\(_5\) excess. Critical temperature 90 K. Diameter is 56 mm. Height is 16 mm. See Fig. 1.

![Figure 1. HTCS disk](image1)

Cooling of the HTCS was performed by liquid nitrogen. The HTCS disk was placed in a plastic tank and immersed in nitrogen vapors. See Fig. 2.

![Figure 2. One of the plastic tanks with the HTCS disk](image2)

The detection of weight changes was made by digital scales HL-100 with accuracy 0.01 gram. Balance rod with mass difference about 20 grams were located in a stable place of laboratory where any vibrations were minimized. The loads are 50 grams and 70 grams. In another experiment two loads were equal to 500 grams and balanced with small (about 20 grams) difference. See Fig. 4. The loads were made of plastic.

![Figure 4. Balance scales](image4)

---

\(^4\) [http://www.can.cz/](http://www.can.cz/)
The HTCS disk was mechanically rotated by a 3.000 rpm electromotor. See Figure 5.

In this experimental setup the HTCS disk that was placed in the rotor and cooled by liquid nitrogen could be used in a superconductive state only during a period of 20-30 seconds. Due to this problem many measurements on rotational tests could not be reported here as reliable data.

![Image of Electromotor and Rotating Plastic Tank for HTCS Disk]

**Figure 5. Electromotor and rotating plastic tank for HTCS disk**

6. Logbook

**June 23, 2007.** Reproduction of Schnurer experiment with balance scales. There were no visible effects for the phase transition from superconductive state to non-superconductive.

It was planned to build a more precise rotational detector for more precise measurements. Production of low-frequency and high-frequency generators and the experimental setup to rotate a HTCS disk was started.

Another experiment was organized June 23: High-voltage discharge to an HTCS disk, which was immersed in liquid nitrogen, See Fig. 6.

![Image of Experimental Setup for High-Voltage Discharge]

**Figure 6**

Initially significant weight changes (up to 0.3 gram) were detected for the case of negative electrode connection to an HTCS disk, which was immersed in liquid nitrogen. But future testing without an HTCS disk also produced effects, which were identified as electrostatic interference to digital weight scales.

**June 30, 2007.** Test with rotational detector. See Fig. 7.

![Image of Rotational Detector]

**Figure 7. Rotational detector**
The detector is made of wooden rods and plastic loads. Small glass plate in central point of the horizontal rod reflect a red laser beam to the wall of the laboratory placed at 2 meters distance that allowed detection of small angle oscillations of the horizontal rod. The vertical axis was made of tungsten wire 0.05 mm diameter. All parts of the detector were placed under glass bell to avoid air flow interferences.

Experiment: cooled in plastic tank HTCS disk was placed near the detector. After 30-40 seconds when the disk was changing to non-superconductive state the attraction of mass to the disk was detected. After 3-5 min the detector is turning back to previous stable position. Maximum of the effect was measured if the HTCS disk was oriented by its flat side to the detector. Experiment was reproduced 4 times.

It seems to be impossible provide any quantitative data on this effect and future testing is necessary.

Possible mistakes here related with heat and cold flows, i.e. thermogravitation theory. To confirm or disprove this idea new tests with cold non-superconductive mass were organized. Metal disk of mass, which is equal to mass of tested HTCS disk, was cooled by liquid nitrogen and placed near of the rotational detector. Small effect of attraction of the load to the cold mass also was detected in this case. Values of effects for HTCS disk and simple metal disk are different. Conclusion: Future testing is necessary to confirm if phase transition in superconductor generate gravity wave and produce attraction/repulsion of the detector.

July 2, 2007. Experiment with permanent magnet installed near of rotating HTCS disk.

This experiment was planned to test if Lorenz force can be the reason for the gradient in Bose condensate that changes its density and generates gravity wave. Fig. 8 is the case of radial magnetic field, and Fig. 9 shows the axial superposition of the permanent magnet (Faraday disk).

![Figure 8. Superconductive disk and radial magnetic field](image)

![Figure 9. Superconductive disk and axial magnetic field](image)

The mass of the loads for this case was 50 grams (above the HTCS disk) and 70 grams (on the weight scales). The rotation velocity was about 2000 rpm. The magnet of the 1T field is made of NdFeB material. The cylinder was 25 mm in diameter and 24 mm in height. The distance from magnet to HTCS disk was about 7 mm.

Weight changes were detected as 0.02 gram only in experiments with axial superposition of the magnet (see Fig. 9). It is equal to 0.04% mass change; that is too small to be considered as reliable data.
July 4, 2007

Tests with low-frequency magnetic fields were organized both for the case of stationary HTCS disk and for the case of rotation of the disk. Sinusoidal input signal with frequency from 10 Hz up to 1 kilohertz was connected to transistor current amplifier loaded on an output coil. For frequencies between 10 Hz – 100 hertz the coil was made of 500 turns of 1 mm wire on a U-shape transformator metal core. See Fig. 11.

Figure 11. Low-frequency tests

Frequencies from 100 Hz up to 10 KHz were tested with another output coil and ferrite core – see Fig.12 and Fig.13.

Figure 12

Figure 13
A small positive result was detected for the case of rotation in the field of 1 kilohertz frequency. Weight changes were detected as 0.02 gram for mass of the load 500 gram. It probably was a measurements mistake since percent ratio of the mass changes here is 0.004% only.

**July 9, 2007**

Tests for frequencies from 10 KHz up to 3 MHz were organized with an air core output coil placed above the HTCS disk, Fig. 14 and Fig. 15.

![Figure 14](image14)

![Figure 15](image15)

All tests in this case were negative. That is it was not confirmed that the electromagnetic field in this case produced significant weight changes. Both stationary and rotational HTCS disks were tested.

**July 12, 2007**

A high-frequency generator was designed. See Fig. 16 and Fig.17 for tests of 3 MHz – 40 MHz frequency band. The output power was about 10-30 watts.

![Figure 16](image16)
Weight changes were detected as 0.06 gram for the case of stationary disk. The frequency was about 30 MHz. A high-frequency generator was installed above the HTCS disk, which was immersed in liquid nitrogen. It seems to be strange that the weight changes were stable after the electromagnetic generator was OFF. Quantitative data: This weight change is about 0.01% only.

The case of rotation of the disk in high-frequency electromagnetic field also was tested but without estimated effects – see Fig. 18. Perhaps that in this case important data was missed due to the short time of superconductive state of the disk placed in the rotor. Another possible reason is that a high-frequency electromagnetic field was dissipated in metal parts of the rotor.

7. Conclusions

7.1. Experiments were organized with low-power electromagnetic fields. Due to the short time of superconductivity state of rotating HTCS disk, reported effects for rotation tests can not be considered as reliable data and additional experimenting can be necessary.

7.2. There are positive effects in the case of rotation of the HTCS disk in permanent magnet field oriented cross the disk axially. If this effect is not a mistake then it can be explained by consideration of conditions created by this design for local gradient of Bose condensate density in the disk due to Lorenz force. Oscillations of this density due to rotation for the disk can generate gravity wave in axial (vertical) directions above and below the permanent magnet.

7.3. The main task of the project was to find resonance effects in the 10-100 MHz frequency range. Some effects were detected for 1 KHz and 30 MHz frequencies. To get more reliable data it is necessary to increase the power of the electromagnetic field.
8. Planning of the future experiment

Rotation or motion of HTCS matter in future tests is not planned. It is planned to test superconductor films instead of solid-state disks. Instead of high-frequency electromagnetic field producing induction currents in the HTCS it is planned to use high-frequency electric fields, which allows creating high-frequency oscillations of Bose condensate and by this way to change its density to find reliable experimental data on resonance frequencies predicted in\textsuperscript{45}.

Source: Alexander V. Frolov is owner and director of the research firm Faraday Lab, Russia, since 2001. He develops alternative energy and advanced aerospace projects. The publication of this article can be useful to find partners and investors for the next stage of experiments.

Mr. Alexander V. Frolov
Director, Faraday Lab Ltd, Russia
http://www.faraday.ru
http://alexfrolov.narod.ru
email: a2509@yahoo.com, phone 7-920-794-4448 +7 910 9482509 Skype alexfrolov2509

Alexander Frolov’s References

1. Radioactive Waste Treatment Methods
1.1. Frolov's method using waves of density of aether was tested in 2006. The customer of research was my Faraday Lab Ltd. company, The contractor was St. Petersburg University. Result is 20% decrease of environmental radioactivity in the area around a generator of waves of density of aether during 10 hours of experimentation. http://www.faraday.ru/radioactivity.pdf


\textsuperscript{45} Large-scale Sakharov Condition, David Noeyer and Christopher Bremner, 35\textsuperscript{th} IAA/ASME/SAE/ASEE Joint Propulsion Conference, Los Angeles, CA, 20-23 June 1999.


**Large Finned Containers Buried in Deepest Ocean Trenches**

Dr. M has patented special large containers that have fins. These are put on container ships and sunk 200 feet into the mud at the bottom of the deepest ocean trenches.

From: Eldon Byrd
To: David Crockett Williams
Date: April 05, 1999
Subject: Re: RadWaste Remediation ACTION OPPORTUNITY

Dr. M's telephone # is: 613-238-4437. I don't think he has an email address. I have just moved recently and I have hundreds of boxes to go through. However, the patent I referred to has to do with putting whatever you want to get rid of (including radioactive waste) into special large containers that have fins. These are put on container ships and sent to the trenches (like the Mariana Trench). The ocean trenches are really big cracks in the mantel of the earth that are filled with mud. The containers are dumped over the side and "fly" into the mud to a depth of about 200 feet. Over the next 1000 years they are sucked into the subduction zone and the molecules are literally torn apart in the molten layer between the earth's crust and the earth's center (the giant crystal). I have the patent somewhere. I talked to the inventor at Purdue several years ago when I was working as an Environmental Engineer.

Eldon

But what happens to the containers when they don’t sink far enough, are blocked by a boulder in the mud, or even not sink into the mud at all? Will the radioactive waste eventually overheat and escape into the ocean? Gary Vesperman

**Hawkings’ Generator of Cold Electricity**

Kenneth Hawkings’ generator results from feeding high voltages oscillating at optimally 150,000 hertz to two 4-inch fluorescent lights. Each fluorescent tube has a strong permanent magnet attached to its center – north pole on one side, and south pole on the other side. The magnetic field between the two poles deflects the electrons in the tube off to one side. The tube is now no longer capable of generating hot electricity. Instead only *cold* electricity is extracted from the zero point energy field by the tube.
The cold electricity emanates out the other end of the tubes which are each wired to a brass electrode. A 6 to 8-inch white spark of cold electricity 4 inches in diameter is produced between the two brass balls.

Apparently very little power is being drawn from two car batteries. An equivalent-sized spark generated by an arc welder would require thousands of amperes and volts. Gary Vesperman suggests that Jack Dea’s proposed design of a ball lightning fusion reactor may function with a spark of cold electricity instead of a hot spark requiring much greater power.

Cold electricity is not measurable with ordinary voltmeters and ammeters since it strangely has no electrons. However, cold electricity can power lamps, etc. Totally different applications could result from the observation that materials inserted in a spark of cold electricity sometimes transmute to elements of higher density.

Gary Vesperman has a video of an earlier version of the Hawkings’ generator where the dazzling white spark of cold electricity is only about the size of a peanut due to a much lower frequency being used. A weird ‘singing’ noise heard in the video indicates that energy is being extracted from the omnipresent zero point energy field. Even Nicola Tesla himself long ago observed the same connection of singing noise to energy extraction.

The Hawkings’ generator, although fairly simple and can completely be made with inexpensive commonly available components, is still in its earliest stages of development. Gary Vesperman’s friend Henry Curtis was the person who brought the Hawkings’ generator to the Gary Vesperman’s attention and provided him with a video. Curtis has been investigating and attending conferences on new energy technologies for over 15 years. Curtis thinks the Hawkings’ generator is the most exciting fuel-less energy source he has ever seen. Gary Vesperman has talked with some Las Vegas engineers about building their own prototype for testing.

Frankly, ‘cold electricity’ is still very much a huge mystery. Gary Vesperman has a B.S. Electrical Engineering degree from University of Wisconsin-Madison and has become familiar with all sorts of weird devices. Even he has no idea as to how mathematical formulas could be written describing the most fascinating phenomenon of cold electricity.

**Remediating Nuclear Waste with Electron-Captured Protons with Significant Net Energy Gain**

This technology constitutes an enormously promising source of "free" energy. Using high-density charge cluster accelerators, it is now technologically feasible to produce 10-20 times as much energy by remediating radioactivity emissions from stockpiles of nuclear waste products as they originally produced. As a result of the patented work of Kenneth Shoulders, Shang-Xian Jin, Dr. Hal Puthoff, Prof. Illyanuch, Prof. Mesyats, and others, this new low-velocity method for remediating nuclear waste with electron-captured protons has been demonstrated in laboratory tests to generate substantially more energy [in the form of photons as light and electrons as heat] than is required to power the treatment apparatus itself.

The technique produces electron clusters with energy densities equivalent to 25,000 degrees Celsius upon impact with a target material, while consuming only 20 microjoules to produce the effect. The electron clusters travel at no more than 10% light speed and have been shown to penetrate any substance with a high degree of precision. Using a deuterium-loaded palladium foil, bombardment areas demonstrate transmutation into silicon, calcium, magnesium and lithium.
Plasma physicist Shang_Xian Jin's paper describes how the high-density electron clusters achieve impact results similar to those produced by high-velocity ion accelerators, including penetration of the nucleus, with 1000 times less power. The new physics of like-charges clustering in bundles under low power conditions opens a wide range of possible applications including micro-thrusters for space craft maneuvering. The over-unity energy conversion efficiency of these systems is currently estimated to be at least nine to one.

The collective ion acceleration method has been designed and developed to the point of bench testing in the laboratory. The collective ion accelerator is completely documented, has been submitted to the Department of Energy, and is ready for full laboratory testing, prototype construction and testing. Development phases II and III each need several million dollars. Phase IV would involve on-site field testing of a transportable system suitable for remediation of radioactive emissions in both liquid and solid wastes; Salt Lake City, Utah research group led by Chinese plasma physicist Dr. Shang Xian Jin.

The following “Radioactive Remediation System – Executive Summary” was prepared for presentation to the Governor’s Office in the State of West Virginia as part of a project development program. It describes the process in layman’s terms and provides substantial background information to create an accurate context.

**Memorandum**

Date: 1 September 2011
From: David G. Yurth, Director: Science & Technology
The Nova Institute of Technology LLC
Fred Spain, Chairman/CEO – RansonGreen Community Development Foundation, Inc.

Ref: RansonGreen Community Development Foundation, Inc.

**Remediation of Radioactive Fuel Waste**

**Abstract**

One of the greatest challenges of the 21st century is to develop a method for remediating high-level nuclear waste generated by fission-based power production systems. The problems associated with reducing alpha, gamma and beta emissions generated by high-level solid and liquid nuclear waste materials are technically difficult for a variety of reasons. The purpose of this project is to suggest alternative approaches which can be designed, tested, prototyped and adapted to satisfy the technical, scientific, and engineering problems associated with reducing radioactive emissions generated by spent nuclear fuel waste materials to ambient background levels.

The remediation technique described here is most easily adapted to the treatment of solid nuclear waste materials. It exploits the nature of a patented phenomenological process referred to in the literature as ‘high-density charge clusters’ to disaggregate the nuclear structure of target materials to lower energy states as a means for reducing the intensity, rate of emissions, and half-life with each interaction.

A multi-phased approach is proposed to resolve the scientific, engineering and technical problems related to the suggested approach in five successive research, design and development phases. Estimated cost to complete the first three phases which will deliver field testable beta units in six fields of application is less than $10,000,000.00. Each phase is estimated to require between 12 – 18 months, with a total expected project term of 3 – 5 years.
Background
More than 30 techniques for mitigating radioactive emissions in spent nuclear fuel waste materials have been proposed and experimentally tested over the past 50 years. They range from simple incineration of low-level waste in a 7000F furnace to catastrophic destruction of the elemental materials via a process called nuclear spallation. Alchemical techniques have been proposed and unsuccessfully tested. Low and intermediate-level liquid waste materials have been subjected to various means for precipitating radiation-emitting solids using three primary techniques, but high-level solids have not been successfully handled using these techniques. At the present time no viable methodology has been developed and/or demonstrated for a scientifically validated commercial or industrial system that effectively ameliorates the problem.

Define the Problem
Radioactivity, the emission of nuclear particles and gamma radiation by elemental materials, occurs naturally everywhere on the planet. Naturally Occurring Radioactive Material [NORM], for example, is brought to the surface in a slurry every time an oil or deep water well is drilled into the surface of the earth. Radium is used on the faces of watches, radioactive isotopes are used in the construction of cellular phones, computer screens, and a host of devices ubiquitously distributed around the world and used by billions of people every day. Radioactive carbon interpenetrates the air we breathe, the soil we use to grow crops, vegetables, and feed stock. Commercial and industrial x-ray and welding equipment rely on the radioactive properties of various materials to increase efficiency and effectiveness. Every microwave oven in the world uses a magnetron emitter that is coated with radioactive thorium to increase effectiveness and penetration. Medical devices and treatment modalities used in the practice of conventional allopathic medicine rely increasingly on the properties of radioactive materials.

Nuclear power plants rely on the heat generated by various combinations of radioactive materials, some of which occur naturally and others that are deliberately manufactured, to create steam which is used to drive turbines that power generators to produce electrical power. Fuel rods made of alloyed zirconium are stuffed with pellets of highly radioactive isotopes such as uranium, thorium, cesium, cobalt, radium, iodine and others. Zirconium is used to encase the materials because in its virgin state it is largely transparent to the emission of the alpha and beta particles and gamma rays generated by the fuel pellets. Neutrons, heavy nuclear particles, are emitted at extremely high velocities, estimated to be as high as 70% of the speed of light. As they interact with similar emissions produced by adjacent fuel rods in an array referred to as a ‘nuclear pile’, tremendous heat is generated.

If allowed to operate unchecked, the amount of heat produced in a nuclear pile will result in the kind of uncontrollable catastrophic events witnessed at Three Mile Island and Chernobyl during the latter half of the 20th Century. Runaway nuclear reactions are moderated – controlled, if you will – by the insertion of rods, bars, or stacks of densely compacted graphite which are strategically placed between the fuel rods contained in the pile. Graphite absorbs and effectively dissipates the electrodynamic and kinetic energy exhibited by the particles emitted in the pile. Temperatures and emission rates can thus be managed by positioning the graphite modulators elements within the pile itself during operation.

During the life cycle of a typical fuel rod several factors combine to eventually render the rod unsuitable for continued use. While the nuclear decay process is taking place inside the fuel rod, daughter products are constantly being formed. These materials come into being as the result of the deterioration and electrodynamic imbalance exhibited by the original elemental pellets themselves. The by-products created during the decay process include substances such as plutonium, for example, which is the primary element used to manufacture nuclear weapons. The amount of time the daughter materials continue to emit high velocity neutrons, protons, electrons, light, heat, and intense gamma radiation varies from $10^{15}$ seconds to more than 3.5 million years, with the average being somewhere in the 250,000-year range.
Fuel rods are removed from the pile after less than 15% of their energy release potential has been exploited because the zirconium fuel rods become structurally unstable and lose their ability to permit emission products from passing freely into the pile. The process by which this occurs is referred to as ‘neutron embrittlement’. Embrittlement occurs in every material used to encapsulate expended fuel rods because the velocity of heavy nuclear particles [e.g., neutrons, protons, nucleons and hadron clusters] is high enough to catastrophically annihilate individual atoms contained in the crystalline lattice of the encapsulating materials. Eventually the embrittlement becomes so severe that it threatens the viability of the containment vessel as a safe means for containing the fuel pellets. The breach of an embrittled fuel rod represents a serious threat to the continued safe operation of every nuclear power plant because the uncontrollable release of high-level radioactive materials into the surrounding pile and cooling elements can trigger a self-sustaining and uncontrollable critical event. This is what happened at Chernobyl to precipitate the eventual disaster that occurred there.

When encapsulated materials are placed in a pile, they are also bathed in cooling agents such as water, some noble gases and mercury. Highly flammable gases such as hydrogen are produced as a by-product of the nuclear bombardment of water used to cool the pile. Direct contact with active nuclear fuel rods results in radioactive contamination of the cooling agents themselves. The cooling agents become so contaminated over time that they must also be removed, encapsulated, and stored for future treatment of one kind or another. At Savannah River, where several million gallons of such material have been stored above ground in 20” thick stainless steel containers, the ground water and the site itself have become so contaminated that it is no longer safe for humans to traffic that site. Neutron embrittlement has produced extensive fissures and cracks in the stainless steel tanks containing high-level radioactive waste materials in liquid form over a period of less than 35 years. It is now known that no material yet designed by humans can be expected to withstand the embrittlement process longer than 100 years, under ideal circumstances. This is one of the primary reasons why the Yucca Mountain initiative has been abandoned by the US Department of Energy and the Nuclear Regulatory Commission.

Define the Target

Like other industrial processes, generating electricity from nuclear power or making nuclear weapons creates waste. These radioactive and chemically toxic wastes result from the mining and processing of uranium as well as from storing or reprocessing spent reactor fuel.

Waste from Uranium Production

The tailings or waste produced by the extraction or concentration of uranium from its ore contain radioactive isotopes of uranium, thorium, and radium as well as significant concentrations of heavy metal including chromium, lead, molybdenum, and vanadium. More than 200 pounds of tailings are produced for each pound of uranium. This sandy waste material must be contained in carefully monitored sites known as tailings piles – an example of which is shown in Figure 1.

Waste from Conversion, Enrichment, and Fuel Fabrication Processes

Uranium production processes do not affect the level of radioactivity and do not produce significant chemical waste. An enrichment process for one ton of uranium hexafluoride produces 130 kg of UF₆ (3.5% U-235) and 870 kg of depleted UF₆ containing U-238. Depleted uranium has few applications. However, its high density of 18.7 g/cm³ makes it useful in armor plating and radiation shielding. It is also a potential energy source for fast breeder reactors.
Waste from Reactors
Spent fuel in the open and closed fuel cycles generates radioactive waste. The components of spent reactor fuel can either be treated as waste (in the open fuel cycle) or reprocessed (in the closed fuel cycle). In either case, spent fuel from the reactor is initially stored in cooling ponds under water at the reactor site to allow a decrease in radioactivity and a corresponding decrease in temperature. The amount of time the spent fuel remains in a pool is determined by whether it is to be kept as waste or reprocessed for either fuel or nuclear weapons. If it is to be treated as waste, it can remain in the pool indefinitely. If it is to be reprocessed to recover plutonium for weapons, it is removed after several months.

Waste from Nuclear Power Generation – The Open Fuel Cycle
In the open fuel cycle, the spent fuel rods remain in the pools under at least 20 feet of water (Figure 2), which protects the surroundings from radiation.

After a minimum of one year, the rods may be removed from the pool and placed in a cylinder in a chemically inert atmosphere of helium gas (Figure 3). The cylinder is then sealed and encased in steel and concrete to contain the radiation and enhance security for storage or transportation to a permanent repository. In 2008 there were 160,000 assemblies containing 45,000 tons of spent fuel from nuclear power reactors in the United States. The majority of these are stored at the reactor sites in reactor pools with only about 5 percent in dry casks. Each year about 7,800 additional used fuel assemblies are placed into storage. If all of the current assemblies were collected in a single location they would cover a football field to about a height of five and half yards.

Waste from Reprocessing Spent Fuel – The Closed Fuel Cycle
Spent fuel to be reprocessed for mixed oxide (MOX) fuel remains in the pool for several years before removal. The PUREX (link to unit on plutonium production) LINK process, used both for extracting plutonium and uranium in the closed fuel cycle and plutonium for weapons, generates large volumes of chemical and radioactive waste. In addition, the small amount of highly radioactive material remaining in spent reactor fuel after extraction of the uranium and plutonium poses a significant waste management problem.
Lastly, today the mixed uranium and plutonium oxides (MOX) from reprocessing are used only once in thermal reactors due to the buildup of neutron absorbing Pu-240. Thus, this spent MOX fuel becomes waste to be managed.
Waste from Nuclear Weapons Production
The highly radioactive liquid waste from reactors used to produce plutonium for the nuclear weapons of the United States is stored in tanks (Figure 4) at the Hanford, Washington, and Savannah River, South Carolina. The Hanford site manages the largest volume of high-level waste, but the Savannah River site contains more total radioactivity. At Hanford, high-level waste alkaline liquid, salt cake, and sludge are stored in 149 single-shell and 28 double-shell underground tanks, while Savannah River has 51 tanks. These tanks contain approximately 88 million gallons of liquid, which is not only radioactive but also chemically toxic. The composition of the liquid varies from tank to tank.

![Figure 4 - Waste Storage Tank](image)

The U.S. Department of Energy has begun a process of mixing this waste with sand at high temperatures to form a liquid glass mixture, which is poured into stainless steel canisters where it solidifies and is sealed for permanent storage. This method of stabilization, known as vitrification, has also been used to process waste from power reactors.

Types of Nuclear Waste
According to the U.S. Department of Energy (DOE), the four major elements of the environmental legacy of nuclear weapons production are

- waste,
- contaminated environmental media,
- surplus facilities, and
- materials in inventory.
We will focus on the first two components. Nuclear weapons production in the United States is a complex series of manufacturing operations that generates large quantities of nuclear and chemical wastes. The term “waste” is defined as solids or liquids that are radioactive, chemically hazardous, or both. This waste consists of materials that have been disposed of previously, await disposal, or have been retrieved in site cleanups and are currently in storage. Waste is measured in terms of its volume (cubic meters) and its radioactivity (curies). Waste from nuclear weapons production managed by DOE includes 24 million cubic meters containing 900 million curies.

**The major categories of waste are**

- high-level waste,
- transuranic waste,
- low-level waste,
- mixed low-level waste,
- 11e(2) byproduct material,
- hazardous waste, and
- THER waste.

**High-level waste** is the highly radioactive waste resulting from spent nuclear fuel from production or power reactors, as well as from the chemical processing of spent nuclear fuel and irradiated target assemblies. The radioactivity comes from fission fragments and their daughter products resulting from the fission of U-235 in production reactors. Although radiation from short-lived fission products (fragments and their daughters) will decrease dramatically in the next hundred years, radiation risks associated with the long-lived products will remain high for thousands of years. In the initial decay period, most of the radioactivity is due to Cs-137, Sr-90, and their short-lived daughter products. Plutonium, americium, uranium, and their daughter products are the major contributors to long-term radioactivity. Figure 5 plots the radioactivity of high-level radioactive waste versus the numbers of years.

![Decay in radioactivity of high-level waste from reprocessing one tonne of spent PWR fuel](image)

**Figure 5 – Radioactive Decay of High-level Waste from Reprocessing One Ton of Spent Reactor Fuel**
**Transuranic (TRU) waste** contains alpha-emitting transuranic elements or actinides with half-lives of greater than 20 years and a combined activity of greater than 100 nanocuries per gram of waste. Because of the long half-lives of many TRU isotopes, TRU waste can remain radioactive for hundreds of thousands of years. Some common isotopes found in TRU are Pu-238, Pu-239, Pu-240, Pu-241, Pu-242, Am-241, and Cu-244. TRU waste results from the fabrication of plutonium components, recycling of plutonium from scrap, retired weapons, and chemical separation of plutonium. Unlike high-level waste, which results from a few specific processes with a narrow range of physical matrices and chemical characteristics, TRU waste exists in many forms with a spectrum of chemical properties.

A small percentage of TRU waste exhibits high direct exposure hazards and is referred to as "remote-handled" TRU waste. The majority of TRU waste emits low levels of direct radiation and is called "contact-handled" waste. The chief hazard of "contact-handled" waste is due to alpha radiation. Alpha particles cannot penetrate the skin but cause serious localized tissue damage when inhaled or ingested. When inhaled, TRU elements tend to accumulate in the lungs; soluble TRU compounds migrate through the body, accumulating in the bone marrow and liver.

**Mixed low-level waste** contains both chemically hazardous waste subject to the Resource Conservation and Recovery Act (RCRA) and radioactive materials. The radioactive component of mixed low-level waste is similar to low-level waste and thus less radioactive than high-level or TRU waste. Hazardous chemical components present in mixed waste include toxic heavy metals, explosives, halogenated organic compounds, and acids.

By-product materials include waste from uranium production described above. The other category is defined by government regulations. A variety of materials not covered previously fall into these categories. These materials include polychlorinated biphenyls, asbestos, and byproduct materials that have been mixed with chemically hazardous substances.

**Waste Repositories in the United States**
Two locations in the United States have been identified as repositories for nuclear waste. The operational Waste Isolation Pilot Plant (WIPP) located in southeastern New Mexico is a geologic repository for the disposal of waste such as clothing, equipment, rags, and other items contaminated with transuranic (TRU) elements resulting from nuclear weapons production. This TRU waste is defined as having activity greater than 100 nanocuries per gram due to transuranic isotopes. These isotopes have long half-lives, extending from 20 to thousands of years but much lower levels of radioactivity than the high-level radioactive waste. The waste is packaged in containers and emplaced in salt beds approximately 2,000 feet below ground. It is hoped that the salt will slowly close around the waste, permanently isolating it from the accessible environment.

Yucca Mountain, located about 100 miles northwest of Las Vegas, Nevada, has been selected as the site of a national geological repository for high-level spent nuclear fuel from civilian power plants and defense-related activities (Figure 6). This site is being studied carefully by the Department of Energy (DOE) to ensure public health and safety. If DOE determines that the site is suitable, it will submit a construction application to the Nuclear Regulatory Commission (NRC). As of this writing, the US DOE has been instructed by Presidential Executive Order to close this project permanently. No alternative facility or storage method has been suggested to replace it.
As the licensing agency, the NRC will use standards currently being developed by the U.S. Environmental Protection Agency. However, conflicting scientific and technical information as well as strong political opposition from Nevada cloud the future of the site. As of 2009, no nation has opened a permanent repository for the storage of high-level nuclear waste. Most nuclear waste remains stored on the site at which it was produced.

Therefore, the nature and extent of the problem can be easily defined. The only way the dangers intrinsic to high-level radioactive waste materials can be effectively remediated requires the implementation of a methodology that can be shown by carefully controlled experimental protocols to effectively reduce the half-life of radioactive materials with each successive interaction, while at the same time reducing concomitant alpha and beta emissions and gamma ray intensity to ambient background levels. In short, what is required is a treatment technique that effectively disrupts the strong nuclear force [which binds the nuclear particles together] without creating a critical, uncontrollable, catastrophic fission event in the process.

To accomplish this, a number of factors have to be taken into consideration. Unfortunately, after more than 70 years of research and development in the field there is still no consensus about the crucial dynamics which are believed to contribute to the behavior and properties of radioactive isotopes. Models have been developed to describe the behavior of single atoms using newly developed non-linear software modeling systems, but no interactive dynamic modeling system has been developed that is capable of accurately evaluating the 4D interactions between isotopes of any elements with atomic numbers greater than 25. All the elements we are charged with treating are heavier than this upper modeling limit. Therefore, the task of estimating how much extrinsic energy must be applied to effectively disrupt the strong nuclear binding force in any aggregation of interactive radioactive isotopes remains largely speculative.
Nevertheless, it is possible to predict with some certainty what ought to happen when sufficient disruption energy has been effectively applied to a target material. During the development and experimental validation of the proposed methodology, sophisticated instrumentation was used to analyze the products generated by the treatment process. The results reported by the test protocols clearly validate that the methods we have developed work as intended.

**Unanswered Questions**

Among the questions that must be addressed, the following are of primary importance:

1. Variable treatment requirements for liquid waste v. solid waste [statistical assessment in gallons, tons, approaches, methodologies, technological alternatives etc.]

2. Calculations – nuclear bonding energies. What is the threshold energy required to temporarily disrupt the integrity of the targeted nucleus?

3. Modeling requirements – Schematic diagrams, animated illustration of nuclear structures in action, individually and adjacent to other materials in a crystalline lattice

4. Calculations – Stochastic electrodynamic [SED] model of radioactive decay [i.e., how many decay stages are needed to reduce current emission structure to generate ambient background levels of gamma, alpha & beta emissions]

5. Calculations – When minimal disaggregation energy is applied, how much energy is released over what ∆t? What form does the output energy take? What is required to manage it?

6. Calculations – When temporary disaggregation occurs, how long before reformation occurs, and in what form(s)? What effect does this dynamic exert on half-life and rate of radioactive emissions and decay cycles? Proposed Methodology

**Proposed Approach**

*Liquefied Radioactive Waste*

Most treatment and conditioning processes for low and intermediate-level radioactive waste have now reached an advanced industrial scale. Although these processes and technologies are sufficient for effective management of radioactive waste at nuclear power plants, further improvements in this technology are still possible and desirable. The increasing cost of radioactive waste disposal provides an incentive to adopt procedures and techniques to minimize waste quantities and to develop new techniques to minimize volumes at the treatment and conditioning step.

Some examples of such new developments include the use of specific inorganic sorbents to improve liquid waste treatment; use of membrane techniques for liquid waste treatment; de-watering and drying of bead resin and filters slurries; incineration of spent ion-exchange resins; dry cleaning of protective cloth to reduce quantity of laundry drains; use of high integrity containers for packaged dried filter sludges; vitrification of some intermediate-level waste to reduce volumes of waste to be disposed of; and super-compaction of unburnable waste.
Extraordinary Voltage Objects Model

**Background**

For more than twenty years, scientist Kenneth Shoulders has conducted independent laboratory experiments focused on a naturally occurring phenomenon exhibited by lightning strikes. The phenomenon is referred to in his patents and the scientific literature as ‘High-Density Charge Clusters’ [HDCC]. Shoulders’ latest documents refer to charge clusters as ‘Extraordinary Voltage Objects’ [EVO’s]. Other prominent scientists around the world have applied for and been awarded patents for similar discoveries in the field.

**High-Density Charge Clusters**

High-density charge clusters consist of micron-sized clusters of electrons, which exhibit soliton-like [standing wave, e.g. a smoke ring] behavior. A typical cluster has been experimentally shown to exhibit electron number density approximately equal to Avogadro’s number. These intense clusters of electrons are produced by an explosive electron emission, typically produced on the tip of a metallic needle cathode positioned adjacent to a dielectric (i.e. a metal dielectric vacuum contact point, or triple point) in a vacuum or low-pressure gas environment. The electron cluster is produced by application of a short negative pulse ranging from a few hundred to tens of thousands of volts to the cathode. In laboratory experiments recently conducted in the US, HDCC have been repeatedly and consistently produced by a system, which generates 2.5 kilovolts in a one-nanosecond discharge. Charge clusters were first discovered and developed into new integration by Kenneth Shoulders in the US. The US Patent and Trademark Office as a result of his work has issued several patents.

A typical individual charge cluster measures on the order of one micron, comprised of electrons numbering on the order of $10^{11}$ (i.e., electron number densities approaching that of a solid, ~ $6 \times 10^{23}$ per cubic centimeter). An analytical investigation to determine the self equilibrium of the moving charge clusters and the conditions under which a dynamic equilibrium state could exist, has been accomplished by S. X. Jin, et al. This analysis of a plasma fluid description provided, for the first time, analytical criteria, which describes the dynamic conditions under which a charge cluster can exist. This analysis showed that the HDCC is a self-organized toroidal electron vortex. Such an electron vortex has been shown to exist at various combinations of electron densities, velocities, and cluster sizes, all of which satisfy the criteria.

---

46 Shoulders, Kenneth C., United States Patent 5,153,990; 5,148,461; 5,123,030; 5,054,047; 5,054,046; 5,018,180
47 Bowman, USPTO 6,233,298; Mesyats-Druce, USPTO 5,774,348; Puthoff, Harold A., USPTO 5,537,009; Stern, USPTO 6,331,774; Venneri, USPTO 6,442,226
HDCC’s exhibit a tendency to link up like beads in a chain. The spacing of the beads in the chain is approximately equal to the diameter of the individual beads. The HDCC chains have been observed to form closed ring-like structures as large as 20 microns in diameter.\textsuperscript{54,55,56,57}

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{figure1.png}
\caption{EVO Plasma Discharge [Jin]\textsuperscript{58}}
\end{figure}

In his research, Shoulders discovered that when a high-energy burst of electrons is emitted at the tip of a properly constructed probe, and directed toward a target material, which is placed in front of an anode, in the presence of properly aligned magnetic fields and in the presence of a proton-rich plasma [e.g., deuteride gas] contained in a vacuum chamber, the cloud of electrons emitted at the tip of the probe organizes itself into a toroid measuring 1 micron in diameter.\textsuperscript{[59]}

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{figure2.png}
\caption{T. Banchoff – Flat Torus in 3-Sphere\textsuperscript{60}}
\end{figure}


\textsuperscript{58} Jin, S-X, EVO plasma discharge toroidal structure image, ref.

