
**WASTE ISOLATION PILOT PLANT
(WIPP)**

**BLUE RIBBON PANEL
MEMBER REPORT**

Newal Squyres
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EXECUTIVE SUMMARY

The Waste Isolation Pilot Plant (WIPP) Blue Ribbon Panel was established by the Secretary of Energy in late August of this year. The five members of the panel were each asked to provide an independent assessment of certain issues related to the recertification or validation of Rocky Flats Plant waste for shipment to WIPP and to the Draft Plan for the WIPP Test Phase: Performance Assessment and Operations Demonstration. Those issues and my recommendations are as follows:

1. **The proposed plan to validate Rocky Flats Plant certification of waste for shipment to WIPP.**

The latest draft of the Rocky Flats Waste Recertification Program Plan (DOE/WIPP 89-025) was received as this paper was being finalized. Although more detail needs to be provided, particularly concerning the audit of RFP's certification processes, it appears to contain most of the elements necessary to provide assurance that RFP generated waste has been properly certified. For waste at INEL, the plan should be developed in conjunction with the September 1989 draft RWMC/SWEPP Compliance Plan for TRUPACT-II Authorized Methods for Payload Control (TRAMPAC). Both plans should be circulated to EEG and/or other representatives of Colorado, New Mexico and Idaho for comment. No RFP waste should be shipped from INEL to WIPP unless it

complies with the TRAMPAC plan, which requires a re-evaluation and examination of the certification for each drum to be shipped; and post-1985 INEL stored waste, which was WIPP/WAC certified by RFP, should not be shipped until validation of RFP's waste certification program. A Colorado representative should have the opportunity to observe each step of the planned re-examination of certain RFP waste to see whether it is properly classifiable as LLW, rather than TRU. RFP stored waste not examined under this procedure should not be shipped to WIPP unless it conforms to TRAMPAC, and its previous certification has been validated. Newly generated RFP waste should be certified to WIPP/WAC under any new procedures or compliance requirements flowing from the recertification/validation process.

2. The concept and timing of the WIPP Demonstration Test Plan and the relationship between the performance assessment and operations demonstration.

a) **Operations Demonstration:** The operational capability of WIPP to safely and efficiently receive and place waste underground is a critical component in fulfilling WIPP's research and development mission of demonstrating the safe disposal of defense generated radioactive waste. An operations demonstration will begin with the receipt of the first waste for use in the performance assessment process. Included in the scope of the operations demonstration must be the capability to retrieve all waste placed underground during the PA; retrieval plans must be correlated to the nature of the PA experiments and be sufficient for the scientific and

technical community to believe they will work. The PA will be an evolving, iterative process. A full fledged operations demonstration should begin when sufficient data is received from the PA to establish with reasonable confidence the conditions (backfill and other engineering modifications) under which particular waste will be disposed of. Final decisions about the optimum design and use of the underground space, including such things as how the waste is stacked and whether some waste is segregated from other waste, will depend on information from the PA. Pending the satisfactory resolution of the institutional, technical and legal/regulatory considerations concerning WIPP's use as a permanent repository, serious consideration should be given to its use as an interim storage facility. In this capacity an operations demonstration would be conducted, which should provide useful information in the research and development process for WIPP.

b) Performance Assessment: The PA process involves TRU and mixed-TRU waste and different regulatory issues and approaches result from these distinctions in waste form. The regulatory requirements need to be clarified so the PA can provide the information necessary to satisfy the regulations or so that necessary changes and modifications can be made to the manner in which the waste is stored (including engineering modifications) or to the methods and procedures under which the waste is initially handled and packaged for shipment to WIPP. Lab scale experiments must begin as soon as possible. Bin-scale and room-scale (alcove) tests will begin as soon as operational readiness and regulatory authority are obtained. All of these tests are necessary to

achieve regulatory compliance and to determine the conditions under which permanent disposal can begin. Based on the unique nature of WIPP and its research and development mission, the performance assessment phase should begin in full as soon as operational readiness is obtained. DOE should explore with ways to allow the experiments to begin even if final regulatory approval has not been obtained by the time operational readiness is achieved. DOE should continue to integrate and expand the PA database, based on WIPP/WAC and TRAMPAC compliance as well as the updating and expansion of the Preliminary Nonradionuclide Inventory for CH-TRU Waste (IT Corporation, May 1989). Information concerning the character of the waste, gathered to satisfy various compliance requirements, needs to be reported uniformly by generator site and coordinated with the process of determining whether, or in what manner, WIPP can comply with applicable regulatory standards. Better knowledge can be gained in the PA by making full use of all available information about the wastes to be shipped to WIPP. The PA process should take into consideration the fact that most of the waste destined for WIPP has not been generated and thus the results of the PA and the needs of the facility may affect the way waste is stored and handled at its inception. There should be a regular, formalized process of interaction and communication between the PA, WIPP/WAC personnel and the generator sites. The underlying assumptions about the character of the waste and the storage methodology used in the PA should be continually reexamined to insure that regulatory compliance and/or public confidence are not undermined by worst case scenarios or other assumptions which have no realistic basis in fact or which could be modified. The PA plan should

