RidsNroMailCenter Resource

To: James, Deonna
Cc: Araguas, Christian; Berry, Lee; Coates, Anissa
Subject: ACTION: YT-2010-0128 - Letter re. Development and Deployment of the Next Generation of Small Modular Nuclear Reactors (SMRs)

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Assigned to: M. Mayfield, ARP

Due Date: TBD (please let us know the due date as soon as one is determine)

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Dr. Michael Johnson, NRC/ONR,

29 July 2010

We are writing this letter as concerned American citizens and businessmen. The ability of the United States to be energy dependent through the fielding of sustainable energy options is not only vital for our national security but can also serve as a major economic driver for decades to come. There are many viable energy sources that need to be part of this solution such as marine, geothermal, wind, solar, biomass, hydrodynamic, etc.

In fact, if recent technological history has anything to teach us, it is that diversification and networked complexity are the fabric of imminent change. Economies of scale for monolithic systems have had their time, and distributed, heterogeneous energy production and consumption offer much greater efficiencies, higher energy security, and better resource stewardship.

This includes the development and deployment of the next generation of small modular nuclear reactors (SMRs).

Generation IV SMRs have the benefits of Generation III systems such as safe operations, low or no atmospheric emissions, moderate energy yields (~ 50 to 300MW_e), and high energy yield per acre. However, Gen IV systems promise an *extended* fuel life cycle, inherently *safer* operations, and *lower* operating costs.

As part of our business responsibilities we research, design, build, and operate energy systems for a wide range of businesses. There are a significant number of energy users in the 50 to 300 MW_e range, in sectors such as metals processing, food processing, discrete manufacturing, and continuous manufacturing in chemicals and refineries. For several immutable reasons these businesses cannot use ambient energy sources such as wind, solar or geothermal as primary supply sources. While industrial users have typically low unit energy costs, capital and political pressures on utility companies will eventually force these rates to increase significantly as well. Finally, most reasonable business people know that a cost on carbon emissions will be imposed sooner or later, yet viable options for this group of companies are few and far between.

Industrial power consumption represents a 28% share of national consumption for just a few thousand companies (using 1,011 TWh out of a total of 3,670 TWh in 2006). This is an area of great impact for national energy management, because that consumption falls on relatively few entities.

As of today distributed generation options for companies of this size include biomass or fossil fuel fired cogeneration. In many cases, fuel fired cogeneration is not feasible, due to fuel or emissions constraints in populated areas, land use restrictions, or high capital costs. In 2006, only 9.4% of industrial users made any use of cogeneration. This percentage will undoubtedly

increase somewhat with the cost of electricity, but the number of companies that can benefit from process steam is limited.

Mid to large businesses will want to control their costs and reliability without necessarily having to make use of cogeneration: Michael Morris, CEO of American Electric Power, recently forecast power *generation* prices "leveling off" at $0.10 per kilowatt-hour. This kind of pricing will be disastrous to the cost of commodities made with this energy.

This leaves SMRs as the only approach that offer the necessary energy density, footprint, and reliability for a reasonable and competitive energy future.

From our industrial consumer perspective, there are a number of significant inhibitors to adoption of Generation III SMR by mid-sized to large industrials:

1. The advanced systems using LWR and PWR designs do not produce electricity at rates that are competitive with existing solutions.
2. The systems require onsite spent fuel storage, which will increase risk perceptions, inhibiting favorable executive decisions.
3. Generation III reactors are designed for utilities, to afford lower prices and modulation versus large monolithic reactors. There are not designed for industrial use.

We have heard DOE and NRC announcements that even Generation III SMRs are not likely to see the light of day until 2021. The NRCs "expedited" certification process appears to be neither timely nor include the more economically attractive Generation IV systems, because, as a recent NRC letter would have it: "The NRC's attention and resources now are focused on the large-scale reactors being proposed to serve millions of Americans, rather than smaller devices with both limited power production and possible industrial process applications." Apparently the millions of Americans served by competitively priced goods and services by industry are of secondary importance, in the NRC's view.

This is the point of our letter: the NRC certification process is slow, focused on Generation III systems, and seems more focused on long term organizational viability than contributing to a resilient national energy infrastructure. By the time current plans are executed, energy options will have been overtaken by events overseas, completely fulfilling Dr. Chu's prophecy of importing Generation IV SMR technology.

From what we can see, NRC/DOE research puts Generation IV systems at a great disadvantage. The net result is that it is highly unlikely that any Generation IV systems will be deployed in the next several decades due to the lack of attention being given to the required certification process.

We are concerned that DOE and NRC will marginalize SMRs because of a self-imposed focus on Generation III systems and antiquated review processes. We do understand the DOE and NRC belief that these new small, modular LWR and PWR systems are a 'great leap forward'. However, modular nuclear power reactors have a history extending for over 50 years. This includes the development of the highly successful navy reactor program that resulted in the first operational nuclear powered vehicles.

Further, given the forecast installation cost of $4,000 per kilowatt for Generation III SMRs, obsolescence and non-adoption are built into whatever the result might be. *We need Generation IV technology at $2,000 per kilowatt* by 2016 in order to support the nascent distributed generation trend.

Now is the time for bold vision and decisive action by applying resources to accelerating deployment of Generation IV nuclear reactor systems. DOE and NRC must ensure that nuclear energy will capture a significant portion of the future distributed generation assets, with the appropriate safety and operating standards and norms. Without an immediate and significant change in procedure – and perspective - we foresee that nuclear energy will be considered too expensive and too slow to deploy to be considered as a key part of U.S.'s energy future.

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cc: Senator James Webb (VA), US Senator

Dr. Stephen Chu, Director, Department of Energy

Senator Jeff Bingaman, Committee of Energy and Natural Resources

Senator Lisa Murkowski, Committee of Energy and Natural Resources