\textsuperscript{59} This image was produced by T. Banchoff and his colleagues at the University of Illinois, in concert with N. Thompson at Brown University and D. Banks of the University of North Carolina and Langley Research Center. It is of no small interest to the authors that this figure was produced with Y-Bias and Angularity data as an expression of a topological model.

\textsuperscript{60} \url{http://www.geom.uiuc.edu/docs/research/ieee94/node25.html}
The toroidal form of the EVO has been photographed with high-resolution tunneling electron microscopes at the point of emission. This phenomenon, which demonstrates the dynamics of self-organizing criticality and super-symmetry at sub-atomic scales, is specifically prohibited by the standard model of physics because it is believed to violate the Pauli exclusion principle.

Nevertheless, as the photographic and digital imaging evidence shows, the toroid formed by the self-organizing behavior of the electrons in a vacuum/plasma is both stable and can be directed through a proton-rich environment along the flux lines of a properly aligned magnetic field, to collide with a target material.
The multiple EVO strikes [shown in Fig. 5] are caused by an induction coil-driven electrode being scanned along the top side of the foil with a spacing of about .75 inch. In some regions the EVO penetrates the 0.02-inch thick coating and 0.001 inch thick foil carrying the fluid out the back side showing as a flare in the photo. In other cases, the EVO penetrates the coating and foil and then reverses direction carrying the fluidized SiC out the entry direction with high velocity.\textsuperscript{61}

![Figure 5 - Edge View of Multiple EVO Strikes in Air on an Aluminum Foil with SiC and Epoxy Mix](image)

Coming from the EVO source at the lower portion of the pinhole camera image, the EVO is seen to follow a helical pattern of motion and decomposing into the individual electrons as it moves at a rate of 1/10 the velocity of light to the top of the photo. The length of the EVO run in this photo is approximately 0.1 inches. This type of charge motion produces a chirped spectrum of radiation sweeping from higher to lower frequencies.\textsuperscript{62}

![Figure 6 - Pinhole Camera Side View of Dual EVO Flight Through Vacuum](image)

The value of the phenomenon as a means for efficiently performing work results from the fact that while 3.5 MeV is required to propel a proton [1,835 times more massive than an electron] to .1 C in a conventional linear particle accelerator, an electron charge cluster can be accelerated to the same velocity with 2.5 KeV, a differential of \(10^3\) electron volts. When undertaken under controlled conditions, the results demonstrate that the acceleration of the protons captured by the EVO does not diminish the velocity of the charge cluster itself. In this case, according to the Shoulders-Jin formulations, the second law of thermodynamics is locally violated, as predicted by Bearden et al.

\textsuperscript{61} The ability to penetrate is tied to having an electrical impedance match for the EVO upon emergence into the space beyond the foil. Deep penetration of the materials depends upon having a form of impedance match between the foil and the airspace.

\textsuperscript{62} http://www.svn.net/krscfs/Electromagnetic%20Pulse%20Source%20Using%20Fluidized%20Electrons-Appendix%20I.PDF
When proton-entangled EVO's are directed at the target material, the cumulative effect supplied by the aggregated kinetic energy represented by the entire collection of protons is shown to be sufficient to disaggregate the nuclear particles comprising the target material.

Instead, at the point of impact, light [in the form of highly energized photons], heat [in the form of infrared emissions], gamma rays and neutrons are emitted as the result of the disaggregating effect of the collision. Within narrow limits, during the pico-seconds following the impact event, the hadrons disaggregated to form a plasma automatically re-arrange themselves to create a nuclear structure which demonstrates a quantum reduction of energy to constitute what is referred to as a more 'steady state,' that is, a condition in which the number and volume of neutrons, gamma rays and other products of nuclear decay are reduced to a lower energy state. This process results in a shortening of the half-life of the target material by 50.0% with each collision and reorganizing event.
In controlled laboratory experiments Jin et al demonstrated conclusively [as Shoulders and others have predicted] that when subjected to a steady, targeted stream of EVO's the gamma and neutron emissions produced by thorium-232 [finely particulated thorium oxalate, as found in common camp stove lantern mantel materials] is reduced to ambient background levels in one hour. Digital images of the target materials taken via tunneling electron microscopy [TEM] conclusively demonstrate the profound atomic and molecular effects produced by bombardment of the target material with proton-entangled EVO's under controlled conditions.

The implications arising from this scientifically validated protocol are quite profound. The procedures developed by Jin et al demonstrate that a low-voltage power source can be harnessed to drive a properly engineered electron emitting apparatus in a way that results in the reduction of gamma, neutron and photon emissions in a target material, without the danger of triggering any sort of catastrophic fission event. The research also strongly suggests that this apparatus can be design-engineered to operate on a continuous, controlled basis with complete safety and at relatively modest cost.

**Simultaneous Acceleration in HDCC Interactions**

An important feature of HDCC’s is their strong ability to ionize nearby materials and the ability to attract and transport positive ions. The ionization effect is produced by the high energy electrons in the potential well of the HDCC. Newly produced positive ions (e.g., protons) can be trapped in the highly-negative potential well of the charge cluster and travel with and be accelerated together with the charge cluster. Experiments show that the number of trapped positive ions is about $10^{-4}$ to $10^{-3}$ percent of the electron number. Therefore, the local positive ion density could be as high as about $10^{17}$ to $10^{18}$ ions per square centimeter. It is important to note that this combined charge cluster can be accelerated to high energies similar to the acceleration of an individual electron.
Jin, Shoulders and Yurth have provided the following formulation for estimating the maximum electric field and holding power in a HDCC ring. As an approximation of the HDCC ring, consider an electron ring with major radius $R$, minor radius $a$, and uniform electron density $n_e$, in a background of ions (charge $+Ze$) of uniform density $n_i$. If we assume $a/R \ll 1$, then the self-electric field $E_r$ of the slender ring could be expressed approximately in cylindrical coordinates ($r$, $\theta$, $z$) by (in MKSA units)

$$E_m = - \frac{en_e r}{2 \varepsilon_0} (1 - f_e)$$

(1)

where $f_e = Z n_e/n_i$ is a charge neutralization factor. The maximum electric field in the ring could be estimated by the electric field at the edge of the ring ($r = a$): $E_m = - \frac{en_e a}{2 \varepsilon_0} (1 - f_e)$, or using the total number of electrons in the ring, $N_e = 2\pi^2 a^2 R n_e$, it can be written as

$$E_m = - \frac{N_e}{4\pi^2 \varepsilon_0 a R} (1 - f_e)$$

(2)

Numerically, it gives
In order for the ions to be accelerated along with the electron ring, the ions must be held within the ring during the acceleration. The “holding power” is defined as the maximum electric field holding the ions in the accelerated ring, $E_h$. The $E_h$ is related to the maximum electric field $E_m$ and can be expressed as

$$E_h = \eta E_m$$  \hspace{1cm} (4)

Because of the neutralization effect of the ions the $E_h$ is always smaller than $E_m$, i.e. $\eta < 1$. The size of $\eta$ depends on the ion number and distribution in the electron ring. As an example, consider the 20 $\mu$m diameter HDCC ring. With the data given by Ken Shoulders\textsuperscript{64,65,66,67}, we have $a \sim 0.5 \mu m$, $R \sim 10 \mu m$, $N_e \sim 10^{13}$ and $f_e \sim 10^{-5} < 1$, and therefore, we get $E_m \sim 10^{14} \text{ V/m}$, and

\textsuperscript{63} Jin used a Ludlum Measurements, Inc., Sodium Iodide detector, Model 4410-D; the Aptec Autobias PC Card, Aptec Multi-channel analyzer [Series 5000 MCard], and Aptect Basic Display and Acquisition Software [PCMCA/SUPER]. This combination provides a relatively low-cost gamma-ray spectroscope.


This field strength shows that the collective electric field in the HDCC ring is millions of times stronger than the electric field in a normally intense relativistic electron beam (~100 MV/m), or about eight orders of magnitude increase compared with the average electric field limit in conventional accelerators (1 - 5 MV/m). This holding power is strong enough to hold ions in the moving potential well of the ring during the acceleration.

There is a possibility that using a specially designed multi-tip cathode array and a properly calibrated magnetic field [as shown in Figure 4], a large high-density electron ring with dimensions much larger than the 20 microns could be generated. For example, consider a situation in which a large amount of HDCC produced by a cathode, such as a metal-dielectric cathode, could be injected into a cusped magnetic field. The magnetic field would be designed to transform the initially longitudinally oriented electron velocity into an azimuthally oriented velocity. With this strategy, the HDCC beam could be accumulated into a large high-density electron ring. The holding power of the electron ring would be strong enough to hold large amount of ions (e.g., protons) and the ions could be collectively accelerated to high energies.

Consider the ion-loaded electron ring with sufficiently high holding power in an external axial (z) electric field $E$. The rate of energy gain of the ion energy $W_i$ in the axial direction is then

$$dW_i(\text{HDCC})/dz = eEM/\gamma_e m_e [(1 - f_e)/(1 + f_e M_i Z \gamma_e / m_e)]$$

where $M_i$ and $m_e$ are the ion and electron rest mass, $f_e = Z n_i / n_e$ is a charge neutralization factor, $n_i$ and $n_e$ are the ion and electron number, $Z$ is the charge state of the ion, $v_e = (1 - (v_e/c)^2)^{-1/2}$ is the relativistic factor, $v_e$ is speed of the electron cluster, and $c$ is speed of light. In the case of small ion loading comparing with electron number, i.e. $f_e = Z n_i / n_e << Z \gamma_e / m_e / M_i$, Eq. (6) reduces to

$$dW_i(\text{HDCC})/dz = eEM/\gamma_e m_e$$

or after integration we have

$$W_i(\text{HDCC}) = eVM/\gamma_e m_e = (M_i / v_e m_e) W_e$$

where $V$ is the applied potential difference, $W_e$ is electron kinetic energy. In the same potential difference $V$, the energy gain of a pure ion is

$$W_i = Z eV$$

Comparing the Eqs. (8) and (9) we have

$$W_i(\text{HDCC})/W_i = (M_i / Z \gamma_e m_e) W_e = 1836 A/Z v_e$$
where $A$ is the atomic weight of the ion. This means that the ion acceleration by electron cluster is about $1836 \frac{A}{Z}$ times more effective than pure ion acceleration. Table 1 shows some applied potential differences and the kinetic energy of a proton (deuteron) collectively accelerated by the electron cluster.

As an example, consider a neutron producing reaction:

$$p + ^{3}\text{Li}^{7} \rightarrow ^{4}\text{Be}^{7} + n,$$

In this reaction the proton energy must be not less than the reaction threshold of 1.88 MeV. To achieve this proton energy in a conventional accelerator, the applied total electric potential differences must be not less than 1.88 MV. In the high-density charge cluster accelerator, however, the required potential differences for the same proton energy is only $1.88 \text{ MV}/1836 = 1.02 \text{ KV}$.

**Table 1 - The proton (deuteron) energy accelerated by HDCC**

<table>
<thead>
<tr>
<th>Applied voltage (KV)</th>
<th>The kinetic energy of Proton (deuteron) (MeV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.836 ( 3.672)</td>
</tr>
<tr>
<td>2.5</td>
<td>4.590 ( 9.180)</td>
</tr>
<tr>
<td>10</td>
<td>18.360 ( 36.720)</td>
</tr>
<tr>
<td>50</td>
<td>91.800 (183.600)</td>
</tr>
</tbody>
</table>

With the electron current density of 0.1 to 10A/cm$^{2}$ per pulse, the ion current density could have about 1 to 100mA/cm$^{2}$ per pulse, which correspond to $10^{17}$/cm$^{2}$ - $10^{18}$/cm$^{2}$ protons per pulse.

**Proposed Development Approach**

Nuclear Remediation Technologies, Inc., was created for the purpose of developing, deploying and commercializing this technology by remediating high-level radioactive emissions in spent nuclear fuels, as an economically and technologically feasible enterprise.

**Technology Development Issues**

Much work remains to be completed before EVO technologies can be properly investigated, understood, and exploited for practical, commercial applications. While it may be heartening to discover that the emissions produced by finely particulated thorium-232 can effectively be remediated in limited laboratory experiments, it is another matter entirely to understand how EVO's work at a level which will permit them to be safely and consistently applied to remediate the growing stockpiles of high-level nuclear materials in the US and elsewhere.

NRT has developed a multi-phased protocol designed to provide researchers with a full and complete understanding of the dynamics, mechanisms and parameters associated with the EVO technologies. The formulations, experimental evidence and basic research already concluded by Shoulders, Jin and others in China and the EEU/CIS suggest that eventually, with sufficient time and careful, deliberate investigation, it should be possible to design-engineer an apparatus which could be used to completely remediate nuclear emissions produced by all classes of spent nuclear fuels on-site and at perhaps $1/1000^{th}$ the cost of nuclear spallation or linear accelerator devices, with none of the dangers associated with their use.
Research and Development Plan
The overall objective of the project is to complete a regime of R & D and, ultimately, to commercialize the HDCC Collective Ion Accelerator. The objective will be achieved through three phases.

Phase I
Phase I is to determine the scientific and technical feasibility of the HDCC Collective Ion Accelerator concepts through extensive research and testing process and further develop the technology.

Phase I – Objectives:
Determine the scientific and technical feasibility of the high-density charge cluster collective ion accelerator concepts, and further develop the technology. Phase I is expected to require 24 months for completion, assuming full funding support from the outset.

Phase I - Tasks:

1. Demonstrate the scientific foundation and theoretical proof of the HDCC Collective Ion Accelerator concepts,
   - Examine existing patents, papers, and other relevant information;
   - File new patents.

2. Establish basic R & D experimental environment
   - 0-100 KV high power pulse generator, with pulse width less than 0.5-microsecond
   - ~1 nanosecond switch
   - High-vacuum system (~10E-5 torr.) with various feed-throughs
   - Scanning electron microscope, and EDX
   - Pin-hole camera
   - Oscilloscope with ~ 1000 MHz
   - Nuclear detectors (proton, neutron, and gamma), including CR-39
   - Control and data acquisition system, and other basic facilities.

3. R&D special cathodes for producing high-density charge clusters
   - Replicate some of Ken Shoulders’ work
   - Pseudo-spark experiment
   - Multiple tip cathode; metal-dielectric cathode

4. R&D various collective ion acceleration concept, and select best acceleration scheme
   - Electron ring acceleration
   - Neutral gas-filled drift tube
   - Evacuated drift tube
   - Ionization front acceleration
   - Wave collective ion acceleration mechanisms

5. Phase I report describing all tasks completed in Phase I, including recommendations for the construction and testing of the pre production prototype system in Phase II.

To meet this objective, it is estimated that upwards of $10 million USD will be required over a period of 36 – 60 months to conduct the investigations, accumulate and analyze the data; design-engineer, construct and test prototype apparatus to a point of sufficient maturity to allow for controlled field trials. Three serious issues stand in the way of developing commercial applications using EVO technologies.
Note: Some of the facilities and equipment needed in Phase I and Phase II are shown in Appendix 2; Appendix 3 lists key personnel needed in Phase 1. After completing Phase I tasks successfully, the project could smoothly proceed to Phase II.

**Phase I - Estimated Costs**

Total estimated cost to complete all tasks identified in Phase I over a period of 24 months is presently undetermined.

Phase I is estimated to require 24 months to completion at an estimated cost of ???

**Phase II**

Phase II is to determine engineering feasibility through the construction and testing of the pre production prototype system. Phase III is the commercialization phase.

Phase II and Phase III depend on the results of Phase I and have not been cost estimated for the purposes of this proposal.

Phase II Objectives

Develop an engineering prototype of the compact HDCC collective ion accelerator and perform test experiments to determine engineering feasibility.

Phase II Tasks:

1. Evaluate Phase I pilot test data to determine design engineering criteria,
2. Design engineer a suitable prototype for use in a controlled laboratory environment
3. Construct, assemble and test (alpha) pre production laboratory prototype system
5. Modify the laboratory prototype design as a basis for the pre production field test prototype.
6. Design engineer the pre production field system, construct/assemble prototype, and evaluate beta test prototype in controlled laboratory conditions.
7. Modify the pre production beta test prototype design based on controlled laboratory test results and performance evaluation.
8. Construct (5) beta test prototypes for pre production field-testing, data collection, and test monitoring.
9. Phase II report describing all task sets, test results, and final design specifications for commercially viable SIA units.

Phase II Cost

Phase II depends on the results of Phase I, and therefore has not been estimated for the purposes of this proposal.

Phase III – Objective

To commercialize the HDCC accelerator system.

Phase III Tasks
(to be developed)
**Conclusions & Recommendations**

The development of an efficient, cost-effective solution to the nuclear waste stockpile problem constitutes one of the most important technology innovations of the 21st century. In order to succeed, it must be financed with quiet, patient, long-suffering private sources of capital. Its research initiatives must be conducted under conditions which are so thoroughly secret and confidential that none of its detractors will be able to interdict the process. Whether or not such a combination of resources and circumstances can be created in time to prevent the irremediable pollution of the earth's ecosystems remains to be seen.

Considerable latitude has been taken by those who have sought to leverage the prospects represented by such a solution as a means for personal enrichment. In fact, it is partly because a number of irresponsible, unethical and essentially amoral individuals have sought to perpetrate a scientific fraud on prospective investors, by making unsupportable claims about the NRT EVO-based technologies, that it has become increasingly difficult to find acceptable financial and political partners. NRT has taken proactive steps to affirmatively prevent others from engaging in this sort of reprehensible behavior, but the taint of over-exaggerated claims has already been unreasonably appended to the technology itself.

In the past, NRT has conducted due diligence and funding negotiations with a number of parties who have claimed to be willing and able to provide the money and political support needed to successfully develop an EVO-based solution. To date, after more than a decade of such activities, none of those who have made these kinds of representations have been able to verify either. To date, NRT has expended more than $250,000 over 17 years in a frustrating search for suitable financial support. As a consequence, all parties expressing an interest in pursuing financial partnership arrangements with NRT are required to verify their financial capability before any confidential information will be released for their evaluation and review.

**Proposed Project Overview** [insert 6]


**Research and Development Challenges/ targets** [insert 7]

- EVO propagation system
  - (1) probe configuration, materials, geometries, arrays, etc.,
  - (2) burst duration @ ≤ 5 x 10^{-9} seconds,
  - (3) magnetic targeting controls in D_2O gas envelope,
  - (4) energy capture and conversion elements [especially gamma, beta, heat, and light]

**Multi-Phased Timelines, Budgets, Benchmarks, etc.** [insert 8]

- R&D Model – Phase I
  - objectives, benchmarks, milestones, resources, budget, time line, people/ skill sets, location, etc. ⇒ proof-of-concept demonstration prototype

- R&D Model – Phase II
  - objectives, benchmarks, milestones, resources, budget, time line, people/ skill sets, location, etc. ⇒ alpha field test prototypes

- R&D Model – Phase III
  - objectives, benchmarks, milestones, resources, budget, time line, people/ skill sets, location, etc. ⇒ beta field test prototypes

Radioactivity Neutralization Methods -145-  
May 30, 2014
Radioactivity Neutralization Methods

R&D Model – Phase IV
[objectives, benchmarks, milestones, resources, budget, time line, people/ skill sets, location, etc. ⇒ on site commercial prototypes in (6) fields of use]

Summary and Conclusions

References


(End of Executive Summary)

While a number of other people and groups have reported the development of treatment systems that could be applied to remediate the problems associated with high-level nuclear radiation, I am unaware of any that have evolved to a point of validation equivalent to the one we have focused our energies on. As you know, we have been actively prohibited from pursuing this work by the DOE and some of their independent contractors. As a result, the problems created by the Fukushima disaster remain unresolved and probably unremediable. – David Yurth

Source: David Yurth’s February 24, 2014 email to Gary Vesperman
Dematerialization Devices A, B, C and D Using Highest Powered Positive Ions Ever

Mike Hanson’s dematerialization devices A, B, C and D using the highest powered positive ions ever transmute any waste into its lowest possible harmless form by passing it through a dematerialization spherical boundary – an extremely active boson field kinetics area of plasmatic surface tension/extreme heat.

Physics: The physical interacting nature of particles. If this were common knowledge, making things like anti-gravity as a form of silent thrust without fuel, would not be so difficult. It may, in fact, be incredibly easy.

Just as Einstein was becoming known, another set of physicists were trying to make it big utilizing a projectively geometrical concept, as it is the root of all geometries and may encompass the true meaning of space/time. Projective geometry does not use math – such as the Euclidean branch in which Einstein based his work on. The latest and ‘best’ physics theory to date is the ‘M-theory’ which uses ‘p-branes’ to explain the atom and the forces of nature such as gravity. I will not go into this, but to make a long story short, physics to them is based on something which has no basis/no logical meaning. Projective geometry, which uses line projection (no numbers), can be the only way to describe reality. To learn more about this projectively geometrical concept, I would refer you to "Olive Whicher's Projective Geometry, Rudolf Steiner Press, London".

Based on this concept to explain everything at once in a unification of fields theory, though limited to projective, I have assembled what can be the only key to unlocking any mathematical conversion of this. (Necessary to relate the theory to experimental evidence.) This originated as I looked for an alternative to string theory based on this concept in 1995. In short, what the great physics professors of our time have been missing, is a ‘boson format’. With this, any element in the periodic table is explained with ease, as well as any of the forces. The theory goes like this: Space is an infinite sea of bosons, the largest particles ever estimated to exist by super-collider experiments [atom smashers]. Space everywhere would be like this, without other particles, if it weren't for the presence of black holes. A dual funnel black hole will inhale bosons through the funnels which aim at each other. These collide at a point to make smaller parts of a boson. Quarks, leptons, mesons, pions, kaons.... these are all parts of a boson. As a sea of bosons moves in, a sea of its parts move out. This flow opposition is what makes time's passage. At a point away from the galaxy, many particles fuse again to become bosons (a never-ending cycle in a never-ending universe). As flow opposition is minimal away from the galaxy, the format is 3, while closer in to the center you will get up to format #9. (This grouping is brought about by a pressure increase between bosons and their parts in flow opposition.)

![Diagram of boson field dynamics]

As the galaxy has its nine parts, so does the periodic table. Each element will surround itself, and is bound by, a particular number of bosons – thus giving it time and space. This also gives it visible color, mass/weight/molecular bonding properties, etc....
PROOF! I believe there is already proof that all matter is influenced by, and sits in a sea of bosons. One proof is this: Take graphite dust for example. Place it in a vacuum of air within a glass container. Expose this dust to direct sunlight. The dust will spin in well-defined recurring trajectories in a clover-leaf pattern. Each element in the periodic table will give a different result. So depending on the molecular bonding arrangement, light from the sun will cause the element(s) to shed leptons off in one manner or another, as the bosons, which contain this atom between its format, will be influenced differently by light which oscillates them in ‘boson kinetics’. This is the only explanation which could be deduced as a projectively geometrical solution to the unified theory. The elements will each have a level of, and angle of execution for, an ionic thrust created by this radiation as it deforms the natural ‘dead’ state of the atom, into an oscillation of the format.

Yet another proof:

Going up in atomic number on the periodic table of elements, the ‘charge’ of the nucleus increases. Here are the ACTUAL #s for the atomic RADII MEASUREMENTS IN ANGSTROMS...


Lithium__Beryllium__Boron__Carbon__Nitrogen__Oxygen__Flourine

1.52_____1.11_______.88______.77_____.70______.66______.64

If the radii change as overall atomic nuclei ‘charge’ counts increase (which they do), and the charge may be proven to be directly related to the boson count for atoms, who could possibly argue with this theory? [Keep in mind that ‘charge’ is a word used by physicists to explain how certain particles attract or repel. The charge of the nucleus doesn't really attract more by itself and the interaction of photons, but allows bosons to assemble about the quark matter creating a much greater assembly of particles overall – and a higher form of atomic mechanics/higher count of centrifuge mass.] In reality, no particle may ‘attract’ another, but larger particles do have the ability to cluster in a sea of waves made by smaller particles, just as soap bubbles would on the surface of turbulent water. This happens with mesons in thermal centrifuges in format 4, and with pions and kaons in centrifuges of higher formats. Lithium works well in watch batteries.
Higher boson formats such as lithium which may sit at format 8 and even 9 in theory [updates on this soon] would have a greater radial measure because of the space occupied by bosons in that high format. Lithium’s great ability to put thermal kinetic waves into orbit is already proven. (Lithium works better than any element for cooling bearing grease on your car.) Lithium has the ability to fuse heavy metals in nuclear reactions. You make the connection. Examining formats 8 and 9 closer, one should realize that the larger boson at center must oscillate to and from (through) the smaller bosons. This is a product of weight exchanging place as the format maintains a 3-d based interaction. Lithium’s flow of electrons in such a case should look something like this...

Consider that the so-called ‘physicists’ today don't care about solving the mystery of this type of evidence. To date, there are only a very few sources of all the experimental evidences being used to solve a unified field theory, and worse yet, they are only utilizing branches of the only root of all geometries. Why do they continue to build on a broken foundation? Every theory to date utilizes a concept based on branch geometry, of which it has no direct experimental evidence of its own existence!!! Perhaps they are trying to keep employed?

The following is an example of gobblygook. It is not how anything can work. Yet it is not far off from what they are teaching in our nation's colleges. Not shown are the ‘photons’ which are supposed to relay between the particles shown and somehow ‘suck’ them together. The most modern M-theory utilizing p-branes is not much different. The atom still ‘sucks’ to maintain stability. It is not possible for any particle/quanta to bound between two others and create an action of mutual attraction. The opposite would happen, as if time were acting in reverse. Kinetics is the key to solving how particles move and interact.
If one were to be closer in to the galaxy inside format 4, all light would orbit in every element but gold (Au). This is because gold traps light in a box, as it is made to orbit its format 5. Copper is format 4, though is not transparent here on earth unless you imitate the presence of an overall surrounding format #4 by passing current through the copper. This is of course uni-directional, not omni-directional, as would be a true format 4 environment. Within the galaxy's format #4 area, electrons are put into flow, as the K-mesons (specifically, but not limited to) replace the electron (and other leptons) in flow. Not only does this agree with the mechanics of the copper atom, but also shows how there may be a ‘Cosmic Microwave Background Radiation’ shift; otherwise known as ‘The Red Shift’, without an ‘expanding universe’. If light is slowed down by glass, why can't microwaves be slowed by format #4? Format 3 simply allows mesons to sit around the nucleus, which is the crossing point for neutrinos bounding between bosons. Format 4 allows mesons to act like a set of ‘gears’ about the nucleus. (As waves would orbit.)
As shown above, format 4 allows for thermal flow, while format 3 holds mesons responsible for thermal activity in a battery as thermal entropy. Below is a depiction of format #5 based on a 3-dimensional plane, as it would house the gold (Au) atom. (Quark matter is not shown.)

Off the subject of physics; set the Way Back machine to 1994

In 1994 I was working on a project (on paper) which would convert thermal kinetics (heat in the air) to usable direct current. I thought, if electricity can make heat, why not vice-versa? I came up with plans for a device which used spherical layers of copper to delay a type of wave release from a medium of gold, which
creates surface tension utilizing mesons. Without this surface tension, all mesons about the sphere having a particle vacuum made at center, would not move in sync. What they release as they move in sync, is a ‘pump z wave’. This wave will move in to the particle vacuum draw, which is a copper ball, at center. The following shows an example of what pump z-waves would look like on an oscilloscope...

This shows the guts of one type of z-wave folding medium as a hemispherical section. Realize that a complete model would have copper spheres, and 8 layers for the thermal converter. [Radial ratio measurements: 0-.5(ball) .75-1.25(spherical layer 1) 1.75-2.25(spherical layer 2) and so on ... to 8.25 for layer #8.]

Attached to the copper ball is a thin lead which removes electrons/etc... from the ball to a point outside the device. This pump z wave [energy in pulse form] would normally move through the center in focal passage, out to the other side, and attract mesons. However, if layers of copper delay the wave on the way in, the successive wave will be set in sync, yet out-of-phase with proceeding waves. The waves after focus in the ball will combine to become one higher frequency – capable of attracting smaller particles than mesons. If 8 layers are used, the particles attracted might be 8 times less massive than the mesons in question. The only force that would build (and something must), would be an electric charge. [Unlike other theories, electricity is more than just the movement of electrons. Electrical charge is directly dependent upon the separation distance of bosons in its surrounding format.]

I was still working on a good method to make the right kind of particle draw, in order to subtract capacitance evenly from all the 8 spherical layers at once, when I realized that a documentary of the crop circle enigma was on television. I previously thought nothing of these enigmas, though I was somewhat interested when I saw something which looked very similar to my thermal converter plan. In time, I was able to find this enigina again, and take its measurements. It was a perfect design for a device which would take the movements of thermal activity, and convert this to direct current! After this discovery, I began studying crop circles more and more. I found that people had already deciphered two languages. One language gives all the notes of the keyboard – based on fractals/projective geometry/white noise absorbing/white noise reflecting. The other language allowed cryptologists to decipher text from the inner walls of the Great Pyramid in Egypt. This is common knowledge.
Almost a year later, I was studying ‘superstring theory’ when I found that if it were converted to a projectively geometrical concept, it would have meaning. I worked on this for a short week before I realized that some of the enigmas looked similar to my projective solutions to physics. This was January 1996. Three years later now, I’ve found every enigma linked to this theory in physics, and in addition, have found more plans in addition to the thermal converter. The circles give the key to antigravity, free energy by other force conversions, and even dematerialization as witnessed in the Philadelphia Experiment, which Albert Einstein himself was witness to.

A note on free energy: Electron photography performed by two head professors at the labs in the University of Texas, of a vacuum, shows enough power bounding through a space the size of a small jar to run a nuclear aircraft carrier. What could be the key to tapping this energy battery of space?

The true ‘state-of-the-art’ technology: manipulation of space/time format for purposes of anti-gravity, free energy by force conversion, and dematerialization...
Progressing past the idea of folding z waves off thermal kinetics to form electrical current, I began a theory on how to fold time/space into a frequency which would build static charge during focal passage. The key is ionization states of matter. All matter has this, and keeps well in balance with neighboring matter. This is why you can't just shove a wire into a vacuum of air and expect to derive free power in the form of electrons. To convert this to something useful, the bosons must be removed. To do this, I've found it is, at the same time, the key to anti-gravity. A spherical device consisting of copper layers, having a thin coat of either H₂O contained within metal, or a quartz/gold lattice grown in an operating H₂O sphere, will emit lines of force which prevent bosons from entering, while the free space in the form of leptons, including electrons, is taken from between the bosons. This is accomplished by inducting current in one way or another from the copper ball placed within the spherical copper layers, and getting rid of it through a hole or seams in the sphere small enough not to be noticed by the spherical vacuum. Just as meson kinetic force may be folded, so may bosons. Bosons, in sets of 3, will move together and lock into sets of 7 [gyroscopically inert], in the most extreme peak of positive (+) ionization possible. Their energy has been removed, and so long as they don't come into contact with the device again, free energy has been made. The best way to prevent this from happening is to allow the sets of 7 to simply drain off the skin of the device, as they are a form of artificial weight. You may recall that any UFO has this weakness: It must expose metal or light-emitting spheres on its underside. You may recall how crop circles have formed. This is a direct result of a hovering UFO [or IFO in this case] releasing this artificial weight [+ions], which will not only smash wheat, barley, and/or corn flat to the ground, but will also align the minerals in the earth when it suddenly re-formats by taking in free particles. The crop circle enigma have been noted to give accelerated growth of plants in their centers, where I would estimate the bulk of these positive (+) ions (7
The 4 forces of ‘Mu’

I doubt the ancients of Easter Island (the Mu) actually meant the four forces to be gravity, electromagnetics, weak, and strong forces of the atom. But outside the kinetic reaction of light (boson kinetics/lepton battery oscillation) it is the first recorded possibility of real intelligence outside of ancient Egypt's technology of making direct current from the ‘energy grid’. (You can read about the world grid from Borderland Sciences, Arcata, CA.) Gravity is nothing more than a mutual attraction between like ‘higher’ formats in an overall surrounding low-formatted space. The presence of bosons in format 4 (ex.) grouped about the quarks which make up copper or steel, for instance, will have a space which maintains a balance of internal kinetics. The passage of time feeds an operation of particle shedding for an atom given altered shape by the presence of another like or higher format giving wave-field attraction. This is no different from explaining how two soap bubbles in water will move to one another. Mesons (ex) push through the atom to the space between the two format 4's (two like attractors). Mesons will return to the inner atom after moving around the outside of the format. During this process the atom/format's overall shape is squeezed to be slightly convex on one side, and biased to concave on the side away from the two like-attracting format 4's. The process of moving mesons will cause a lepton ‘thrust’ by shedding particles away from the two attracting format 4's, as the shape of the particle set will move it through space like wind moves those ‘multi-cup windmills’.

Electro-magnetics:

Argon gas is not conductive as metal, since metal uses format #4, which allows electrons to move fluidly between bosons. Now picture two metal plates both extremely flat. Scientists once conducted the experiment of moving two such plates close together... and just before contact was made, the two plates slammed into one another with great force. This is now known as the ‘Casimer effect’. The forces of magnetism and the forces involved in the experiment were no different. Bosons from each metal plate made an attempt at molecular bonding when the final complete layer of bosons between the two plates were expelled. These could not expel through the metal, as they are too large. Neutrinos constantly bounding about must have pushed the bosons sideways out through the space left between the two plates. In magnetism, metal molecules are aligned unparallel. This causes the compiled sets of metal molecules to fuse together, i.e., to expel any large particles contained between the alignments more so in one direction than the other. The ionization state is biased from one side of the magnet to the other, but doesn't drive the object through space if the ionization is allowed to return to its original point in space, making a constant loop. If you have questions on this, I would be glad to respond. Graphics update to follow.

The strong and weak forces of any atom

First consider that bosons are absolutely everywhere in space, maintaining pressure against one another. Now consider how galaxies expel the smallest decayed particle bits, e.g., neutrinos, from their centerpoints. These are small enough to travel between bosons, in the electron neutrino's case – for millions of miles...
without having suffered much loss in speed – even when traveling through lead. The crossing points of multiple paths, where the particles small enough to travel between the format in question exist, maintain a strong force for any atom. This is where the ‘up’ and ‘down’ quarks are trapped, as the frequency created by this path crossing will contain them between wavepeaks.

The weak force sits between the strong force, and the boson, within the boson set. It is nothing more than a centrifuge. Its movement is fed by the same which influence the nucleus, while it is held in place from the other side by a large boson. This second form of entrapment in the ‘centrifuge’ causes particles of varying size and relative mass to separate into categories. Too much of one category, and the stability of the overall format is biased. This could mean thermal kinetics, or anything. In the case of format 3 atoms such as nitrogen, it would be a bias of mesons. Refer to the format diagrams for a better realization of how varied boson formats will hold different particles in differing centrifuges beween themselves. For example, the copper would be allowed more centrifuges, while nitrogen can have only so many in format 3. Lithiums carry the highest formats I know of, thus have ease in moving from one ‘dimension’ (placement from galaxial center) to the next without going into fusion or fission. DNA contains a good amount of lithium. Could it be this is our connection to another type of existence?

