

RADIOACTIVITY DISPOSITION As It Applies to Nuclear Waste #359

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ABSTRACT

We introduce new physics, $Ep = m (<c^2)$ - *mass energy released at less speed of light is ground state energy potential*, the antithesis for Einstein's Equation and the fundamental basis for our discovery.

We have developed a Process to treat radioactive matter so it is unable to further undergo radioactive decay. The significance of this to the nuclear power and defense industries is that said treatment is less cost than long-term storage. It is important to note that a non-radioactive benign waste stream results because radioactive daughters normally conceived by natural decay are eliminated because radioactive prodigies are aborted in the Process. Permanent results that other treatments cannot provide.

This process can be mobilized to treat nuclear material where it is currently stored or produced. This eliminates the threat associated with transporting radioactive material that could be used by terrorist groups and the risk of catastrophic accidents while in route to repositories. In today's volatile world, national security is important to consider. Apart from its benefit to the power industry and the environment, The Process can be mobilized by defense departments to treat nuclear stockpiles of rogue nations as well. This eliminates dangers brought by nations that would covertly convert nuclear material to 'dirty' weapons once, and for all.

Treating nuclear waste so its inherit danger - its radioactivity is eliminated a pragmatic and prudent policy to implement. On the 50th anniversary of nuclear energy, what better celebration can be provided than a viable solution for its waste dilemma? What better comfort can be given the people of the world being held hostage by maniacal dictatorships who threaten to convert their fugitive nuclear stockpiles to bring harm's way? Why store nuclear waste when it can be made benign cheaper? Why even gamble with the risk now that a viable solution is available? The solution we will present.

1. Introduction

The US Nuclear Waste Policy Act of 1982 (NWPAA) established the costs for disposal of commercial Spent Nuclear Fuel (SNF) in a potential geologic repository was to be funded by a fee levied on electricity generated and sold. It ensured that the beneficiaries of nuclear power pay for the costs of the disposal of the waste.

- Pursuant to Section 8 of the NWPAA, President Reagan decided in 1985 to use the disposal capacity of the Civilian Radioactive Waste Management System (CRWMS) for the disposal of high-level radioactive waste, including naval SNF and other material resulting from atomic energy defiance activities. As of FY 1999 Defense Nuclear Waste Disposal Appropriations have totaled \$1.1 Billion. By the time a permanent disposal facility is built and operable, if at all, that amount will increase to a staggering amount.

- The events of 9-11 have ushered in a new era of concern for America's national security. Now nuclear material can be used in ways to bring harm that was unthinkable before 9-11. In the United States alone this lethal material is stockpiled throughout the country in quantities that equate to millions of pounds. This number grows exponentially when nations of the world are counted. And the fear grows further of its danger when rogue nations and terrorists intent on using it as a WMP is thrown into the equation.
- In 1982 when the NWPA was established as well as on and after 9-11, our government science programs, though well funded, had failed to offer anything more viable and cost effective than geologic disposal and or long term stewardship for the growing nuclear waste dilemma. That solution is based on 1957 technology that is antiquated and obsolete for world we live in today.
- Defense appropriations for the disposal of its nuclear material is based on 1957 technology.
- More importantly defense strategies for protecting the homeland from dirty nuclear devices is based on 1957 technology.
- Energy Metals Corporation (EmC) can change that and the Department of the Defense will have the opportunity to enjoy the benefit of 2003 technology.
- The military advantage of our novel Process will be realized when taking control of rogue nuclear material stockpiles and our own national stockpiles is required by denying would be terror groups the very harm that this material provides. *Its radioactivity.*

2. Radioactivity Disposition as it Applies to Nuclear Waste

- Energy Metals Corporation has developed and demonstrated a proprietary process that cost effectively, safely and permanently reduces the level of any radioactive isotope to a level whereby it no longer undergoes radioactive decay. In other words the radioactive material is made benign.
- Accelerated De-densification -The AD Process provides a practical solution to the nuclear waste dilemma that has been haunting society for the past fifty years.
- Present-day nuclear waste treatments are based on 1957 technology that includes vitrification encapsulation for geologic disposal. Not only is the present-day technology antiquated it is inherently flawed because the nuclear material is stored while it is still highly radioactive.
- Such process cost effectively eliminates the risk commonly associated with HLW, SNF and Depleted Uranium because such material can be made non-lethal with the end product being benign. Something that no other treatment can provide.
- It is estimated that the SNF that the Navy has and will produce alone will have cost the US Navy over \$4 Billion by the time a nuclear waste disposal facility is operational, if ever.
- Why store nuclear waste for the next 10,000 years when it can now be made benign cheaper?
- Why spend manpower and resources to protect vast stockpiles of surplus nuclear material when it can be made benign cheaper.
- Why take the risk of this material falling into the hands of terror groups or used by rogue nations when it can be made benign cheaper?

- Why put forth the effort to recycle weapons grade material in other nations that still leaves a radioactive waste stream when it can be made benign cheaper?
- Why trust nations that we police to protect their nuclear material from falling into the hands of terrorists or rogue armies when it can be made benign cheaper?

The nuclear genie can be put into its bottle. To control that genie is the ultimate personification of control over nuclear material. True power over something is only when you eliminate its power.

3. The Science

Unstable matter follows a course to equilibrium within a field and decay provides means to that destination.

Decay can be accelerated by specific events directly to ground state just as well as nature facilitates decay to ground state.

DENSITY

Density in time prior to decay is a thesis for matter relevant to an event in time.

Decay is antithesis of density at given time and de-densification is synonym of that event.

