

Statement of Paul M. Golan
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U.S. Department of Energy
Before the
Committee on Energy and Natural Resources
U.S. Senate

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Mr. Chairman and members of the Committee, my name is Paul Golan and I am the Acting Director of the Department of Energy (DOE) Office of Civilian Radioactive Waste Management (OCRWM). I appreciate the opportunity to provide an update of the Yucca Mountain Project to the Committee.

About a year ago, Secretary Bodman asked us to take a hard look at Yucca Mountain to find ways in his words to “make it safer, make it simpler, and make it more reliable.” With that direction, we have taken actions to improve our operations and processes. I would like to discuss those actions today, including:

1. The clean-canistered approach to waste handling
2. Resolution of concerns associated with infiltration modeling done by the U.S. Geological Survey (USGS)
3. Designation of Sandia National Laboratories as the Project’s lead laboratory
4. Use of independent scientific review
5. Environmental Protection Agency (EPA) Radiation Protection Standards
6. Need for a second repository
7. Licensing schedule

1. Clean-canistered approach to waste handling

In October 2005, the Department announced a redirection for the Project to a primarily clean-canistered approach to spent nuclear fuel handling operations. A single canister would be used to transport, age, and dispose of the spent nuclear fuel without needing to re-open the waste package and handle individual fuel assemblies. While a transportation, aging, and disposal canister, or TAD, is not certified today, we believe that the technical challenges of this approach can be resolved and will result in simpler, safer, and more reliable operations. We are working with industry to develop canister specifications and working diligently on an acquisition strategy. Under this approach, the spent nuclear fuel will be packaged for disposal primarily by the utilities. This would allow the Department to take advantage of existing commercial capability and to reduce the risks of radiation exposure and contamination from spent nuclear fuel handling operations at the repository by reducing the need to handle individual fuel assemblies several times prior to packaging for final disposal.

The clean-canistered approach requires an examination of the existing repository design and operations. Additional time is required to develop and revise portions of the license application in support of this new approach. The Department is currently reviewing the existing design and developing the appropriate documentation to support a Secretarial decision on the clean-canistered approach. A decision is expected later this summer.

2. Infiltration work performed by the USGS

In March 2005, the Department became aware of Project emails between some employees of the USGS that suggested non-compliance with certain quality assurance (QA) requirements associated with their work in preparing the water infiltration model and maps. Infiltration is a

parameter in the Total System Performance Model predicting the flow of water through the mountain over time.

In February 2006, the Department issued a technical report, evaluating the infiltration estimates developed by the USGS. The independent technical evaluation found the infiltration work completed by the USGS to be consistent with the conclusions of infiltration work completed by scientists independent of this Project, including the State of Nevada's Engineering Officer, under present and future predicted climate conditions. Our review also confirmed that the net infiltration rate of precipitation into Yucca Mountain is very small, in the range of one to six percent of annual precipitation (which itself is a very small amount, approximately 7.5 inches per year).

While we found that the science was sound, some of our QA requirements were not met, and consequently we are expending time and resources to replace the affected work. We have directed Sandia National Laboratories to develop computer codes that will generate new infiltration rate estimates---in accordance with our QA requirements---and then replace the infiltration rate estimates. The Sandia infiltration rates will be independently reviewed prior to incorporation into the Total System Performance Model.

3. Lead national laboratory

In January 2006, the OCRWM designated Sandia National Laboratories in Albuquerque, New Mexico the lead laboratory to coordinate and organize all scientific work on the Yucca Mountain Project. Since this Program represents a major scientific and technical challenge, we want to ensure the Program takes full advantage of the resources that reside in our national laboratories.

Today we are working to transition the scientific work to Sandia and expect to complete that transition by the end of the year.

4. Use of independent scientific review

To further ensure the highest quality and objectivity of the science and technology supporting the Yucca Mountain Project, we are working to instill a culture of “trust but verify.” As part of this effort, we will use a University-based consortium to independently review key aspects of the Project to ensure we stay objective and without bias. In April, the Department selected the Oak Ridge Institute for Science and Education to perform this work. Additionally, we are in the process of implementing the *Safety Conscious Work Environment* across the entire Yucca Mountain Project.