**Dematerialization: ( Shrinking all matter within time/space format surrounding a spherical area.)**

A dematerialization device is constructed of copper only. It has the capability of suspending vapor from the air at a specific radius from the device – if it can be surrounded with vapor at that radius. The vapor (H₂O) will create its own spherical vacuum, and unlike the other vacuums, has the ability to physically ‘shrink’ both its own tension layer (not unlike any bubble), and all matter within the given radius. This is possible as the stacks of H₂O in oscillation against one another have the ability to move closer together in a type of self-correcting perfection. Once a craft is dematerialized, it has the ability to move anywhere at light speed – since all it needs to do this, is to change the shape of this vapor layer ever so slightly by emitting more free space (leptons) on one side than the other. (Bending time/space around itself.) This is what happened in the Philadelphia Experiment, to which Albert Einstein was a witness. The ship may have lost its mast as it extruded from the dematerialized space. Unlike the movie made about the incident, nobody ever traveled back in time.

Here is an inaccurate example of any one of the 3 anti-gravity spheres, shown without the lattice coat.

Layer thickness not to scale...
SPHERICAL LAYERING
HEMI-SECTIONS

This Enigma Shows Format #5
An Enigma Schematic of a Format #3 Atom

This Enigma Shows Transmission and Reception of a Lightwave

An Example of Format #6?
More on dematerialization

Witnesses of the Philadelphia Experiment described a US Navy ship becoming enveloped in some sort of ‘steam cloud’ which made a perfect spherical layer about the ship. Just as it appeared, it began to change color, most noticeably green, just before it disappeared and left a big hole in the water which quickly filled making a splash. I don't believe this could be much different than what my own father saw with a telescope in broad daylight in 1971. He was in our yard in Klamath, California, in the heart of the redwood forest. He noticed a bright light passing overhead the nearby radar base on the coast in Requah, moving to the southeast. He happened to be near his scope, and decided to take a look. What he now saw was 3 red lights in triangular formation, each brighter than the sun. Just as it passed over his location, it appeared to envelop with a spherical light, which emitted sparks down to the earth. As it began to move away, he noticed the sparks were increasing with speed drastically (like 20 times) the closer they were to the ground. It is my theory, that since the device in question absorbs all kinetic activity in order to make power in denting space/time's format, the ‘sparks’ were being slowed down in time when near the device/craft. It would be assumed that they were a form of miniature balled lightning. Moving on.... The craft then disappeared. Years later in 1998, some friends and I were camping up the creek, and noticed two spherical lights dancing about the night sky. The lights acted as if they were playing hide and seek. At one point they moved to the mountain, and we thought they would crash. But in an instant they vanished just before reaching the side of the mountain. I’ve heard many logger stories about the same lights in the hills, and wouldn't doubt a connection between these lights, and the same lights over Mount Shasta, where some tourists have reported seeing aliens.

Source: Scanned and edited hard copy snail mailed by Mike Hanson to Gary Vesperman in 1999.

Mike Hanson’s Flying Saucer Engine Explanation

Denise Gordon
From: Gary Vesperman [vmanskylink.net]
Sent: Friday, February 19, 1999 1:59 PM
To: Denise Gordon
Subject: Mike Hanson's flying saucer engine explanation

Gary, that’s great. It's amazing where communication can lead.

(The following text of this email (edited) was from Mike Hanson. I don’t remember who was Denise Gordon. Gary Vesperman)

The theory is very simple really. To first explain how the engine as you call it works, one must have a basic knowledge of physics – which isn't so difficult. Basically there are particles in space, both large and small. These particles exert force upon one another. This force is measured as the ‘Planck’s constant’ to our popular ‘physicists’ today (my interpretation – that times constant is also a particle pressure constant).

What I've done is find a method of manipulating this pressure in the making of a new type of science altogether. This previously undiscovered science is based on my theory in physics which in a roundabout way explains how to convert superstring theory into the true unification of fields theory by introducing the idea of ‘boson format’ – making way for the following: Each atom has its own time, thus its own mass, color, etc....
Radioactivity Neutralization Methods

Space has also its own time, depending upon how far you are from any black holes which sit at the center of each galaxy – and do in turn create that galaxy. Gravity is this; the atom/element in question which exists only between a particular format of bosons will make a ‘dent’ in space. When the space surrounding the atom is less in format than the atom (copper format 4 opposing format 3 which is the average for earth’s placement from the nearest black hole) . These ‘dents’ will attract one another because in the constant noise of space (particle noise in the passage of time) each gives a signature wave. These waves have the ability to influence the shape of the ‘dents’ made by other nearby elements/matter.

Now consider this: A machine with the ability to cause dead space of format 3 to convert suddenly into format 7. Such a machine would be making a temporary and artificial type of weight. This is possible by altering the ionization state of the bosons, closing them together – thus altering the pressure they exert upon one another in the ‘Planck’s constant’. The device made spherical will inhale sets of 3, and exhale sets of 7, which drain off the spherical device causing it to ‘float’ from the heavenly body anywhere in space which its format 7's being shed are moving to.

One simple device uses H₂O contained between two metal spheres. The H₂O molecules will align in stacks oriented away from the center of the device if electrons are forced to move into the center through the skin of the water. (The electrons are then expelled through a small hole away from the device in concentration.)

Now once the stacks of H₂O molecules align, they will oscillate against one another, in the creation of ‘lines of force’. To begin, these are magnetic. However, bosons are being held at bay between lines of force outside the sphere, since the lines of force extended narrow the closer you arrive to center. At some point the lines of force absolutely must give in to making a vacuum of these bosons. Since neutrinos are everpresent, these attempt to bombard these bosons to fill spaces. However this will be a biased space. You should recall that every action requires an equal an opposite reaction. The lack of bosons within, creates a surplus outside.

Another way to explain this is that bosons, when they have their free particles taken from between them altering their natural ionization state, will end up locking together into sets of 7. These sets (based on a 2D plane) have virtually no gyroscopes; thus will prevent them from maintaining separation by the presence of smaller particles. These smaller particles, mesons, kaons, muons, etc... would normally allow the set to move like gears.

Moving on: A spherical device may alone ‘float’, however to maneuver laterally to and from heavenly bodies, will need to have a vacuum which maintains a lenticular shape/ or flattish. [Just as a flat bubble in water will have ability to maneuver laterally.] To accomplish this, you may either make your device a standing oval instead of a sphere, or you may simply place 3 spheres in close vicinity in triangular formation. These 3 oriented to the earth will now have the ability to maneuver lateralty.

(The following is reproduced (with some editing) from Gary Vesperman’s copy of one of Mike Hanson’s geocities.com sites. Vesperman’s file is dated January 25, 1999.)

A note on free energy

Electron photography performed in labs at the University of Texas of a pure air vacuum the size of a small jar, shows enough force in the form of electron clusters bounding through to run a nuclear carrier. What could be the key to tapping this energy battery of space?
I will continue to update this site weekly. The point of this page is to introduce a concept of ‘super-magnetics’ by monopolar magnetics force building, made possible by the spherical magnet. This ‘magnet’ extends lines of force on one side of the bias to a central spherical medium. Magnetics are first of all made possible by particles moving along the lines of magnetic force IN A CONSTANT LOOP, so if this ‘experiment’ were ever taken seriously, one would find that the ‘mach angles’ of magnetism, once reached, will in fact cause another force to arise, due to the suffocation of magnetic – as nothing can keep the spherical device from operating. The outcome of this you will have to decide for yourself, based on the following paragraphs.

**A note on physics**

What physics theory today really lacks, is how the atom maintains stability in a co-existence with gravity. My theory is that the atom does not contain itself, but is trapped between the largest particles known, Bosons. These ‘Bosons’ maintain nuclear strength (prevent the atom from flying apart within) as they are always in extreme pressure against one another in an infinite sea throughout an infinite universe. Ask yourself this... ‘What is reality?’ Is it something cooked up by a professor in a lab utilizing branch geometries?... or could the reality of physics only be explained by utilizing ‘Projective Geometry’ to encompass the true meaning of space/time? Projective geometry is the root of all geometries. It uses line projection to explain reality, rather than some Euclidian concept for example. Say you're trying to explain the passage of time, and you had no idea what it was, or what it was caused by. Would you want to assume that it works off Euclidian math, which bases the atom on one central point for all interactions? NO!!! The latest theory physicists have concluded upon is ‘The M-Theory’, which uses P-branes in its makeup (explains how the atom is made of multiple bubbles stuck together.) This is their basis of reality. But what is it based upon? A branch geometrical concept! Useless, as logical deduction would state that reality is simply particles in action against each other, having no relation to anything else. No Mickey Mouse wearing a wizard cap is going to tell me that his basis for time's passage, or anything else, is caused by anything but a kinetic reaction. Particles will flow always by paths of least resistance, not to obey any concept of a ‘bubble’ or a dual geometric plane, of which it has no experimentally evident proof. I will update this page with more on the subject in time, but for now ... this provides the necessary ingredient, though based solely on a projectively geometrical concept, what we've been missing in physics theory... Based on my theory, outer space near earth, I would rate at a ‘Boson Format #3’(more on this later). Closer in to galaxial center, you can reach up to a format #9. This is how bosons arrange themselves in sets as they oppose the flow of smaller particles which exit from the center of the galaxy where a dual funnel black hole forces bosons to decay. Atoms can have their own format, as they noticeably fit a specific number of bosons around them to have their own ‘space’ and time, evident color, mass, etc.... This is what a format 3 atom would look like:

(Figure not included)

This is a format 4 atom:

(Figure not included)

Note that in the FORMAT#4, the meson environment previously spherical in nature, now has the ability to move in pathways similar to a 4-leaf clover, or 4 gears. Try to imagine 3 gears turning together at once. [won't happen]. Stepping up to format 5, mesons responsible for thermal kinetec exchange will actually orbit. This is already proven, evident Au[gold]atom, which traps one large boson in between the quarks and smaller bosons in the shape of a box.
Two languages of the crop circle enigma have already been recognized well by the world of common science. I have deciphered yet another two. One is the key to a unified field theory in physics. The other gives plans for various devices, all working off a ‘boson particle vacuum technology’. Relate any UFO sighting you can find to this...

When you see a UFO your first reaction is of course, that it is an unidentified flying object. I'm not going to explain balled lightning here, just those flying objects which are assumed to have living entities inside. There are 5 main categories...

1) Triangular craft having sets of 3 lights, sometimes with one large one at center.
2) Disc craft having an inverted cup brim on the underside with something round within this.
3) A single light, usually in the shape of a sphere, but in some cases a standing oval or a disc shape, with nothing attached.
4) A metal disc having 3 visible metal spheres on the underside [notoriously known as the ‘Drone’ craft] as once sighted over or near Mexico City during the Olympics.
5) A disc, or somewhat disc shaped craft, having a non-luminous body, with a ring or rings of spherical lights and one large spherical light at center.

These all have one thing in common, whether they shed light or not. They all have to expose their spheres to the naked eye. Why must they have this weakness? These must be exposed, because they are no different than a rocket's red glare, or any other form of thrust. These ‘float’, in a matter of speaking, and without the underside exposed, the thrust produced will counter the effect, preventing the hunk of matter from ever taking off. Another thing to keep in mind, they are always oriented parallel to the earth. Sets of 3 lights, or standing ovals, will tilt slightly to maneuver laterally. They work opposite direction to a helicopter blade's tilt-path-plane. You may recall an upstate New York sighting in the 1980's, where a triangular craft slowly moved over the city at night. Some of the 3-light sets, included in a set of 9 in the craft, would rotate slightly... which gave the impression that this was an aircraft formation. This was not the case. They adjusted to perfect direction of movement, as sets of 3 spheres in any case, are not able to simply tilt to move in a specific direction and have maximum accuracy, as would a standing oval. These spheres are creating 'boson particle vacuums' within. By mutual influence only can spheres have 'flattish' or 'lenticular' bubbles within, which are very necessary if you want to maneuver laterally. What good is it without this? The craft which have spheres of light are high output, high thrust capability types. While the spheres of metal are not so productive, and would not be good in combat for example, a standing oval light, or standing metal egg within a metal disc craft, creates within itself a disc vacuum for lateral maneuverability. This may sound great, but isn't for variable thrust/floating, because only with the sphere can efficient ‘Force Conversion’ take place.

This is the schematics for one of the crop circle enigma, which I believe to be plans for a craft capable of anti-gravity, and dematerialization.

(Figure is missing although it could be a duplicate of a figure shown above.)

And a rough depiction of any one of the three anti-gravity spheres shown cut open here... layer thickness not to scale.

(Figure is missing although it could be a duplicate of a figure shown above.)

Prelude to force conversion for ‘free energy’ and...
This is something you don't see every day: How to make kilowatts of direct current without fuel (other than the fuel of time's passage). Our society is controlled by high prices in, what should be ancient now, sales of fossil fuels...and nuclear power by 'reactors'. You can get the same power without the plasma heat, and nuclear waste. Most of what you need is just copper! You may think you know a lot about science, but tell me this, have you ever heard of an experiment undertaken to find what happens when you try to create a true 'particle vacuum'? Not an air vacuum. As you might recall, electron photography of a vacuum, shows enough power bounding through in the form of these so called 'electron clusters' to run a nuclear carrier from a space the size of a ladel jar. My point is that bosons, the largest particles, format space everywhere.

Whenever a space is created big enough for a boson to fill, it is instantaneously pushed there by neutrinos which pass through the spaces between bosons for vast distances. Neutrinos do this because they are light, small, and have been shot out of a galaxy somewhere, which has been busting bosons into bits as small as neutrinos. This force is what drives neutrinos to move as they do. Earth is at a distance from galaxial center to allow it times passage by way of neutrinos only. Closer in, where larger particles are more present, time's passage is caused by electrons, and so on. There are 9 levels of time/boson format. Graphics are on the way.

Free energy by force conversion

Time/space is nothing more than boson format, kept constant by nature's flow of free particles from dual funnel black holes within galaxies. Bosons will arrange themselves in sets of 3, 4, 5, 6, 7, 8 or 9, depending on the pressure they can maintain to stick together. When I say 'stick together', I mean by mutual wave attraction, not any different than how two bubbles of like size on the water's surface, will attract to one another. This is a common rule anywhere in reality, either 2d, 3d, 4d, or etc.... Elements on the periodic table exhibit higher formats than the format natural for that distance from the galaxy in question. This is what gives them weight, mass, color, as they have their own time, and their own space they have created as they fit between a higher number of bosons than surrounding space. A sphere of H\textsubscript{2}O, or a specially made quartz/gold lattice grown in operation of H\textsubscript{2}O on the atomic scale in the shape of a sphere, allows one to create lines of force extending outward from all directions at once – like an omni-directional gyro. ONLY this can cause bosons to lack within a space, as this disallows a return flow. Small particles are taken from a central point, where they are shot from the sphere, while outside the sphere larger bosons are held at bay between lines of force they have created for themselves. The ion state is what is in question here, and this is the answer: Boson format is equal to ion state. Matter's presence will battery this state, or it may be left in a state of unparalleled format, until the boson sets in question slowly or quickly find their natural state for the constant format held for that area of space.

The varying formats and how they affect matter trapped between them

What is a format? And why have I displayed them based on a 2d plane? A format of bosons is nothing more than how many bosons may collectively pair at a time, based on a 2d plane, as this is the key reference for velocity/pressure – as bosons oppose flow of small particles such as neutrinos in format 3.

Format 3 as shown will have neutrinos bounding through it, allowing the center point where they cross paths to make up the atomic nucleus of light gasses, such as nitrogen.

Format 4 allows for something greater; electrons may now move constantly. Copper is a format 4 atom. Every time a format is stepped up, the lightest particles move to flow in a constant cycle, while those previously left stagnant and non-interacting will become part of the atom's mechanics. Copper \textit{is} conductive, while it is also the greatest thermally disapating element (that is, has the greatest amount of...
thermal conductivity). K-mesons, responsible for thermal kinetics, flow in a 4-leaf clover fashion here within the set of 4 bosons. This works just like geared wheels. A set of 3 would not turn. A set of 4 would.

Format 5: The only atom having perfect format 5 is Au/gold. It puts K-mesons into flow, while it also allows for (just pions?) to orbit a larger centrally based boson. You will notice the graphic depiction of this having 5 bosons, but when applied to gold, one large boson sits at center, while 8 smaller surround this. (4 on two separate 2d planes) in the existence of the 3d atom.

Format 6: Just another step up. Exact details/specs on this to come.

Format 7: The locked set. Imagine these as gears... it wouldn't work well. The set of 7 is gyroscopically inert. In nature, I believe this is one of the Li/lithium atoms, which has the best overall ability to cool, as it prevents any thermal kinetic storage even. Lithium is used in lubrication of wheel bearings. It is used to prevent instant landing gear lubrication boil off in outer space on NASA Space Shuttles.

Format 8: Almost there....

Format 9: The last possible format. To my knowledge, this does not exist, unless as a heavy radioactive element, which would only last if the overall format for surrounding space is format 7 or above. It is the ‘universal joint’ of atomic mechanics. You should be able to see, that if another boson came into the picture, the format would not hold onto the center boson anymore. Perhaps there is a place in the Universe where the large central format 9 ‘Higg's’ bosons will group into 3's...? Neutron stars perhaps.

If you've read and somewhat understand the above, you should now be able to comprehend this:

Anti-gravity as it relates to the extraterrestrial craft previously outlined, is a form of thrust. It is silent. It is made possible by a spherical device which inhales small particles such as electrons to a centerpoint, and then jettisons these from the sphere through a small hole or seams. (Don't jump ahead of me yet)... Meantime, you have large amounts of the largest particles known to exist, building up outside the skin of the sphere. The sphere will use either H2O or a specially made quartz/gold lattice to extend lines of force (lines of oscillation) from a central spherical point to all points outside the spherical device. These lines of force will hold bosons at bay, preventing them from entering with the smaller particles – as they are held at a specific distance from the sphere in operation. Bosons naturally separate themselves at a standard distance in nature, this is their ‘ionization state’ [they exist everywhere], but in this case, they pack together as free space is taken from between them. When this happens, surface tension between the bosons which have now locked together into sets of 7, will cause ‘free space’ to pulse through the boson shell in the form of a ‘pump z wave’. This can happen in a fraction of a second. These sets of 7 bosons are now extremely positively charged ions. They are also heavy, almost like water.

At this point, if the base in which the spherical device is mounted, is out of the way of a downward flow of positive ions, the spherical device will weigh less, as it is now producing a form of thrust. This ‘thrust’ isn't much different than a flow of water. It can smash wheat flat to the ground in the formation of ‘crop circles’, for example. When you see a UFO, consider that it is floating. You will soon come to realize that there is no other explanation.

More on pump z waves and how ‘space’ is folded to become energy

Not shown here would be more copper layers and a medium which extends lines of force, such as H2O or a quartz/gold lattice. Gold plus other crystalline structures work as well. Lithium may be ideal.
The oscillating lattice or liquid allows for pulses of energy to bound inward to spherical center. As these pump $z$ waves move in, they are delayed by the presence of copper. This will set the successive waves in sync yet out of phase with proceeding waves. Once the focusing point within the copper ball is reached, waves combine to form one higher frequency. In a way, this is how laser light is made, as infrared waves combine to become light waves. Nikola Tesla utilized wave folding from a low frequency to a high frequency in some of his work.

Now the waves lost off bosons outside the $\text{H}_2\text{O}$ or otherwise, which would normally continue out the other side to attract bosons, are now forced to attract smaller particles with this higher frequency. This builds ion charge in the copper ball. A thin copper rod may extend from the ball to a point outside the device to enamate power in the form of direct current. Any questions???

The 4 forces of ‘MU’

I doubt the ‘MU’ of Easter Island really knew about gravity, electromagnetism, or the strong and weak forces that keep atoms together. But they did leave some script behind which could point to the possibility. In any case, here it is:

Gravity: Local molecular bonding of an atom may give it a lower or higher format than overall surrounding space. This bonding requires either larger or smaller particles to bound in and out of it. If these are larger, such as electrons which copper has put into flow, they are what is lost ‘upward’ when the matter or simply highly formatted ion, is pushed downward. This format ‘falling down’ now, attains more electrons as they are ever present. The electrons would be lost ‘up’, because the high format (higher than overall surrounding space) is mutually attracted to the large mass of higher format (such as an Earth.) This mutual attraction is the direct result of naturally enamating waves from both objects. It causes the gyroscopes of each to change, which make them both slightly teardrop shaped with their shell of surrounding electrons, and etc....

Electromagnetism: Say you have an assembly of format 4 atoms which create between them holes large enough for mesons, pions, kaons, and even bosons, to travel through. [This is a theoretical estimation of the particles involved in magnetics and may not be correct.] If the metal has its tunneled holes aligned to bunch close together on one side, and far apart on the other, the passing free particles such as neutrinos, will have a hydraulic advantage of pushing these pions/kaons/bosons etc... through the tunnels in the metal. This is possible only because the bosons which surround each metal atom, create a surface tension than involves the use of gyrating/orbiting mesons/etc... And this tension may prevent the entrance of larger particles into the metal if the holes on that side are spread apart more than the opposing.

Strong force of the atom: Many theories have come and gone as to how this works with everything else, especially the co-existence of gravity. It is simple though. Bosons having immense kinetic pressure against one another everywhere throughout the infinite universe, keep close to one another. Only this can allow for the smallest particles for that particular format number of assembly, to enter and exit. As the neutrinos for example, bound between a format 3 for nitrogen, the point at which paths cross is the point where the ‘up’ and ‘down’ quarks will sit. They cannot go into flow, and they cannot move too far from this assembly, as any attempt to do so, would be a move away from the field waves created by the crossing paths of neutrinos.

Weak force of the atom: Between any format, a very interesting thing happens. Larger particles [e.g. mesons] are pushed around by small particles passing through the format. This, in one way or another, causes everything trapped between the boson format to separate into categories, like a centrifuge would separate white and red blood cells. As these ‘centrifuges’ sit, they act like gears. A format 4 will have
'gears' which make space for quarks large enough to create a copper atom, if the quarks are present. In time, I hope to have a revision of the periodic table of elements for this, but for now I have only a few of the elements categorized... Light gasses= format 3. Most metals= format 4. Gold= format 5. Lithium 6 and 7 are categorized as formats 6 and 7, though may not be correct. But must be close, as they do not conduct heat as copper would, and don't reflect it as gold does so perfectly. The degree of thermal reflection is directly evident their degree of separation which points directly to the number of smaller bosons surrounding the larger boson. This concludes the 4th ‘weak’ force.

Light: I would not prefer to categorize this as a 5th force, as it performs just like magnetism, though it uses smaller particles in use of its field waves. It does utilize boson kinetics more directly than anything, as electrons are put into surplus or deficit as an amount contained between a boson format, on one side or the other of the light wave. Light from distant stars shows just how great the pressure is maintained between bosons.

Cosmic Microwave Background Radiation (CMBR)/the ‘red shift’

This is not a shift evident of the universe rapidly expanding! It is a delay and slowing of field waves made possible by the presence of galaxies which have higher boson formats! Light is delayed by glass, right? You may recall how you will see only blue light through thick glass. Wouldn't this oppose the theory? No. The medium for all interactions is based on format 3, as Earth is at a distance from the galaxy to give its surrounding bosons and average of format 3. Microwaves do not pass through metal correct? If galaxies have format 4 as a minimum close-in, wouldn't it be assumed that this would at least delay such waves?

Unifying Field Theory with Projective Geometry

This section is dedicated to making sense out of particle physics. For long, so many have theorized methods of explaining all particle interactions with one theory, yet have neglected the use of a projectively geometrical approach – which can be the only way to encompass the true meaning of space and time. I have made this website easy to understand for both the complete novice and advanced physicist.

The missing link is bosons. This is not a pseudoscience. Fermions only have spin because of bosons. The bosons are the medium for this, as they ‘FORMAT’ space, allowing time to happen. These particles, known to be the largest, have been neglected since until now fermions (obvious interacting particles such as quarks) interacting only with the totally theoretic and imaginary photons, have been used to explain too much. The same goes for strings with p and d branes. The illusion math gives is a near perfect solution. But to encompass the true meaning of space and time, how can one assume that any branch geometrical concept (think about this, really), can truly encompass the true meaning of space and time!!!!! If it works, it must be translatable to one simple sentence, as it was so well put by Einstein.

Why haven't the bosons been introduced into the equations made by our so called ‘modern day’ physicists? In the shadow of the boson particles, all matter retains alignment with space and time, and while photons show a method of explaining interaction, fools forget to continue the pursuit of explaining particle physics with just particles. Euclidian geometric equations base this photon activity on dual geometric planes of movement – which have no basis for either their existence nor fuel for movement!!!

On the left, you have our modern day physicist’s basic plan for an atom, utilizing ‘p branes’ in the ‘M theory’. On the right, you have my modification, wherein bosons surround the atom, and all interactions work through wave reflection only. The 2 ideas are close to being the same, yet one method may use ONLY particles. This theory doesn't sell with physics professors, since I've found it difficult to translate my projective idea into math without higher math schooling. The solution is however obvious, since the
modification is basic in principle. The wave reflections form particle vortex centrifuges (a natural method of particle separation and confinement). No photons then, just waves through particle fields as neutrinos (initially) fuel the movement of this interaction.

The vortex concept:

This describes the basic idea of a vortex: Two or more particle weights come in, are separated in a centrifugal action, and are released. Not shown here is how one or the other of the subjects may be routed to re-enter the flow. In particle physics, the smaller particles will constantly re-enter the flow in low radius groupings, while the large and heavy are either lost from the loop or simply continue looping at a larger radius with decreased speed.

The Higgs boson, largest particle known, has 0 spin. This shouldn't mean it does nothing! They are the MEDIUM for every interaction – a yang for the yin. These format space since neutrinos move through the universe in such a way to keep them in order/format (format explained below). Not only are bosons THE missing link to explaining absolutely everything, but in absolusion, these also provide us with the necessary tool to make complete and logical hypothesis of methods for creating anti-gravity, and or, particle thrust machines, as well as final solutions in breaking down riddles in chemistry.

Any element in the periodic table is explained with ease, as well as any of the forces. The theory goes like this: Space is an infinite sea of bosons in an infinite universe (not expanding and no ‘Big Bang’. ) Space everywhere would be like this, without matter, if it weren't for black holes. Black holes inhale bosons, break them down, and exhale small parts which are all other particles. (Stephen Hawking once theorized this). The unequivocal proof of this, and the demise of ideological photon theorems are in part as follows:

**Sideband emission from black holes, evidence that the fabric of space/time is stretched.**
(Links to article ‘Observing Lense-Thirring Precession’.)

The **OTHER EVIDENCE** (links to a Hubble telescope photo) to support this theory has come to light – a new class of black holes has been discovered [ref: NASA HQ Press Release, April 13th, 1999.] In our galaxy for example, dual funnels inhale bosons, while quarks, leptons, mesons, pions, kaons, etc... are all released from the center. As a sea of bosons moves in, a sea of its parts moves out much faster for equal weight exchange. This flow opposition is what makes time's passage, as most evidently neutrinos passing between atoms at light speed cause the atom to oscillate from within!! Just because stars are swallowed by black holes does not mean the overall action of this excludes the galaxy's black hole from growing. This is only an example of natural growth. At a point away from the galaxy, usually at arm's ends, particles fuse/freeze again to become bosons (a never-ending cycle in a never-ending universe). Any body of matter in this theory then, should have an accompanying black hole, and based on this new evidence of the existence of black holes having a mass 100 to 10,000 times the mass of the sun *(click on link above ‘Latest Evidence’), it should be more than obvious that black holes not only make the galaxy, and make time as neutrinos and other particles are released to fuel the movement of atoms, but allow for 7 dimensions as well. (Dimensions explained below). Dimension number (number of dimensions or dimension number? Vesperman) rises closer in to the galaxy’s center. Galaxies put a dent in space and time (time moves slower within), and causes an inhalation of any wave passing the galaxy, which is why **CMBR SLOWS WHEN PASSING THROUGH GALAXIES BECAUSE EACH GALAXY HAS A DUAL FUNNEL BLACK HOLE INSIDE.**

Previously, there were only two known classes of black holes, the ‘supermassive’, and the ‘stellar’. Astrophysicists representing the Naval Research Lab. N.W. Univ. and the University of California at Berkley, who collaborated in the discovery of antimatter emission, appearing as a burst of steam spurting...
upward from the yolk of a fried egg, should have easily deduced then, that all galaxies have black holes within, and likewise, must consider these not as something which could only cause the demise of a galaxy, but could very well be what makes a galaxy work!

As flow opposition is minimal away from the galaxy, the format is 3, while closer to the galaxy’s center, format 9 is present. The number of bosons in a ‘format’ rises when flow opposition between bosons and their smaller parts increases in pressure. The pressure may prevent electrons from orbiting in format 4, while replacing them with mesons responsible for the thermal spectrum. Format 4 fully active exists just at light speed. (The element copper is format 4, which is why it sheds light under current passing, as electrons are disrupting its synchronous meson interactions). Later I will mention more on the elements. Elements have formats based on how much they have to expand the format of bosons from within. Gluons, which DO NOT exist, would not in this theory because every particle orbits about a smaller particle, rather than the other way around, in the strong force – just another disproof for the Euclid-heads.

The weak force acts as a gear attached to the strong force, and is not directly affected by the passage of time which is a count of particles passing through an atom at one time in fueling its oscillations/movements. The weak forces do have a direct connection to molecular bonding. The weak force is what remains of an atom which might surpass its ability to interact with surrounding space after passing a level of light speed, or format interaction. This is because the bosons arranging in sets of 4 for format of 4 for example, when passing light speed, will allow its molecular bonding waves to act without interruption. i.e.: K-mesons (over 600 x electron mass) replace the electron, and because of this the strong force of the atom shifts its geometry to work with other particle sets. The reason for this is simple; particles group because of orbital waves, which continue past light speed by mesons, not electrons. When passing light speed, the final particle sets left can only be those which are heavy enough to allow a wave through its own to orbit an elliptic about the boson which opposes the head on flow of the atom’s greatest speed though all else. For a visual of this see the depiction of formats a few paragraphs down.

(Figure is missing although it could be a duplicate of a figure shown above.)

Shown below left are the two funnels of a supermassive black hole which inhale bosons. Shown below right I’ve depicted the flow opposition between bosons and their outbound parts, which is what creates time’s passage. Note that some neutrinos are around a million times smaller than bosons, and these are responsible for time’s passage/fueling the mechanics of the atom where earth sits relative to the center of its galaxy. That is, it would take about a million electron neutrinos to allow a boson to move just 1 space into the galaxy’s black hole.

Galaxies are created by and can only exist about a black hole. This explains why the Cosmic Microwave Background Radiation slows when passing through galaxies, since black holes would obviously slow passing microwaves. Once you consider this, doesn't it seem ludicrous to consider a ‘Big Bang’? In this case, there was no ‘Big Bang’. The universe is infinite. Stephen Hawking, the best black hole theorist to date, once theorized that black holes do in fact make particles.
As the galaxy has its 7 parts, so does the periodic table. Each element will surround itself, and is bound by, a particular number of bosons – thus giving it time and space. Formats 3 to 9 (7 total) give time and space for either the element, or the space near a black hole within a galaxy. The disruption of particle flow/time's flow between bosons gives any format the ability to have permanent weight, molecular bonding ability, color, etc... just as any element would. That is, the disruption is the matter which is trapped between the bosons and disrupts the flow of free particles traveling between bosons. These free particles may be any lepton, meson, pion, or kaon. The higher formats have a higher ‘vortex’ ability. That is, these allow storage of larger particles, and more of them. Pure evidence of this is lithium, and how it suppresses heat so well. It may act as a living vortex when linked with other elements. (Good reason for its use in thermonuclear reactions.)

Another proof of the theory of bosons composing time/space formats; Take graphite dust for example. Place it in a vacuum of air within a glass container. Expose this dust to direct sunlight. The dust will spin in well-defined recurring trajectories in a clover-leaf pattern. Each element in the periodic table will give a different result. So depending on the molecular bonding arrangement, light from the sun will cause the element(s) to shed leptons off in one manner or another, as the bosons, which contain this atom between its format, will be influenced differently by light which oscillates them in ‘boson kinetics’ – which is the only explanation which could be deduced as a projectively geometrical solution to the unified theory. The elements will each have a level of, and angle of execution for, a thrust created by this radiation as it deforms the natural ‘dead’ state of the atom, into an oscillation of the format. Each element maintains ion state by surrounding particle aura density/size.

Yet another proof:

Going up in number on the periodic table of elements, the ‘charge’ of the nucleus increases. Here are the ACTUAL numbers for the atomic RADII MEASUREMENTS IN ANGSTROMS...


Lithium___Beryllium___Boron___Carbon___Nitrogen___Oxygen___Flourine
1.52____1.11_____.88_____.77_____.70_____.66_____.64

If the radii change as overall atomic nuclei ‘charge’ counts increase (which they do), and the charge may be proven to be directly related to the boson count for atoms, who could possibly argue with this theory? [Keep in mind that ‘charge’ is a word used by physicists to explain how certain particles attract or repel.]

Radioactivity Neutralization Methods -169- May 30, 2014
Click here for a useful link; "Atomic Nature Of Matter".

The charge of the nucleus doesn't really attract more by itself and the interaction of photons, but allows bosons to assemble about the quark matter creating a much greater assembly of particles overall and a higher form of atomic mechanics – [higher count of centrifuge mass.] In reality, no particle may ‘attract’ another, but larger particles do have the ability to cluster in a sea of waves made by smaller particles, just as soap bubbles would on the surface of turbulent water. This happens with mesons (responsible for thermal kinetics) in format 4, as the mechanics of format 4 will allow thermal waves to orbit internally. You may find pions and kaons use other orbital waves in higher formats, as it is all by rule of the size of the bosons.

Consider that the so-called ‘physicists’ today don't care about solving the mystery of this type of evidence. To date, there are only a very few sources of all the experimental evidences being used to solve a unified field theory, and worse yet, they are only utilizing branches of the only root of all geometries. Why do they continue to build on a broken foundation? Every theory to date utilizes a concept based on branch geometry, of which it has no direct experimental evidence of its own existence!!! Perhaps they are trying to keep employed?

The following is an example of gobblygook. It is not how anything can work. Yet it is not far off from what they are teaching in our nation's colleges. Not shown are the ‘photons’ which are supposed to relay between the particles shown and somehow ‘suck’ them together. The most modern M theory utilizing p-branes is not much different. The atom still ‘sucks’ to maintain stability. It is not possible for any particle/quanta to bound between two others and to create an action of mutual attraction. The opposite would happen, as if time were acting in reverse. Kinetics can be the only reality of real particle physics. If time were acting in reverse for any of the forces they have described, this would mean they've got that part of the atom inside-out. The force I speak of is gravity. Using string theory, gravity works backwards when passing light speed, or when entering the event horizon of a black hole. Containing the atom with bosons fixes this problem, while still allowing the center of the atom to ‘suck’ as it would seem, but only because kinetics forces strong and weak force ‘centrifuges’ to attach themselves to the ‘string like’ flow of particles passing between bosons. Obviously these centrifuges are held in place as they are caged by surrounding bosons in kinetic resistance.

You may wonder how the bosons conform to the element/atom while the atom is subject also to containment between bosons. The answer is simple. Time's passage (free particles flowing between everything) gives all like sized particles surface tension between one another, so long as there exists a smaller particle sea where this can happen. The modification is as simple as 123. The latest M theory shows atoms as an arrangement of particles in a p-brane group which forms a ‘diamond’ shape, and what would a shape be between 4 bosons? Go figure.

Inertia: A comparison with Schrodinger's cat; an approaching object will seem to shift to the blue spectrum, while leaving shifts to red. What is different, however, is that non-stationary objects, relative to surrounding bosons only, complete their cyclic interactions non-uniformly. Time is altered on two sides of the sphere initially, and once inertia is set, as particle weight moves, nothing can prevent this but ion exchange by one of a number of methods. One would be molecular pressure from another object, as in maintaining the correct count of all particles between bosons in time's passage. This exchange of kinetic
force must influence the bosons directly to do so. The other would be for the object itself to change ion states from one side to the other, as ions are directly relative to weight since they are set by bosons counts in grouping and separate distances. In a matter of speaking, all matter is always in motion in all directions simultaneously. Understanding this will prove useful for the section on ‘dematerialization’.

FORMAT 3 BASED ON A 2D PLANE

FORMAT 4 BASED ON A 2D PLANE
THE 4 CIRCLES ENVELOPING THE 4 WEAK SHELLS REPRESENT THE MESON ENVIRONMENTS

As shown above, format 4 allows for thermal wave orbits, while format 3 holds mesons responsible for thermal activity in random flux as a state of thermal entropy.

