

Independent Oversight of Radioactive Waste Management - Influence on the Past - Benefit for the Future – 10143

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ABSTRACT

This paper will examine the impacts of independent oversight on the development and implementation of radioactive waste management and disposal projects, programs, and facilities in the United States. Approaches used by federally commissioned or sponsored studies will be reviewed, as will oversight activities by public interest groups and professional scientific or technical organizations. The efficacy of these three oversight sources will be evaluated from the perspective of the scientific and technical merit of their recommendations, the consideration given to their concerns and suggestions by regulators or managing entities, and the mechanisms used to get their recommendations implemented.

Specifically, independent oversight effectiveness for first-of-a-kind projects will be presented via a review of activities at the Waste Isolation Pilot Plant (WIPP). Throughout its history, independent oversight has been in evidence at WIPP: as a part of the planning process starting in the mid 1950s; intensifying in the 1970s and 1980s as location selection and layout became important; and continuing today with evaluations of operating procedures and requirements.

INTRODUCTION

The intent of independent oversight is to provide an outside review by knowledgeable, unbiased people of actions proposed or being implemented by others, whether public or private, to ensure that action is scientifically and technically sound and well-managed. In the broadest consideration, independent oversight is a part of the functions of governmental bodies, public interest groups, and the media. The function can be internal, such as actions performed by the Inspector General and Quality Assurance or Health and Safety programs, or external in the form of review boards, peer review groups, and the like. Either way, the intent is that reviewers perform an independent and un-conflicted evaluation of the facts and judge the correctness and effectiveness of the action accordingly. In plain English: Independent oversight must have no axe to grind and no hidden agendas.

BACKGROUND

It can be argued that independent oversight of the Waste Isolation Pilot Project (which segued to the Waste Isolation Pilot Plant (WIPP) in 1999) began in 1955 when the Atomic Energy Commission (AEC) asked the National Academy of Sciences (NAS, or the Academy) to examine the issue of permanent radioactive waste disposal in the United States. This request grew out of the results of two conferences on radioactive waste disposal held in 1954 – one to explore the possibility of ocean disposal and the other to consider underground disposal. The Academy had previously been established by President Abraham Lincoln on March 3, 1863, in order to “investigate, examine, experiment, and report upon any subject of science or art” when

requested by any government department. Consequently, NAS is considered an independent oversight entity. They have no regulatory or organizational authority over the actions of federal agencies – they are an “honorific society of distinguished scholars” that recommends, but does not enforce, scientific courses of action.

The Academy responded to the request from AEC by establishing a committee under the National Research Council (NRC) to evaluate alternate disposal methods. The committee organized a conference that was held at Princeton University in September 1955. They identified and invited participants who had not only a broad spectrum of scientific and engineering knowledge, but also experience with radioactive waste management and disposal and geology. The conference was attended by 65 persons representing numerous universities, research institutions, federal government agencies, private companies, and state agencies. However, in this pre-environmental impact era (the National Environmental Policy Act was not enacted until 1970) no environmental group representatives were included. In fact, there were no environmental groups even focused on the radioactive waste issue at that time. The Princeton Conference resulted in the 1957 NAS report which concluded that “The most promising method of disposal of high-level waste at the present time seems to be in salt deposits.” This led to a series of actions by the AEC, Energy Research and Development Administration (ERDA), and the Department of Energy (DOE) that culminated in the selection of the salt formations in southeastern New Mexico as the site for WIPP in the 1970’s.

The NRC continued to provide independent oversight for the entire radioactive waste management issue in the United States, including the development of WIPP. Specifically, in response to a request by DOE, the NRC established a scientific panel for the project in 1978. That panel, which evolved into the “Committee on the Waste Isolation Pilot Plant”, continued the earlier focus to determine if the chosen location and design for WIPP had the ability to isolate transuranic (TRU) waste from the biosphere, even in the event of possible human intrusions. They also conducted broader independent assessments or reviews of the project as demonstrated in their 1983 report about the criteria for site suitability studies, and approaches for project design, construction, and operation. Another major NRC oversight report was issued to address the 1991 review of DOE’s scientific and technical program about the TRU waste isolation capacity of WIPP and its ability to demonstrate compliance with relevant regulations.

Once WIPP opened in 1999, the NRC continued to provide independent oversight but changed the focus with respect to two issues; research needed to enhance confidence in the long-term performance of WIPP; and methods to increase the throughput, efficiency, and cost-benefits of characterizing, certifying, packaging, and shipping waste to WIPP without compromising safety. For some issues, the role of the NRC was more closely considered as providing expert advice on how to improve WIPP-related programs, such as the 2005 study of risk assessment methods and approaches. The objective was to advise DOE on how to implement risk-based approaches during the development of their TRU and high-level radioactive waste disposition program. Effectively, this effort can be considered independent oversight in that the NRC committee reviewed the current methods being used by DOE and recommended improvements. The committee also reviewed and provided input on proposed changes to WIPP site characterization activities in a 2004 report. The report stated that while such changes may be justified, DOE

needed to provide better quantitative assessments to show that any proposed changes would not adversely affect the protection of workers, the public, or the environment.