5. EPA Radiation Protection Standards

In August 2005, the EPA proposed revised standards for Yucca Mountain in response to a decision by the U.S. Court of Appeals for the District of Columbia which vacated portions of the existing EPA radiation protection standards. Specifically, in response to the decision, EPA proposed a radiological exposure limit for the time of peak dose to the general public for a one-million year period following the disposal of waste at Yucca Mountain. This new evaluation period is 100 times longer than the previous period of 10,000 years, and it is longer than any other regulatory period involving quantitative limits.

The proposed EPA rule retains the existing 10,000-year individual protection standard of 15 milliRem per year, and supplements it with an additional standard of 350 milliRem per year at the time of peak dose.

The Department supports the EPA approach.

A rule with two compliance periods recognizes the extraordinary challenges in making quantitative predictions of effects a million years from now. It recognizes:

- The limitations of bounding analyses,
- The greater uncertainties at the time of peak risk, as well as
- The lessened precision in calculated results as time and uncertainties increase.

Retaining the existing 15 milliRem per year standard for the initial 10,000-years ensures that the repository design will include prudent steps, including the use of engineered and natural barriers to limit offsite doses.

Through the one-million year performance period, the natural and engineered barriers will continue to keep exposure levels low, below what many people receive today, depending on where they work or where they live. The proposed 350 milliRem annual limit for the out years reflects a level of risk that society normally lives with today. The allowable dose for an individual at the location of peak dose at Yucca Mountain, several hundred thousand years in the future, for example, would be no greater than the average dose a resident of Denver, Colorado, or other similar high-altitude location receives today.

Further, studies have not detected that people living in areas with higher levels of natural background radiation have a higher rate of cancer or other radiation-linked illnesses than do those living in areas with lower levels of natural background radiation.

6. Need for a second repository

The Department will form a task team to evaluate the need for a second repository. The Department will provide its report, as required by the Nuclear Waste Policy Act of 1982 (NWPA), to the President and Congress between 2007 and 2010. The Department has projected that more than one hundred thousand metric tons of spent nuclear fuel will be generated by the current licensed commercial reactor fleet, there will be a need for capacity in excess of 70,000 metric tons which is the administrative limit currently imposed by the NWPA on the Yucca Mountain repository.

7. Licensing schedule

The Department is committed to developing a realistic schedule that will result in the submission of a robust license application. Later this summer, we will publish our schedule and strategy for submittal of the license application to the NRC which will be consistent with Section 114 (e) of the Act that directs the Secretary to develop a plan “that portrays the optimum way to attain the operation of the repository.” After we publish this schedule, we will provide the Committee and its staff briefings.

Conclusion

Over the last 50 years, our Nation has benefited greatly from nuclear energy and the power of the atom, but we have been left with a legacy marked by the generation and accumulation of more than 50,000 metric tons of commercially generated spent nuclear fuel, 2,500 metric tons of DOE spent nuclear fuel, and an estimated 20,000 or more canisters of DOE high-level radioactive waste. Additionally, 2,000 metric tons of commercial spent nuclear fuel will be generated this

year and in every succeeding year by the current fleet of commercial electrical power generating reactors as they supply 20% of our Nation's electricity.

There is a clear national need for Yucca Mountain, even if we could reduce our national electricity consumption by 20% and were able to shut down every commercial reactor and nuclear project in the country today. We are taking steps to ensure that we develop and construct the safest, simplest repository that we possible can, based on sound science and quality work.

There is a strong international scientific consensus that the best and safest option for dealing with this waste is geologic isolation. This consensus includes the National Academy of Sciences which has generally endorsed the geologic disposal option as far back as 1957.

To conclude, I believe that our license application will provide the necessary assurances that we can operate Yucca Mountain in compliance with the performance requirements of the EPA and the NRC. We will also demonstrate that our approach to operations will be carefully planned, logical, and methodical.

That completes my prepared statement.