Below is a depiction of format 5 based on a 3-dimensional plane, as it would house the gold (Au) atom.

(Quark matter is not shown.)

THE 4 FORCES OF NATURE FROM STRONG TO WEAK....

Strong: The force inside the center of an atom; this is possible as particles which continually pass in succession through the atom's bosons will allow 3-dimensional crossing points of its own. About these
points particles will oscillate faster than anywhere in the atom, and since bosons are difficult to displace, just as difficult then to displace would be the matter held in oscillation of one of these junctions in oscillation.

**Weak:** This force is an allowance of both local time and space granted to it by the preoccupying strong force. Because of the strong force, particles (for ex: the mesons in copper in F#4), will internally form orbital waves in, for example, 4-leaf clover patterns. These patterns though based on 2d planes, are in fact 3-dimensional, and thus create a spherical particle vacuum in their oscillation which in a ‘sea’ of particle noise and waves, much like bubbles on the surface of water, will internally contain for example quarks – strange, charmed, bottom, and top.

**Electromagnetic:** This classification shows how over either very short or very long distances, particles of specific weights are exchanged, as elements in particular molecular bonds have the ability in their formations to use time's passage in moving them a particular direction. This is only possible by molecular bonds of successive atoms aligned to strain ion compression between themselves from one point to the next. This may be as little as two differing elements.

**Gravity:** The 4th force to be set by the rule of ion states. This force is possible because atoms are all living vortexes, processing passage of many particles – especially neutrinos. Any element nearby emits waves relative to its own molecular bonding orbital waves which dampen a field between the two attractors. This dampening field of relatively lower frequency, or at least not random, makes the atoms lose its neutrinos away from each other, as their unstable groupings will simply fly off, and in this exchange allow the atoms/attractors to 'push' towards each other.

Source: There is no direct link to Mike Hanson’s website which hasn’t been active since August 15, 2001. I, Gary Vesperman, lost contact with Mike Hanson many years ago, and I haven’t been able to find him using various people finder websites. He was in Texas (?) and then moved to Portland, OR? There is an entry from or about him in a 2010 anti-gravity website.

To access his site, first Copy [http://www.geocities.com/ResearchTriangle/Lab/6771/magnet.html](http://www.geocities.com/ResearchTriangle/Lab/6771/magnet.html). Then click on [http://www.archive.org](http://www.archive.org). Paste into www.archive.org’s Wayback Machine. Then first click on ‘2001’, and then click again on ‘August 15’. The proceeding article will appear. At the top of the page are links to his pages (reproduced below) on anti-gravity, dematerialization, and DNA/RNA. Not reproduced here is his interesting page re earth axial shifts, how the Siberian mammoths were quick frozen, etc.

**The Anti-Gravity Page**

Once you understand the basics of particle physics, and what my modification does, you may read on. I’ve also mentioned how each element surrounds itself with a particular number of boson particles based upon its ability to disturb and use ‘free’ particles, such as electrons, mesons, leptons, kaons, and pions – thus giving it weight, color, its own time, molecular bonding properties, etc....

To an atom, its weight is allowed only by its increased format number surrounding by boson group numbers. The amount of quark matter within determines how much the atom inducts time's passage (neutrino flow) and vortexes its force (transforms). Now what if you can make these bosons group without the quark matter long enough to use the altered weight state as thrust? This would mean that anywhere in space, really anywhere, you may create grouped bosons to use as thrust.
In the simple design of an anti-gravity device, it is required to have ion transformation. This means the boson particles which by their own separation distance and number in a group, are this level of ionization. This is what ionization is, as the free particles which fill the gaps are the yang for the yin.

To make a boson kinetic force or ion transformer, you need 6 spherical layers of copper, a copper ball at center, and a micro-thin lattice of quartz/gold grown on the skin of the outermost spherical layer, accurate to .7 microns. The process to create this is beyond any earthly technology, but with the help of monopolar magnetism, you may grow this lattice to scale within H₂O, as the gold spikes need to orient to spherical center within the lattice of quartz.

This simple plan, if followed correctly, will produce for you at least 20 times the thrust needed to lift its own weight, and copper is heavy!

Copper spherical layers must be complete, and welded from hemispheres to a mirror finish or close to it. General surface tolerance for error = 15/10,000'ths in machinists’ terms.

You must use a conductive copper alloy, not pipe alloy. Zinc and aluminum may be in the mix minimally. Copper used in wire is comparable.

Separate copper layers with a non-conductive.

If made actual size, suggest a copper rod of 2/16 to 3/16 inches width, which contacts the copper ball at center, and is separated from spherical layers by a coat of plastic, or glass.

**How does it work, free energy, more**

Electron photography performed by two head professors (from the University of Texas) proves enough power in the form of electron clusters bounds through the space the size of a ladel jar (about 2 cups) to run a nuclear carrier. This technology shows how to tap the energy source with monopolar magnetics! I found it obvious that this energy is stored in the ion states of space.

First, bosons battery these electrons, and other related particles which make electricity possible. The complete sphere has the ability to extend lines of magnetic force from one point at spherical center, to all points about the sphere. Lines of force will hold bosons at bay (keep them out of the sphere in a boson vacuum) as free particles such as electrons are taken in. It does this by

1: Creating boson modulation in a pump z wave format.
2: Synchronizing this wave comes naturally about the sphere, just as dropping a pebble onto water's surface.
3: Passing the pump z wave through multiple layers of copper sets successive waves in sync, yet out of phase with proceeding waves.
4: Once multiple out-of-phase waves pass through the nonlinear medium at spherical center (in the ball), all waves combine to form one higher frequency. This means no longer can the original wave frequency (lost from bosons) attract bosons, but can now only attract particles a fraction of their size!
5: As the new higher frequency wave attracts small particles, the natural thing for copper to do is build an electrical charge. A similar technology is used in lasers, but works with light instead. Another example is sonoluminescence, which is actually explained here, and only here, with the idea of bosons formatting space, and giving time degree.
The Dematerialization Page

Dematerialization of space

Before you read this, read the physics and antigravity pages (above).

Closer into the center of galaxies, you will find a much greater flow opposition of inbound boson particles and outbound boson ‘parts’. Also in this space, meson particles, responsible for thermal kinetics (all heat levels in any atom, thermal expansion and contraction) will replace electrons in orbits. Dematerialization is a constant in such a place, as also space is much more compact. As you see the format 3, its natural state for the bosons is to separate from each other a good degree more than in format number 4.

Compiling together three ideas at once allowed me to figure out a plan for a device which will ‘dematerialize’ space, artificially – something like a miniature black hole or galaxy model. Imitating space as it exists nearer a galaxy’s center/nearer a ‘black hole’ (each galaxy has one at centerpoint) is fairly simple. I will not disclose plans for this upon the website. However I will describe to you how this works.

One dematerializer device is fairly basic. You build a device which suspends H\textsubscript{2}O in the air wrapping completely about a spherical area. The H\textsubscript{2}O creates lines of force necessary to sustain its presence in the air, allowing for a spherical wrap of the H\textsubscript{2}O under molecular bonding surface tension – which retains the spherical shape, and is a self-correcting shape just as any other bubble having surface tension by molecular bonds. In this case the bond becomes extremely strong. It does this by both creating flow opposition of electrons (initially – but working its way up in particle weights as the particle vacuum increases) against bosons to create lines of force with vapor. Much like the image above showing a cross section cut, there are 2 layers of copper (spherical) on the way in to the copper ball which transforms the pump z wave released from the H\textsubscript{2}O – by allowing wave focus inside copper.

The transformation of electrical pulses inward from the water (happens naturally in sync as a pebble would make waves on a pond) is what pulls in other particles larger than the electrons, as the copper ball, by rule of time/space format must maintain a balance of particle weights.

Space may shrink in order to hide from the effects of time...

Consider any atom, or just plain space. It holds within it many particles which are not bound within any atom, but move freely from one to the next. The dematerializer extracts many of these in order to bring boson particles closer together, as they are the only particles which refuse to be made a vacuum of, since they are the ones making the vacuum of other particles in this design. There are three weights/classes of these known. Increasing the number of bosons which occupy a space is what happens as you would try to make a vacuum of these utilizing the lines of force. It is possible because meson particles are running a loop circuit, allowing awesome amounts of thermal order without either fusion or fission between the bosons.

Four Dematerializers can Neutralize Radioactive Waste

(The following is a highly condensed, rearranged and edited version of email correspondence between Mike Hanson and Gary Vesperman in 1999. Note that the topics don’t always flow smoothly from paragraph to paragraph.)
I found it interesting that transmuting waste was already accomplished utilizing positive ions, considering my device can make the most positive ions ever possible, plenty of them, and without a cent spent on power to create the ions....

How does one get positive ions and not spend any money?

Gary, I have designs for 4 different types of dematerializers. Any one of these will create enough radiation to kill if you get close enough to it. So please take care if you plan to experiment. I suppose I should put this warning and more on the web site accompanying the plans.

This is old news, unless you're talking about high-level nuclear waste. However, primarily strontium 90, is used to give more power than the original in Paul Maurice Brown's nuclear battery. Originally it was 'Nucell' of Portland, Oregon in the 1980's. Then they lost the license to handle waste for poor procedures. I know it's in use today, but where or who I don't recall. I read also a publication from the International Tesla Society about some chemical reaction performed in a bucket of all places to burn up nuclear waste. Well proven.

(I am pretty sure Hanson is referring to the Keller catalytic process AKA 'volcano in a can'. Keller’s process has been found unworkable. Vesperman)

I didn't mention it in my web site, though I know it is possible to transmute any waste into its lowest possible harmless form by passing it through a dematerialization spherical boundary – an extremely active boson field kinetics area of plasmatic surface tension/ extreme heat.

That would be high-level nuclear waste, including stontiums. Strontium is used in Paul Maurice Brown's Nucell nuclear battery by the way. Anyway, yes this would be a new method of degrading it to a harmless form.

Q: How? How does this work?

Well let me in on it. Let's get a cut. Just have to build a device. Dematerializers are made small or large. May only cost a couple of thousand?? Copper spheres are easily lathed, but exacting the outward flow of electrons from 4 points may be difficult.

Gary, yes, it can. It has the ability to heat the stuff hotter than the sun – to the point where anything is converted into its lowest form. Nuclear waste, primarily strontiums, will annihilate themselves since their almost unnaturally huge dent in space/time dissolves to near a low format environment. I would really like to explain this to someone who is actually serious about doing something with it before our nuclear waste dumps sink into the ocean during the coming equatorial shift in May or so, 2000. The shift, which is based on the energy grid for axis of alignment, will turn the earth to a new rotational axis based on a point of the 'Greenwich Meridian'. (Those old guys knew something about the grid before we even began a world time line). Once the earth begins to spin on a new axis, the crust will stretch out a bit, changing earth's shape. What you may have seen in Gordon Michael Scallion's new world map isn't far off from the truth. So what if he's a screwed-up prophet.

To access his other site, which has not been active since April 14, 2002, first Copy http://www.geocities.com/mw0440/magnet.html. Then click on http://www.archive.org. Paste into www.archive.org’s Wayback Machine. Then first click on ‘2002’, and then click again on ‘April 14’.

The website’s topics include:
Antigravity: ion propulsion – build your own spacecraft parts
Thermal transformer: transform heat into direct current
No-brainer summary of my M-theory modification (Reproduced below)
Light speed and light speed travel (altering time's speed inside a sphere.)
Earth rotational axis changes past and future (Interesting but not relevant to space travel)

(The first two pages and the fourth page are unfortunately not available. Vesperman)

**A Summary of My M Theory Modification**

There is no simple way to summarize a theory in particle physics. Putting this as simply as possible however:

Particle physics is just that; particles. There can be no imaginary items used to explain reality. I've seen physics explained using branch geometrical concepts only. But ask yourself, do you exist in a branch geometrical concept? To bring gravity together with all other equations, one must resort to this projective concept I've devised. The latest M theory may have us closer, but still has no proof. Many of my ideas, I found have already been thought of to some degree in the past. The vortex atom, using projective geometry to explain physics, etc.... M theory is the most accepted now, because it uses multiple dimensions to explain physics. My idea uses 9, and from what I understand, M theory uses 10. Some modeling done with M theory's atoms show the atom to be diamond shaped. This was an idea I first introduced in 1996, before M theory was published. The reason the diamond shape works better, is because it shows how the atom is working as a diamond shape. The diamond shape is necessary if it is to have its particle mechanics occurring between sets of boson particles, as only I have theorized!!! Their theory still has no basis for the photon, and its reason for shape. My theory shows how shape logically falls into place, as do all mechanics of the atom, working with all the forces as well.

Source: “Mike Hanson’s Flying Saucer Engine” (truncated), Space Travel Innovations, pp 13-45, (www.padrak.com/vesperman)

**Transmutation with Lasers**


"WE DID an experiment the other day that turned gold into mercury," says Ken Ledingham, a laser specialist at the University of Strathclyde in Glasgow, UK.

The achievement might not have impressed medieval alchemists, whose goal was precisely the reverse – turning base metals into gold. But it could still be the start of a revolution. Using lasers to transmute elements means that within a few years scientists could be doing alchemy on their desktops, with huge implications for applications as diverse as medicine and nuclear power.

The alchemists of old never got close to creating gold. Their experiments were mere chemistry, which affects only the electrons on the surface of atoms. True alchemy requires changes to the atom's nucleus: either embedding more protons and neutrons in it or tearing them out. Altering the number of protons changes one element into another, while adjusting the number of neutrons tunes the atom's stability, transforming an unstable isotope into a stable one, or vice versa.
Since Ernest Rutherford ‘split the atom’ in 1919, we have known that bombarding atoms with particles such as neutrons or protons can convert one element into another. This generally requires nuclear reactors or particle accelerators with kilometres of tunnels and huge superconducting magnets, but Ledingham and colleagues have used a laser to do the job. True, the laser is a huge one. Called Vulcan, and housed at the Rutherford Appleton Laboratory in Oxfordshire, it is the most powerful laser in the world and the size of a small hotel. But laser technology is progressing fast, and within 5 years lasers nearly as powerful as Vulcan could be small enough to fit on a table top. And this could bring the power of transmutation to the masses.

Ledingham and his colleagues have used Vulcan to add protons to gold nuclei to create mercury. But there is more to the new alchemy than turning one heavy metal into another. In a paper accepted by the Journal of Physics D: Applied Physics, the team holds out the tantalizing possibility of neutralizing dangerous radioactive waste. They used Vulcan to convert iodine-129, an isotope that remains active for millions of years, into iodine-128, which decays in minutes.

To carry out the transmutation, the researchers fired a picosecond laser pulse at a gold target. The intense energy of the laser beam blasts the gold atoms into a plasma of free nuclei and electrons, which then emit gamma rays as they pass through the rest of the target. These intense gamma rays collide with the atoms of iodine-129, shaking the nuclei so violently that a neutron is squeezed out.

Transmuting nuclear waste has long been considered an attractive way of dealing with the ugly by-products of nuclear power. Researchers in France, which uses nuclear energy to supply 80 per cent of its electricity, are obligated by law to investigate transmutation. The US also has an active research programme into this kind of alchemy, and the British government is considering whether to start one. Until now, the only options have been modified versions of nuclear reactors, in which neutrons released during fission collide with the unwanted isotopes and break them apart. But many anti-nuclear groups see this as a ploy for reviving nuclear power.

Laser transmutation might provoke less hostility, say its advocates, as well as potentially being able to clean up waste that already exists, so it has long been a goal of laser researchers. "In the early 1990s we were thinking 'wouldn't it be great if we could transmute waste with high-intensity lasers?'" recalls Scott Wilks at the Lawrence Livermore National Laboratory in California, who was part of the team that demonstrated laser-induced fission for the first time in 2000. Ledingham says that lasers should now be considered as a serious alternative to reactor transmutation.

But it won't happen any time soon. Because the laser light has to be converted to gamma rays – only a small fraction of which collide with the target atoms – the process Ledingham has demonstrated is extremely inefficient. His recent experiments converted only 3 million atoms of iodine-129 into iodine-128 – less than a billionth of a microgram. To convert the entire test sample, which measured just a couple of centimetres across, the laser would have had to fire more than $10^{17}$ times, swallowing an enormous amount of energy in the process. "You might need to build a power station to do it," says Karl Krushelnick, a laser physicist at Imperial College London and a member of Ledingham's team. Besides, the laser can currently only fire once an hour.

As well as destroying unwanted isotopes, alchemists can also make new elements. "Nuclear physicists can make everything that is in nature, and more," says Jim Al-Khalili, a nuclear expert at the University of Surrey. For example, the element with 110 protons has just been officially named ‘darmstadtium’ by the International Union of Pure and Applied Chemistry. This element is not found in nature, but was created in a particle accelerator in Darmstadt, Germany. Other unnaturally heavy nuclei have also been created, and scientists continue to search for more.
But the first practical benefits of desktop alchemy are more likely to appear in medical physics, which might have pleased the original alchemists, who believed that transmutation would lead to cures for disease. "Alchemy is really useful in making radioisotopes for medicine," says Philip Walker, head of the nuclear and particle physics division at Institute of Physics in the UK.

These isotopes are used in medical imaging: for example, fluorine-18 decays by emitting an antimatter particle called a positron, which annihilates in a burst of energy as soon as it hits an electron. If this happens within the body, detectors arranged outside can capture the photons emitted and pinpoint the location of the fluorine isotope. The technique is called positron emission tomography, or PET scanning, and it is often used to look for tumours.

Fluorine-18 and other radioisotopes used in medicine have to decay rapidly so that they are picked up during scanning and don't persist for long in the body, which means that they have to be made just hours before they are used. But the small particle accelerators that are currently needed to make them are available in very few hospitals, and have to be housed in concrete bunkers to shield patients and staff from the radiation they produce. Ledingham believes that within 5 years fluorine-18 could be produced by lasers housed in back rooms. "It could have a huge impact," says Walker.

To prove the point, the team has just used Vulcan to make fluorine-18 from oxygen. This work has been submitted to Nature. The new atoms were rushed in a taxi to the Patterson Institute for Cancer Research in Manchester, where they were incorporated into the sugary compound that is used to treat patients. One laser shot created one-tenth of the amount of fluorine-18 needed for a single treatment, says Ledingham.

http://www.gdr.org/deactivationofradiation.htm

**Flame-Free Incineration of Radioactive Waste in a Catalyzer**

Scientists at the Institute of Catalysis, led by Professor Zemfir, have developed a device that neutralizes radioactive waste through flame-free incineration in a catalyzer. Capable of incinerating 50 metric tons of waste annually, the device was installed at the Novosibirsk Chemical Concentrate Plant. According to A. Kostin, the factory's deputy technical director, "The device is based on a catalytic converter that provides low temperatures for the oxidation process," – thus reducing the amount of nitrous oxides produced. Experiments have confirmed the method's efficiency and environmental safety.


**Implosion Machine can Annihilate High-Level Nuclear Waste**

The implosion machine is an electric arc welder which is modified to duplicate nature's ball lighting. The circuit makes and then breaks a pure direct electrical current flowing between two electrodes. The electromagnetic energy field around the current completely collapses which causes an implosion. An object held between the two electrodes disappears in a manner similar to quasars or black holes swallowing matter. Imploded matter is possibly converted into "dark matter” which is not of the elements as we know them. Astronomers tell us that "dark matter” makes up 99% of the universe but can not be directly detected.
Several years ago, Sonne was looking out the window of his house and saw a bright pinwheel 6” ball of plasma traveling on electrical wire coming into his house. This plasma of energy traveled down the 2” meter head tube and completely vaporized his electrical meter with no apparent damage to any other component parts.

In his years of research on various electric motor systems for cars, he also observed this unique phenomena, a collapsing electromagnetic field around the motor, which Sonne also believes is implosion, or the cooling down or negative energy effect or zero point energy.

A few years ago, he set out to find or build a machine that would duplicate implosion or a ball lightning effect. The component parts were once available through Fomey Arc Welding Co. in Fort Collins, Colorado, complete with carbon rods up to one-half inch in diameter. He obtained a unit and then set out to modify this system to produce pure, unrectified direct current, similar to all forms of lightning occurring in nature. He used 2 Optima, 12-volt batteries as a power source. Optima batteries are capable of producing up to 800 amps of DC power.

The trick to the system is the make/break circuit and the carbon rods, which when connected, create plasma or man-made ball lightning. This can occur only when the energy field around the system is completely collapsed, and pure direct current is produced. This ball of energy appears to vaporize anything that is placed between the rods. Because there is no frequency, minimal voltage, only current, only pure energy, or plasma, is produced which appears to swallow or implode matter similar to quasars or black holes in space.

In late November, 1994, his wife Paula and Sonne flew to the Department of Energy Headquarters in Washington, D.C. to submit Alternate Proposal #6 (see below), which will provide funds to experiment with disposing of nuclear waste on site using this implosion technology. It is listed in the scoping process at Oak Ridge, Tennessee, Page 137, as Implosion. If the technology proves successful, it will demonstrate a quantum leap in development in nuclear waste clean up.

Bob De Cerasse
Directors Office of Fissile Material Disposition
1000 Independence Avenue SW
Washington D.C. 20585

ALTERNATE PROPOSAL #6

On-Site Removal of Spent Nuclear Fuel

To Whom It Concerns:

In the fission of atomic matter (U-235, U-238, plutonium, etc.) disassociation of electrons occur. The matter thereby being unstable because of the upset of dislocated electrons will emit harmful gamma and other radiations. If we are to obtain fusion we will have to reverse the process. When we replace the electrons by implosion we restore matter to a passive state. We all know from particle accelerators that new elements have been identified. To our knowledge, this excitement of matter, though controlled, requires tremendous amounts of electron input. It would appear that an increase in electron flow increases the speed of the particle. If the correct implosion were to be created, the matter should become stable. In the implosion stabilization of plutonium we get an additional 66% net energy out which can be sold by the utilities in their on-site disposal of nuclear waste. In all of our tests, the faster we draw electrons, the colder they become, thereby reducing the temperature in the conductor.
This was first observed and documented by Nikola Tesla and released to the New York Academy of Sciences, April 6, 1897.

We seriously ask you to look at our ideas.

Respectfully yours,
Sonne Ward
Future Free Transportation
P0 Box 235
Hamer, ID 83425

Sonne demonstrated the implosion machine at the Lincoln Center at Fort Collins, Colorado, December 11, 1994. This man-made star-plasma machine vaporized/imploded glass, rocks, metal, and carrots.

For preliminary testing of imploding nuclear waste Sonne was recently given a circular concrete chamber about a foot and a half in diameter together with a complimentary nuclear rod stuffer, temperature and emission measuring devices. Sonne lives on the border of the Idaho National Engineering Laboratory, and because his stepfather was a particle physicist at the Idaho Labs, he gained much technical insight to nuclear reactions as a boy. This gives him sufficient background to carry out the imploding of nuclear waste materials such as U-235, U-238, U-239, and hopefully, the ultimate goal of imploding plutonium.

Sonne recently obtained U-235 and U-239 from an undisclosed source nearby and imploded them with ease. It appears that the higher the level of nuclear waste, the less energy it takes to implode or neutralize the material, and a higher audible sound pitch is observed.

Also, Sonne has noticed that the more energy the implosion machine uses, the cooler the wire becomes when carrying the power to the rods. Resistance heating of wire naturally produces heat which is normal in any power cable with a lot of current flowing through it. When this implosion or zero point energy is tapped, the power wires characteristically run cool or cold as noticed in other zero point energy devices. This is a sure sign of zero point energy tapping and is an example of the sought-after implosion devices discovered by Victor Schauberger and Nikola Tesla. Sonne Ward will continue to work with improving his make/break circuit and experimenting with small donated chemical and nuclear wastes while he awaits for funding through the Department of Energy, Alternate Proposal 96, or other private or governmental firms worldwide.

At the 1996 International Tesla Society Symposium in Colorado Springs, Colorado, Gary Vesperman witnessed a demonstration of the implosion machine which was videotaped. The tape shows a green halo which has been interpreted to be a result of conversion of matter to X-rays.

An Internet search for "implosion machine" "Sonne Ward" turned up the following:
http://www.teslatech.info/ttstore/report/articles/v1n3art/starship.htm
http://teslatech.info/ttspecial/tapepop/01ovrvw.html
http://newenergytimes.com/v2/archives/fic/N/N199603.PDF
http://www.energycentral.com/articles/article/2420sign.php

The implosion machine’s inventor is Sonne Ward, Nova Plasma Tech, PO Box 235, Hamer, Idaho 83425 (208) 662-5268.
List of 60 Patents Worldwide for Transmutation of Radioactive Elements to Nonradioactive

US7012168  Boron-based containment matrix for the storage or transmutation of long-life radioactive elements

US6442226  Accelerator-driven transmutation of spent fuel elements
Also filed under WO9747015
Venneri, et al.
Abstract -- An apparatus and method is described for transmuting higher actinides, plutonium and selected fission products in a liquid-fuel subcritical assembly. Uranium may also be enriched, thereby providing new fuel for use in conventional nuclear power plants. An accelerator provides the additional neutrons required to perform the processes. The size of the accelerator needed to complete fuel cycle closure depends on the neutron efficiency of the supported reactors and on the neutron spectrum of the actinide transmutation apparatus. Treatment of spent fuel from light water reactors (LWRs) using uranium-based fuel will require the largest accelerator power, whereas neutron-efficient high temperature gas reactors (HTGRs) or CANDU reactors will require the smallest accelerator power, especially if thorium is introduced into the newly generated fuel according to the teachings of the present invention. Fast spectrum actinide transmutation apparatus (based on liquid-metal fuel) will take full advantage of the accelerator-produced source neutrons and provide maximum utilization of the actinide-generated fission neutrons. However, near-thermal transmutation apparatus will require lower standing inventories of plutonium and higher actinides. Uranium, presently the largest volume constituent in nuclear waste, is fully utilized and not discharged as waste. Since no plutonium, higher actinides or fission products are present in the reconstituted fuel elements, the present processes can be used repeatedly. Since the performance of the existing reactors is not changed, full utilization of both thorium and uranium resources is achieved.

US6738446  System and method for radioactive waste destruction
Mike Venneri / Francesco Baxter
Also published as: WO2004040588 / CN101061552
Abstract -- A method for transmuting spent fuel from a nuclear reactor includes the step of separating the waste into components including a driver fuel component and a transmutation fuel component. The driver fuel, which includes fissile materials such as Plutonium<239>, is used to initiate a critical, fission reaction in a reactor. The transmutation fuel, which includes non-fissile transuranic isotopes, is transmuted by thermal neutrons generated during fission of the driver fuel. The system is designed to promote fission of the driver fuel and reduce neutron capture by the driver fuel. Reacted driver fuel is separated into transuranics and fission products using a dry cleanup process and the resulting transuranics are mixed with transmutation fuel and re-introduced into the reactor.; Transmutation fuel from the reactor is introduced into a second reactor for further transmutation by neutrons generated using a proton beam and spallation target.

US2008232532  Apparatus and Method for Generation of Ultra Low Momentum Neutrons
Larsen Lewis G [Us]; Widom Alan

MX9702606  Transmutation Reactor To Improve Fuel Combustion In Internal Combustion Engines.
Lara Estanislao Martinez

Source: Extraordinary Science - April/May/June 1995 pp 10-12
Radioactivity Neutralization Methods

US2008123793 Thermal power production device utilizing nanoscale confinement
Loan James F [Us]; Cooper William

US2004047443 Electron capture by magnetic resonance
Bondoc Edwin L [Ph]
Also published as: WO03019219 (A1)
Abstract -- The process of capturing electron by subjecting proton to magnetic resonance until its magnetic moment is in opposite direction relative to the electron's magnetic moment. As soon as the particles’ magnetic moments are opposite in direction, spinlocking technique is applied for a period of time to induce transmutation of the particles and the consequent reactions of the product with an adjacent particle or a group of particles and the release of energy.

WO03098640 Processing Radioactive Material with Hydrogen Isotope Nuclei
John Dash
Abstract -- A method for processing radioactive materials is disclosed. The method employs hydrogen isotope nuclei for the treatment of radioactive materials, such as uranium, and effectively increases the observed decay rate of such materials. Therefore, the disclosed method allows remediation of dangerous radioactive materials, such as uranium, without requiring long term, geologically-stable storage sites or costly, accelerator-based transmutation equipment.

US2003226401 Atomic structure recognition and modification method and apparatus
Letovsky Howard
Also published as: US2005145031 / US2005155340 (A1)
Abstract -- The present invention provides methods and apparatus for determining the precise makeup of atomic and molecular structures, as well as providing the capability of modifying said structures. The invention uses induced resonant frequency wave effects to define and modify the electromagnetic, electrical, radioactive, atomic weight, and co-valent bonding characteristics of matter. One embodiment of the present invention may produce directionally controllable magnetic fields in gaseous media that interact with magnetically polarized vehicle surfaces to allow high-speed, highly energy efficient inter-planetary space travel. Another embodiment of the invention may neutralize waste products remaining from nuclear fission power production. The invention utilizes controlled multi-spectrum frequency induction to catalyze changes in atomic structures that may include: focused and dramatically amplified release of energy relative to natural states of matter; production of new alloys; transmutation of dangerous organic compounds into non-toxic media; and controlled polarization of matter. The benefits of the invention may include highly efficient interstellar spacecraft propulsion systems, hazardous waste elimination systems, efficient electricity production, and health enhancement of biological organisms.

WO0231833 Nuclear Transmutational Processes
Arie De Geus
Abstract -- The invention relates to a method of generating energy, comprising the steps of: a. introducing hydrogen in a reactor vessel, the vessel comprising a cathode, an anode and an ionization element, the cathode comprising a primary and a secondary transmutational element, the transmutational elements having in their nucleus a number of neutrons which is larger than the number of protons, and wherein at least one neutron has a preferred orientation; b. Ionizing at least a part of the hydrogen with the ionization element to form a plasma, c. Applying a voltage differential across the cathode and the anode, causing protons to travel to the cathode and to induce a transmutation of the transmutational elements which combine to form an element of higher mass number than the mass number of said transmutational elements under the release of energy; and d. collecting heat and/or on other energy formed in step c. In a preferred embodiment the primary transmutational element comprises formula (i) or any combination thereof, whereas the secondary transmutational element comprises formula (ii) or any combination thereof.
NL1031962  Energy generating process for producing electricity, comprises electron discharge in flow of nitrogen or air in order to cause nuclear transmutation of nitrogen into carbon monoxide
Arie de Geus
Abstract -- A flow of nitrogen or air, or a plasma thereof, through a reactor (1) is exposed to an electron discharge, resulting in the nuclear transmutation of gaseous nitrogen into carbon monoxide, followed by oxidation of the carbon monoxide to carbon dioxide. A method for generating energy comprises passing a continuous flow of nitrogen or air, or a plasma thereof, through an optionally enclosed reactor in which electron discharge takes place, resulting in the nuclear transmutation of gaseous nitrogen into carbon monoxide, followed by oxidation of the carbon monoxide to carbon dioxide. An INDEPENDENT CLAIM is also included for the process apparatus, comprising a reactor with a pressure reducing means (6) and an inlet (7) for providing an intermittent supply of nitrogen or air; at least one cathode and at least one anode on the inner side of the reactor space ends; a means connected to the cathode (4) and anode (5), used for generating high voltage pulses with a predetermined waveform and frequency between the cathode and anode; a casing around the reactor, through which air flows in order to be heated by the process heat from the reactor; and optional conduits for recirculating the heat-laden air back to the casing.

NL1033078  Energy generating process, by applying voltage between cathode comprising transmutation elements and anode in reactor vessel containing plasma
Arie de Geus
Abstract -- The process comprises the following steps: (A) adding hydrogen to a reactor vessel (6) containing a cathode (8), anode (9) and optionally an ionization element; the cathode comprises a primary and secondary transmutation element, the cores of which contain more neutrons than protons; the primary element contains a neutron with a preferable orientation; (B) ionizing at least some of the hydrogen to form a plasma; (C) applying a voltage difference with a given time character between the cathode and anode, causing a flow of protons towards the cathode, to which they become temporarily bonded; the transmutation elements next to the cathode surface and in the resulting plasma vortex fuse to form an element with a higher mass number and a second element or molecule with a lower mass number; and (D) collecting the radiation, which can be converted directly into electricity or heat.

US2003202623  Low-Cost Elimination of Long-Lived Nuclear Waste
Heinrich Hora
Abstract -- Aspects of the present invention include a non-metal, a hydrogen absorbing metal, a selected isotope to be exposed to ions of hydrogen or ions of isotopes of hydrogen, and a hydrogen source. The hydrogen source can be an electrolytic solution, a gas or plasma. In some embodiments the hydrogen absorbing metal covers the non-metal to form a microsphere. The hydrogen absorbing metal is positioned to contact the hydrogen source. Further, the hydrogen absorbing metal can be made of multiple layers of dissimilar metals with different Fermi energy levels. The multiple layers of metals have interfaces where swimming electron layers exist. Interfaces between the non-metal, hydrogen absorbing metal, and the hydrogen source also exist with swimming electron layers. The selected isotope is placed in these regions of swimming electron layers to be exposed to the ions of hydrogen and its isotopes from the hydrogen source.

DE19803629  Transmutation of Isotopes with Long Half-Life
Heinrich Hora
Abstract -- For the transmutation of long half-life isotopes, their surfaces are exposed to an electrolyte or a gas or plasma atmosphere to form intermediate layers or vol. zones of a number of structure layers. The threshold zones are placed against a carrier material or close to vol. zones of metals or metal layers, composed of metals capable of absorbing \textless{}1 atom\% of hydrogen or its isotope.
RU2212069 Method For Solidifying Solutions Of Long-Living Radionuclides
Dzekun E G ; Korchenkin K

GB1187188 Nuclear Conversion Process.
Westcott Carl Henry

US2002186805 Accelerated Radioactivity Reduction
Sidney Soloway
Abstract -- A method for reducing radioactivity in a radioactive sample is disclosed, comprising contacting said sample with a beam of photons, said beam having an energy level sufficient to cause said radioactive sample to emit particles including photons in an amount sufficient to accelerate a reduction in radioactivity of said sample. Also disclosed is a method of increasing radioactive decay in a radioactive isotope comprising the steps of: determining a beam of an effective energy and effective flux of photons to increase radioactive decay in the radioactive isotope; applying the beam to the radioactive isotope; and maintaining the beam for an amount of time effective to increase the radioactivity of the radioactive isotope.

US2008134837 Method and System for Recovering metal from Metal-Containing Materials
Abstract -- Embodiments of a method and a system for recovering a metal, such as uranium, from a metal-containing material are disclosed. The metal-containing material is exposed to an extractant containing a liquid or supercritical-fluid solvent and an acid-base complex including an oxidizing agent and a complexing agent. Batches of the metal-containing material are moved through a series of stations while the extractant is moved through the stations in the opposite direction. After the extraction step, the metal is separated from the solvent, the complexing agent and/or other metals by exposing the extract to a stripping agent in a countercurrent stripping column. The complexing agent and the solvent exit the column and are separated from each other by reducing the pressure.; The recovered complexing agent is recharged with fresh oxidizing agent and recombined with fresh or recovered solvent to form a recovered extractant, which is distributed through the extraction stations.

WO Patent 9,403,906 Methods for Manufacturing & Producing Products
Ronald Brightsen, et al.
Abstract -- A method for generating high energy 32He particles includes the steps of accumulating protons and deuterons in intimate contact with a lattice structure storage member and repeatedly reacting one proton and one deuteron to produce 32He particles and excess energy greater than 6 MeV for each of the 32He particles. A method for controlling an energy production reaction of isotopic hydrogen atoms includes steps for storing a first isotope of hydrogen and a second isotope of hydrogen in contact with a lattice structure to produce a first ratio of the first isotope to the second from a mixture having a second ratio of the first isotope to the second isotope, adjusting the energy of the lattice structure to initiate the energy production reaction caused by the interaction of one nucleus of the first isotope with one nucleus of the second isotope and controlling the second ratio to control the rate of the energy production reaction based on the interaction of the first isotope with the second isotope. Methods for treating radioactive waste by transmutation and for forming a superconductive material from a plurality of constituents, as well as methods for forming improved semiconductor devices, improved atomic lattice structures and improved molecular structures and ionic compounds, are described along with selection rules for fine tuning these methods. An apparatus for producing controlled emissions of high energy vHe particles, which can be adapted as a beam producing device or as motor, is also disclosed.