The second formal independent oversight group associated with WIPP is the “Governor’s Advisory Committee on WIPP” established in 1975 by New Mexico Governor Apodaca. This committee consisted of 10 individuals representing New Mexico’s scientific and academic communities. In essence, this group was established to provide the New Mexico state government with scientific and technical advice about environmental, health, and safety issues associated with transporting and disposing of TRU waste at WIPP. To some extent, the committee was formed because of a historical lack of openness and cooperation between the federal government and the State with respect to radioactive waste disposal issues in New Mexico. The only known public input to this committee was a 1979 submission of comments about the draft WIPP Environmental Impact Statement (EIS). When reviewing their comments, it is easy to see that this group followed the premise of independent oversight by raising scientific and technical questions stemming from the information presented, rather than adhering to a pre-conceived position either for or against WIPP.

While this committee was active, discussions between the State of New Mexico and ERDA/DOE led to the 1978 establishment of a full-time independent technical evaluation group, the Environmental Evaluation Group (EEG). Even though EEG was funded by a DOE contract, this group was originally made part of the New Mexico Health and Environment Department. In doing so, the State of New Mexico could have a group of full-time experts providing relevant input as a check or counterpoint to the studies and reviews conducted by NAS and other federal regulatory agencies.

EEG focused much of its initial effort on geotechnical issues associated with mining and operating a radioactive waste disposal repository in the middle of a massive salt formation more than two thousand feet underground. One of their initial oversight actions was to convene a meeting of 35 individuals, both scientists and interested parties, to review information available about the proposed the WIPP location in order to identify unresolved geotechnical issues. EEG also broadened their oversight to include an assessment of radiological health issues, mine safety, post-closure performance, and other scientific and technical topics. By 1983, EEG had essentially determined that the proposed disposal site was safe for use as a radioactive waste repository.

In their years of operation, EEG functioned somewhat differently than most independent oversight organizations in that they conducted an active radiation sampling and analysis program at and around WIPP from 1985 through 2002. One of the strengths of EEG during the pre-startup period for WIPP was that they were perceived as being more open than either DOE or the regulatory agencies when it came to listening to and addressing concerns of the public.

Yet another state-related oversight entity was established in 1990. The New Mexico Environment Department (NMED) formed the DOE Oversight Bureau through a grant from DOE according to provisions set up in the Agreement-in-Principle (AIP) between the State and DOE. The duty of the Oversight Bureau was to ensure that New Mexico’s DOE facilities were “managed and controlled in a manner that is protective of public health and safety and the

environment.” Thus, not only was WIPP being monitored by NMED, but so were New Mexico DOE sites (such as Los Alamos National Laboratory (LANL) and Sandia National Laboratory) that generated TRU waste bound for WIPP. The Oversight Bureau had and continues to have no regulatory authority. Instead, it oversees monitoring and assessment programs including “both joint and independent evaluations for environmental and public health protection of all media, including air, soils and sediments, groundwater, and surface water. The focus of these evaluations is on the potential contaminant levels of heavy metals, organic and inorganic compounds, and radionuclides”. (New Mexico is not alone in this oversight function. It should be noted that other states, such as Tennessee, also have DOE Oversight Bureaus.)

The independent oversight role for WIPP changed extensively after its opening in 1999. While the Academy continued their role as discussed above, the role of EEG was reduced with the expansion of the AIP in 2004, at which time EEG’s radiation surveillance program was transferred to the Oversight Bureau. In that same timeframe, EEG’s contract with DOE was terminated due to inadequate fiscal management and control.

In addition to the inherent peer review nature of NAS and EEG activities, another form of independent oversight instrumental in the development of WIPP was the peer review process implemented directly by DOE. Peer reviews were conducted for such wide-ranging topics as waste characterization, nuclear safety of WIPP operations, and development of the WIPP performance assessment. In regulations that were promulgated in 1996, EPA mandated that DOE conduct peer reviews on any proposed changes to assumptions or models that would impact WIPP’s compliance with EPA standards. However, DOE had, in fact, initiated approximately fifteen peer review actions between 1989 and 1996 in addition to the independent oversight studies and reports provided by NAS and EEG. Subsequent to the promulgation of EPA regulations, seven peer reviews were conducted and incorporated into the initial certification application to EPA. For the first recertification, which was submitted in 2004, seven additional peer review panel reports were issued under DOE sponsorship. Additional peer reviews related to the issue of deep geologic repositories were also prepared by international agencies.

More recently, there was public concern that additional full-time independent and unbiased oversight of WIPP was still needed to ensure environmental and public protection. Consequently, DOE was directed to re-issue an independent oversight contract, which was awarded to PECOS Management Services, Inc. (PECOS) in 2005. Unlike regulatory agencies or the Oversight Bureau, PECOS was hired to provide a pure scientific and technical perspective to the health and safety and environmental aspects of WIPP. PECOS was specifically tasked to be independent of DOE and the regulators, including the Oversight Bureau who continues to conduct radiation surveillances. PECOS has taken that mission very seriously, from the perspective of both public perception and agency interaction – listening to concerns and opinions from all parties, and weighing that input against all available scientific and technical information.