This confrontation results in synthesis of timed events that end to begin a next thesis that is less dense.

Such is natural order to ground state. However, these events are bypassed altogether if ground state is attained in one event.

DECAY AND EXPANSION ARE SYNONYMOUS

Unstable matter is in a constant state of decay but rate of decay is not required to be constant. Decay can be constant or it can be accelerated.

Matter expands as it decays. Expansion is a synonym for decay.

As matter conforms for equilibrium, it conforms specifically, but only to what it specifically becomes eventually.

Thus, matter becomes environment and environment becomes matter.

Decay and expansion are antitheses of density. De-densification is synonym for expansion. Expansion is a synonym for decay. By decay, matter conforms by and for environment.

Universes are made of matter in a constant state of expansion and the rate of expansion is not required to be constant.

Matter constantly expands/decays by de-densification to conform to specific field/environments at constant rates or they can be accelerated, but only to inevitability of its specific field.

As matter and energy are interchangeable different only of form in time, one is the other, then the other for the other in perpetual motion because permanent equilibrium is forbidden.

MAXIMUM VELOCITY

Einstein presented that mass/energy at velocity C expands rapidly with his famous equation. Then it decays. However, his postulate, $E=mc^2$ was only for maximum mass energy and maximum velocity.

Einstein's Equation is prejudiced because it represents only maximum potential. It does not account for less.

Until now, science has only interpreted its significance for converting mass \approx energy at said velocity to generate heat and ghastly power.

But more importantly for science today his equation also serves as thesis to its antithesis for less potential energy as well.

Per Einstein's Equation, manipulating unstable radioactive nuclei can release energy in the form of heat for devastating destruction or generate electrical power. Decay results in each instance. The latter taking a very long time that produces many radioactive daughters. The first in the twinkling of an eye, with only remnants of unstable bastard prodigy left behind in the aftermath of critical chain reactions.

Unstable matter expands and decays by de-densification to conform as ground state eventually or spontaneously, but only to what they inevitably become: A product of and for a dominant field's environment.

VELOCITY DILATION \equiv MASS DILATION

Mass and energy are equivalent. Mass is simply concentrated energy. Matter is energy and energy is matter with the distinction being only of state and time. When matter sheds mass at velocity C it radiates. When energy congeals, it takes on form called matter.

Dialectically, energy at less than velocity C is potential for ground state. Mass energy when velocity is strong synthesizes less mass when velocity is weak. By Dialectic Equilibrates activation energy EA is created that negates binding energy.

While mass energy E is represented in Einstein's Equation when velocity is strong, by dialectic equilibrates less potential mass energy results when velocity is weak. Thus energy,

$$E = m - Eb \quad < \quad E = mc^2$$

velocity dilation	maximum velocity
less Ep	maximum Ep
greater ground state	less ground state
potential	potential

Mass energy increases with velocity. Consequently mass energy of m decreases by loss of Eb to mass ml . With mass being at rest mo

$$m - Eb = \sqrt{\frac{1 - v^2}{c^2}} = ml$$

results in mass ml having less potential velocity. This equates as less energy, mass density and de-densification of thesis mass m .

ACCELERATED DE-DENSIFICATION

Radioactive decay transcends to benign decay. For that, benign decay is the dominant of the two. Permanent equilibrium is forbidden so such state of radioactive nuclei is not allowed. However, a temporary condition forbidding further radioactive decay can be achieved.

The typical result from Einstein's Equation is allowed due in part to the binding energy of the nucleus. Similar to that of the expanding balloon that aids the velocity of escaping air when it bursts, escaping nucleon velocity is aided by the bond of binding energy's resistance up and to breaking points to achieve C .

Remove the E_b of a nucleus and energy is minimized from less velocity and potential energy is diminished whereby *mass/energy at less than C is ground state energy potential*. Thus,

$$E_p = m(<c^2)$$

provides antithesis to Einstein's $E=mc^2$ of maximum mass/energy and basis for radioactivity disposition.

Escape velocity C facilitates maximum E . Velocity at less than C results in ground state E potential with E_p contingent only on the specific matter \leftrightarrow environment confrontation equal to or greater than its mass defect.

To attain energy equilibrium within a field, radioactive matter need only have its energy assimilated to the energy of a benign field. Thus transformed to this ground state it is unable to further undergo *radioactive* decay where it abides benign.

All that is needed to accelerate radioactive matter to ground state is a means of mechanics that negates the binding energy of radioactive nuclei, implode its weakened state and release fugitive energy to and for the benign field/environment.

SUMMARY

A unified field force aF affecting spin, weak and strong interactions, electromagnetic and pressure (when gravity is negated) manipulate a fourth dimension of space displaced by matter (4+1) to facilitate a 6 dimensional non-fertile field/continuum within laws of conservation to proceed/release mass/energy at less than C . This allows ground state E_p of unstable structures to precipitate in field stable when aF subsides without producing prodigy typical of natural decay because E normally conceived to daughters, becomes captured embryonic energy for the field/continuum instead as E , in entropy fosters field equilibrium. Einstein postulated only for maximum mass/energy with velocity C squared and typical binding energies. By negating E_b , we have replicated less mass/energy by less velocity ($<C$) is ground state E_p and show this to be 1) antithesis to Einstein's Equation and 2) basis of unstable structure's inability to further undergo radioactive decay. Being that mass and energy are different only in form, we present means for one to its other to ground state in forward non-sustaining reactions that leave quarks, gluons (and leptons not annihilated) reassigned, benign forbidding further radioactive decay.

Why store nuclear waste when it can be made benign cheaper.