UA19842 Device for suppressing radiation
Y. Zuzanskyi / B. Bolotov
Abstract -- The proposed device for suppressing radiation contains a toroidal ferromagnetic core, inductance coils, and a screen.
RU1804280  Method for purification of soil from radio nuclides
V. Romanovskij / B. Bolotov
Abstract -- The invention relates to the field of clean technologies razrabortkiaktivnyh pochvyot radionuclides in binary tsiklahprotivodstv using phyto-activation of the soil as an active technical liquidation and utilization in accidents such as Chernobyl.

Reiko Notoya
Abstract -- To obtain an electrode for cold nuclear fusion which can manufacture isotopes, precious metals, rare elements or thermal energy through nuclear transformation by containing as a material for the electrode a substance which can cause nuclear transformation. Solution: Radioactive or nonradioactive isotopes are manufactured by the nuclear transformation in an electrode and the combination of nuclear reactions such as neutron capture and natural nuclear disintegration of products made through the nuclear reactions. The kinds of manufactured isotopes are very numerous, and it is especially easy to obtain non-single isotopes. Since the conditions of electrolysis can be controlled very precisely, it is possible to manufacture only target substances precisely. For an electrode for cold nuclear fusion, an element whose atomic number is close to that of a precious metal or a rare element is chosen as a substance which can cause nuclear transformation, or a material for the nuclear transformation of a precious metal and a rare element. For example, W, Ag, Sn and Pt are cited as materials for platinum-family metals and gold. As materials for rare elements, chemical species such as the halogen family, alkaline metals, Po and W are chosen.

http://www.gdr.org/deactivationofradiation.htm
including the preparation of the culture medium for the growth of microbiological cultures deficient isotope obtainable by transmutation, and containing the necessary transmutation initial isotopic components; growing in a nutrient medium microbiological cultures requiring these isotopes for their growth, isolating from the culture medium grown culture and isolation of stable isotopes [2] In the conventional method describes the procedure for growing microbiological cultures Aspergillus niger IFO 4066, Penicillium chrysogenum IFO 4689; Phizopus nigricans IFO 5781; Mucor rouxii IFO 0369; Saccharomices cerevisiae IFO 0308; Torulopsis utilis IFO 0396; Saccharomyces ellipideus IFO 0213; Hansenula anomala IFO 0118 in a nutrient medium is an aqueous solution of a number of chemical compounds and deficient in one of the essential components for the growth of crops (potassium, magnesium, iron, calcium) and for monitoring, standard for them spedi. In experiments on the implementation of the method has been shown that the cultivation of these crops in the corresponding element deficient media (data media in these specific elements did not exist) in the resulting culture of these elements were present, which can only be attributed to their synthesis in the nuclear transmutation of the other elements present, and isotopes.

RU2034414  Accelerating Complex For Transmutation Of Nuclear Production Waste
Danilov Mikhail M [Ru]; Katarzhnov Yurij
GB2246467  Transmutation treatment of radioactive wastes
Kenji Konashi / Nobuyki Sasao
Abstract -- A method for the transmutation treatment of radioactive wastes comprises: accelerating radioactive nuclides contained in the radioactive wastes to be treated to an energy level corresponding to a compound nucleus resonance level; and bombarding the accelerated nuclides into a thermal neutron field, which is under a magnetic field, to cause the compound nucleus resonance reaction to occur; thereby transforming the radioactive nuclides into those which are more stable or have shorter life. The nuclides are accelerated in accelerator 9 then passed into an annular-cylindrical chamber 3 positioned about a reactor 1 where they are treated with neutrons.
RU2052223  Method For Producing Stable Isotopes Due To Nuclear Transmutation, Such As Low-Temperature Nuclear Fusion Of Elements In Microbiological Cultures
Vladimir I. Vysotskij / Alla Kornilova
Abstract -- A method of obtaining stable isotopes by nuclear fusion of elements in microbial cultures.

US4721596  Method for net decrease of hazardous radioactive nuclear waste materials
Richard Marriott / Frank Heney
Also published as: ZA8007201 / JPS56125698 / AU6435380 / AU539393 / EP0030404
Abstract -- A method for decreasing the amount of hazardous radioactive reactor waste materials by separation from the waste of materials having long-term risk potential and exposing these materials to a thermal neutron flux. The utilization of thermal neutrons enhances the natural decay rates of the hazardous materials while the separation for recycling of the hazardous materials prevents further transmutation of stable and short-lived nuclides.

GB970091  Transmutation of elements
Noel Ignatius Rafferty
Abstract -- Sept. 10, 1963 [June 19, 1962], No. 23586/62. Heading G6P. A process for the synthesis of helium and the simultaneous generation of energy comprises admixing in a steel pressure-tight vessel in presence of air following reactants in the following order: aluminium in a physical form presenting a large volume/surface ratio, solid sodium hydroxide, and water in the ratio of 4 : 8 : 8. The reaction is stated to be thermonuclear involving the carbon cycle proposed by Bethe, the effect of which is to transmute hydrogen into helium.

JP2009128052  Nuclear Battery
Ito Takehiko; Iwamura Yasuhiro

JP2004117106  Structure For Nuclide Transmutation And Method For Forming It
T. Ito Takehiko / Mitsuru Sakano
Abstract -- To provide a structure for transmuting nuclides with a relatively small-scale device and a means for manufacturing the structure. ; SOLUTION: A mixed layer consisting of lamination layers of a Pd layer and a layer of a substance which has a smaller work function than Pd is placed on a substrate made of Pd, a Pd alloy, other metals occluding hydrogen or alloys of these metals, the structure shaped like an approximate plate where an additional Pd layer is placed on the mixed layer is formed and a substance which is given nuclide transmutation is supplied to the Pd layer of the structure. The substance which is supplied to the Pd layer and is given nuclide transmutation is acceptable if it has become metallic, and salt may adhere to the surface of it. Electrodeposition and ion implantation can be used as a means for supplying the substance which is given nuclide transmutation.

JP2007322202  Method, Device And Program For Predicting Nuclear Reaction In Flocculation System, And Method For Detecting Substance After Nuclide Transmutation
Ito Takehiko / Iwamura Yasuhiro
PROBLEM TO BE SOLVED: To provide a method for predicting nuclear reaction in a flocculation system which enables high-accuracy prediction of the nuclear reaction. ; SOLUTION: In the method for predicting the nuclear reaction in the flocculation system, where a substance which is subjected to nuclide transmutation is placed in contact with a structure in the flocculation system and deuterium is made to flow into it to induce nuclear reaction in the substance which is subjected to nuclide transmutation; a substance where 2n (n is a natural number) is added to both the atomic number and the mass number, respectively of the substance to which nuclide transmutation is given is predicted as being the substance to be generated after the nuclide transmutation.
US2003210759 / EP1202290  Nuclide transmutation device and nuclide transmutation method
Iwamura Yasuhiro [Jp]; Itoh Takehiko

JP2005062025  Method For Increasing Nuclear Transmutation Quantity From Nuclear Transmutation Device And Nuclear Transmutation Device
Mitsuru Sakano; Takehiko Ito
To provide a method for increasing a nuclide quantity which enables transmutation from a nuclear transmutation device in the first nuclear transmutation process, and a nuclear transmutation device.
SOLUTION: With this method, a nuclear transmutation quantity from a nuclear transmutation device is increased by a process for applying electrolysis process or plasma treatment to a surface of a structure including a hydrogen occlusion metal, and adding a material causing nuclear transmutation to the surface.

WO2006005813  Method And Device For Transmutation Of Nucleons Free Of Prior Or Permanent Plasma
Geraud Vitrac
Abstract -- The invention concerns a method and a device for transmutation of nucleons free of prior or permanent plasma to provide particles whereof the kinetic energy is quantified for resonance of the active section for specialized application. The exact distribution results from vector compositions of quanta generated by structural piezoelectric actuators and spin inducers. The fusion is then obtained by activation ad minima tunnel effect. The economy and reliability of the system are linked to the programming of quantum models representative of discrete cycles, and the minimized supply of reagents with stage-recycling possibilities, and annihilations, while promoting the option of low level radiation. Various fields of application concern said inventive mini-reactor such as radiochemistry, medical imaging and non-destructive controls, selection and treatments of waste.

FR2855309  Plasma-free nucleon transmutation comprises use of piezoelectric actuators to produce energy particles compatible with targets
Geraud Vincent Vitrac
Abstract -- Nucleon transmutation, initiated by plasma-free fusion uses piezo-electric actuators to ensure particle transfer where the velocity vector benefits from additional quantum that favors collisions and automatically-triggered fusion. This accords, in particular, with the laws of velocity distribution and the probability of collisions for energy particles compatible with targets.

US2003210759  Nuclide transmutation device and nuclide transmutation method
Y. Iwamura / T. Itoh
Abstract -- The present invention produces nuclide transmutation using a relatively small-scale device. The device 10 that produces nuclide transmutation comprises a structure body 11 that is substantially plate shaped and made of palladium (Pd) or palladium alloy, or another metal that absorbs hydrogen (for example, Ti) or an alloy thereof, and a material 14 that undergoes nuclide transmutation laminated on one surface 11A among the two surfaces of this structure body 11. The one surface 11A side of the structure body 11, for example, is made a region in which the pressure of the deuterium is high due to pressure or electrolysis and the like, and the other surface 11B side, for example, is a region in which the pressure of the deuterium is low due to vacuum exhausting and the like, and thereby, a flow of deuterium in the structure body 11 is produced, and nuclide transmutation is carried out by a reaction between the deuterium and the material 14 that undergoes nuclide transmutation.

RU2340966  Method Of Fixation Of Radioisotope I-129
Tikhonov Valerij Ivanovich [Ru]; Kapustin Valerian Konstantinovich
RU2210630  Facility For Generation Of Gas Mixture And Transmutation Of Nuclei Of Atoms Of Chemical Elements  
F. Kanarev / V. Podobedov
Abstract -- Facility for generation of gas mixture and transmutation of nuclei of atoms of chemical elements has body made of dielectric material with though hole, interelectrode chamber, cooling chamber for vapor condensation, vessel for working solution, branch pipes to feed and drain working solution, anode connected to positive pole of power supply source and cathode connected to negative pole of power supply source. Body has upper boss with internal cavity. Cathode is brought into cathode space from above through axial hole of upper boss. Internal space of boss communicates with cooling chamber which space is connected to vessel for working solution. EFFECT: simultaneous generation of gas mixture and transmutation of nuclei of atoms of chemical elements.

WO9735324  Method For Preparing Highly Radioactive Materials For Transmutation And/Or Burn-Up  
Claude Fuchs / Serge Fourcaudot  
Also published as:  GR3036593 / PT888623 / LU88727 / JP2000506976 / ES2159115  
Abstract -- The invention concerns a method of preparing highly radioactive materials for transmutation and/or burn-up by irradiation in a nuclear plant. The invention proposes that the materials are first converted into liquid form by melting or chemical dissolution and a porous carrier material which is essentially insoluble in the liquefied materials is impregnated with the liquefied materials and then heated in such a way that the materials are converted into the finally required chemical form and density.

WO9919881  Low Temperature Electrolytic Nuclear Transmutation  
James Patterson / George Miley  
Abstract -- A method for producing low temperature nuclear transmutations by electrolysis in an aqueous media. New elements produced by transmutation are identified as having discrete peaks in occurrence by atomic number (Z) and by atomic mass (A). New complex nuclei produced by transmutation are identified as having existed based upon the nature and occurrences of fission transmutation elements produced. The electrolytic cell (12) includes a non-conductive housing (14) having an inlet (54) and an outlet (56) and spaced apart first and second conductive grids (38 & 44) positioned therein. A plurality of cross-linked polymer non-metallic cores each having a uniform conductive exterior metallic surface formed of a high hydrogen absorbing material form a bed (35) of conductive beads (36) closely packed within the housing (14) in electrical contact with the first grid (38) adjacent the inlet (54). An electric power source (15, 16) in the system (10) is operably connected across the first and second grids.

WO9740211  System, Electrolytic Cell And Method For Producing Excess Heat And For Transmutation By Electrolysis  
James Patterson / George Miley  
Abstract -- An electrolytic cell (12), system (10) and method for producing excess quantities of heat as a result of low temperature nuclear transmutations which occur during electrolysis in an aqueous media within the cell (12). The electrolytic cell (12) includes a non-conductive housing (14) having an inlet (54) and an outlet (56) and spaced apart first and second conductive grids (38 & 44) positioned within the housing (14). A plurality of preferably cross linked polymer non-metallic cores each having a uniform conductive exterior metallic surface formed of a high hydrogen absorbing material, such as metallic hybride forming material, form a bed (35) of conductive beads (36) closely packed within the housing (14) in electrical contact with the first grid (38) adjacent the inlet (54). An electric power source (15, 16) in the system (10) is operably connected across the first and second grid (38 & 44) whereby electrical current flows between the grids (38 & 44) and within the aqueous media (59) flowing through the cell.
WO9803699  Nuclear Transmuted Elements Having Unnatural Isotopic Distributions By Electrolysis And Method Of Production
James Patterson / George Miley
Also published as: AU4644097
Abstract -- A method for producing low temperature nuclear transmutations which occur during electrolysis in an aqueous medium within a cell (12). New elements produced by transmutation during operation of the cell are both higher and lower in atomic mass than the original element undergoing transmutation. Many of the new elements also exhibit isotopic shifts from natural isotope abundance. The electrolytic cell (12) includes a non-conductive housing (14) having an inlet (54) and an outlet (56) and spaced apart first and second conductive grids (38 and 44) positioned within the housing (14). A plurality of preferably cross-linked polymer non-metallic cores each having a uniform conductive exterior metallic surface formed of a high hydrogen absorbing material, such as a metallic hydride forming material, form a bed (35) of conductive beads (36) closely packed within the housing (14) in electrical contact with the first grid (38) adjacent the inlet (54). An electric power source (15, 16) in the system (10) is operably connected across the first and second grid (38 and 44) whereby electrical current flows between the grids (38 and 44) and within the aqueous medium (59) flowing through the cell (12) during cell operation.

EP1202290  Nuclide transmutation device and nuclide transmutation method
Y. Iwamura / T. Itoh
Also published as: EP1202290 / US2012269309 / US2012263265 / US2002080903
Abstract -- The present invention produces nuclide transmutation using a relatively small-scale device. The device (10) that produces nuclide transmutation comprises a structure body (11) that is substantially plate shaped and made of palladium (Pd) or palladium alloy, or another metal that absorbs hydrogen (for example, Ti) or an alloy thereof, and a material (14) that undergoes nuclide transmutation laminated on one surface (11A) among the two surfaces of this structure body (11); The one surface (11A) side of the structure body (11), for example, is a region in which the pressure of the deuterium is high due to pressure or electrolysis and the like, and the other surface (11B) side, for example, is a region in which the pressure of the deuterium is low due to vacuum exhausting and the like, and thereby, a flow of deuterium in the structure body (11) is produced, and nuclide transmutation is carried out by a reaction between the deuterium and the material (14) that undergoes nuclide transmutation.

WO03025951  Multi-Step, Time Programmed Procedure For The Transmutation Of Radioactive Wastes And Multi-Region Salt Melt Apparatus For Carrying Out The Procedure
Gyula Csom / Attila Aszodi
Also published as: HU226177 / HU0103762 / US2005013397 / RU2004111795 / JP2005503568
Abstract -- A radioactive waste containing medium is circulated within two or more systems (1, 2, 3) separated from each other flowtechnically; and the circulated radioactive waste is exposed to neutron radiations of different energy spectrum in each system by operating a reactor physically united entirety of irradiated sections of the said systems as a nuclear reactor or an accelerator driven subcritical system. Each system (1, 2, 3) has a heat exchanger (9, 10) and, in given cases, a circulating pump (10, 21) and an expansion tank (5, 16, 27). The disclosed apparatus has two or more reactor regions (1, 2, 3) separated from each other by partitions (37, 38) and, preferably, arranged coaxially within a reactor space encircled by a common shell structure (39). A particle beam (45) produced by a particle accelerator is preferably directed into the innermost reactor region (3).

RU2212072  Method And Device For Transmutation Of Radioactive Wastes
Aleksandrov Valentin Levadnyj / Kristina Konstanti Rutkovskaja
FIELD: nuclear power engineering. SUBSTANCE: proposed method and device are intended for power generation, transmutation of radioactive wastes, burnout of weapon plutonium and actinides. Interaction of neutron beam coming from neutron generator is effected on lead matrix wherein nuclear fuel and...
Radioactivity Neutralization Methods

Radioactive wastes are distributed; then they are decelerated and bred in subcritical thermal core. Device implementing this method has its central target made in the form of lead matrix with nuclear fuel and radioactive wastes distributed therein. EFFECT: enhanced efficiency of transmutation process.

RU2343575 Method Of Long-Living Radionuclides Fixation For Storage And Transmutation
Valerij Ivanovich Tikhonov / Valerian Konstantinovich Kapustin
FIELD: chemistry, waste recycling. ^ SUBSTANCE: invention relates to field of liquid radioactive wastes recycling. Long-living radionuclides are isolated from nitric acid solution of used nuclear fuel (UNF) into solid phase in form of acetates, oxides and other compounds, which do not contain elements strongly activated with neutrons. Radionuclides are imbedded and fixed in carbon matrix. Carbon matrix is obtained in process of carrying out reaction of metal acetates with excess of phthalonitryl and their further pyrolysis. For radionuclides isolated from UNF in form of oxides or other compounds, carbon matrix is obtained by their mixing with yttrium acetate, then synthesis and pyrolysis of yttrium diphthalocyanine are carried out. Operation of synthesis and pyrolysis of yttrium diphthalocyanine is carried out in inert atmosphere, pyrolysis is carried out at T=850-1100 DEG C.; Obtained carbon matrix does not contain elements strongly activated with neutrons, which allows using it both for long-term storage and for transmutation of long-living radionuclides without any chemical processing and additional operations. ^ EFFECT: obtaining carbon matrix which can be used both for long-term storage and for transmutation of long-living radionuclides without any chemical processing and additional operations.

CN101325092 Solution stack for burning plutonium and transmutation of neptunium-237 or americium-241
Wu Yinghua / Wang Lianjie
Abstract -- The invention discloses a solution reactor used for the plutonium combustion and the neptunium-237 or the americium-241 transmutation. The solution reactor adopts plutonium or plutonium and americium in the spent fuel of the nuclear power plant as the fuel, and adopts neptunium-237 or americium-241 as the target. By adopting the solution reactor, the minor actinides which have long half life and high toxicity and can not be stored for a long time, such as the neptunium-237 or the americium-241, can be changed into nuclides with short half life and low toxicity through transmutation. Because the solution reactor adopts the spent fuel and can generate electricity at the low temperature, the cost-effectiveness and the security are high; the neutron provided by the plutonium combustion can extract plutonium-238 from the neptunium-237 solution target as the isotope battery, thereby the inexpensive energy is provided; the americium-242m extracted from the americium-241 solution target can be widely applied to the aerospace industry and the medical industry

US2008240330 Compact Device for Dual Transmutation for Isotope Production Permitting Production of Positron Emitters, Beta Emitters and Alpha Emitters Using Energetic Electrons
Charles Holden
Abstract -- A method and apparatus for directing high energy electrons to a converter material that emits gamma rays, which, in turn interact directly with parent isotopes to produce unstable, short-lived medical isotopes and product isotopes by the gamma, n reaction, or which interact with high-z materials to produce neutrons that then produce valuable isotopes by neutron capture in parent isotopes.

US2005155340 Method and apparatus for the transmutation of nuclear waste with tandem production of tritium
El-Sharawy / El-Badawy
Also published as: US2005145031 / AU2001297883
Abstract -- The transmutation of radioactive material using a hybrid transmutation reactor is disclosed wherein a kinetic proton source is used to collisionally induce the transmutation of radioactive material with the generation of thermal neutrons as a byproduct. Additionally, a system and method for the
Radioactivity Neutralization Methods

production of tritium utilizing the thermal neutrons generated in the transmutation process is further described. The present invention offers advantages and improvements over existing nuclear reactor technologies in that nuclear waste may be rendered inert, or otherwise at least partially deactivated and/or made less dangerous, with the substantially simultaneous production of energy and/or tritium as a byproduct of the transmutation process.

US2009135981  Element Transmutation Method And Energy Generation Method
Norio Yabuuchi
Also published as: JP2009128300
PROBLEM TO BE SOLVED: To achieve a reliable method to output energy using nucleus condensation.
SOLUTION: Deuterium nuclei are coordinated at vertical angle positions of each face constituting a regular hexahedron, inside a metallic crystal. Electrons are coordinated to the other vertical angle positions. By Coulomb attraction acting between four protons and four electrons, four deuterium nuclei are fused to transmute into two helium atoms.

RU2156001  Radioactive Waste Processing Technique
B. Taratorin / S. Ivanov
SUBSTANCE: radioactive wastes are placed in nuclear explosion zone of weapon plutonium wherein intensive neutron flux is allowed to pass through them to convert them to steam that condenses into particles measuring about 10^-6 cm. Neutron flux and heat energy released due to explosion of weapon plutonium cause transmutation of nuclides in desired quantities and their separation into long- and short-living ones in condensed state from steam by centrifuging. Proposed technique provides for using products of explosion to produce electrical energy and transuranium elements. EFFECT: provision for peaceful use of weapon plutonium.

US2004047443  Electron capture by magnetic resonance
E. Bondoc
Abstract -- The process of capturing electron by subjecting proton to magnetic resonance until its magnetic moment is in opposite direction relative to the electron's magnetic moment. As soon as the particles' magnetic moments are opposite in direction, spinlocking technique is applied for a period of time to induce transmutation of the particles and the consequent reactions of the product with an adjacent particle or a group of particles and the release of energy.

US2007297554  Method And System For Production Of Radioisotopes, And Radioisotopes Produced Thereby
Efraim Lavie / Ido Silverman
Also published as: WO2006035424 / EP1807844 / EP1807844 / AT468589
Abstract -- A system and method for the production of radioisotopes by the transmutation of target isotopic material bombarded by a continuous wave particle beam. An ion source generates a continuous wave ion beam, irradiating an isotope target, which is cooled by transferring heat away from the target at heat fluxes of at least about 1 kW/cm^2.

US8373087  A plasma torch for use in a waste processing chamber
Also published as: WO2006114793 / KR20080005986 / JP2008539061
Abstract -- The invention is a plasma torch for insertion through an opening in the wall of a waste processing chamber. The plasma torch of the invention is characterized by comprising a coaxial sleeve having an upper end and a lower end. The sleeve surrounds at least the portion of the outer surface of the torch that is located in the opening, thereby forming an insulating chamber between the outer surface if the torch and the inner surface of the sleeve. At least a portion of the portion of the coaxial sleeve that surrounds at least the portion of the outer surface of the torch that is located in the opening in the wall of
the processing chamber is porous or permeable to a heat exchanging fluid. The torch comprises an inlet for introducing the heat exchanging fluid into the insulating chamber. When the plasma torch is inserted through the opening, a gap exists between the processing chamber wall and the coaxial sleeve. Thus the coaxial sleeve and the insulating chamber shield the outer surface of the plasma torch from a significant amount of the heat that radiates from the processing chamber wall and from inside the processing chamber and the heat exchanging fluid that flows through the inlet exits the insulating chamber into the processing chamber.

US8090072  Neutron-driven element transmuter  
Carlo Rubbia  
Also published as: WO9859347 / US7796720 / SK166999 / SK286044  
Abstract -- A material is exposed to a neutron flux by distributing it in a neutron-diffusing medium surrounding a neutron source. The diffusing medium is transparent to neutrons and so arranged that neutron scattering substantially enhances the neutron flux to which the material is exposed. Such enhanced neutron exposure may be used to produce useful radioisotopes, in particular for medical applications, from the transmutation of readily-available isotopes included in the exposed material. It may also be used to efficiently transmute long-lived radioactive wastes, such as those recovered from spent nuclear fuel. The use of heavy elements, such as lead and/or bismuth, as the diffusing medium is particularly of interest, since it results in a slowly decreasing scan through the neutron energy spectrum, thereby permitting very efficient resonant neutron capture in the exposed material.

US6233299  Assembly for transmutation of a long-lived radioactive material  
Toshio Wakabayashi  
Abstract -- A new transmutation assembly permits an efficient transmutation of a long-lived radioactive material (long-lived FP nuclides such as technetium-99 or iodine-129) which was produced in the nuclear reactor. Wire-type members of a long-lived radioactive material comprised of metals, alloys or compounds including long-lived FP nuclides are surrounded by a moderator material and installed in cladding tubes to form FP pins. The FP pins, and nothing else, are housed in a wrapper tube to form a transmutation assembly. The wire-type members can be replaced by thin ring-type members. The transmutation assemblies can be selectively and at least partly loaded into a core region, a blanket region or a shield region of a reactor core in a fast reactor. From a viewpoint of reducing the influence on the reactor core characteristics, it is optimal to load the transmutation assemblies into the blanket region.

US6,233,298  Apparatus for transmutation of nuclear reactor waste  
Charles Bowman  
Abstract -- A subcritical reactor-like apparatus for treating nuclear wastes, the apparatus comprising a vessel having a shell and an internal volume, the internal volume housing graphite. The apparatus having means for introducing a fluid medium comprising molten salts and plutonium and minor actinide waste and/or fission products. The apparatus also having means for introducing neutrons into the internal volume wherein absorption of the neutrons after thermalization forms a processed fluid medium through fission chain events averaging approximately 10 fission events to approximately 100 fission events. The apparatus having additional means for removing the processed fluid medium from the internal volume. The processed fluid medium typically has no usefulness for production of nuclear weapons.

US5,160,696  Apparatus for nuclear transmutation and power production using an intense accelerator-generated thermal neutron flux  
Bowman  
Abstract -- Apparatus for nuclear transmutation and power production using an intense accelerator-generated thermal neutron flux. High thermal neutron fluxes generated from the action of a high power proton accelerator on a spallation target allows the efficient burn-up of higher actinide nuclear waste by a
two-step process. Additionally, rapid burn-up of fission product waste for nuclides having small thermal neutron cross sections, and the practicality of small material inventories while achieving significant throughput derive from employment of such high fluxes. Several nuclear technology problems are addressed including 1. nuclear energy production without a waste stream requiring storage on a geological timescale, 2. the burn-up of defense and commercial nuclear waste, and 3. the production of defense nuclear material. The apparatus includes an accelerator, a target for neutron production surrounded by a blanket region for transmutation, a turbine for electric power production, and a chemical processing facility. In all applications, the accelerator power may be generated internally from fission and the waste produced thereby is transmuted internally so that waste management might not be required beyond the human lifespan.

US5848110 / US5764715  Method and apparatus for transmutation of atomic nuclei
John Eric Maenchen, Ruiz Carlos Leon
Abstract -- The present invention addresses the problems outlined above. An accelerator based on a combination of a high repetition rate high energy pulsed power supply (RHEPP) and a magnetically-injected anode plasma (MAP) source diode is used to provide pulsed particle beams having intermediate energy (0.2–20 MeV) and average power levels of hundreds of kilowatts to megawatts. This will increase the rate of isotopic production by 2–3 orders of magnitude over processes based on conventional accelerators. Any gaseous ion can be accelerated with this technology (proton, deuteron, and helium beams are of special interest). This capability can be applied to transmute target nuclei selectively into desired isotopes. RHEPP/MAP accelerators are also extremely power efficient and relatively small in size, making application of small units practical in, for example, major local or regional medical facilities. Finally, the use of relatively low beam particle energies reduces or eliminates the problem of undesired products and the subsequent generation of radioactive waste. Although the invention is being discussed in terms of embodiment via the RHEPP/MAP system, any pulsed ion beam generator having sufficient ion kinetic energy and total average beam current can be used in the same manner.

RU2169405  Method for Transmutation of Long-Living Radioactive Isotopes into Short-Living or Stable Ones
Buttsev Vladimir Stepanovich [Ru]; Buttseva Galina Lechnidovna
Abstract -- Transmutation of long-living radioactive isotopes into short-living or stable ones is conducted under the action of electromagnetic radiation. In the process, highly ionized atoms with energy-resolved hole of accelerated beta-decay are produced from atoms of long-living radioactive isotope and held in ionized state until transmutation of mother nuclei to daughter short-living or stable ones takes place. With coefficient of operating time k preset for daughter nuclei, atoms of long-living radioactive isotope are held in highly ionized state for at least time beta, where beta is lifetime of mother nuclei under accelerated beta-decay conditions. Electromagnetic radiation may be effected by beams of accelerated charged particles (electrons, protons, or ions) or by photon flux. Radiation by charged-particle beam may be combined with photon flux radiation. EFFECT: enhanced transmutation efficiency dispensing with nuclear reactions of collision character and avoiding formation of by-products.

US2003138068  Method for Transmutation of Long-Living Radioactive Isotopes into Short-Living or Stable Ones
Buttsev Vladimir Stepanovich [Ru]; Buttseva Galina Lechnidovna
Also published as: EP1274099 // WO0173474 / RU2169405
Nuclear physics; decontamination of radioactive wastes and the like from long-living radioactive isotopes. Substance: transmutation of long-living radioactive isotopes into short-living or stable ones is conducted under the action of electromagnetic radiation. In the process, highly ionized atoms with energy-resolved hole of accelerated beta-decay are produced from atoms of long-living radioactive isotope and held in ionized state until transmutation of mother nuclei to daughter short-living or stable ones takes place. With
coefficient of operating time $k_p$ for daughter nuclei, atoms of long-living radioactive isotope are held in highly ionized state for at least time $\beta$, where $\beta$ is lifetime of mother nuclei under accelerated beta-decay conditions. Electromagnetic radiation may be effected by beams of accelerated charged particles (electrons, protons, or ions) or by photon flux. Radiation by charged-particle beam may be combined with photon flux radiation. Effect: enhanced transmutation efficiency dispensing with nuclear reactions of collision character and avoiding formation of by-products.

US20040238366  Method and System with Apparatus for Acceleration of Activity Decrease and Radioactive Material Deactivation
Vladimirovich, Kinderevich, et al.
Radioactive material can be processed by an apparatus that includes at least a cylindrical outer shell electrode, an inner electrode, and a plurality of prism-shaped ferromagnetic elements positioned between the outer and inner electrodes. The prism-shaped ferromagnetic elements are positioned around the inner circumference of the metal cylinder. The inner electrode component is located within the metal cylinder and is configured to cover the inwardly-pointing portions of the prism-shaped ferromagnetic elements. Radioactive material in a container is placed into the apparatus, and an AC voltage excitation signal is applied to the electrodes of the apparatus during treatment of the material. The frequency of the excitation signal is selected according to the frequency of structurization or the frequency of destructurization of the ferromagnetic material. The process can be monitored and controlled with the use of alpha, beta, and gamma radiation intensity measuring instruments.

Sources: http://www.rexresearch.com/alchemy6/transmutation.htm

A note of appreciation is due Las Vegas energy expert Robert Nelson who took the time to search for all of these patents plus a few more elsewhere in this ebook. His website www.rexresearch.com includes thousands of pages of information re energy and other technologies.

Method, System and Apparatus for Conditioning Electromagnetic Potentials, Fields and Waves to Treat and Alter Matter

Provisional Patent Application of
Thomas E. Bearden, Ph.D.

METHOD, SYSTEM AND APPARATUS FOR CONDITIONING ELECTROMAGNETIC POTENTIALS, FIELDS, AND WAVES TO TREAT AND ALTER MATTER

This invention pertains to the treatment of matter with electromagnetic energy to cause specified changes in the matter. More particularly, this invention deals with methods, systems and apparatus for the creation and application of conditioned electromagnetic potentials, fields, and waves, wherein the conditioning comprises the selection and combination of identified constituent electromagnetic waves, in order to produce desired interactions with matter. The matter may be chemicals, nuclear materials, living cells, and the like, and the results of the interactions may be the time-reversal of the matter to a previous state, or the application of a chosen delta to the matter's current state, so as to effect desired chemical reactions, nuclear reactions, or biological changes, respectively. The invention covers two versions of the conditioning process, depending upon whether EM conditioning is externally accomplished or internally accomplished. The two versions of the process are: (1) the formation of the conditioning of the electromagnetic potentials, fields, and waves outside the body, and then irradiating the body with EM radiation carrying the desired conditioning, and (2) the irradiation of the body dielectric with the same EM waves, fields, and potentials.
emitted by the body dielectric, but amplified. In the latter process, the formation of the desired conditioning of the induced EM potentials, fields, and waves into every part of the body is accomplished by the highly nonlinear characteristics of the body and cellular material at every level, in every location in the body dielectric.

SUMMARY OF THE INVENTION

The present invention exploits the fact that all electromagnetic fields, potentials, and waves are composed of more fundamental electromagnetic structures. To directly engineer spacetime and induce desired changes in matter – specifically the mass-energy of the body dielectric, in all parts and dynamics – the invention uses and applies these more fundamental electromagnetic structures, which constitute curvatures of spacetime capable of directly affecting and changing matter according to the exact pattern and dynamics of the internal structures.

The invention also utilizes a known but novel "dielectric channel" effect wherein every part of a dielectric participates in the absorption and emission of a photon or of an electromagnetic wave, at any point on the surface of the dielectric. It further uses the unique properties of the difference frequency between two frequencies. While the transmitted waves themselves are subject to overshoot and breakup in an isotropic nonlinear medium, the difference frequency passes through the dielectric medium unchanged. In this way the difference frequencies rather than the actual transmitted frequencies are considered as the active transmission frequencies communicating everywhere within the body and all its cells. Thus the desired difference frequency signals can be and are delivered to every point in the entire body dielectric medium, and the response from every point in the entire body dielectric medium participates in the electromagnetic signals emission from the body.

A scalar potential is just a bundle of bidirectional longitudinal electromagnetic waves, in pairs, where each pair consists of an incoming time-polarized EM wave (EM energy moving along the time-axis) and an outgoing longitudinal EM wave in 3-space. That is the nature of the potential as it exists in spacetime (in 4-space) prior to interaction with charged mass. The halfset of all the outgoing 3-space longitudinal waves also forms a set of 3-space EM wavepairs comprising the 3-potential portion. Any electromagnetic field or wave may be decomposed into two scalar potentials, as shown by Whittaker in 1904, thus initiating that branch of electrodynamics known as superpotential theory. Everything that is presently recognized as an ordinary electromagnetic field or transverse electromagnetic wave is in fact created through the interference of potentials’ internal longitudinal EM wave structures, as shown by Evans et al. and also by Cornille. This extended superpotential approach is a legitimate higher group symmetry – such as O(3) symmetry – electrodynamics, which is more fundamental and extensive than orthodox electrodynamics using U(1) group symmetry. The extended electrodynamics provides an electrodynamically engineerable unified field theory that is capable of directly changing matter through action-at-a-distance, including time-reversing matter (either living or inert), through the manipulation of the internal longitudinal wave pairs with associated time-polarized EM waves. The present invention provides methods, systems, and apparatus to engineer and utilize this new electrodynamics as a means of conditioning and altering materials.

The invention addresses all the steps in such a process. First, it provides methods to convert transverse electromagnetic waves into longitudinal waves, which are always accompanied by one-to-one correlated time-polarized EM waves with exact phase conjugate pairing. It then advances techniques to combine collections of input waves into a conditioned scalar potential, being a scalar potential containing a desired modification to its internal structure and internal dynamics. Moreover, it gives means to transmit the conditioning over a distance, and reconstitute the input transverse waves in a target zone through interference therein or thereupon. It also provides for recording, digital processing, and synthesis of engineered waveforms that can be used in conjunction with these embodiments. By combining the
Radioactivity Neutralization Methods

Radioactivity Neutralization Methods, embodiments are provided to solve problems of environmental pollution, nuclear waste, hazardous chemicals, disease, biological warfare, and so forth, by deterministically altering and treating living or inert matter. These are all secondary goals that can be achieved by engineering higher group symmetry electrodynamics at the more fundamental level.