Effectively, the PECOS approach is to use everything that has been learned about the TRU waste disposal program in order to identify areas of improvement and therefore minimize the risk to workers and public – now and in the future – with respect to characterization, treatment, transportation, and disposal of TRU waste. To this end, nearly a dozen reports have been

submitted by PECOS to DOE. For example, PECOS issued one in 2006 about installing massive concrete block walls and a concrete monolith to isolate each filled waste disposal panel in WIPP. Based on an analysis of thousands of data points for potential airborne contamination via salt and TRU waste, PECOS found that the initial risk had been vastly over-estimated, and that the health and safety benefits from installing this type of barrier were substantially less than the risks of injuries to workers during barrier construction. Others dealt with liquids in waste container, waste characterization techniques, and comparable topics.

It should be mentioned that several concerned citizens groups have been very active in their review/oversight of WIPP and other New Mexico DOE facilities. They commented extensively, both privately and publicly, to DOE during the EIS process, as well as during regulatory activities associated with EPA certification, and the issuance of hazardous waste facility permits by NMED. Some of those groups were and continue to be scientifically astute and unbiased, but most concerned citizen groups are not viewed in such a light. In fact, they are often perceived to be biased in their reviews of “technical information.” Moreover, they exhibit a history of blocking solutions to radioactive waste disposal issues by employing an overall objective of somehow stopping the use, *any use*, of radioactive materials. Nevertheless, their influence on New Mexico’s DOE sites and WIPP has been substantial in large part because they, unlike the other independent oversight groups, are in a stronger position to challenge either DOE or the regulatory agencies through legal action. In fact, it was largely due to their efforts that the mission of WIPP was scaled back to simply accept defense-related TRU waste, notwithstanding that there is no scientific basis for imposing such a limit.

WIPP is not the only facility that has benefitted from some sort of independent oversight. Yucca Mountain, before its demise, had groups similar to WIPP, ranging from concerned citizens to DOE-sponsored peer reviews. Secretary of Energy Chu has promised that a Blue Ribbon Panel will be established to determine a scientifically-based course of action for this nation’s high-level radioactive waste problem. This might be similar to the NRC panel convened over 60 years ago, and quite different than the Defense Nuclear Facilities Safety Board (DNFSB) and the Environmental Management Advisory Board (EMAB), which are discussed further below.

There are several other Congressionally mandated groups that perform independent oversight of DOE environmental activities including Citizens’ Advisory Boards and the Defense Nuclear Facilities Safety Board (DNFSB). Citizen Advisory Boards (CABs) have been established at several DOE locations including Hanford, Oak Ridge, Savannah River, and Los Alamos under the Federal Advisory Committee Act (FACA). FACA established the CABs to provide a formalized on-going public forum for the reporting and discussion of environmental management activities at DOE sites. It ensures advisory board deliberations and recommendations are available to members of the general public.

One example CAB, the Northern New Mexico Citizens’ Advisory Board (NNMCAB) was formed in 1997. The NNMCAB provides recommendations directly to DOE with respect to “environmental monitoring, remediation and waste management issues” at Los Alamos National Laboratory. The NNMCAB is composed of technical and lay people with varying levels of knowledge and understanding of the environmental, health, and safety issues associated with environmental remediation and waste management. As a result, their recommendations, while

well-meaning, often do not reflect scientific reality. CAB recommendations are not binding, but DOE must listen and respond to such recommendations. Additionally, DOE can also make suggestions to the CABs, as evidenced by a March 2009 request made by the Office of Environmental Management through the NNM CAB's DOE representative that NNM CAB included reviewing topics that were less technically complex.

DNFSB was created by Congress in 1988 to provide the Executive Branch with a source of independent oversight of DOE's defense-related nuclear facilities. (Before 1988, there was no governmentally mandated external independent oversight of DOE.) DNFSB is responsible for supplying "advice and recommendations to the Secretary of Energy to ensure adequate protection of public health and safety." However, the Secretary can reject any recommendation made by DNFSB. These recommendations are also included in the DNFSB annual report to Congress about its oversight activities and improvements in nuclear-site safety that have resulted from those oversight activities.

Within DOE itself, the EMAB provides "independent and external advice, information, and recommendations to the Assistant Secretary for Environmental Management (EM) on corporate issues relating to accelerated site clean-up and risk reduction." As with the CABs and the NAS, the activities of the EMAB are governed by FACA and its members come from a wide variety of backgrounds (government, academia, and private industry). While DOE has to take into consideration and respond to the EMAB recommendations, the Assistant Secretary is not obligated to do what EMAB suggests.

CONCLUSION

In conclusion, overall the U.S. has benefitted by the independent oversight of DOE environmental activities, as evidenced by the ten year safety record of WIPP, for example. Further, through the independence of oversight groups, including peer review groups, numerous concerns about radioactive waste disposal were identified, explored, and resolved. Going forward, independent oversight functions offer one of the best methods for translating what we have learned into continually safe and cost-effective radioactive waste management.

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