Atomic Battery Design and Technology

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PGP I (2010-2012)
Abstract-

The Atomic Nuclear Battery is a new generation of power-generating devices based on the concept of producing electrical power from radio isotopic fuel sources. It is alleged by Executive engineering that recent innovations in both materials and technology have made such devices feasible to generate electrical power in a very efficient manner. Currently, MEMS laboratory is utilising the advanced techniques necessary for the fabrication of the Nuclear accelerated generating devices.

Introduction to the Nuclear Accelerated Generator-

The nuclear accelerated generator, (NAG), is an entirely new form of atomic battery. The NAG represents a new form of nuclear power conversion technology. It represents a smaller, safer and far more efficient than any conventional nuclear power generator now in existence. It can be used for virtually any power application from large to small hand devices. The other atomic batteries present in the market have not been able to achieve the efficiency or size reduction inherent in the NAG design. Atomic batteries possess isotope which is by far the most costly component. The unique design of the NAG allows it to use less isotopic fuel than any other atomic battery to produce the required power. It is alleged by Executive engineering that recent innovations in both materials and technology have made such devices feasible to generate both exceedingly large and exceptionally small amounts of electrical power and do it more efficiently, with fewer breakdowns than conventional technologies now being utilised. Currently, MEMS laboratory is utilising the advanced techniques necessary for the fabrication of NAG devices.

History of Atomic Batteries-

Until recently we did not have the technology to build Nano nuclear battery technology. Previously there were many limitations on the quantity of power that could be extracted from a nuclear battery. But with the advent of new technologies it is now possible to make extremely small Nano nuclear batteries that produce power in multi watt level and produce negligible heat in day to day operation. The new nuclear technology makes them viable in all kinds of electronic devices. The NAGs can be scaled to reach power levels even into thousands of watts if required.

Nuclear Waste stored in USA-

Executive engineering is dedicated to using nuclear waste for the promotion of inexpensive energy. The United States has an approximate 250,000,000-300,000,000 Million cubic metric tons of nuclear waste stored in all types of containers. Out of this waste 3% is radioactive material mostly used in fuel rods U235/238 and Strontium-90. Executive engineering uses Strontium in the nuclear battery technology. The nuclear power plants in the USA produces at least 500 pounds of nuclear waste every of the year and it can provide power to every person in the USA for the next 200 years just from this nuclear waste.
**Background**

Due to the fact that United States military depends, to a large extent, on the use of high-technology devices to maintain superiority over potential enemies, the combined armed forces consume massive amounts of fuel to meet their need for power. Such needs run the gamut from small hand-held devices designed for individual soldiers all the way to the large engines that propel planes, tanks and ships. Soldiers need to carry pounds of batteries into the field to ensure that power is available at night for using vision goggles, laser scopes for weapons, computers, radios and host of other small devices. Army tanks and other large vehicles are followed by whole convoys of tankers carrying the fuel they need. Utilisation of NAG devices to provide power would make this a moot point. Since there would be no need for any expenditures on fuel tankers, tanker trucks, storage facilities, or batteries for smaller devices. Likewise, pilots of both combat and cargo planes must also keep a constant eye on their fuel gauges so as not to outrun their respective fuel sources. Often, they are refueled in the air to avoid running out of fuel. The weight-to-power ratio of NAG would allow it to power both combat and cargo planes with no fueling ever required.

In fact, the widespread use of NAG to provide power for industrial, civilian and military applications would eliminate both chronic fuel shortages as well as diminishing the ever spiraling cost of traditional fuel sources. Along with its versatility, one of the greatest advantages of the NAG is its economy of use. For instance, NAG technology would virtually eliminate dependence on conventional power sources such as fuel cells, solar cells, fossil fuel engines and diesel engines. Not only would the NAG eliminate all these sources of power but it would do it far less expensively than current technology allows. Previous attempts have been made for the use of nuclear power. Beginning with Dr. Paul Brown back in the 1980's, sporadic attempts have been made to create isotopic nuclear batteries. Other than RTG, all such attempts have failed. Dr. Brown had innovative ideas but could not make it work. Although his device represented a new concept in power, his experiment failed.