Most centrally, the invention advances a practical means, using the above scheme, to treat living cells and living bodies, in order to reverse disease and damage. In summary this is done by irradiating a body with longitudinal EM waves, which are always accompanied by correlated time-polarized EM waves. The longitudinal EM waves and their correlated time-polarized EM waves may be produced externally to the body, or triggered to be produced internally within the body. In either case, in the body dielectric the accompanying time-polarized EM waves pump the mass-energy of the body mass (including all cells and every part of each cell) in the time domain rather than the spatial domain. This is an extension of present nonlinear phase conjugate optics, which has until now only considered spatial EM pumping and has omitted time-domain EM pumping.

The normal phase conjugation process produces the time-reversal of planar EM wave energy in 3-space, as stated in the well-known distortion correction theorem. In short, it produces a planar wave that precisely retraces the exact 3-space path in the transmission medium, point for point, previously taken by the stimulus wave. In the new process, 3-dimensional EM energy is retraced back along the previous time-path taken by the stimulus 3-space energy -- which latter is simply the resident mass-energy of the time-domain pumped mass, together with the internal structuring and dynamics of that mass-energy. The extended phase conjugation process resulting from the time-domain pumping is applied to the nonlinear "input" 3-space mass-energy as it previously traveled through time, rather than being applied to an "input" plane wave energy in 3-space as it has traveled through space. The result is that, analogous to normal reversal of the 2-dimensional planar EM wave energy in 3-space, the pumped 3-dimensional mass-energy and its exact dynamics are reversed back along the time axis, to a previous 3-dimensional physical mass-energy state and dynamics. Since all the mass energy and its dynamics in the pumped 3-space mass are thusly time-reversed, the process also time reverses not just one but all the electromagnetic signal energy and EM process energy ongoing in the body's mass-energy, thereby time-reversing all of the body's biological, chemical, and nuclear processes back through a precession through previous states to arrive at a previous healthy physical state. Because of the dielectric channel effect, every part of the body cells including the genetics are also precisely time-reversed through previous states to arrive at a previous healthy physical state.

It is further pointed out that, in a curved spacetime, the photon may be said to have mass, as shown by Lehnert and Roy. Any change of energy or dynamics in spacetime, including electromagnetic energy or

---

68 Amnon Yariv, Optical Electronics, 3rd Edn., Holt, Rinehart and Winston, New York, 1985, p. 500-501. Quote: "If a scalar wave E1(r) propagates from left to right through an arbitrary but lossless dielectric medium, and if we generate in some region of space [say near Z = 0] its phase-conjugate replica E2(r), then E2 will propagate backward from right to left through the dielectric medium, remaining everywhere the phase-conjugate of E1."

69 B. Lehnert and S. Roy, Extended Electromagnetic Theory: Space-Charge in Vacuo and the Rest Mass of the Photon, World Scientific, New Jersey, 1999. Extended forms of Maxwell's equations as well as EM fields, based on a nonzero divergence of the electric field and a nonzero electric conductivity in vacuo. Predicts the existence of both longitudinal and transverse solutions, space charge in vacuo, steady EM equilibria, a photon rest mass and a photon axial magnetic field. [For the purposes of this invention, we point out that normal classical electromagnetics assumes a flat local spacetime (falsified by general relativity for nearly a century) and no net exchange with the local active vacuum (falsified by particle physics for a half-century). When the real system -- with local curvatures of spacetime and local net energy exchange between the local active vacuum and the system -- is analyzed, the electromagnetics must be extended to include such interactions. Lehnert and Roy show that in the real case the photon is not massless but has mass. Hence, by delivering photon energy everywhere within the real physical body that is precisely accepted and involved in all the body's ongoing processes, the process involved in the invention is also delivering mass and mass-energy as necessary. This is not the normal photon interaction in an assumed flat spacetime, but is a different kind of photon-with-mass interaction in a curved spacetime. In this way, actual mass changes can be produced in the various minute
dynamics, constitutes a curved spacetime as is well known in general relativity. Hence the invention deliberately uses photon energy which also possesses mass, contrary to normal electrodynamics in a flat spacetime. In this way mass may be added or subtracted from the tiniest parts of the cells, in accordance with the time-reversal back of the time-domain-pumped cells back through their intermediate physical states to an earlier healthy physical state.

This is in fact the normal healing mechanism discovered by the inventor and used by the cellular regenerative system of the human body, within its limitations, to heal damaged cells and gradually restore them to a previous normal condition. Becker, e.g., demonstrated that weak potentials indeed time-reversed (in biology terms, dedifferentiated) red blood cells, then continued to "eliminate the deltas" in the previous bone-fracture area by then redifferentiating the resulting cells into the type of cells that make cartilage, then further into the type of cells that make bone, and depositing the latter cells in the fracture site to heal the fracture. In all these rigorously demonstrated changes, the mass of the cells was also being manipulated, although Becker was unable to decipher the mechanism accomplishing that feature.

In the present case, the time-reversed waves comprising the body's mass-energy are amplified by the pumping energy pumping the cells and their constituent atomic particles and subatomic particles in the time-domain and causing their time-reversal.

In addition, a much shorter method of accomplishing this amplified time-reversal of cells and their processes is provided by one version of the invention. The body is highly nonlinear in every part of itself, including the cell and every part of the cell. Consequently the nonlinearity of the cellular material can be made to partially decompose normal EM potentials, fields, and waves – transmitted into the body from outside – into their Whittaker longitudinal EM wavepair constituents, to include their accompanying time-polarized EM waves in the time-domain.

This can be seen by the "porthole" concept, where the internal body EM dynamics are regarded as a set of light-type or optical-type interactions ongoing everywhere within the body and its cells. We are not referring to optical frequencies, but to optical-type functioning. It is known in electrodynamics that in a dielectric, such as the body, every part of the dielectric participates in each photon emission from the body surface. A differential area on the body's surface thus represents a special sort of "porthole" where the EM radiation (together with its internal Whittaker structuring) that is emitted is a direct function of all the internal EM dynamics ongoing in the body and every part of the body, down to the smallest level inside the cells. It follows that, if we record that external emission, and input it again to that body differential surface area, we are returning energy in reverse. Note that we are also directly utilizing the difference frequencies, which are the most important. Specifically we are returning, back through the dielectric and to all those EM processes everywhere within the body, a set of precise counter-forces and dynamics for the ongoing forces and dynamics. If we amplify the irradiation back to that differential surface of the body, the excess energy returned to all the processes in the body will slightly amplify and partially time-reverse all those EM interactions ongoing in the body cells. Specifically, this process will act to eliminate the "deltas" between the present interactions and dynamics and the body's past normal interactions and dynamics, since time-reversal rather than spatial reversal is involved. It is stressed that the 3-space forces affected, continue to operate in a "time-forward" manner, but are slowly and steadily changed in direction, phase, and magnitude by the existing "time-domain" delta between the present state at any given time in the pumping and the past

___

ongoing body dynamics and interactions as required to eliminate the physical differences between the present mass-energy of the body in a diseased or disordered state, and the past mass-energy of the body in a healthy and normal state.]  
70 G. C. Reali, "Reflection from dielectric materials," American Journal of Physics, 50(12), Dec. 1982, p. 1133-1136. The reflected EM field emitted from a dielectric material is not generated just at its surface but comes from everywhere in the interior of it. [Reversing this principle, the impinging of EM radiation upon a dielectric material, such as the human body, results in effects everywhere in the interior of the body dielectric.]
healthy state to which the pumping is changing the ongoing dynamics, physics, and chemistry of the functioning cells.

The photon is its own antiparticle. That is, an antiphoton is simply a photon reversed in direction. So for any photon radiation pattern we can create antiphoton radiation comprising its precise antipattern, merely by precisely reversing the direction of photon radiation of that pattern. If we amplify the reversed direction radiation, we amplify the antiphoton radiation pattern so that it is stronger than the body's own emitted photon radiation pattern. This antipattern is forcibly transmitted through the porthole effect into all internal regions of the body, no matter how small.

To make a powerful effect, we record all the normal EM radiation from the body, from all its surfaces or a substantial portion thereof and including the difference frequencies, amplify this received radiation precisely, and feed it back precisely into the same body. We thereby much more strongly amplify the counterforces and time-reversals in those processes throughout the body. In short, from a physics view we overcome the body mass-energy's movement through forward time, and place it into simultaneous reversed-time movement along the time axis of 4-space, back to a previous point in time, changing its mass-energy and mass-energy dynamics as it reverses. We point out that both "movements through time" of the operating cells and their internal parts continue to exist vectorially; the body's mass energy is still moving through forward time at the same velocity, but is simultaneously moving through reversed time at a greater velocity. Hence the net movement of the mass-energy and its dynamics, as seen by the external observer, is a movement in reversed time, which thus is purely a "movement to eliminate the deltas between the present unhealthy state and the past healthy state". However, this is actually a set of very precise dynamic changes and forces, being imposed upon the mass-energy of the body, to change it back to a previous physical state before the cellular damage or disease. But the body mass-energy remains "normally alive" with all its ongoing functions during this process, and only net "deltas" are induced. So the living body's functions are not disrupted in a detrimental sense, but in a very positive sense known as "healing" – i.e., time-reversing the body and its dynamics back to a previous healthy state. The foregoing in fact may be taken as the definition of cellular healing itself.

The overall result is to time-reverse (physically) the cells and processes of the body back to a previous earlier physical state and condition. Any healthy part of the body's cells and cellular dynamics is simply made a little younger (rejuvenated). Any diseased or damaged cell or group of cells and their dynamics, is/are time-reversed back to their previous healthy condition (healed). This process is actually an amplification and application of the natural, but more limited, healing process the cellular regenerative system of the body has used for millennia.

For emergency conditions in mass casualty situations, the amplification of the time-reversal can be increased to where a treatment of only one minute is required, but with some discomfort and stress to the patient. A lesser amplification and two to three minutes radiation can be used to eliminate most discomfort, if the situation is still urgent. Three such treatments one week apart are the normal requirements. In normal situations, a treatment of 15 to 30 minutes at reduced amplification is indicated, so that the discomfort and stress is eliminated. Again, three such treatments one week apart are indicated.

This latter version of the invention – letting the body dielectric itself produce the pumping longitudinal EM waves and time-polarized EM waves everywhere within the body dielectric – greatly simplifies the accomplishment of the time-domain pumping process of the invention. It can thus be adapted to provide for portable treatment units, approximately the size of a large suitcase, which are suitable for the very rapid mass treatment of mass casualties – even in the millions – utilizing the aforesaid principles. Due to the novel mechanism used, the invention is applicable to a wide variety of infectious diseases and physical disorders.
Barker’s Patented Radioactivity Remediation Method

From: John Schnurer
Date: Monday, March 30, 1998
Subject: Re: Peer-Reviewed Articles on Low-Energy Nuclear Transmutation

Dear Folks,

The 'bar none' and easiest most effective and least messy method for remediation is Barker's method. It is dry, reproducible, one shot of only minor energy is required and then the process self runs. The equipment is simple, off the shelf and inexpensive and requires no special skill, nor it is "twitchy".

JHS

Gary Vesperman copied the following from http://www.escribe.com/science/vortex/m20760.html, which is no longer active.

On Wed, 5 Sep 2001, Orris Dent wrote:
From: John Schnurer <herman@antioch-college.edu>
To: Orris Dent <orrisd@hotmail.com>
Subject: Re: The Barker Process
Date: Wed, 5 Sep 2001

Dear Orris,

Before you give the Van De Graff away:

thread truncated>>

I will probably get back to you with details tonight, from home. But first one question for you: Can you please describe an experiment that the Barker(s) performed that convinced you that their process really worked?

Regards.

The Barker Process
From: John Schnurer
Date: Wed, 5 Sep 2001

Old experiment

Briefly, for the replication of Barker patent radioactivity remediation work, we used a radioactive mineral specimen from a geology laboratory. This was carefully broken and two fragments, about 2 mm roughly spherical that appeared uniform and were radioactive about the same amount and sounded like a really hot and loaded popcorn popper full of cooking popcorn were used. This was, as described by a geologist, a periclase and the mineral was thought to be substituted some with radioactive strontium or radium.
The same Geiger-Muller (GM) counter was used for the whole study. This counter is an inexpensive lab-type counter and is sensitive to beta, gamma and short X-rays. The counter was placed inside the Van de Graff sphere with the sample about 1 inch away. The GM counter used a small thin walled 1-inch long by 3/8-inch tube excited at about 850 volts.

The belt and rollers were removed from the Van de Graff, and it was powered with an external 40-kilovolt bench power supply made by the Glassman company. The negative high-voltage lead went up the tube which supports the Van de Graff sphere. This lead is connected to the inside of the sphere. This causes the inside of the sphere to be zero volts and the outside to be negative 40 kilovolts. A hole 1/2 inch diameter is made in the side of the Van de Graff sphere. The wall of the sphere is less than 0.010 inches.... this makes an intense gradient of zero volts to negative 40 kilovolts in less than 0.010 inches.

The sample is placed RIGHT NEXT TO THE EDGE OF THE GRADIENT and is held in a thin piece of 2 mil (1/1,000 inch thick) polyethylene plastic film. A little dielectric shelf made of cardboard, paper tape and wood was constructed inside the sphere to support the Geiger-Muller counter and the sample. The low-voltage power supply wires for the Geiger-Muller counter go up inside the tube which supports the sphere also. This allows us to turn on the counter at any time and take a reading without ever opening the sphere or disturbing the experiment. The high-voltage wires are silicone elastomer insulated to 60,000 volts.

1) With the sample in place the Geiger-Muller counter was energized and the typical "popcorn" was heard. Note it is easy to record this with a tape recorder.

2) 40 kilovolts was employed for 14 hours. NOTE: ONE EXPOSURE ONLY was used and no further excitation of high-voltage was used at any time ever again for the rest of the test.

3) Over the course of 11 months the counts were taken and at 11 months the sample was about the same as background counts. At one point one of the witnesses thought the Geiger-Muller counter sounded as though the sample must have been removed....but the whole set up was still sealed and the sample was in place. It worked fine.

We know now what to do to make the process work better, but would like to have someone replicate. The problem is that, so far “Everyone” we have contacted either wants to or has CHANGED the set up!

Las Vegas energy expert Robert Nelson (www.rexresearch.com) has discovered these two patents by Barker:

US5076971  Method for Enhancing Alpha Decay in Radioactive Materials
William Barker

Apparatus and method for decontaminating radioactive materials by stimulating the atomic system of radioactive materials. The stimulus is kept applied to the radioactive materials for a predetermined time. In this way, the rate of decay of the radioactivity of the materials is greatly accelerated and the materials are thereby decontaminated at a rate much faster than normal. The stimulus can be applied to the radioactive materials placing them within the sphere or terminal of a Van de Graaff generator and allowing them to be subjected to the electrical potential of the generator, such as in the range of 50 kilovolts to 500 kilovolts, for at least a period of 30 minutes or more.
Accelerated decay of radioactive materials is used for power production. In the method of this invention an alpha-emitting radioactive material is placed in a region. The region is selected so that when a negative potential is applied to the region, enhanced alpha decay of the radioactive material results. The energy of the alpha decay particles is captured and converted to thermal energy.

**DOE in 1992 Witnessed 96% Reduction of Radioactivity of Cobalt-60 with Brown’s Gas**

Professor Yull Brown was the original inventor and advocate of the unusual gaseous fuel known as ‘Brown's gas’. This gas – on its face a stochiometric mixture of hydrogen and oxygen obtained by electrolysis of water – has unquestioned practical applications in welding and metal cutting. However, it has not been widely used (yet) for this purpose. The gas apparently has other properties, more controversial to be sure, including the possibility that it is a more efficient generator of forms of hydrogen (including mono-atomic hydrogen) and oxygen, that it can weld metals to ceramics, and that it can denature radioactive elements.

An experiment involved the treatment with Brown’s gas of a sample of the radioactive isotope cobalt-60. A Geiger counter’s reading dropped from 1000 counts per minute to 40 counts per minute – a reduction in radioactivity of 96% that was witnessed by some Department of Energy officials. Their clumsy explanation of their denial that the reduction of radioactivity was due to Brown’s gas was found to be ludicrous.

Mark Porringa of Zeropoint Techtonix Inc, 430 Bass Lake Road, R R # 1, Deep River, Ontario K0J 1P0 (613) 584-2960 fax: (613) 584-4616 porringam@aecl.ca

The text of one of Porringa’s brief descriptions of nine alternative, peer-reviewed techniques as candidates for the global clean-up of nuclear waste is copied below. (Mark Porringa’s report was forwarded to Gary Vesperman by Andrew Michrowski, The Planetary Association for Clean Energy, Inc.)

**Brown’s Gas-Metal Matrix Process**

The BG-MMX process utilizes a patented electrolysis cell of the Australian Professor Yull Brown’s design that is said to produce a stochiometric mixture of monatomic hydrogen and oxygen or possibly a quasi-stable water molecule raised to a high-energy state. This gas has some very peculiar properties including the ability to sublimate tungsten (6000°C) with an implosive flame that burns cool in air with a temperature of only 130°C.

The gas is used to heat a proprietary mixture of metals and/or metal oxides including the radwaste to be neutralized. A highly exothermic radiant reaction appears to result in the immediate reduction of radioactivity approaching 95% of the original levels judging from preliminary tests, within seconds of treatment. The process is conjectured to be effective with high level solid wastes and possibly gasses, but probably not liquids. The high temperatures involved may also preclude the processing of more volatile wastes.

Since 1991, this technology has been successfully demonstrated, on a small scale, at least 50 times to US, Chinese, Japanese and United Kingdom officials on a variety of nuclear waste products including americium, cobalt, uranium, and plutonium. The technique can be applied for the immediate decontamination of stockpiles of nuclear waste materials being held near nuclear power plants. The process...
is very simple, safe, and inexpensive to develop further into robotics application for on-site treatment with no foreseen environmental effects.

(End of Porringa’s report)


Introduction

The production of a nonpolluting and cheap energy source has always been a major concern to mankind. The rapid industrialization in this century has led to the enormous consumption of the fossil fuels: oil, coal, and gas. The high rate of consumption of the limited reserves of these fossil fuels triggered the urgent pursuit for other fuel sources.

The immediate potential for a revolutionary non-polluting renewable energy process which is the conversion of non-portable cheap electrical energy to a gas fuel which is portable, namely Brown's Gas, is vast and virtually limitless.

Brown's gas is a technological breakthrough discovered by myself – Yull Brown. I am a research professor, scientist, inventor, and Chairman of Brown's Gas International Corporation, a Nevada corporation, incorporated in 1993. (Brown’s corporation is no longer listed with the Nevada Secretary of State. Vesperman) Brown's Gas International Corporation has the worldwide rights for the use of Brown's Gas Generators/Welders as produced by NORINCO, the manufacturers for Research Institute 52, Daotou, Inner Mongolia of the Peoples Republic of China. Research Institute 52 has a staff of 1500 scientists and engineers, and two million employees.

I have a perspective of the current and future role this discovery will play in economics and environmental cleanup, especially employing this technology for nuclear radiation dilution/destruction which has given very good results in tests up to now. A modification of Brown's gas with special conditions and application of other new technology has had dramatic results in reducing radiation by as much as 96%.

Throughout the world there has been a trend toward the development of hydrogen as an energy source. The major problem of hydrogen as a viable fuel has been its volatility. Well known is the fact that when hydrogen and oxygen/air or other gases are mixed, there is a high potential for an explosion.

Traditionally, electrolysis was the method for separating water into its component gasses of hydrogen and oxygen by passing an electric current through the water. But due to the volatility of the gases when mixed, an impermeable membrane was used to keep the oxygen and hydrogen separated. The electrical requirement caused by this barrier has made this method less efficient, uneconomical, and very bulky.

I believed in the intuitive idea that water would provide a practical fuel source and began in 1970 to experiment with water electrolysis to attempt to discover a method of mixing hydrogen and oxygen together to create a nonexplosive mixture that was unknown until then. Ultimately, the mixing and compressing of the gas was to be done within the cell safely, efficiently, and economically.
After 22 years of intense research, I developed a highly efficient electrolysis cell which disassociates water, without the need for a diaphragm, to a mixture of hydrogen and oxygen with the exact ratio of two volumes of hydrogen to one volume of oxygen. The fuel gas so produced is called ‘Brown’s gas’ with an efficiency of 90% (one of the highest in the world). The process has been granted patents in 31 countries.

For the first time in history, a stable hydrogen and oxygen mixture could be generated efficiently, stored under pressure, and used safely as a source of energy. This achievement, through my special electrolytic cell, allowed hydrogen AND oxygen to be mixed in the cell and safely used as a fuel source.

In fact, it was immediately apparent that when the gas mixture was applied as a fuel source for welding, the properties exhibited by the flame were considerably different from that of the flame produced by combining conventional hydrogen and oxygen gases from bottles.

It must be mentioned here that nowhere in national or international studies of fuel processes is there any mention of such a process. There is no other method capable of producing such a gas safely and with efficiency. Brown's gas is a new product so that there is no literature describing the properties of this gas which are very unconventional.

It has been a popular practice of other investigators of my electrolytic cell to ascribe to the gas properties of molecular hydrogen and oxygen gases in the proportion of 2:1. Although these assumptions seem very plausible, they are incorrect. Brown’s gas properties are sufficiently different from the combined molecular hydrogen and oxygen gas mixture to be significant in scientific, industrial, and other commercial applications.

**The Properties of Brown's Gas**

The first property of the gas is the temperature developed by the flame. Hydrogen burning in a pure oxygen environment should theoretically obtain the temperature of 4915°C. The Brown's gas flame can sublime tungsten which occurs at a temperature of approximately 5900°C. Holes can be burned through refractory bricks, ceramic tiles can be pierced by the flame, and steel can be welded to brick.

In contrast, Brown's gas can also be used for applications with lower temperature requirements. Aluminum welding which occurs at approximately 700°C can be handled by the flame equally well. It would appear that a species of atomic hydrogen and a species of atomic oxygen are present in the flame and engage in a reaction with the substance being heated.

Another property of the flame is that it can concentrate into a small area, the flame itself tapering to a very fine application point. Various functions can be performed without the interference of the widespread dispersal of the applied heat.

The second remarkable property of Brown's gas is demonstrated when the reverse reaction occurs. In the initial reaction, one unit of water yields approximately 1866.6 units of Brown's gas. When the volume of gas is ignited using a spark, the expected explosion does not occur. Instead, a low-decibel ping is noticed, and a volume reduction of 1866.6 units of vacuum plus one unit of water occurs.

In effect, this net implosion (not explosion/implosion) produces a near perfect vacuum almost instantaneously without any moving parts being involved.
The third remarkable property of the gas is its safety aspect. The stoichiometric hydrogen and oxygen gas mixture known as Brown's gas can safely be produced and stored. The storage of the gas under pressure is in complete contradiction to the procedure employed for the safe handling of conventional hydrogen and oxygen gases.

To mix hydrogen and oxygen in the past was impossible and unknown; and the compression of these gas mixtures up to 100 psi was completely unknown. The mixing and compression of these gasses were totally revolutionary and absolutely novel achievements never accomplished before.

The mixing and compression of these gasses in my generator is a reality and is commercially available in many countries. Because of the high volume of the gas, I am continuing my experimentation to liquefy this gas mixture which will represent low volume, extremely high energy with only water as a residue. I hope this can be achieved.

**The Electrolytic Cell and the Process**

Brown's gas is the electrolysis of water using the patented electrolytic cell with the resultant gases of atomic and molecular hydrogen and atomic and molecular oxygen produced within the cell, mixed and compressed in stoichiometric proportions of 66.6% hydrogen with 33.3% oxygen. The Brown's gas generator can produce gas at almost any rate using electrodes in series.

The electrodes themselves consist of inexpensive ordinary mild steel. The efficiency produced is up to 95%, the highest of all electrolytic cells in the world, and the second highest of all machines and devices converting electric energy to mechanical or thermal energy.

The conversion of alternating current to direct current may be as high as 90% leaving the maximum efficiency of Brown's gas at approximately 93% from an ancillary source.

The raw materials for the production of Brown's gas are water and electricity. One kwh DC of electricity produces 340 liters of gas approximately. The cost of Brown's gas in comparison with bottled oxyacetylene oroxyhydrogen is many times—times, not percent, cheaper.

**Safety of Brown Gas**

Many countries' explosive departments have approved the manufacture and use of Brown's gas after extensive testing.

Brown's gas burns with a clean flame and the electrolyzer supplies the gases at 40 to 100 pounds per square inch (PSI). The flame contains hydrogen and oxygen and no other elements; so the product that is burning is water. The gas burns with a variety of nozzle sizes and presently can have a flame length of up to 400 mm. The flame is an exothermic reaction either with water as an end product in some applications or disassociated hydrogen and oxygen in other applications. It is extinguished by reducing the gas flow at the handle, and this is accompanied by a popping sound.

Australia’s New South Wales Department of Explosives and many other countries have approved the manufacture and use of on-demand generation of Brown's gas. After continued testing, they have approved it as completely safe. Brown's gas is safely stored, with little reassociation in the control cell of the generator, releasing electrical potential and acting like a fuel cell.
Welding with Brown's Gas

The immediate commercial value of Brown's gas is totally apparent. Professor Brown's companies will produce for the commercial and domestic markets a range of generator equipment suitable for gas welding, soldering, bronzing, and cutting. In fact, a complete welding unit is under design which will have the optional facilities of AC and DC arc welding, and automatic arc welding. This process involves burning a combustible gas with air or oxygen in a concentrated flame at high temperature. The purpose of the flame is to heat and melt the parent and fill a metal at the joint.

Gas heating is the means for fine cutting, metal spraying, bronze welding, brazing and soldering. Acetylene is the most important hydrocarbon in the welding industry. It is almost universally used as the combustible gas because of its high flame temperature. This temperature, estimated to be about 3200°C, is far above the melting point essential for welding. One disadvantage to acetylene is its danger if it is not handled carefully, and it is polluting to the atmosphere.

Professor Brown's gas is a new and highly competitive alternative to many commercial fuel gases.

Flame Characteristics of Brown's Gas

The flame produced when Brown's gas is ignited under 40 to 100 pounds per square inch of pressure is initially colored yellow due to some alkali (approximately one part to one million) coming over on startup. But this quickly reverts to the neutral blue cone with a long extension. There are several distinct regions called "mantles" within the flame's sheath.

The remarkable property of this flame is that it is NOT formed as a set of explosions, but is formed as a set of implosions!

Consequently, the conventional theory of combustion products, as accepted in worldwide established teachings on physics and electrochemistry, must be completely revised.

The central blue cone is the region separating the inner sustained vacuum from the continuously forming implosion products, and it is in this narrow band that the novel combustion situation is sustained. The temperature limit of the applied flame is governed by the element being heated by the flame.

The outer mantles surrounding the blue cone region prevent oxygen from interfering in this combustion process. In fact, the mantles about the central hot region form an inert zone as supplied in modern TIG and MIG weldings.

Interactive Combustion Effect

When the flame is applied to aluminum, there isn't the immediate reaction of white heat as obtained when it is applied to brick. Instead, the flame may be shown to produce water on the aluminum by condensing the steam in the mantles on this heat conductive surface. The reasons for this low temperature reaction are two fold:

1) Firstly, because the flame temperature is not high in its natural state; and
2) Secondly, because aluminum is a good conductor of heat.
Flame Cutting

In addition to a broad range of welding applications, Brown's Gas International Corporation is developing business plans to enter markets involving gas for welding and flame cutting.

Flame cutting is done today by preheating a spot on ferrous metal to its ignition temperature and then burning it with a stream of oxygen. Acetylene is widely used as a fuel because of its hot and adjustable flame. As the metal is burned and eroded away, the torch is moved steadily along the path of the cut. A uniformly wide slot called the curve is cut by the jet of oxygen. Today's technology requires a high degree of skill to get good performance in flame cutting. The gas and oxygen pressure, position of torch, intensity of flame heat, cutting speed, and type of tip are important variables in the cutting results.

Initial preheating tends to burn a hole in metal, so a cut is started right from the line of cut and usually outside of the edge of the plate where ignition is quick.

Flame cutting of some high alloy steels, such as stainless steel, and many nonferrous alloys is difficult with oxyacetylene because the alloying elements such as chromium and nickel oxidize along with the base metal. Many of these oxides do not melt at attainable temperatures and form an insulating coating on the parent metal that hinders progress of the cut. Oxidation does not occur with Brown's gas on stainless steel and other non-ferrous alloys. For this and other competitive advantages, Brown's Gas International Corporation expects to be highly competitive in broad areas of welding and flame cutting.

Other Applications for Brown Gas

Other applications for Brown's gas include:

1. Underwater Cutting
   Brown's Gas International anticipates broad applications in underwater cutting and welding using Brown's gas due to its unique underwater welding and cutting properties.

2. Metal Spraying

3. Welding, Brazing, Soldering

4. Tungsten Cutting
   Tungsten alloys up to 12 to 14% may be cut readily, but higher percentages of tungsten make cutting difficult. In the last decade tungsten has evolved from a rather specialized aerospace material into a wide range of other applications. Tungsten is used in many areas where technology has taken temperature strength requirements way beyond the capabilities of lower temperature melting materials. Brown's Gas International Corporation believes that following additional research, Professor Brown's gas may represent an important contribution to industrial processes involving exotic metals.

5. Stainless Steel Cutting
   Stainless steels, chrome nickel, and straight chrome are virtually impossible to cut by normal cutting procedures because chromium oxide is formed and prevents continued action of the cut. There are methods being developed to overcome this problem. Brown's Gas International anticipates a highly competitive entry into this market area. Tests indicate no oxidation results in the use of Professor Brown's gas mixture.

6. Domestic and Industrial Waste Disposal
   The high temperatures developed by the process have many applications. The growing problem of toxic and general waste disposal is a source of potential development. Large town incineration facilities would be practical because of the low cost of producing the gas. The use of Brown's gas
as a means of converting noxious hydrocarbons into heat energy and leaving as residue basically solid material is a solution to domestic waste, the dream of many an Urban Authority.

7. Coal to Oil Conversion
8. Hydrogen Production
9. Aerospace Applications
10. Refractory Applications

    The ceramic industry, the brazing of bricks and tile, and other processes requiring high temperature provide potentially significant outlets for the application development of Brown's gas. For example, brick samples have been treated with the flame producing a decorative brown coating. This leaves the surface abrasion-proof, nonabsorbent and unaffected by heat and cold.

    Fusion bonding is also possible with the temperature that is generated. The fixing of steel elements directly to brickwork or concrete would be of great advantage to builders and engineers. Continued research and development, with ongoing awareness of the principles involved will almost certainly extend the applications for the gas beyond those discussed. The theory behind the formation of the gas and the interaction between the components of the gases and the materials heated is still in its infancy.

11. Implosion

    One of the unique applications of Brown's gas is implosion. When a volume of Brown's gas in a metal container is detonated by a spark, the resulting implosion is a contraction of volume on the order of approximately 1860 to one.

    It is convenient to redefine the contraction that occurs as an implosion in contrast to an explosion as both are dynamic processes. One of the numerous, unique properties of this new gas mixture is that in contrast to the conventional meaning of the word implosion – when air rushes inside the rupture, rendering the whole device useless – when Brown's gas is detonated, a nearly perfect vacuum is instantly created allowing this to employ atmospheric pressure as a source of power.

    Another absorbing prospect is to utilize Brown's gas as the agent to produce a cheap vacuum as a source to trigger atmospheric pressure as a source of energy. The use of the phrase as a source of energy is deliberate. Suppose Brown's gas is attached to a heat source; then it will readily expand. Implosion of this expanded gas will utilize atmospheric pressure. Truly, the possibilities have worldwide applications in pumping and in the development of an atmospheric implosion motor.

    IMPLOSION as a single reaction is only possible with Brown's gas and is impossible with other substances... and the contraction that occurs is revolutionary in character. Applications are atmospheric motor (stationery and transportable). A simple way has been found for making a vacuum so atmospheric pressure can be employed as a source of energy.

12. Pumps, Desalinators, etc.

    The preceding list is not exhaustive nor fully descriptive nor is it meant to rank in order of importance any of the applications.

Nuclear Radiation Reduction/Dilution

    There is a very unusual effect which can be utilized for nuclear radiation disposal. After the special reaction which melts two different metals, the radiation could not leave the molten material, but by implosion, it is pulled into the material. The material which remains has very little radiation and sometimes none at all.
The existing knowledge about heating radioactivity states that radioactivity is dispersed into the surrounding air. But under the Brown's gas implosive condition, the reverse occurs which decreases the radiation from a reading of 1000 on the Geiger counter to a reading of 40. These experiments have been replicated time and time again in many places. This could be very much improved if we utilize liquefied Brown's gas. This will be done in future research when I have the interested party to a joint venture providing the necessary capital. As I pointed out before, it is not a theory, but practical experiments exist. This new technology which is a modified Brown's gas reaction for the decreasing of nuclear radiation is something the WHOLE WORLD NEEDS.

This is a significant discovery for present and future generations. Naturally, this challenges many existing businesses which will be resisting – but not for long. Many nuclear institutions and scientists have tried to object to the evidence that Brown's gas has reduced nuclear radiation in tests observed by scientists here in the United States and abroad. They will ultimately have to accept the reality that it works.

The response was so alarming and confusing that a former Congressman from New York, Dan Haley, decided to conduct his own inquiry into the situation.

His observations and findings were written in his report published in PLANETARY ASSOCIATION for CLEAN ENERGY, INC., JULY 6, 1993 issue. That report is as follows:

(The following report was originally in The Planetary Association for Clean Energy Vol. 6, No. 4., July 6, 1993, and then reprinted in Infinite Energy Vol. 4, Issue 20 1998 pp 40, 42, in addition to being reprinted in this Extraordinary Science article.)

Transmutation of Radioactive Materials with Yull Brown's Gas
96% Radioactivity Reduction
By Daniel Haley, Former Chairman
Joint Coinmission on Energy, New York State Legislature

On August 6, 1992, a team of five observers led by officials from the San Francisco field office of the Department of Energy (DOE) visited Southwest Concrete Products in Ontario, California for a demonstration of the effects of Brown's gas on radioactive materials. This visit resulted from a request to the DOE by former Congressman Berkeley Bedell.

Months later, the DOE field office summarized their conclusions on the experiment they witnessed.

Admitting lower radiation levels were achieved, they attributed the phenomenon to two causes: 1) "dispersal within the molten matrix" – encapsulation, and 2) "different geometric configurations" – different shape.

The author, Alex Dong, director of the Environmental Research and Waste Management Division, declared, "Nothing in this demonstration, before or after, provided quantitative evidence that radioactive materials had been destroyed.", and that "This office does not intend to pursue the subject further.".

One of the five observers was upset by the handling of the low-level radioactive material (cobalt-60) during the experiment and, upon leaving, called the Los Angeles office of the California Department of Health Services, which sent an inspector the same day to inspect the premises. Southwest Concrete Products put on the same demonstration for the Health Services inspector, whose office sent a letter a few days later on what had been observed.
Since neither of these letters confirmed the destruction of radioactive materials, early in 1993, I [Dan Haley] called Russ Roberts, whose name was on the DOE letter. He returned my call, joined by Gary Callahan, who seemed to be the senior of the two and who stated that he had organized the visit to see the Brown’s gas demonstration.

Both Roberts and Callahan stated that they were sure that radioactivity had been released into the environment, and that they had stood far back from the experiment behind something in an attempt to shield themselves. Since their letter had granted that the Geiger counter radioactivity reading had been reduced, I asked them by how much and they said it had been reduced by an order of 3 or 4; I pressed them for specific numbers, and they told me that the initial reading was 1000 counts/minute and that after the experiment, the reading was 40 counts/minute. They seriously defended, against my skepticism, their concept that by changing the shape of the radioactive material, Brown could have lowered its Geiger counter reading. In addition, as stated in their letter, they said that radioactivity had been encapsulated within the material.

