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October 12, 2001

Comments in Response to the Yucca Mountain Preliminary Site Suitability Evaluation

Dear Sir / Madam:

Thank you for your consideration of this response. The nuclear spent fuel issue has been an extremely vexing problem for this country for a long while. As with most technical problems which become entangled in politics, the spent fuel issue has accumulated significant barriers which impair it's successful solution. Many diverse parties have become involved, each with their own agendas, who will attempt to stall, negate, and manipulate the system to achieve their desired endpoint. I wish you good success in this endeavor as it is critical to the well being of our country.

With regards to the proposal to develop Yucca Mountain as the nation's repository for spent nuclear fuel; it is incumbent upon the United States to open a central storage location for spent nuclear fuel to free utilities from the burden of storage and monitoring of this fuel. There should be one storage facility and it should accept all utility fuel. Storage of spent fuel at over 100 sites in the country is wasteful and counter-productive to our national interests.

My recommendation is the repository be opened as a nuclear spent fuel research station. The ultimate goal of the station should be solving the nuclear spent fuel issue by funding and developing technology which addresses and resolves all problems associated with spent fuel.

Describing the spent fuel as waste is a disservice to all who those come after us. Many activities thought impossible in the past by our fore-bears have been made simple by advances in technology. The ability to artificially affect decay of radioactive isotopes would erase the problem of nuclear waste. It is extremely short-sighted to presume our country will never achieve this state of knowledge.

Further arguments supporting the research station concept may be made by analyzing the fission product inventory from a typical 4 % enriched, 17 x 17 PWR fuel assembly irradiated for 337 days at a flux of 4.1 E12 neutrons/cm²/sec. The radiation level of this unshielded assembly is approximately 2,000 R/hr after one year of storage. This radiation level is potentially lethal after 15 minutes of unshielded exposure. One hundred years from now this same assembly has a radiation level of approximately 30 R/hr, significantly less radiation and potentially lethal after over 15 hours of unshielded exposure. This is important because this assembly contains approximately 680 grams of Pu-239, which could be diverted to manufacture weapons of mass destruction. Pu-239 has a half-life of 24,000 years, so most of the assembly's inventory will still be there in 100 years. An accepted published value (from Argonne National Laboratory) for fabrication of a perfectly reflected Pu-239 weapon requires the Pu-239 inventory from only four fuel assemblies. Therefore, these assemblies cannot be buried and forgotten. They will require active security forever to preclude diversion.

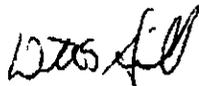
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Another argument for continued research concerns utilization of the large amount of non-fissioned uranium still inside the fuel assembly. This uranium represents an energy resource that should be recycled back into an energy production system, not thrown away. Similar diversion concerns apply to this material as apply to the Pu-239.

In conclusion, it is recommended that the government proceed with the development and operation of a nuclear spent fuel research station which consolidates spent nuclear fuel into one location. This station should be tasked with the responsibility of consolidating and safely storing the country's spent nuclear fuel and solving the spent nuclear fuel issue by funding and developing technology which addresses and resolves all problems associated with spent fuel.

Sincerely,



William E. Hill

Nuclear Engineer – Oak Ridge National Laboratory
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These views are the opinion of the author and may not reflect the views of my employer or the American Nuclear Society.