**Fuel Source**

Since isotopes are the fuel of all Nuclear Accelerated Generators, a quick note about radioactive isotopes is in order. Radioactive isotopes are continuously being produced as part of radioactive waste. Current estimates place the amount of such waste in United States at over 100 million gallons. They are being stored in temporary tanks, at underground sites at great expense to tax payers and serious hazard to the environment because till date there has been no discovery of large scale practical uses of them. Isotope production at existing level costs less than the current cost of fuel. With numerous half lives of many isotopes and trade-in values factored in, the cost advantage of the isotopic fuel is even more pronounced. As the demand for isotopes inevitably grows, the costs associated with their production will only decrease.
Once placed as fuel into a NAG, these radioactive fuels could theoretically last from approximately three years to more than 400 years before they need replacement. Additional, outside electrical power is not required. The NAG is completely and totally self-sustaining. Further, due to unique design of the NAG, there is virtually no danger of meltdowns and absolutely no danger of explosions or other catastrophic incidents. The device can stop working or can be shut down for maintenance with no danger to personnel, the environment or nearby population centres.

The fuel source of the Nuclear accelerated generator is a radioisotope. There are many different isotopes that can be used as a power source for the NAG. Pure Beta emitters work best in the device and will extend the device’s life longest. Included in this list would be such isotopes as NI-63, SR-90,PM-147 and SN-121m. All appear to have the ideal properties for the production of power. Assuming an active lifespan of three to hundred years, most isotopes would have at least 10 half lives worth of useful energy discharge. Nuclear isotopic power will bring to fruition such things as particle beam weapons, ion-powered space planes, nuclear powered jet aircraft, high powered laser canons, nuclear powered tanks, nuclear powered naval ships and even cryogenic coolers. NAG devices can also be easily adapted to power large metropolitan areas, forward military bases and other applications where dependable power is needed in remote areas. The NAG device can perform these functions cheaper and more efficiently than current technology.

**Oil dependency**

If a significant portion of generating capacity was switched to the devices using NAG, a large percentage of foreign oil dependence could be eliminated. This, in turn, could lead to a steady decrease in the price of fossil fuels, including oil and gas. Estimates vary on how many years the world’s oil reserves will last but it is admitted by everyone that the amount of reserves is finite and will eventually run out. The NAG is one of those generating devices which can bridge the gap both to delay the depletion of oil reserves and to take over when they eventually run out.

**Safety**

It is asserted by Executive engineering that there are several other significant attributes that make the NAG far safer than conventional facilities. To begin with, the NAG needs no large scale containment or special shielding. The NAG has absolutely no external emissions and produces no contaminated steam that can leak. It also produces no nuclear waste on its own. On the contrary it utilizes nuclear waste for its own fuel. Also, the NAG cannot produce any contaminated water since no water (or any other liquid) comes in contact with the nuclear material. The nuclear fuel for the NAG is solid and there are no rods that need to be adjusted to produce different power levels. Lastly, and possibly the most important, the radioactive isotopes that power the NAG do not need to be cooled. The NAG is not a heat producing device as is the conventional nuclear facility. One gram of Strontium 90 (a potential and likely fuel for the NAG) can produce 10,000 watts of power and heat.

**Adaptability**

Perhaps the most important aspect of NAG is its adaptability to widely differing applications, both civilian and military. For instance, this device should easily be able to handle the electrical generating tasks for large metropolitan and rural areas alike. However, this technology is truly scalable and there should be no problem adapting it to power other things as well which can include virtually any ship in the Navy. This implies that fleets of ships could sail for years without needing to refuel. The small size of the NAG should make it feasible to replace existing ships with this new power supply. Executive engineering also believes that versions of the NAG could be made to power other large military vehicles such as tanks and armored personnel carriers.

It is suggested that tanks fitted with NAG power supplies could run for years without the need to worry about expensive and cumbersome fuel re-supply efforts. Other military uses could include the ability
to parachute smaller NAGs directly into the field to supply the power needs for forward military bases, military hospitals and other such needs, all without the need for fuel/ fuel tanks/ trucks.