After talking with them, I called Bob Dzajkich at Southwest Concrete Products. He told me that he showed exactly the same experiment that was demonstrated to the DOE group to the Health Services inspector, who before and after the experiment took Geiger counter readings around the room, finding that, "essentially no cobalt-60 was dispersed into the environment – that is, the heating and test chamber and immediate area around the test chambers were contamination free." This statement demolished the DOE people's verbal assertion that radioactivity had been released into the ambient air – one wondered why they didn't take such readings instead of relying on their assumptions.

Bob Dzajkich further told me that when he read the DOE letter asserting encapsulation, he decided to see if they were right. He took Geiger counter readings of the material left from the experiment, ground it to dust and then took Geiger counter readings of the dust. He found that the readings had not changed at all.

Thus, radioactivity did not go into the air since the Health Services inspector measured it before and after the experiment. In addition, as determined by Bob Dzajkich, radioactivity was not encapsulated inside the material, or "matrix," as the DOE called it.

Thus, their theories of encapsulation and dispersal into the ambient air do not hold water. This leaves only the DOE notion that changing the shape of a radioactive substance could reduce its radioactivity to support their conclusion that, "Nothing in this demonstration, before or after, provided quantitative evidence that radioactive material had been destroyed." Of course, this is a statement of the obvious: Nobody said that material would be destroyed, but that radioactivity would be destroyed; that they refused to state.

My impression after speaking to them for an hour on the phone was that these DOE fellows must have decided that if they attempted to report favorably on the results of Brown's experiment – something they "knew" to be impossible – that they would be ridiculed. Even then, unlike the Department of Health Services, it took them nearly three months to decide what to state.

After talking with the DOE people and examining their letter and that of the Health Services Department, and after talking with Bob Dzajkich, my observations are that: 1) radioactivity was not released into the environment, 2) radioactivity was not encapsulated, and 3) by the process of elimination, only the DOE notion that "changing the shape of a radioactive material can reduce its radioactivity" is left to account for the drastic drop in radioactivity readings from 1000 counts/minute to 40 – according to the DOE figures. This I find too bizarre to accept.
Therefore, I conclude that in Yull Brown's demonstration to the DOE Environmental Restoration and Waste Management Division of August 6, 1992, transmutation of radioactive material was accomplished – resulting in a drop in Geiger readings from 1000 counts/minute to 40 counts/minute – a 96% reduction of radioactivity or, inversely, resulting in a radioactive waste residue of about 4% of the original pre-treatment radiation level (or less when accounting for natural background radiation levels). – Daniel Haley

(The following was appended to Infinity Energy’s reprint of the above report by Daniel Haley.)

The Canadian government's Federal Environmental Assessment Review Panel issued in March 1992 Final Guidelines for the preparation of an Environmental Impact Statement on the Nuclear Fuel Waste Management and Disposal Concept. Such environmental impact statements (EIS) will have to be prepared by the proponent, Atomic Energy of Canada Limited. Under the guidelines, the EIS must discuss the capability of possible alternatives in order to address the risks to the health of humans and human communities, and to the work site and the natural environment. Of pertinence to the case of Dr. Yull Brown's proven method, the EIS would have to include "consideration of the transmutation of nuclear fuel waste".

"It has been my good pleasure to witness experiments done by Dr. Yull Brown in which it appeared to me that he significantly reduced the radioactivity in several nuclear materials. Under the circumstances, I believe it is very important for our federal government to completely investigate Dr. Yull Brown's accomplishments in this area." — Hon. Berkeley Bedell, Former Member of U.S. Congress

(End of Infinity Energy’s appendix to Haley’s report.)

**Humanity's Common Ground**

The resulting experiments with Brown's gas treating and reducing radioactivity (1000 rads to 40 rads, for example) done on many occasions are pushing the 'experts' to accept the findings.

**OR**, if they reject these findings, perhaps they have some ulterior motives. The ulterior motives are too numerous to describe here. I merely refer you to an article in the December 14, 1992 issue of U.S. NEWS & WORLD REPORT describing "...waste, fraud, and contamination at America's nuclear weapon plants." This expose details the cover-up of the incredible quantity of radioactive wastes proliferating at these sites and the horrendous costs the Department of Energy estimates will be needed to bury and encapsulate the nuclear waste, using concrete and steel to encapsulate, trucks for transport, and men and energy to truck this waste to another spot, burying it in another location which now will ultimately become a radioactive wasteland. The exclusive cover story is entitled: *A Two Hundred Billion Dollar Fraud.*

An official from the Department of Energy testified at a Senate Hearing in Washington, DC, May 1993, that the costs for this cleanup had escalated to an estimated TRILLION DOLLARS, and he described this situation as the "...worst problem facing humanity."

Brown's gas is the solution. There are some important points regarding the use of Brown's gas and technology for the nuclear destruction/cleanup of the radioactive material:

1) The cleanup can be accomplished at the site where the material is now located eliminating the transporting to distant locations for proposed burial.

2) Each nuclear power station could be decontaminated and no future radiation "waste" material would be stored or accumulated.
3) There should a special generating plant inside the nuclear power station where the nuclear waste will be destroyed, creating extra electrical energy, and totally utilizing all radiation – including that resulting from its destruction.

4) The radiation chambers of nuclear power stations absorbed with extremely high radiation can be cleaned – extending the life of the nuclear power stations.

5) There is a great possibility with further experimentation to de-radiate or remove radiation from people who have absorbed radiation and have become ill, as well as from all other elements and the earth which have absorbed radiation.

I am looking for the organization with some humanitarians who will understand how big this project is, and that with limited resources, it is almost impossible for me to continue. I am looking for the help in research and finance to joint venture with my corporation and colleagues.

Conclusion

In summation, I will continue my efforts of more than 22 years to bring the benefits of Brown's gas to humanity. In spite of obstacles and difficulties created by closed minds refusing to accept something that is "not in the books", I will continue to develop and modify the limitless applications of this amazing breakthrough – which makes it possible for the world to have a nonpolluting cheap source of energy ... (oil can be saved for plastic production) ... but the people will ultimately have the benefits of clean energy, clean air, and clean water as the uses of Brown's gas become evident.

The earth needs to be remedied of the nuclear waste problem which proliferates all major countries. That is the NUMBER ONE PROBLEM facing humanity.

The answer is here – not a theory – IT'S BROWN'S GAS. It was discovered by a single man with limited financial resources – no billion dollar grants and laboratories. It was just my commitment to find the truth... the truth of what secrets were locked in water and how to use the most abundant resource on the Earth for the benefit of all.

After the nuclear waste problem is contained, then major steps can be put in place to solve other life threatening problems of air and water pollution.

BROWN'S GAS is the answer for these cleanup problems as well. I urge you to get behind the efforts to see that Brown's gas technology is given the chance to stop the dismal decay that is bankrupting the world._YB

WARNING--Attempts at applications made by unqualified people who do not know all of properties of the gas could be very dangerous and create extremely hazardous conditions leading to possibly an explosion. The Brown's Gas Generator/Welder machine is completely safe when used as a source of heat for welding. Experimentation is not to be attempted with the gas separate from the generator. _YB

(End of report)

George Wiseman makes and sells Brown’s gas electrolyzers from his website www.eagle-research.com.

The following is Wiseman’s edited January 31, 2014 email to Gary Vesperman:

> Brown's gas has been experimentally demonstrated to reduce the radioactivity of cobalt-60, for example, by 96%.
That's true. I have the video and report. Wiseman

> When funded, further research is expected to show additional reduction of radioactivity beyond 96% by utilizing liquefied Brown's gas.

First I've heard of it. Wiseman

> This mixture, called Brown's gas after its inventor, can be used as a fuel source for welding.
>
> The properties of the flame are considerably different from that of the flame produced by combining conventional hydrogen and oxygen gases from bottles.

Not so. They're pretty much the same except for the ExW. Visibly there is no difference and have a very similar performance when welding too. Wiseman

> Brown's gas is so hot it can weld any solid substance to any other solid substance.

That's a Myth for a couple of reasons. First, Brown’s gas isn't 'hot' in that it doesn't radiate much heat (I think it radiates in the 270°F range). It is a high-energy flame, but the energy can be thought of as 'electrical'. Second, Brown’s gas cannot weld any substance to any substance. Think of it as a 'super' torch fuel, (except for welding iron) it just does what every other torch fuel does, only faster and better. Wiseman

> Brown's gas also has a very unusual effect which can be utilized for nuclear radiation disposal. After the special reaction which melts two different metals, the radiation cannot leave the molten material, but by implosion, it is pulled into the material. The material which remains has very little radiation and sometimes none at all.

That's just weird bunk. The radiation is neutralized by the molecules reforming into another material that is 'balanced'. Materials are radioactive when their electron shell has been stripped and is not balanced with the inner protons and neutrons. The inner mass radiates particles trying to become balanced again. Brown’s gas just allows the protons, neutrons and electrons to come apart and back together again in a balanced (non-radioactive) form; forming a glasslike material.

The two different metals are iron and aluminum, which when melted together make thermite. They may contribute some of the atomic material needed to help the radioactive material become neutral and they definitely provide the shock pulse needed to trigger the reaction when the thermite goes 'pop'. Wiseman

(End of email)


Brown’s Gas and Radioactivity

By George Wiseman, Thu, 2011-04-14 07:40

I'm getting a lot of questions from people and organizations that have heard that Brown’s gas can neutralize radioactive materials.

Organizations are trying to help Japan neutralize their radioactivity at the source. People are usually concerned and wanting to prepare for or deal with nuclear fallout.

First, in my opinion, there is no real danger of serious (dangerous) widespread (worldwide) radioactive contamination. Most of my readers are in America, Europe and Australia; all these areas will not receive enough radiation (from meltdown of Japanese reactors) to be too concerned about.

There are a lot of myths that have built up about radiation. Don't misunderstand me, it's a serious subject, but our bodies have evolved to be able to handle constant light doses which we get just by living on the planet.

There is radioactivity around us all the time. Everything that lives IS radioactive! Carbon absorbs and concentrates radioactivity from the sun. All the plants and animals we eat are radioactive. Living things start losing their radioactivity when they die... it's how scientists can 'carbon-date' how old bones are, by the 'lack' of radioactivity.

In fact, it's against the law (in the USA at least) to sell non-radioactive alcohol. Alcohol can be made (much cheaper) from coal but that would affect the revenue of people who make alcohol from plants. Coal is carbon that's been in the ground long enough to lose most of its radioactivity. So by mandating a certain level of radioactivity, the government prevents the manufacture of coal based alcohol.

So while I think it's a really good idea to have potassium iodine in your emergency preparedness kit, I do not think you need to get it now when the people who sell it are marking up the price to people who are panicking.

Put it on your TO DO list to get once the crisis is over, and the manufacturers reduce the price because of an over-supply due to producing for the current demand. It's good to be prepared because we do live in a world of CONCENTRATED radioactive 'accidents', and the American military seems to have no concern about dumping its nuclear waste as bullets on foreign soil.

Americans are largely unaware of the multiple nuclear accidents (and sometimes deliberate release of radioactivity for 'experimental' interest) that have occurred on or near their own continent. Large areas have been irradiated similar to what Japan is now experiencing and the public (because American news media is suppressed) are uninformed. I learn of these incidents when I travel to other countries. Also remember that Americans nuclear bombed Japan in the second world war and the Japanise recovered fast enough to put a lot of Americans out of work by selling electronics and cars of higher quality and less expensively than USA manufacturers.

My advice is, don't panic. Do pay attention and prepare for CONCENTRATED radioactivity, which will happen from time to time in the world. There are several things you can do to prepare, see below.
What can Brown’s gas do to help?

To answer that you need to understand that the only effective radioactive neutralization protocol I currently know of, that uses Brown’s gas, is to mix the radioactive material with approximately equal quantities of iron and aluminum (by volume) and heat the whole mixture to liquid (using a Brown’s gas flame). When the mixture is hot enough it will explode... not like a bomb, more like a firecracker.

Iron and aluminum make thermite (research thermite to learn the optimum quantities to use), and the Brown’s gas provides the special transmutation energy. Brown’s gas exhibits transmutative characteristics in other applications too, like processing ore.

Most materials are radioactive because the electrons have been stripped off the molecules; the nucleus then ejects particles of various kinds (radioactivity) to try to 'balance' the 'weight' (and transmute to a lighter, glasslike, material). Somehow, the molecules are able to use the special energy in the BG to complete this transmutation in seconds (instead of millennia), when the material is molten and given the shock of the thermite explosion.

So it's impractical to use Brown’gas, as far as I know, on anything that you don't want to destroy. The Brown’s gas 'explodes' the material and does the neutralization during the explosion. You need to affect the material on an atomic level to neutralize the radioactivity.

Also it's impractical to use Brown’s gas on any material that isn't concentrated radioactive. It takes electrical power to make the Brown’s gas, plus quantities of iron and aluminum to make the explosive reaction.

Thus, Brown’s gas works well to neutralize CONCENTRATED nuclear waste, like spent fuel rods or decommissioned warheads, but practically useless at remediation of radioactive materials that have dispersed into the general environment.

Brown’s gas has been proven (Canada government certified tests) to be an extremely effective, practical and inexpensive method to neutralize the radioactivity of materials generally produced by nuclear powerplants. The neutralization can be done onsite, eliminating the need for transportation and storage of nuclear waste.

There is a Canadian-based organization Planetary Association for Clean Energy (PACE) that has been lobbying for the Canadian government to use Brown’s gas to neutralize radioactive waste – with zero results. It seems that the nuclear industry does NOT want its waste neutralized. I think they see it as potentially useful to make small power sources (like nuclear batteries), bullets, etc.

I have assembled a bunch of information, (including a video showing the testing being done at the Canadian research reactor at Chalk River Ontario), that documents what I've just told you. No need to buy it unless you want to be involved with using Brown’s gas to neutralize concentrated radioactive materials.


Some Frequently Asked Questions

I am aware of the statements on your website indicating that you believe this application of Brown's gas is highly controversial and because of this you do not believe the time is ready to promote the use of Brown's gas to clean up radioactive waste.
Not entirely correct. I do promote the use of Brown’s gas to clean up radioactive waste. I just think that the people who own the waste think of it as having a residual value (for low-level energy production and assorted radiation applications) so do not want to destroy it. Also, the people contracted to store it have very powerful lobbyists and pretty much squash any (and there are several) means of neutralizing radioactive waste. So the time is right to promote it, because it works and is needed – but I do not expect it to be implemented unless the People can put more force on their representatives than the lobbyists.

You have gathered together material on cleaning up radioactive waste using Brown's gas (available on your website). You imply on your website that you and your company have done enough research to confirm this application of using Brown's gas works. Could you expand on what research you have performed to confirm that you can clean up radioactive waste using Brown's gas?

I have done NO personal work with radioactive materials. All work that I report about neutralizing radioactivity with Brown's gas has been done by individuals and organizations that are trained and competent to handle radioactive materials. I merely build the Brown's gas electrolyzers that they can use. Our WaterTorches are one of the most practical and efficient designs on the planet.

My research into using Brown's gas to clean up radioactive waste indicated that the process involved mixing or combining the radioactive material with other substances before applying a burning torch of Brown's gas to the combined material for a period of time. Could you explain your understanding of the protocol to use Brown's gas to clean up radioactive material?

My understanding is to mix the radioactive material with roughly equal parts of aluminum and iron by volume... then heat the whole mixture into a molten mass using Brown’s gas. As it turns to liquid and heats up, the aluminum and iron will turn to thermitie and pop. After the pop, the whole mass has 97% less radioactivity than it started with. The whole process takes only a few seconds. See the Chalk River video and data. http://www.eagle-research.com/cms/store/browns-gas

My understanding of the protocol for using Brown's gas to clean up radioactive waste, imply that it is best used to clean up physical blocks of radioactive material, rather than radioactive particles in the atmosphere etc. What do you believe are best applications of using Brown's gas to clean up radioactive waste?

As you stated, Brown’s gas works best on mass that has concentrated radioactivity.

What further research do you believe is necessary to make using Brown’s gas an effective process to clean up radioactive waste?

The 'batch' protocol exists and is both effective and practical. As far as I can see, there is no technical reason that prevents Brown’s gas from being used to neutralize concentrated radioactive materials. The bottlenecks for considering any type of neutralization are economic and political, as I explained above.

The statements on your website indicate that promoting Brown's gas to clean up radioactive waste is currently too controversial. What do you believe must have to happen to make this application of using Brown's gas more acceptable?

Convince the owners of the waste to let it go.
Links to Brown’s gas radioactive neutralization on the Internet.

BTW, if you want to download anything from YouTube I highly recommend the "Easy YouTube Video Downloader 6.7" for FireFox et al – the free version is fine (http://www.bestvideodownloader.com/).

New York State Assemblyman Dan Haley in 1993 or thereabouts discussing demonstration by Yull Brown; available from http://www.youtube.com/watch?v=FqImZpjqIgM and https://www.youtube.com/watch?v=3NWtX7lZYjM

Mark Porringa neutralizing americium-241 with, I believe, one of your units:
http://www.youtube.com/watch?v=1R5G5hTC7pc

Interesting lecture by a handsome man:
http://www.youtube.com/watch?v=E-dca5fVLTM

Tom Bearden's provisional patent application:
http://www.cheniere.org/patent%20application/claim.htm#nuclear

Various write-ups:
http://www.lnhatom.com/radwaste.html
http://www.rumormillnews.com/cgi-bin/archive.cgi?read=202659
http://pacenet.homestead.com/Transmutation.html
http://befreetech.com/techpage.htm

Things you can do to protect yourself personally:

Do not depend on the Government to help you; they will be too late and use ineffective techniques. Do not depend on the medical services to help you; their training is restricted to the same archaic, abusive, ineffective and expensive techniques. Do your own research to find simple, inexpensive, effective and practical health solutions that are not taught to Doctors and are suppressed by the AMA, FDA and other organizations. Watch Japan, because they have experience dealing with radioactivity on the scale of a bomb. Of course help if you can; they are our neighbors on this small, fragile environment we call Earth.

How To Make Sure Radioactivity Leaves Your Body As Quickly As Possible.

THE LONGER IT STAYS IN YOUR BODY THE LONGER IT WILL DESTROY YOUR CELLS. THIS CAUSES CANCER IN SOME PEOPLE VERY QUICKLY. This includes normal, so called, background radiation which we all receive on a daily basis (one of the reasons cancer has been rising very quickly – polonium, a daughter of radiation, is the culprit in all cancer patients tested by this Doctor.)

The information below is very timely and helpful re: radiation which includes background radiation. This research from Hulda Clark is some of the best, if not the best, research in the world on the immune system and the effects of radiation on same. This shows you how to get rid of the radiation that is coming into your body on a daily basis no matter the source.

This is worth your time in today’s world. Click on the link below to see two short videos. The second one gives you the meat of this information.
Combining Brown’s Gas with Bucking Magnetic Fields Inside a Plasma Ball

Hans Becker has conceived of a method where spent nuclear fuel pellets are dropped into a magnetic bottle. The fuel pellets are then destroyed by a combination of Sonne Ward’s implosion machine, Brown’s gas, and the Keller catalytic process.

Jana Dixon's “New Energy List” includes the following:

- www.rense.com/RodinAerodynamics.htm
- http://rodin.freelancepartnership.com/
- www.virtuescience.com/enneagram.html

Rodin Aerodynamics, Marko Rodin PO Box 7470. Hilo, Hawaii 96720. Telephone 1 (808) 935-1670. Email: rodinmath@gmail.com · www.rodinmath.com

The Rodin Coil can be used to create geometries in plasma which will be able to tap zeropoint energy. Till then we can use his electronics to increase efficiency in our wiring. It could be used to change the magnetism of metal objects.

It would be interesting to see what happens if you put two opposite wound coils on a shaft and run a current through them and rotate them in opposite directions...ie: bucking magnetic fields. Then if the air could somehow be made to show magnetic fields, it would be interesting to see what shape arises. This is kind of modeling the caduceus and the underlying toroid shape of nature. This is probably a free energy machine.

You might be able to contain a plasma ball in the middle of the magnetic lines of force with this double toroid...in which case it might be the preliminary work to establish a matter/antimatter energy propulsion and generating system.

Nassim and Marko
http://www.youtube.com/user/dwvand#p/a/u/6/_80ISFPryqc
http://www.youtube.com/user/dwvand#p/u/7/5pMEiJbOMJQ

Awesome Marko-Nassim videos...that explains the connection between the 9 and the singularity...between 9 and phi. This seems like a bottomless inquiry here.

In a dream I surmised the Phi spiral wound toward singularity to be the secret of spiritual evolution. In that going with the Phi so to speak prevents consciousness (light) lost via standing wave issonance/incoherence. This is the same thing as the perfect Phi relaxation toward singularity (or the emanation point) that is represented in Marko Rodin's Mathematical Fingerprint of God which is based on the number 9. This is a cosmological exploration of the Name of God which when spoken takes us back to "center" – towards the superconduction of coherent light.

Rodin alternates the blue and red wires in the sequence of 9 to get a bucking magnetic field. This bucking magnetic field must have something to do with tapping zeropoint.
If you were to wrap a sphere with a blue wire in the angle of phi surely it would cover the entire sphere and return to the starting point. Then you could wrap the sphere with a red wire in the angle of phi going in the opposite direction. Then if you run a current through the wires and spin the sphere, you should be able to contain a ball of free plasma in the middle.

A highly speculative idea.

**Three Anti-Gravity Spacecrafts for One-Way Trips Out of the Solar System**

“Space Travel Innovations” is linked at www.padrak.com/vesperman. The ebook includes three chapters on these anti-gravity spacecrafts:

**John Searl’s Magneto-Gravitational Converter (Searl Effect Generator)** – The magneto-gravitational converter (Searl effect generator) apparently can create a strong anti-gravity field in addition to generating electricity. It comprises of three concentric magnetic rings with magnetic rollers rolling around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

**David Hamel’s Gravito Magnetic Device** – The gravito magnetic device encloses opposing magnetic fields that have varying vector angles to produce a strong anti-gravity field.

**David Burns’ Anti-Gravity Flying Saucer** – A four-foot model of a self-propelled flying saucer flies under remote radio control. Its anti-gravity field is produced by a circular mechanism inside its relatively thin body.

Radioactive waste could conceivably be loaded into unmanned versions of these anti-gravity spacecrafts which are then launched from anywhere convenient on Planet Earth. They would never be seen again as they fly away from the sun – avoiding planets and asteroids on the way out of the solar system.

**Refresher-Regenerator**

By Gordon Ziegler

Abstract

A ‘Refresher-Regenerator’ machine has been theorized and costed that could reverse all radioactive isotopes to relatively safe uranium in situ in twelve days of machine time. This could be the ultimate solution to high and low-level radioactive wastes and contamination. The radioactive wastes would not need to be transported to, or stored inside Yucca Mountain for centuries. Positive side effects of the machine operation would be reverse aging adults to young adulthood, backing diseases out of existence, reversing all decay and pollution, providing a new means of food preservation, and disarmament in the active footprint of the machine in areas ranging by decades from 1.0 meter radius to over the radius of the earth orbit around the sun, etc.

For $70 million or less, we could design and build a Refresher-Regenerator machine in one year or less that could reverse the order-to-disorder arrow in the second law of thermodynamics in a machine footprint the radius of 1.0 meter to over the radius of the earth orbit around the sun. (See Table 1.) We live in a ubiquitous sea of negative-order energy, causing all processes and energy transfers to go from more order to more disorder. Creating and operating a Refresher-Regenerator would be like creating a small or large
island of positive-order energy in this sea of negative-order energy – causing all reactions and energy transfers on or in this island to go from more disorder to more order to the maximum state of order. In chemical or nuclear reactions, the direction of the reactions would be reversed.

According to the author’s research, the processes involved would be perfectly safe—far safer than what we now experience.

As seen above, the Refresher-Regenerator would have many positive uses, many not listed. It will be curious to find out which use will be the primary use of Refresher 1. Safely denaturing high-level radioactive wastes quickly and inexpensively could well be the first primary use of Refresher 1.

The Refresher-Regenerator capitalizes on a new Grand Unification Theory (GUT) employing the Electrino Fusion Model of Elementary Particles and the Electrino Hypothesis that fractons come in \( \pm e, \pm e/2, \pm e/4, \) and \( \pm e/8 \) – not in \( \pm 2e/3 \) and \( \pm e/3 \) of the Quark Hypothesis. Unique to this theory is that electrinons can fuse, but every time they do so, they switch from matter to antimatter or vise versa. The Refresher-Regenerator fuses positrons (antimatter) into the core particles of protons and neutrons (matter) with positive order energy, reversing the order-to-disorder arrow in the second law of thermodynamics in the machine footprint to disorder-to-order direction.

The control of the Refresher-Regenerator machine is through controlling the effective beam currents to the collision chamber of the positrons through the timed gating of beam peaks. (See Table 1.)

<table>
<thead>
<tr>
<th>For an area the size of</th>
<th>r</th>
<th>beam current</th>
</tr>
</thead>
<tbody>
<tr>
<td>A bed</td>
<td>1 m</td>
<td>100 pA</td>
</tr>
<tr>
<td>House</td>
<td>10 m</td>
<td>10 pA</td>
</tr>
<tr>
<td>4 football fields</td>
<td>100 m</td>
<td>1.0 pA</td>
</tr>
<tr>
<td>Community</td>
<td>1 km</td>
<td>100 fA</td>
</tr>
<tr>
<td>City</td>
<td>10 km</td>
<td>10 fA</td>
</tr>
<tr>
<td>Small nation</td>
<td>100 km</td>
<td>1.0 fA</td>
</tr>
<tr>
<td>Large nation</td>
<td>1,000 km</td>
<td>0.1 fA</td>
</tr>
<tr>
<td>Continent</td>
<td>10,000 km</td>
<td>0.01 fA</td>
</tr>
<tr>
<td>World</td>
<td>100,000 km</td>
<td>0.001 fA</td>
</tr>
<tr>
<td>Moon orbit</td>
<td>1,000,000 km</td>
<td>1.0(^{19}) A</td>
</tr>
<tr>
<td>Venus at times</td>
<td>1.0(^{10}) m</td>
<td>1.0(^{20}) A</td>
</tr>
<tr>
<td>Short of earth orbit of Sun</td>
<td>1.0(^{11}) m</td>
<td>1.0(^{21}) A</td>
</tr>
<tr>
<td>Over earth orbit of Sun</td>
<td>1.0(^{12}) m</td>
<td>.0(^{22}) A</td>
</tr>
</tbody>
</table>

**Table 1. Beam currents versus affected radius for reversal of the order to disorder arrow of the second law of thermodynamics.**

There is another important use of the refresher machine: A clean energy source (no carbon emissions and no radioactive wastes) is possible through electrino fusion technology, but not without a simultaneous operation of a refresher in their footprints.

For the theory of the Refresher, please see *Refresher 1*, by Gordon Ziegler, published by Xliebris (call 888-795-4274 ext. 7879).

Source: Gordon Zeigler’s February 25, 2014 email to Gary Vesperman
For an extensive discussion of Gordon Ziegler’s electrino fusion power reactor, see Gary Vesperman’s compilation of “130 Electrical Energy Innovations” in www.padrak.com/vesperman.

E.Coli Cleans Up Nuclear Waste Cheaply, Efficiently

by Ariel Schwartz, 09/22/09

E. coli bacteria does more than just make people sick — it can also be used to clean up nuclear waste, according to researchers at Birmingham University. The research team found that E. coli bacteria effectively breaks down phytic acid (a phosphate storage material found in seeds) and releases the phosphate molecules, which bind to uranium to create a uranium phosphate precipitate. The precipitate can be harvested to recover uranium, and voila – no more nuclear waste.

The uranium recovery process isn’t new. It was discovered in 1995, but scientists used an additive that was more expensive and less efficient than phytic acid. And since the price of uranium was low at the time, scientists saw no need to look into commercializing the process. But with an uptick in the price of uranium and the discovery of phytic acid’s effectiveness, the process has become economically viable. In addition to cleaning up nuclear waste sites, uranium recovered with the phytic acid process can be reused for nuclear energy. And for countries like the UK that lack natural uranium reserves, E. coli could be one of the keys to a low-carbon future.

Source:  http://inhabitat.com/e-coli-cleans-up-nuclear-waste-cheaply-efficiently/

Russian Process Uses Liquid Lead Bismuth to Trigger Transforming in the Form of Neutrons

Monday Dec. 7, 1998 Las Vegas Sun article:

Nuclear physicist Anthony Hechanova works at UNLV’s Harry Reid Center for Environmental Studies. He is studying a Russian process that uses liquid lead bismuth to trigger transforming in the form of neutrons. No working machine exists yet.

http://nstg.nevada.edu/research/fac_staff/Hechanova_Anthony.shtml

‘Hutchison Effect’ for Neutralizing Both Radioactive Waste and Dispersed Radioactivity

John Hutchison claims that by employing his ‘Hutchison effect’ via a specially designed Hutchison-Lazaryan electronic frequency generator, he can neutralize radioactive waste and also excess radioactivity dispersed over an area of several square miles and maybe up to within a radius of 75 miles. See his website www.liferaygroup.com.

For a video of Hutchison’s demonstration of transmutation of an alpha emitter with his ‘raygun’ see http://www.youtube.com/watch?v=0cnrMm4t7Ws&feature=youtu.be.

More of Hutchison’s videos can be linked at
An energy researcher has emailed Gary Vesperman that “I have tested some of his crystal cell batteries and they do work, very low power outputs nearly continuous,…”.

### A Cool Solution to Radioactive Waste Disposal

Author is Edwin Cartlidge, News Editor, Physics World – July 31, 2006

A group of physicists in Germany claims to have discovered a way of speeding up radioactive decay that could render nuclear waste harmless on timescales of just a few tens of years. Their proposed technique – which involves slashing the half-life of an alpha emitter by embedding it in a metal and cooling the metal to a few degrees kelvin – could therefore avoid the need to bury nuclear waste in deep repositories, a hugely expensive and politically difficult process. But other researchers are sceptical and believe that the technique contradicts well-established theory as well as experiment.

The leader of the German-based group, Claus Rolfs of Ruhr University in Bochum, is an astrophysicist and made the discovery about alpha decay after replicating the fusion reactions that take place in the centre of stars. Using the university’s particle accelerator he fired protons and deuterons (nuclei containing a proton and a neutron) at various light nuclei. He noticed that the rate of fusion reactions was significantly greater when the nuclei were encased in metals than when they were inserted into insulators. He also observed that the effect is enhanced at lower temperatures (*J. Phys. G: Nucl. Part. Phys.* 32 489).

Rolfs believed this effect could be explained in simple terms by assuming that the free electrons in a metal act like the electrons in a plasma, as described in a model by Dutch physicist Peter Debye. The lower the temperature of the metal, the closer the free electrons get to the radioactive nuclei. These electrons accelerate positively charged particles towards the nuclei, thereby increasing the probability of fusion reactions.

But Rolfs realized that the reverse reaction might also occur and that free electrons could enhance the ejection of positively charged particles from a nucleus. This would reduce the half-lives of α-decay or β+-decay, and increase half-lives for processes involving electrons (which are repelled by the free electrons within the metal), i.e. β--decay and electron capture.

The group has investigated this hypothesis by embedding a number of radioactive nuclei inside metals and then cooling the metal to a few degrees kelvin. As expected, they observed a longer half-life for the electron capture of beryllium-7 and shorter half-lives for β+-decay in sodium-22 (*Eur. Phys. J. A* 28 251) and α-decay in polonium-210. They are now investigating the α-decay of radium-226, a hazardous component of spent nuclear fuel with a half-life of 1600 years. Rolfs calculates that this half-life could be reduced to as little as a year and at the very least to 100 years, and believes that the half-lives of all other hazardous alpha emitters within nuclear waste could be shortened by similar amounts.

"This means that nuclear waste could probably be dealt with entirely within the lifetimes of the people that produce it." he says. "We would not have to put it underground and let our great-great-grandchildren pay the price for our high standard of living."
Rolfs admits that much engineering research needs to be done to convert his idea into practice, but he believes there are probably no insurmountable technical barriers. Other physicists, however, think that the basic idea may be flawed. According to Nick Stone, a nuclear physicist recently retired from Oxford University, physicists have already carried out experiments in which they cooled alpha emitters to 4 K and below, but found no significant changes in their half-lives.

Meanwhile, Hubert Flocard, director of the CSNSM nuclear-physics lab near Paris, believes that Rolfs' model contradicts standard solid-state physics, although he admits that he cannot explain the group's data himself. Rolfs concedes that he needs a more sophisticated theory, but stands by his results. "Nature decides what is right," he says.


**Piezonuclear Reactions in Solutions Cavitated by Ultrasound**

Physicist Fabio Cardone is one of the pioneers of piezonuclear reactions induced by cavitation. Andrea Rampado offers an interesting contribution on piezonuclear reactions drawn of its protagonists.

Monday, February 20, 2012

Following a growing interest in piezonuclear reactions induced by cavitation, I received a short note of explanation produced by the parties concerned and the discoverers of this new phenomenon. The brief note is necessary because recently, particularly in a blog edited by Dr. Camillo Franchini, were raised objections and criticisms of various types and of various kinds.

These objections and criticisms, legitimate and acceptable, expired, unfortunately, as often happens in speculation and provocation intended to ridicule and disparage not so much a scientific discovery, but the people involved.

A totally unscientific attitude and incomprehensible.

I leave space to note, that although short is very explanatory and full of interesting content.

Allow me to point out that the first of the 3 main arguments specified in the note is difficult to understand, CHEMICAL very few experts are able to understand its meaning – a drop of double-distilled and deionized water with a specific analysis of the elements contained in it in ppb (parts per billion) is able to possess all the elements that make up our planet with the exception of the rare earths – is basically our fingerprint.

Happy reading

Andrea Rampado

**BRIEF NOTES ON PIEZONUCLEAR CAVITATION**

BY Fabio Cardone, Giovanni Cherubini, Roberto Mignani, Walter Perconti, Aelianus Pessa, Andrea Petrucci, Francesca Rosetto, Guido hopes.
WITH THE APPROVAL OF Aracu Antonio, John Albertini, Claudio Bertoli, Alberto Carpinteri, Andrea Dodaro, Joseph Lacidogna, Amedeo Manello, Manello Andrea, Francesco Mazzuca, Massimiliano Monti, Fabio Pistella, Filippo Ridolfi, Walter Hall, Emilio Santoro, Massimo Sepielli, Sixth Viticoli.


This fact indicates that our work is not made of mere conjecture or hypothesis inventive. However, the subject of our research is absolutely like new and everything new (especially in physics) meets most objections that approvals. Nevertheless, some examiners have considered our reports and convincing evidence in the manuscripts.

We wish to emphasize that each feature of the experimental device, from which are obtained emission of pulses of neutrons, is absolutely crucial for reproducible results.

It is impossible and even wrong to think that any one device which produces cavitation can generate this new type of nuclear reactions and produce pulses of neutrons as is suggested by some research groups. The statement about the critical nature of the project of the experimental apparatus should not sound strange, since we are dealing with something completely new compared our knowledge of physics. It's up to us to first understand how to produce the effect, and then as reveal, and do not assume that the effect manifests itself, however, with any device cavitation that is available to anyone.

We have worked on three main topics: Cavitation of doubly distilled deionized water and in which are found abnormal changes in the concentration of the elements; cavitation of solutions of iron from which they were obtained pulses of neutrons without gamma emissions above the background level; cavitation of solutions of a radionuclide, which is apparently a decrease of the radioactivity obtained more quickly than is the case for the natural decay. Regarding the first and the second argument, we conducted several experiments with 100% repeatability and the only observation of the examiners was about the emission of neutrons. In any circumstance argued regarding the use of passive bubble detectors are used to detect neutrons. They suggested to use instead the detectors active boron trifluoride. We followed their suggestion and conducted numerous experiments with this type of detector and obtained evidence of pulses of neutrons absolutely compatible with those obtained with the bubble detectors. All of this can be found by comparing the works "from Piezonuclear Neutron Reactions" and "Piezonuclear Neutrons", where you can find also that a third type of passive detector (CR39 polycarbonate shielded with boron) was also used and that the evidence obtained with the CR39 were compatible with those of the detectors in bubbles and boron trifluoride. No other objection or observation on the cavitation of solutions of iron and the emissions of neutrons has been advanced so far.

