

Summary of an invited presentation to be made by Lokesh Chaturvedi to the Disposal Subcommittee of the Blue Ribbon Commission on America's Nuclear Future on July 7, 2010

Honorable Co-Chairmen Chuck Hagel and Jonathan Lash

Thank you for giving me this opportunity to present my perspective on the issue of the geological disposal of civilian and defense used nuclear fuel, high level waste, and materials derived from nuclear activities. I have worked in the field of nuclear waste disposal since 1979, mostly to provide scientific evaluation of the Waste Isolation Pilot Plant (WIPP) project in New Mexico, but also as a reviewer of the Yucca Mountain project license application, and have served on a Technical Review Group for the Tank Closure and Waste Management EIS at the Hanford Site in Richland, Washington. These experiences have helped form my views on this subject; however, the views I am expressing today are entirely my own and do not represent any organization that I have worked for in the past or consult with at present.

I will present my views on the three broad questions that this meeting plans to explore and, as requested, will do so in light of my experience at the WIPP.

1. Is a disposal facility (or facilities) needed under all foreseeable scenarios?

From what I know, permanent geological disposal in carefully sited repository is the best solution to the problem of civilian and defense high level waste. Geological repository or repositories will be needed even if large scale reprocessing is undertaken, because "closed fuel cycle" remains a mirage.

2. If so, what are our alternative approaches for disposal?

One has to find a suitable location for an underground repository, go through the process of getting it licensed by Nuclear Regulatory Commission (NRC), excavate it, and start emplacing waste in it. Having professionally reviewed the license application for Yucca Mountain before it was submitted to NRC in 2008, I think the site had a good chance of receiving the NRC license and becoming the first high level nuclear waste repository, but failed because of a lack of public support. Now that the project has been cancelled and the license application has been withdrawn, the only alternative is to find another suitable location. The search for a new site should begin as soon as possible.

3. What should the disposal system development process look like?

The process should start and proceed in partnership with the States and local communities; should use the information collected in the past; should be transparent, fair and based on technical merits; and should involve the regulator (NRC) from the outset.

With respect to what can be learned from the WIPP project experience, as you know, WIPP is a success story and the only operating nuclear waste repository for waste rich in long-lived radionuclides such as Plutonium-239. It was, however, originally promoted as a "demonstration project" and a "pilot plant" when, in fact, a permanent repository was needed and planned. After several attempts in 1988 to 92 period to develop plans for underground experiments with waste failed to demonstrate the need for conducting such experiments, the DOE abandoned that strategy in 1993 and accepted the idea of showing compliance with the radiation protection standards (40 CFR 191, promulgated by the Environmental Protection Agency in 1985) through probabilistic analyses using geological, hydrological, chemical and rock mechanics data and computer analyses of risk assessment. Only after the results of these analyses were submitted in a certification application to the EPA in 1996 and the EPA certified the site in 1998, was WIPP able to open to accomplish its mission as a repository for defense transuranic waste. Now, WIPP has successfully operated for 11 years and has disposed more than 130,000 containers of nuclear waste underground. The WIPP experience demonstrates the importance of transparency of purpose.

In my opinion, it may not be a good idea to try to locate another repository in the vicinity of WIPP, for three technical reasons: First, the WIPP area is an active oil field with oil and gas wells producing and new wells being drilled all around the WIPP site. Second, the effect of heat from high level waste would create a corrosive environment in salt beds which would be bad for the integrity of the waste containers. And third, retrieval of waste after disposal in salt beds would be very difficult and expensive.