Civilian uses could include instances of disaster relief in such cases where large areas of land could have been devastated by natural disasters such as floods or earthquakes. NAGs could be transported or dropped in to provide quick, efficient power for relief teams.

Unlike conventional devices, NAG can work under a wide range of external conditions ranging from many degrees above zero to many degrees below zero. Simply put, this device should work equally well in the Antarctic or the Sahara.

The isotopic fuel of the NAG can easily be transferred from one device to another allowing for quick transfer and minimal loss of power. For instance, if an NAG were to become damaged for one reason or another, the old/ damaged one could be unhooked from the device, and a new one attached with very little effort, even in the field.

**Cost/efficiency-**

There are other advantages of using radioactive isotopes as fuel. Since the availability of the atomic isotopes is more than ample, costs of this fuel should be considerably less than either conventional atomic fuel or fossil fuel. Further, since the casement of the NAG is not very expensive, the cost of replacing damaged and/ or broken parts is quiet small. It is relatively a low cost replacement device.

**Power Output-**

It is further asserted that this NAG technology could produce 30-50 times more than conventional nuclear technology. This has already been proved in experiments. This could mean that a given amount of power, a facility could be built far smaller than existing nuclear or fossil fuel power plants.

It is admitted that much of this sounds too good to be true but Executive Engineering has been able to convince that this device, although totally new in concept, is based on hard science and can be developed to produce exactly what is claimed. It is firmly believed that research will bear out each and every one of the statements made on its behalf.

**Radiological damage-**

There is no such thing as a safe isotope as even a few molecules of a particular isotope over a long time can be damaging. From the perspective of a conventional nuclear power plant, however, a NAG is one of the safest devices on the planet. The device is self contained with little or no X-rays whether in operation or not in operation. Beta particles are never emitted outside the casing of the device.

There are some isotopes that do emit Gamma radiation and in such cases it may become necessary to add shielding for the Gamma rays. Most of the isotopes being considered for the NAG devices do not emit Gamma rays. The only possible way it can be harmful is if a person would pry the device open and breathe from inside it. A distance of two to ten feet from the device is quite sufficient to protect personnel from danger even if it were to be shot open or exploded. The only danger would be if the isotope actually entered a person’s body or came in prolonged contact with the skin.

**Repair and Maintenance-**

It is reasonably expected that both these NAG devices should have a 10-year life span after which time the nuclear source would be removed and replaced. It is an easy task to replace either the
nuclear source or the Power core. Generally, it is expected that over the five to ten year life span, the power core will be damaged from the constant bombardment of Beta particles and would need to be replaced. Unlike current RTG’s, a NAG device does not require the source to be in contact with the walls of the device. The source is mounted in the middle and the removal and re-insertions is an easy task requiring very little time or effort. The exchange would involve a snap-in/snap out operation using safety procedures to ensure correct operation.

Uses of the Nuclear Accelerated Generator-

Executive Engineering has found immense scope of business in the auto industry as having cars that never need refueling and have minimal maintenance. The car can be plugged to our homes and all electrical needs of our homes can be fulfilled. At work we will get electric credits from the electric company as our car supplies power to the electric grid.

Nuclear batteries produce 100000 times the energy over the standard batteries that are in use today. Nuclear batteries can be built to last as long as three to hundred years at just about any power level you can think of.

The following are a few pictures of the Nuclear power battery-
This is the direct energy conversion atomic battery developed by Executive engineering for powering truck and air craft with a life span of three to hundred years. These are the Radioactive nuclear materials-
Atomic batteries Nuclear Accelerated generator-

How to go about power conversion of Isotope-

![Diagram of atomic battery and nuclear generator](image)
Here are some of the information required-

1) SR-90 emits 300-540 Kev DC beta/ electrons.

2) 1 gram of SR-90 is 138 curies per gram.

3) 1 gram of pure SR-90 = 0.54 watts per hour of thermal heat.

4) How many emissions of electrons are there that is measured in a curie?

   1 curie = $3.7 \times 10^{10}$ per second of emissions. This needs to be changed into an hour.

   So 138 curies = $3.7 \times 10^{10}$ to the 12 power emissions per second, 60 seconds in a minute, 60 minutes in an hour = 3600 seconds in an hour, times the above equation. This is a big number of emissions per hour.

