October 23, 2011

Note to Reviewers:

The House of Representatives Committee on Science, Space, and Technology requested this testimony by letter on Tuesday, October 18, 2011.

Full text of the five-minute oral statement was requested by Tuesday morning, October 25; 48 hours in advance of the hearing at 10 AM October 27.

A one-page summary of the oral statement was also requested.

To simplify the review, I have combined the full text (two pages in length) and the one-page summary into a single file on the following pages. The two files will be submitted to the committee separately, as requested.

I will be traveling to Washington DC on Monday, October 24, and will be unavailable most of the day. Please contact Erik Ridley in Government Relations (925 294 3423) with comments or questions.

Thank you,

Peter Swift

Statement of Dr. Peter Swift
Distinguished Member of the Technical Staff
Sandia National Laboratories[1]

United States House of Representatives Committee on Science, Space, and Technology

Joint Hearing of the Subcommittees on Energy and Environment and Investigations and Oversight on *Review of the Blue Ribbon Commission on America's Nuclear Future Draft Recommendations*, October 27, 2011

Chairman Harris, Chairman Broun, Ranking Members Miller and Edwards, and the distinguished members of the Committee; thank you for the opportunity to testify. I am Dr. Peter Swift, a Distinguished Member of the Technical Staff at Sandia National Laboratories.

In your letter requesting my testimony, you asked me to address three topics. First, you asked me to provide my views on the draft recommendations of the Blue Ribbon Commission on America's Nuclear Future regarding the need for a permanent geological repository. Second, you asked me to describe my role as the Chief Scientist for the Yucca Mountain Lead Laboratory. Third, you asked me to describe the various scientific issues and technical conclusions in the Department of Energy's License Application for the proposed Yucca Mountain repository.

I'd like to start with the second and third questions, and I'll close with my views on the Blue Ribbon Commission's draft recommendation.

I'm speaking only for myself; anything I say here today represents my own personal beliefs and does not necessarily represent the position of Sandia National Laboratories or the U.S. Department of Energy. Specifically, I am not here to amend or add to Sandia's technical position with respect to the Yucca Mountain License Application. That position remains unchanged from its documentation in the License Application.

I'm a geologist by training, and I've worked for the last 22 years studying how deep geologic repositories for radioactive waste will perform over hundreds of thousands of years. In my role as Chief Scientist for the Yucca Mountain Lead Laboratory team, I focused on ensuring the integrity and credibility of the scientific basis for the postclosure portions of the License Application that the DOE submitted to the Nuclear Regulatory Commission in June 2008. I was extensively involved in interactions with external and internal technical review and oversight groups, and I had a significant role in preparing the application and presenting it to the NRC.

The development of the technical basis for the Yucca Mountain repository was the work of hundreds of scientists and engineers, spread over decades. When I speak about the scientific and technical work contained in the License Application, I'm summarizing the contributions of the multiple experts who prepared the individual sections.

What types of postclosure scientific issues does the application consider? The detailed analyses presented in the application focus on those processes that have a significant potential to affect long-term performance of the repository, but all relevant events and processes, including those that are highly unlikely and those that are shown to have little or no impact on the system, are summarized in the application and evaluated in detail in supporting documents.

Subsections of the application address each of the major processes affecting the repository, including, for example, climate change, groundwater flow, and long-term degradation of the waste packages. As required by EPA and NRC regulations, analyses provide an estimate of the mean annual radiation dose that a person living in the vicinity of the repository might receive at any time in the next million years. One of the main conclusions of these analyses is that estimated releases and radiation doses to hypothetical future humans are well below the EPA and NRC standards. Overall, the application concludes that there is a sufficient technical basis for the NRC to issue a license authorizing construction of the facility. This conclusion was a fundamental basis for the 2008 submittal of the application to the NRC for review.

This brings me to my views on the Blue Ribbon Commission's draft recommendation regarding the need for a permanent geological repository. The Commission observed in their draft report that "every foreseeable approach to the nuclear fuel cycle still requires a means of disposal that assures the very long-term isolation of radioactive wastes from the environment." I agree with this observation. Alternative approaches to the nuclear fuel cycle that involve separating and recycling fissile material in irradiated fuel can change the type and character of waste requiring geologic disposal, but they will not eliminate the need. The Commission also concluded in its draft report that "deep geological disposal is the most promising and accepted method currently available," and the Commission further noted that disposal could occur either in mined repositories or potentially in deep boreholes. Again, I agree. Research to date in the United States and elsewhere provides confidence that safe and effective disposal facilities could be designed and operated in a range of geologic settings.

Recognizing that there is much to be done to establish the scientific and technical basis for licensing any of the disposal concepts available to us, and also recognizing that the regulatory process essential to ensuring public health and safety may be time-consuming, I strongly support the Blue Ribbon Commission's draft recommendation for "prompt efforts to develop one or more geologic disposal facilities."

Thank you.

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[1] Sandia is a multiprogram national security laboratory owned by the United States Government and operated by Sandia Corporation for the National Nuclear Security Administration. Sandia Corporation is a subsidiary of the Lockheed Martin Corporation under Department of Energy prime contract no. DE-AC04-94AL85000.

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Joint Hearing of the Subcommittees on Energy and Environment and Investigations and Oversight on *Review of the Blue Ribbon Commission on America's Nuclear Future Draft Recommendations*, October 27, 2011

Summary

I am speaking for myself, and this statement does not necessarily represent the positions of Sandia National Laboratories or the U.S. Department of Energy. My statement neither amends nor adds to Sandia's position regarding the Yucca Mountain License Application, which remains unchanged from its documentation in the License Application.

In my role as Chief Scientist for the Yucca Mountain Lead Laboratory team, I focused on ensuring the integrity and credibility of the scientific basis for the postclosure portions of the License Application that the DOE submitted to the Nuclear Regulatory Commission in June 2008.

The detailed analyses presented in the application focus on the processes that have a significant potential to affect long-term performance of the repository, but all relevant events and processes, including those that are highly unlikely and those that are shown to have little or no impact on the system, are summarized in the application and evaluated in detail in supporting documents. As required by EPA and NRC regulations, analyses provide an estimate of the mean annual radiation dose that a person living in the vicinity of the repository might receive at any time in the next million years.

These analyses conclude that estimated releases and radiation doses to hypothetical future humans are well below the EPA and NRC standards, and that there is a sufficient technical basis for the NRC to issue a license authorizing construction of the facility.

The Blue Ribbon Commission on America's Nuclear Future draft report recommends "prompt efforts to develop one or more geologic disposal facilities." The draft report concludes that "deep geological disposal is the most promising and accepted method currently available" for isolating high-level radioactive wastes, and that disposal could occur either in mined repositories or potentially in deep boreholes. I agree. Research to date in the United States and elsewhere provides confidence that safe and effective disposal facilities could be designed and operated in a range of geologic settings.

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