Let us now turn to the results obtained with solutions containing a radionuclide (thorium-228).

We conducted this type of experiment once (but with 12 samples each of which consists of an experiment in itself) because of technical difficulties in the treatment of radioactive substances and the obvious health concerns. An experiment with a positive or negative result is absolutely far from conclusive due to insufficient statistical results. The sole purpose of this work was to bring to the attention of others to the fact that apparently the cavitation also affects the radioactive nuclei and that this opens new perspectives for research.
So the comments of others do not add anything new to what anyone might say about this stage of the preliminary results.

As long as the observations are made without conducting new experiments it is difficult to say something new or reveal deficiencies in our work which we are not already well aware of.

However, a group of Canadian researchers published in Physics Letters A their work entitled "Measurement of the thorium-228 activity in solutions cavited by ultrasonic sound" that relate experimental evidence that claim to be contrary to our evidence on thorium. We give the reference for convenience (Physics Letters A 374 (2010) 701-703, R. Ford, M.Gerbier-Violleau, E.Vázquez-Jáuregui).

Their experiment is a perfect example of how this type of experiments MUST NOT be done in the sense that we have said before that is the criticality of the device. If you read our papers and theirs, you will soon become aware of the huge differences and that their equipment does not apply to the cavitation solution containing thorium-228 because they enclosed this solution in small cylinders. That precaution prevents ultrasound from suitably affecting thorium.

Here's the link to Arxiv (http://arxiv.org/abs/1001.5391) where you can find our objections to this Canadian experiment and suggestions on how to conduct experiments with piezonuclear reactions.

**BRIEF NOTES ON PIEZONUCLEAR CAVITATION**

EDITED BY Fabio Cardone, Giovanni Cherubini, Roberto Mignani, Walter Perconti, Aelianus Pessa, Andrea Petrucci, Francesca Rosetto, Guido hopes.

WITH THE ASSENT OF Aracu Antonio, John Albertini, Claudio Bertoli, Alberto Carpinteri, Andrea Dodaro, Joseph Lacidogna, Amedeo Manuello, Manuello Andrea, Francesco Mazzuca, Massimiliano Monti, Fabio Pistella, Filippo Ridolfi, Walter Hall, Emilio Santoro, Massimo Sepielli, Sixth vine.

The results on piezonuclear cavitation have already been published in peer reviewed journals like Physics Letters A, International Journal of Modern Physics B and E, Journal of Radioanalytical and Nuclear Chemistry, Annals of the Foundation of Louis de Broglie (at the end of these notes there can be found a list of papers including the book on the theory foreseeing these new phenomena).

This indicates that fact our work is not made of mere conjectures or inventions. However, the subject of our investigation is indeed new and like anything new (in physics above all) encounters blackberries than frowns approvals. Nonetheless, some referees deemed convincing evidences and our reports in the papers.

We would like to stress that every characteristic of the experimental set-up, from which we obtained emission of neutron bursts, is crucial for achieving compatible results. It is impossible and even wrong to imagine that any equipment for producing cavitation may generate this new type of nuclear reactions and produce neutron bursts as some research team hypothesized. The statement about the criticality of the design of the experimental set-up should not sound strange, since having to do with something completely new to our physical knowledge, it is up to us to understand how we can produce the effect first and then detect that and not assumed, by the cavitation equipment at one's disposal, the effect will show up anyway.

We have been dealing with three main subjects: Cavitation of bi-distilled deionised water in which we found out anomalous changes of concentration of elements; cavitation of solutions of iron obtained from which we bursts of neutrons without gamma emission above the background level; cavitation of solutions of a radionuclide, from obtained in which we apparently decrease of radioactivity blackberries quickly than
it would happen through natural decay. As to the first and second subjects, we performed many experiments with 100% of compatibility, and the only remark from the referees was about neutron emission. Every time they frowned on the passive bubble detectors that we used to detect neutrons.

They suggested using boron trifluoride active detectors instead.

We followed their suggestion and performed many experiments by this type of detector and achieved evidences of neutron bursts absolutely compatible with those obtained by bubble detectors. All of this can be found by comparing the papers "Neutrons from Piezonuclear Reactions" and "Piezonuclear Neutrons", where you will find also that a third type of passive detectors (CR39 polycarbonate screened by boron) was used as well and that the evidences obtained by CR39 were compatible with those of bubble detectors and boron trifluoride. No objections or other remarks on cavitation solutions of iron and neutron emission not have been put forward since then.

Let us move now to the results obtained with solutions containing a radionuclide (Thorium-228).

We performed this type of experiments with only two ounces due to the technical difficulties of dealing with radioactivity and the obvious concerns about health. Anyway we used not less than 12 samples in order to get enough confidence with the results.

One experiment with either positive or negative evidences is absolutely far from being conclusive due to the lack of sufficient statistics of results. The only purpose of this paper was to let people know that apparently cavitation affects radioactive nuclei That this too and open new perspectives of research. Thus, the comments by anybody do not add anything new to what everyone of us would say about these early stage results.

As long as the remarks are made without performing new experiments, they will hardly say anything new or point out any shortcoming of our paper that we are not aware of.

However a Canadian research team published a paper on Physics Letters A entitled "Measurement of the thorium-228 activity in solutions cavitated by ultrasonic sound" in which they report experimental evidences that they claim to be against our evidences about thorium.


Their experiment is the perfect example of how these kind of experiments MUST NOT be done in the sense that we mentioned above, i.e., the criticality of the equipment. If you read our papers and theirs, you will soon become aware of the huge differences and that their equipment does not apply to the cavitation solution containing thorium-228 because they enclosed this solution in small cylinders. That precaution prevents ultrasound from suitably affecting thorium.

Here is the link to Arxiv (http://arxiv.org/abs/1001.5391) where you can find our remarks on this Canadian experiment and suggestions about how to perform experiments of piezonuclear reactions.

LIST OF REFERENCES


http://www.worldscinet.com/ijmpe/15/1504/S0218301306004600.html
DOI No: 10.1142/S0218301306004600
http://dx.doi.org/10.1142/S0218301306004600

Las Vegas energy expert Robert Nelson (see his www.rexresearch.com) has found these patents by Fabio Cardone:

WO2008041254  Apparatus and process for the production of neutrons by means of ultrasounds and the cavitation of substances
Fabio Cardone
Abstract -- The invention relates to an apparatus and a process for the production of neutrons in doses which are not dangerous for living beings, starting from stable elements by means of insonation or sonication using an electromechanical transducer, called a sonotrode-cavitator, characterized in that said...
electromechanical transducer comprises a stack of piezoelectric elements mechanically connected to a sonotrode of such a size as to operate at its own resonance frequency as a function of the electrical activation energy applied to said piezoelectric elements. The process is conducted in the liquid phase, preferably in the presence of iron ions at atmospheric pressure in an open environment to make the bubbles naturally present in the liquid phase implode.

WO2008041255  Process and plant for the production of endothermic and exothermic piezonuclear reactions by means of ultrasounds and the cavitation of substances

Fabio Cardone
Also published as: ITRM20060522

Abstract -- The invention relates to a process and plant for the production of endothermic and exothermic piezonuclear reactions by means of ultrasounds and the cavitation of substances. The plant comprises in sequence a storage tank for the working liquid containing an active medium in solution and/or in suspension, said storage tank being connected up to a cavitation chamber in which the piezonuclear reactions take place. In the case of exothermic reactions, there is production of vapour under high pressure, which is then conveyed to a turbine for the production of mechanical energy or electrical energy by means of an alternator or equivalent; the process is accompanied by the secondary phenomenon of production of material different from that making up the working liquid. In the case of endothermic reactions, there is consumption of electrical energy for the generation of piezonuclear reactions that produce substances regarded as useful starting from the working liquid available.

WO2008041253  Apparatus and process for the quenching of the radioactivity of radioactive materials by means of piezonuclear reactions induced by ultrasounds and cavitation

Fabio Cardone

Abstract -- The invention relates to an apparatus and a process for reducing the radioactivity of natural and/or artificial elements through piezonuclear reactions generated by means of insonation or sonication using an electromechanical transducer. The apparatus is characterised in that said electromechanical transducer comprises a stack of piezoelectric elements mechanically connected to a sonotrode of such a size as to operate at its own resonance frequency as a function of the electrical activation energy applied to said piezoelectric elements, to obtain the cavitation of the bubbles present in the liquid in which the radioactive substances are to be placed.

Dispositivo e metodo per rilasciare neutroni
ITMI20110553

Metodo per la produzione di nuclidi mediante ultrasuoni e cavitazione.
ITRM20020563

Patience Pays Off with Methanol for Uranium Bioremediation

Summary:

Uranium contamination is a devastating legacy of nuclear weapon and energy development, but new testing has shown that adding organic molecules can positively affect the bioremediation of uranium, converting it to a solid mineral and sequestering it within the sediment.

The legacy of nuclear weapons and nuclear energy development has left ground water and sediment at dozens of sites across the United States and many more around the world contaminated with uranium.
The uranium is transported through ground water as uranyl (U\(^{6+}\)). In one bioremediation strategy, uranium immobilization in contaminated ground water and sediment may be achieved by the addition of organic molecules known as electron donors to stimulate microbial activity. The microbial community utilizes the electron donors as ‘food’, consuming all of the available oxygen during aerobic respiration. Once the ground water becomes anaerobic, U\(^{6+}\) may be converted to U\(^{4+}\) as UO\(_2\), a solid mineral, sequestering the uranium within the sediment. Researchers have been investigating the effectiveness of various electron donors, but have been frustrated by residual U\(^{6+}\) which is not converted to insoluble U\(^{4+}\).

A team of scientists from Oak Ridge National Laboratory has investigated effectiveness of several electron donors for uranium bioremediation in a study funded by the Department of Energy’s Environmental Remediation Sciences Program. Madden et al. report that the particular electron donor chosen affects not only the rate of uranium removal from solution, but also the extent of U\(^{6+}\) conversion to U\(^{4+}\). Results of the study were published in the January-February issue of the Journal of Environmental Quality.

Microcosm experiments containing uranium-contaminated sediment and ground water demonstrated equivalent rapid uranium reduction when amended with ethanol or glucose. In contrast, reduction was delayed by several days when microcosms were amended with methanol. Spectroscopic analyses of uranium oxidation state in stimulated microcosm sediment slurries demonstrated almost complete uranium reduction when methanol was the donor, as compared with less than half reduced using ethanol or glucose. However, addition of methanol did not always result in uranium reduction. These results suggest that the use of donors such as methanol which are not as readily and rapidly coupled to microbial metal reduction may lead to increased stability of the subsurface towards uranium immobilization.

Research is ongoing at Oak Ridge National Laboratory to investigate the effectiveness of various electron donors for long-term uranium immobilization. Further research is needed to understand the coupling between the microbial community and the biogeochemical processes that occur to immobilize the uranium. While previous research has focused on individual groups of bacteria which most efficiently reduce uranium, these results suggest the need for understanding the microbial community system.

Story Source: The above story is based on materials provided by Crop Science Society of America. Note: Materials may be edited for content and length.

Journal Reference:


Source: http://www.sciencedaily.com/releases/2009/02/090223121411.htm

**GE Hitachi Plans to Turn Nuclear Waste into Fuel**

by Ariel Schwartz, 02/18/10

President Obama’s recent announcement that the U.S. government will offer $8 billion in federal loan guarantees for the first new nuclear plant in the country in 30 years upset clean energy advocates for a number of reasons. One of the biggest problems: All that radioactive waste. Now GE Hitachi Nuclear
Energy, one of the world’s biggest suppliers of nuclear reactors, claims that it can safely turn nuclear waste into fuel. Goodbye, Yucca Mountain.

GE’s process separates nuclear waste into three streams: Waste material that needs to be stored underground for a few hundred years (vs. thousands of years for standard nuclear waste), uranium that can be used in deuterium uranium reactors, and a mixture of transuranic elements (plutonium and neptunium) that can be used as fuel in nuclear reactors that use molten sodium as a coolant.

In the past, the idea of repurposing nuclear waste into fuel has been criticized because of the potential for terrorists to steal the pure plutonium produced as part of the process and use it for nuclear weapons. But GE Hitachi’s fuel is difficult to steal because the plutonium isn’t separated from other elements, making it difficult to detect.

The fuel is far from perfect – deuterium uranium reactors are only found in Canada and molten sodium-cooled reactors haven’t yet been approved in the U.S. – but if the Obama administration is serious about bringing even more nuclear power plants into the world, it might want to look into GE Hitachi’s process.


China Finds Way to Extend Life of Nuclear Fuel 60 Times

by Brit Liggett, 01/04/11

The Chinese government just announced they’ve made a breakthrough in nuclear fuel reprocessing technology that would increase the reuse rates of nuclear fuel by 60 fold. Though nuclear power remains a touchy subject in the United States, countries around the world – like France, the UK and Russia – are turning to it as a ready-for-the-market technology that can wean them off coal-fired power plants in order to reduce emissions. Reprocessing, disposal and mining are at the top of the list of nuclear energy concerns, but if China’s new breakthrough proves fruitful it could help to diminish the problems that arise with all three.

At present 70% of China’s energy comes from coal-fired plants – that’s a lot of energy driven pollution – and they are making strides to change that number. The country currently has about 10 gigawatts of nuclear energy generation capacity and hopes to increase that to 40 gigawatts by 2020. However, at that increase rate – and with current technology – China’s supply of uranium would only last them 50-60 years. As Chinese Central Television noted, “With the new technology, China’s existing detected uranium resources can be used for 3,000 years.” This new development has Chinese authorities bringing their 2020 nuclear energy generation mark up to 80 gigawatts.

Costs, technology and the threat of nuclear weapons proliferation have impeded the use of nuclear fuel reprocessing in the past. Though the Chinese government is holding close the secrets of how exactly this new technological breakthrough works, it would definitely solve the second problem on that list. They’ve announced nothing about the cost of the technology. But if it truly extends their uranium resources 3,000 years, it would possibly have a payoff down the line – however expensive it might be now. Opponents of nuclear power state that uranium mining is extremely destructive, and while this technology could greatly reduce it, it doesn’t solve a lot of their other concerns. We’ll have to hold tight until we see the scientific merits of this new reprocessing technique before we jump on board. Nuclear power is historically an extremely touchy process and adding a complex element to its production could open a whole new door to nuclear power plant disasters.
Nuclear Fusion-Fission Hybrid Could Contribute to Carbon-Free Energy Future

Jan 27, 2009

Physicists at The University of Texas at Austin have designed a new system that, when fully developed, would use fusion to eliminate most of the transuranic waste produced by nuclear power plants. The invention could help combat global warming by making nuclear power cleaner and thus a more viable replacement of carbon-heavy energy sources, such as coal.

"We have created a way to use fusion to relatively inexpensively destroy the waste from nuclear fission," says Mike Kotschenreuther, senior research scientist with the Institute for Fusion Studies (IFS) and Department of Physics. "Our waste destruction system, we believe, will allow nuclear power – a low-carbon source of energy – to take its place in helping us combat global warming."

Toxic nuclear waste is stored at sites around the U.S. Debate surrounds the construction of a large-scale geological storage site at Yucca Mountain in Nevada, which many maintain is costly and dangerous. The storage capacity of Yucca Mountain, which is not expected to open until 2020, is set at 77,000 tons. The amount of nuclear waste generated by the U.S. will exceed this amount by 2010.

The physicists' new invention could drastically decrease the need for any additional or expanded geological repositories.

"Most people cite nuclear waste as the main reason they oppose nuclear fission as a source of power," says Swadesh Mahajan, senior research scientist.

The scientists propose destroying the waste using a fusion-fission hybrid reactor, the centerpiece of which is a high-power Compact Fusion Neutron Source (CFNS) made possible by a crucial invention.

The CFNS would provide abundant neutrons through fusion to a surrounding fission blanket that uses transuranic waste as nuclear fuel. The fusion-produced neutrons augment the fission reaction, imparting efficiency and stability to the waste incineration process.

Kotschenreuther, Mahajan and Prashant Valanju, of the IFS, and Erich Schneider of the Department of Mechanical Engineering, report their new system for nuclear waste destruction in the journal Fusion Engineering and Design.

There are more than 100 fission reactors, called ‘light water reactors’ (LWRs), producing power in the United States. The nuclear waste from these reactors is stored and not reprocessed. (Some other countries, such as France and Japan, do reprocess the waste.)

The scientists' waste destruction system would work in two major steps:

First, 75 percent of the original reactor waste is destroyed in standard, relatively inexpensive LWRs. This step produces energy, but it does not destroy highly radiotoxic, transuranic, long-lived waste, what the scientists call ‘sludge’.
In the second step, the sludge would be destroyed in a CFNS-based fusion-fission hybrid. The hybrid's potential lies in its ability to burn this hazardous sludge, which cannot be stably burnt in conventional systems.

"To burn this really hard to burn sludge, you really need to hit it with a sledgehammer, and that's what we have invented here," says Kotschenreuther.

One hybrid would be needed to destroy the waste produced by 10 to 15 LWRs.

The process would ultimately reduce the transuranic waste from the original fission reactors by up to 99 percent. Burning that waste also produces energy.

The CFNS is designed to be no larger than a small room, and much fewer of the devices would be needed compared to other schemes that are being investigated for similar processes. In combination with the substantial decrease in the need for geological storage, the CFNS-enabled waste-destruction system would be much cheaper and faster than other routes, say the scientists.

The CFNS is based on a tokamak, which is a machine with a 'magnetic bottle' that is highly successful in confining high temperature (more than 100 million degrees Celsius) fusion plasmas for sufficiently long times.

The crucial invention that would pave the way for a CFNS is called the Super X Divertor. The Super X Divertor is designed to handle the enormous heat and particle fluxes peculiar to compact devices; it would enable the CFNS to safely produce large amounts of neutrons without destroying the system.

"The intense heat generated in a nuclear fusion device can literally destroy the walls of the machine," says research scientist Valanju, "and that is the thing that has been holding back a highly compact source of nuclear fusion."

Valanju says a fusion-fission hybrid reactor has been an idea in the physics community for a long time.

"It's always been known that fusion is good at producing neutrons and fission is good at making energy," he says. "Now, we have shown that we can get fusion to produce a lot of neutrons in a small space."

Producing an abundant and clean source of ‘pure fusion energy’ continues to be a goal for fusion researchers. But the physicists say that harnessing the other product of fusion – neutrons – can be achieved in the near term.

In moving their hybrid from concept into production, the scientists hope to make nuclear energy a more viable alternative to coal and oil while waiting for renewables like solar and pure fusion to ramp up.

"The hybrid we designed should be viewed as a bridge technology," says Mahajan. "Through the hybrid, we can bring fusion via neutrons to the service of the energy sector today. We can hopefully make a major contribution to the carbon-free mix dictated by the 2050 time scale set by global warming scientists."

The scientists say their Super X Divertor invention has already gained acceptance in the fusion community. Several groups are considering implemented the Super X Divertor on their machines, including the MAST tokamak in the United Kingdom, and the DIIID (General Atomics) and NSTX (Princeton University) in the U.S. Next steps will include performing extended simulations, transforming the concept into an engineering project, and seeking funding for building a prototype.
The illustration in http://cdn.physorg.com/newman/gfx/news/ hires/2009/nuclearfusion.jpg shows how a compact fusion-fission hybrid would fit into a nuclear fuel cycle. The fusion-fission hybrid can use fusion reactions to burn nuclear waste as fuel (people are shown for scale). It would produce energy and could be used to help destroy the most toxic, long-lived waste from nuclear power. The hybrid would be made possible by a crucial invention from physicists at the University of Texas at Austin called the Super X Divertor. Credit: Angela Wong

Source: http://phys.org/news152284917.html#jCp

Accelerator-Driven Transmutation of Nuclear Waste

Advanced Accelerator Applications and Transmutation of Nuclear Waste
March 13, 2002

Denis E. Beller, Ph.D.
Los Alamos National Laboratory and University of Nevada, Las Vegas

ABSTRACT: In 1999 the U.S. Department of Energy developed a roadmap for research, development, demonstration, and deployment of Accelerator-driven Transmutation of Waste (ATW) from used nuclear reactor fuel. The concept of ATW is being examined in the U.S. because removal of plutonium and minor actinides from the used fuel, as well as iodine and technetium – two very long-lived (roughly one million year half-lives) isotopes that are candidates for transport into the environment via ground water movement – could achieve some important objectives. Plutonium would be nearly eliminated, the inventory and mobility of long-lived radio-nuclides in the repository would be reduced, and the energy content of the used fuel could instead be exploited in producing power. In this presentation Dr. Beller will discuss current philosophy for accelerator-driven transmutation, physics and other bases of transmutation, technology advances, and R&D challenges. He will describe ongoing research and development initiatives at the national laboratories, universities, and international institutes. Past, current, and future academic and international participation that is critical to the success of this project will be presented. He will also discuss alternate deployment scenarios (multi-tier approaches) in view of a renaissance in the U.S. nuclear industry and a change in recycling philosophy, and will report the current status of the AAA program.

BIO: Denis E. Beller (Ph.D., Purdue Univ., 1986; M.S.N.E, Air Force Inst. of Tech., 1981; B.S.Ch.E., Univ. of Colorado, 1976) has a background in engineering design and analysis and in management of defense systems. Dr. Beller's research activities have included design and analysis of conceptual systems for nuclear effects testing with inertial confinement fusion, conceptual design of nuclear-pumped lasers, systems studies of long-term national and global deployment of nuclear energy, and formulation and testing of solid rocket propellants (including propellant formulations that were used in Operation Desert Storm). He also managed a rocket test facility, a nuclear detection laboratory that monitored radioactive emissions to support Safeguard D of the Nuclear Test Ban Treaty, and an intelligence division that collected and disseminated foreign science and technology information. After graduation from Purdue in 1986, Dr. Beller was a professor at the Air Force Institute of Technology, where he taught graduate nuclear engineering (weapons effects) to military officers for more than seven years. As a result of teaching, research, and professional activities, the faculty selected him as the first tenured military professor in AFIT's 70-year history. Dr. Beller is currently enjoying a sabatical from Los Alamos to the Harry Reid Center for
Environmental Studies at the University of Nevada, Las Vegas, where he coordinates university participation for the LANL AAA Program, UNLV, and other universities. He is best known amongst the nuclear science and technology community as the co-author of a *Foreign Affairs* essay that, according to the Congressional Record, “sparked renewed debate of nuclear energy’s role” as a non-emitting domestic energy source.

**Mark Porringa’s Candidate Techniques for Clean-Up of Nuclear Waste**

June 14, 2002, long-time friend, physicist, and email correspondent Andrew Michrowski, Ph.D., emailed Gary Vesperman two reports. Dr. Michrowski is with The Planetary Association for Clean Energy, Inc. (in French La Société planétaire pour l'assainissement de l'énergie, inc), 100 Bronson Avenue / Suite 1001, OTTAWA, Ontario K1R 6G8 (613) 236-6265 fax: (613) 235-5876 pacenet@canada.com http://pacenet.homestead.com.

One report is a copy of Bill C-27 submitted to Canada’s Standing Senate Committee on Energy, the Environment and Natural Resources as “An Act respecting the long-term management of nuclear fuel waste”. The other report was written by Mark Porringa of Zeropoint Techtonix Inc, 430 Bass Lake Road, RR # 1, Deep River, Ontario K0J 1P0 (613) 584-2960 fax: (613) 584-4616 porringam@aecl.ca. The text of Porringa’s brief descriptions of nine alternative, peer-reviewed techniques as candidates for the global clean-up of nuclear waste is copied below unless utilized elsewhere in this compilation of radioactivity neutralization methods.

**Advanced Nuclear Waste Decontamination Technologies**

The following is a reasonably comprehensive list of potentially effective nuclear waste treatment methods that might be employed to treat the entire range of radioactive wastes that have proven to be such a daunting and horrendously expensive problem for the nuclear industry (in all its forms) with major, long-term implications for the environment.

A wide variety of methods will probably be required to accommodate the many different radioactive waste sources including high and low level, solids, liquids and gases. Process names used here are in some cases just convenient labels used to categorize and set them apart from each other.

Theories on several of these processes are still quite speculative and solid evidence that would pass conventional peer review is still lacking. This is after all a very new field of science.

Some of these technologies are already well protected by international or national patents, with additional US and international patents pending, and further patents may be obtained on new developments as they are made.

**Photoremediation**

The *Photoremediation* process of the American Dr. Paul Brown is essentially conventional physics, *albeit* applied in a new and novel way. The process involves the use of a high-energy electron beam impinged on a target which in turn produces a monochromatic gamma radiation that is tuned to induce *photofission* and *photoneutron* reactions in the target material causing rapid neutralization of radioactive isotopes. The
efficiency claimed exceeds 500% due to the high cross-section reactions in the giant dipole resonance region. The 10 million electron-volt (MeV) electron beam produces typical fission reactions in the 200 MeV range effectively turning high-level solid wastes such as spent fuel into an energy source. The process is apparently intended for on-site treatment with some waste-partitioning required, an aspect which may not be desirable in certain countries.

While this idea is similar in topology to a system being developed by Los Alamos National Labs, Dr. Paul Brown’s approach offers several advantages: no need for extensive chemical pre-processing and the energy required to effect transmutation is greatly reduced. No new technology needs to be developed, yet the engineering of such a photon reactor must be completed and it could itself become a practical method for generating power.


Plasma Induced/Injected Transmutation Processes

Plasma induced/injected transmutation processes include a gamut from recent achievements dating back to the Oshawa-Kushi cold plasma transmutations reported in 1964. The patented High-Density Charge Cluster (HDCC) process was first discovered by Kenneth Shoulders and added on to by Harold E. Puthoff. Later, the late Stan Gleeson discovered HDCC in properly processed solutions. Still later, Alexander Ilyanok of Belarus discovered HDCC, followed by Vasiliy Baraboskin in Russia.

The production of condensed charge clusters and various plasma glow discharge phenomena in a variety of gaseous atmospheres is again implicated as the underlying cause with what should be by now an obvious connection with the coherence of zero-point energy from the quantum or stochastic vacuum. Desk-top high energy particle accelerators have also been envisioned, based on the “piggy back” principle, in which the clusters permit acceleration of “piggy-backed” heavier ions to extremely high energies capable of causing fusion and transmutations in target materials including those in solution and the materials of which the electrodes are composed. Brown’s gas implosion and cavitation bubble collapse reactions are also believed to be prevalent in these types of cells due to the prevalence of electrolysis.

A high-density charge cluster technology was discovered and used by Stan Gleeson to stabilize radioactive liquid wastes and has been developed further in the last 4 years by a group led by S-X Jin and Hal Fox. Best results for radioactive liquids have been demonstrated in the processing of thorium for a 30-minute period and achieving a reduction of radioactivity of about 90% from a liquid sample.


His POC is
Robert Bass
Dallas, Texas (?)
702-387-7213
817-682-2655
817-377-7638
817-370-7109
ZIPP Fusion

The ZIPP fusion process, identified by Mark Porringa, induces a wide variety of fusion reactions, resulting from the radial compression of individual diatomic and other simple molecules dissolved or suspended in a light water, carbon arc electrolysis cell. A variety of other cell configurations are envisioned.

The process appears to produce only stable isotopes, which should therefore make it capable of stabilizing a wide variety of radioactive waste materials. The theory on the process draws from condensed charge phenomena, Brown’s gas implosion, cavitation bubble collapse and sonoluminescence – all variations of the Casimir effect – which is believed to cohere the zero-point energy of quantum vacuum fluctuations. Transmutations using variations of this basic process may be applicable to a wide variety of nuclear wastes and appears capable of operating with an efficiency exceeding 100%.

A major implication of this process is that the strong force of the nucleus is understood as an ultra close range Casimir effect. Oakridge Nuclear Laboratories in the US in conjunction with several international collaborators have just (this month, in fact) announced a deuterium cold fusion process based on the essential elements of the ZIPP fusion process first reported in 1998. The process is very simple and inexpensive to develop.

RIPPLE Fission

The RIPPLE fission process is an adaptation of existing potential technology utilizing a supersonic ionized gas to aerosol a counter flow heat exchanger that envelopes the radioactive waste aerosol in a vacuum induced plasma vortex which appears to disrupt the matter stabilizing influence of the quantum vacuum fluctuations resulting in “gentle” low recoil fission reactions which produce only stable fission products, with excess neutrons being prompt converted to protons via quenched beta emissions. The process is apparently proven with conventional non-radioactive wastes and is believed applicable to the entire spectrum of radwaste without the need for waste partitioning. This process is also conjectured to operate with an over-unity efficiency.

LENTEC Processes

The Low Energy Nuclear Transmutation Electrolytic Cells of the Cincinnati group produce a variety of transmutation reactions using a variety of exotic electrolysis cell designs that generally produce condensed charge clusters composed primarily of up to $10^{11}$ electrons each. These electron charge clusters produced with the use of special electrodes can penetrate the nuclei of larger atoms in solution and transmute these atoms into stable elements.

The range of design and operating protocols and potential applications are essentially limitless provided for the waste that is dispersed in the electrolyte. The reported transmutation of thorium to stable titanium and copper by the Cincinnati Group and by the Salt Lake City group is one of the more dramatic examples of this type of treatment process. Application to other high-level liquid transuranic fissionable wastes such as surplus plutonium seems likely. The glaring absence of normal fission yield energies is perplexing but probably explicable as another form of low recoil fission reaction, similar to RIPPLE fission.
Kervran Reactions

The very compelling evidence compiled by French Nobel candidate Dr. Louis Kervran has identified a wide range of nuclear transmutations in biological systems that have not been adequately explained. Coherence of zero-point energy via Casimir effects within the Somatid particles identified by the Canadian Gaston Naessens is implicated as a possible cause. A wide variety of in vitro and in vivo reactions are believed to be possible as proven in nature and numerous experiments typically involving a reaction medium composed of a dielectric fluid such as water. Highly radiation resistant microorganisms have been found thriving in the core of nuclear reactors indicating the possibility of microorganisms being capable of transmuting some bioactive nuclear wastes in the course of the normal metabolism of such organisms.

The AmoTerra Process

The AmoTerra process involves confined explosions involving proprietary mixtures of materials that include radioactive waste. Ignition of such mixtures causes nuclear transmutations resulting in reduced radioactivity (to near-background levels) following combustion, gradually over 1 to 4 days. This technique has been confirmed by the Italian ENEA and is supported by the French CEA scientists as a serious candidate for treatment of waste stockpiles. The system, as currently designed, required waste to be inserted into a chamber.

Currently, AmoTerra Corporation, through its wholly owned Canadian subsidiary, “Total Environmental Solutions, Inc.” holds an “Approval” (licence) from the Ministry of Environment in British Columbia, Canada, to show that its process can be used to deplete low-level radioactive waste on a commercial scale. The company facility is located in Kamloops, B.C. The process has been independently monitored since 2002 by a number of distinguished scientists, including (among others) Dr. John Coleman, Senior Research Scientist, MIT (now passed), Dr. Philippe Duport, Director, Low-Dose Radiation, University of Ottawa (recently retired), and Dr. John Johnson, Ph.D, formerly Senior Scientist, Hanford (recently retired).

Research on what is now the AmoTerra process was originally started by Dr. John O’Malley Bockris at Texas A&M.

Higher Group Symmetry Electrodynamics

Extremely weak, non-classical, higher group symmetry electromagnetic fields were found during a 1991 experiment made by Glen Rein to alter significantly the level of radioactivity in materials, even those in the environment. The experiments suggest that higher group symmetry electrodynamics modulate the quantitative and/or qualitative properties of radioactive species. If the non-classical fields directly affect the radioactive species, it is likely that the appropriate field parameters will be discovered to neutralize radioactive emissions. In 1999, a theoretical basis for the phenomenon was developed by the Welsh physicist, M. W. Evans, with the participation of Lt. Col. (retired) Thomas E. Bearden.

The technology is extremely simple and could be applied with minimum logistics for treating massive structures, in-toto outdoors, such as the Chernobyl disaster site.

(End of Mark Porringa’s report)
Miscellaneous

http://freeenergynews.com/Directory/NuclearRemediation/Vesperman/ is Gary Vesperman’s original list of “Methods of Neutralizing or Disposing of Radioactive Waste”.

http://peswiki.com/index.php/Directory:Nuclear_Remediation was the source of some of this compilation’s radioactivity neutralization methods.

http://www.nanohealing.net/EESystem.html offers possible methods of mitigating negative health effects from Fukushima radiation.

The State of Nevada’s Agency for Nuclear Projects (see http://www.state.nv.us/nucwaste/) compiles at http://www.state.nv.us/nucwaste/whatsnew.htm an extensive bibliography of publications, government notices, and newspaper and magazine articles that is updated daily. A Find for “Fukushima” turned up 56 articles including some scary articles such as http://sfbayview.com/2014/50-reasons-we-should-fear-the-worst-from-fukushima/.

The list of “Clean Energy Inventions” in www.padrak.com/vesperman includes “Radioactive Waste Treatment Methods”. However, most of the list is so old that it includes three methods for which more information could not be found:

$50,000 grant from the Canadian government to neutralize radioactive waste using an esoteric technology; Dr. Andrew Michrowski.

Transmutation of low-level nuclear waste into a glassy substance by running a super high voltage through it; unknown.

Dr. Ronald Gillembardo’s method of neutralizing waste. He showed it to the Czechoslovakian government which had been digging their own version of Yucca Mountain, and they stopped digging. He did testify about his method at a Yucca Mountain hearing in Las Vegas during the mid-1970’s. Perhaps the DOE still has a record of the hearing which includes details of his method. He died in 1997.

Someone has suggested that determining the nature of an atomic nucleus by bombardment with other particles is like trying to find the form of an expensive vase by shooting at it with a .22 caliber rifle!

Policy myths create bad policy

(Excerpted from Dennis Myers’ column in the March 6, 2014 Boulder City Review, Boulder City, Nevada.)

Last week, Bob Halstead, director of the Nevada Agency for Nuclear Projects, spoke before the Nye County Commission.

He briefed the commissioners on funding deficits and other problems facing the federal efforts to build a dump for high-level nuclear wastes. In the course of his presentation, Halstead reported on some of the misinformation that is floating around about Yucca Mountain in Nye County, previously the all-but-certain site for the dump.

"They create the impression a repository was ready to accept waste, and the current administration walked away from it," Halstead said. "Simply not true."
Three years ago, I reported on this policy myth after discovering that the nuclear power lobby and other supporters of Yucca were spreading the story that the dump had already been built and was ready to start taking wastes.

During a 2010 U.S. House debate, Rep. Ed Whitfield said, "As I said, we have already spent billions of dollars on Yucca Mountain. In fact, in the very near future it was getting ready to open." (Whitfield's home state of Kentucky has a privately operated uranium enrichment facility at Paducah that has generated 140,000 tons of nuclear waste, and the Kentucky Senate in 2011 voted to repeal the state's moratorium on the construction of nuclear power plants, thus making the generation of more waste possible.)

A Newsweek reader wrote in a letter to the editor, "The site can already hold everything we have and was being doubled before all work was stopped."

At the right-wing site Free Republic there is this comment: "The reason I think that the waste belongs in Yucca Mountain is because we have already built the facility – no other reason."

It is all claptrap, of course. A lot of suitability work costing about $8 billion was done at Yucca Mountain, but not on a dump. The construction of a Yucca dump would cost about $96.7 billion, although with inflation and the passage of time, that figure is probably low now.

This kind of myth helps drive a lot of mistaken government policies. Policy myths can even kill. Remember weapons of mass destruction? "But disaster lies in wait for those countries whose officials smoke the same hashish they give out," journalist I.E Stone once said.

Dennis Myers is a Veteran and Nevada journalist.

**DISCLAIMER:** Inclusion of any invention or technology described in this compilation of radioactivity neutralization methods does not in any way imply its suitability for investment of any kind. All investors contemplating any investments in these devices and technologies should first consult with a licensed financial professional. Prospective investors should exhaustively perform their own investigation of pertinent facts and allegations of facts. Investors should also ensure thorough compliance with regulations of the federal Securities and Exchange Commission and appropriate state securities divisions. For more information, see [http://www.zpenergy.com/modules.php?name=News&file=article&sid=1655](http://www.zpenergy.com/modules.php?name=News&file=article&sid=1655).