5) We measure electron power in watt hours.

6) Next we need to know how much energy is present in all the electrons. The magnetic field changes with the velocity of the electrons. So the average will be considered here. There is going to be 300 Kev DC that is 30,000 volts direct current for each electron. The voltage of the electron determines the speed.

7) Electron Velocity-

Now that the speed of the electron is known to us we can compute the magnetic energy. As we approach light speed the energy required goes off the chart. This is where all the energy comes from in a BETA isotope. Any electron at rest has no energy other than its own electrostatic electrical
charge. Zero speed equals zero energy! The high speed energy can be calculated by $V = 1.30E + 08$. Hence, $V^2 = 1.69 \times 10^{16}$. Here, $E$ is the charge of a particle at rest where velocity $V = 0$ of an electrostatic field.

To put this in perspective, the following diagrams represent the MFE or what is referred to as the H-field. We also need to know the area this field covers and the distances and coupling actions in this case.

The H Field area and distance from the electron is just enormous compared to the size of an electron. The order of the electron being earth size the H field would be light years in distance. Electrons are so small that it’s difficult to determine its size. In any case the H field covering an area is $H/8\pi$. A single electron is 300000 volts.
The heat produced in an isotope is generated by the smashing of atoms against each other. There are two forms of energy involved here. One is Kinetic Energy which determines speed of an electron hitting something and the other is Dynamic (H field) Magnetic Energy. We need to divide this in two sections Kinetic Energy and Magnetic Energy (H field) so the total energy is represented by the equation: \[ \text{TOTAL ENERGY} = \frac{1}{2} M/V^2 + E^2V^2/A3 \]

To explain how an isotope can produce so little heat and yet so much power we need have an understanding of the following science. A good point to start is friction. Friction is caused when two solid objects are rubbed against each other till they get hot. Friction between the atoms generates the heat. This Isotope temperature per gram is quite simple. The problem is with the electrical and electro chemical part. From an electrical stand point it is similar to Ohm’s law. \[ E = I \times R \] where \( E \) is the voltage, \( I \) is the current and \( R \) is the resistance or friction of the isotope. Power, \( P = I^2 \times R \) or \( P = V \times I \).

This is how the ENTROPY of an isotope thermal system works!

A good analogy to this is wire, all types of wire and electron flow through that wire. Another good analogy to this is semiconductors and in fact most nuclear isotopes that are used for RTGs technology are semiconductors.

The driving force of the electrons is voltage. The right chemicals need to be selected and friction of the semiconductor to make the isotope produce its best power for the emissions. If we change the conductivity of the isotope in either direction from its optimal heat performance the heat production will go down. If the semiconductor is too high in resistance the heat drops or if the isotopes resistance gets too low the heat drops. You have to get it just right to produce that maximum heat level.

For those of you that have looked at other atomic battery configurations and seen these huge numbers on power conversion, those numbers did not come out of thin air in fact there is a process in electronics that is referred to as electromagnetic eddy currents and works on the quantum physics level. These currents in fact may increase the decay acceleration of an isotope increasing its output power but decreasing its half life, no matter what way you look at it, you cannot create or destroy energy, but can only transform it!

Summary-

The Nuclear Accelerated Generator (NAG) is believed to represent an entirely new concept in power generation. It is asserted that this device can and will produce stationary power sufficient for the needs of large cities or military bases. It is also asserted that the NAG offers the only true scalable source of power; one that can provide power to a whole range of applications ranging from small, hand-held devices carried by individual soldiers to large military equipment including ships, planes, tanks, armored personnel carriers and even applications as the power supply for particle beam weapons. It is designed to be portable, durable, self-sustaining, safe and, above all, powerful.
**Final Note**-

This article is intended to offer a preview of the Nuclear Accelerated Generator. It is not meant to be an all-inclusive report on how it has been developed and how it would be manufactured. Those details are undoubtedly of great interest to many people. It should be noted that the NAG device has been patented and the patent number, also, will remain confidential. The Nuclear Accelerated Generator is, in its entirety, 100% the proprietary property of Executive Engineering of Florida.

**References**-

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