Jack Fuller, GE Hitachi Nuclear Energy

Blue Ribbon Committee Subcommittee on Reactor and Fuel Cycle Technology Meeting

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ORAL STATEMENT

Good morning, I am Jack Fuller, chairman of the board of GE Hitachi Nuclear Energy. I am delighted to have this opportunity to be here with you today to share with you my vision for America's nuclear energy future and to specifically outline a policy direction that makes sense for the country.

As it has done for decades, the U.S. nuclear industry has the potential to lead in the innovation of the next generation of nuclear technologies – new technologies to enrich uranium; to generate safe, clean, reliable electricity; and to recycle used nuclear fuel.

However, as is often the case in the nuclear industry, government policy is the key to success.

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GE Hitachi Nuclear Energy, a global alliance formed by GE and Hitachi, is prepared to offer new technologies to customers around the world. Headquartered in Wilmington, North Carolina, GEH is a world-class enterprise with a highly skilled workforce and global infrastructure dedicated to serving the nuclear industry. We are proud of our record of accomplishments in the U.S. and overseas that spans more than five decades. Our nuclear alliance is recognized as the world's foremost developer of boiling water reactors, robust fuel cycle products and highly valued nuclear plant services.

For years now we have been hearing about the next nuclear "renaissance". I'm a little reluctant to use that term, but I do envision a future that includes as many as 250 to 1000 new units worldwide by 2030 as has been estimated by the World Nuclear Association.

As we enter this new era, GEH innovation will help bring solutions – such as:

1) life extension and power uprates on our current fleet of plants;
2) developing the Generation III+ passive ESBWR technology;
3) enriching uranium more efficiently with laser technology; and
4) addressing the most debated, although I would argue not the most difficult challenge – how to manage used nuclear fuel.

We have been tempted in the U.S. to believe that a solution to the back-end of the fuel cycle is too complex to solve. However, on a simple level, it is no more difficult than what we do at home – recycle and reuse waste.

We can boil down the options into what I call the 3 R's: Repository, Reprocessing and Recycling.

Certainly we can design a safe repository for the long-term storage of used fuel. Or, we can follow the policy choice of our allies to reprocess light water reactor used fuel.

However, we have another option – the next step in technology - recycling our nuclear fuel, using scientifically proven technology. We believe it is time for the U.S. to embrace a policy of **recycling** used nuclear fuel.

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Full recycling takes used nuclear fuel and separates the uranium and transuranics using a molten salt bath and electricity. The recovered uranium and transuranics are then used as fuel for Generation IV reactors, thereby generating electricity from used nuclear fuel. The remaining fission product wastes are placed into ceramic and metal alloy, which require safe storage.

This process is preferred to other solutions for several reasons including:

1) reducing the required storage time to 300-500 years;
2) extracting greater than 90 percent of the available energy from uranium ore as compared to less than 5 percent extracted with current technology;

3) minimizing proliferation concerns by not separating plutonium from the other transuranics; and
4) eliminating the need for government support after commercialization.

Our vision is to have Advanced Recycling Centers located near operating plants. As shown on the slide, the Center would include two buildings – one that houses modules that would do the separations and a second that houses a sodium cooled reactor, creating electricity, and burning up the transuranics materials. By the way, this is a "Small Modular Reactor" of about 300 MW per unit. The capital cost of these two buildings is relatively low since just like adding an additional capacity to your home as your family grows, you can add additional separation capacity as your needs increase. The economics of the recycling centers improves as additional units are added through replication.

We believe that if a recycling policy is adopted, we could have a demonstration Advanced Recycling Center operating in about 15 years, followed by multiple commercial units in the next decade. Some of the specific items needed to get to this vision are highlighted in my written statement, but let me quickly point out what needs to be done now.

First, Congress needs to adopt the FedCorp legislation, creating an organization that has the authority to establish and manage a long-term solution to the back-end of the fuel cycle.

Second, Congress should fund a small modular reactor R&D program that includes advanced reactors such as PRISM and pyroprocessing.

And finally, by recommending full-recycling, the Blue Ribbon Commission can help ensure U.S. technological leadership and enhanced energy security, while at the same time, address the difficult policy challenge of nuclear fuel management in a pragmatic way.

Thank you for the opportunity to be with you today. I look forward to your questions.