not be constricted by unrealistic or arbitrary time limits that do not consider the research and development mission of WIPP or that do not reasonably correspond with the gathering of data necessary to determine the long term acceptability of WIPP as a permanent disposal site. Performance assessment, broadly defined, should continue as long as data is generated which supports modifications/improvements in the use of WIPP to demonstrate the safe disposal of TRU/Mixed-TRU waste. Based on the knowledge gained from using the facility, the waste management disposal systems at WIPP will probably not remain static. Changes may occur because of alterations or modifications in the character of waste shipped to WIPP, considering the time period when the waste was generated, the effect of RFP's waste minimization plan, the effect of compaction or other unanticipated changes which might flow from the increase in knowledge about WIPP. The PA is the principal mechanism to implement the congressionally mandated goal of demonstrating that a geological repository such as WIPP is a viable solution to the need for a safe long term disposal site. Continuing consultation and interaction with the EPA, NAS and EEG is appropriate and necessary to achieve this goal.

DISCUSSION

I. INTRODUCTION

The primary statutory basis for WIPP is contained in section 213(a) of Public Law 96-164, the Department of Energy National Security and Military Applications of Nuclear Energy Authorization Act of 1980. This section directed the Secretary of Energy to proceed with construction of the Waste Isolation Pilot Plant and further provided:

Notwithstanding any other provision of law, the Waste Isolation Pilot Plant is authorized as a defense activity of the Department of Energy, administered by the Assistant Secretary of Energy for Defense Programs, for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission.

Congress required the Secretary of Energy to consult and cooperate with officials of the state of New Mexico in carrying out WIPP's mission and further provided in section 213(c):

No law enacted after the date of the enactment of this act shall be held, considered, or construed as amending, superseding, or otherwise modifying any provision of this section unless such law does so by specifically and explicitly amending, repealing or superseding this section.

It is now nine years since Congress established WIPP's mission, and numerous groups, including this panel, are involved in addressing issues associated with beginning to use WIPP as a site for the disposal of TRU and mixed-TRU waste resulting from defense activities and programs of the United States.

At the initial briefing held for the panel, the representative from the National Academy of Sciences stressed the need to move forward with the test phase for WIPP in order to obtain the information necessary to determine the conditions under which WIPP can serve as a permanent disposal site. At the present time, TRU and mixed-TRU waste are stored "temporarily" at various sites throughout the United States with the vast majority being stored at the Idaho National Engineering Laboratory. A relatively small amount of more recently generated waste is stored at the Rocky Flats Plant (RFP) in Colorado, but there are currently strict limitations on the amount this may increase. Similar waste is being generated on a regular basis due to national security requirements. There is thus a strong national interest in storing and permanently disposing of this waste safely. WIPP was established by Congress (and has been funded in the total amount of \$780 million through fiscal year 1989) to determine whether such a geologic repository can demonstrate its capability to serve as a permanent disposal site. That final decision cannot be made yet, but it is now time to do what is necessary for the research and development process to go forward.

II. VALIDATION/RECERTIFICATION OF ROCKY FLATS PLANT WASTE FOR SHIPMENT TO WIPP

Because of recent events at the Rocky Flats Plant concerning, broadly speaking, its handling and disposal of waste from nuclear weapons production, DOE has perceived a need to validate or recertify waste previously certified by RFP to WIPP's Waste Acceptance Criteria standards. I am not aware of any allegations that directly relate to the WIPP/WAC certification program at RFP. No assertions have been made that any individuals associated with the certification process intentionally or negligently did something to raise any substantial concern about the original waste certification process. In addition, there have been periodic audits and inspections of the RFP WAC certification program conducted by WACCC, non-RFP personnel. My understanding is that an EEG representative has accompanied such audit teams and that no substantial problems have been identified. These are relevant considerations in evaluating the scope and efficacy of a plan to recertify Rocky Flats waste.

There are at least three interrelated, yet distinct, categories of waste involved in the validation/recertification program. First, there is a portion of previously certified RFP waste that may be properly classifiable as low level waste, rather than TRU. Re-examination of this limited category of waste will be conducted by re-assaying the waste with more sophisticated equipment than was used initially. The object is

to determine whether a particular container has a sufficiently low amount of radioactive material to be characterized as low level radioactive waste, rather than TRU. Because this re-assay process may create an ability to continue storing this waste at RFP without contributing to the 1601 cubic yard limit agreed to by DOE and the state of Colorado, it is particularly important for an appropriate representative from Colorado to have the opportunity to be present during each step of the re-examination process. The Colorado representative should be fully briefed for a thorough understanding of how the waste was originally assayed; how the waste was identified for re-examination; and how the new equipment differs from the old, including the use of controls to assure that the new equipment is being operated and functions accurately to produce measurements that are not open to question. In summary, DOE should make the necessary arrangements with the Governor of Colorado to obtain the presence of a technically competent representative to sign off on this portion of the validation/recertification process.

The second category subject to the validation/recertification plan is waste now being stored at RFP, which was previously WIPP/WAC certified by RFP. Before this waste can be shipped to WIPP, it must also be certified for shipment under the TRUPACT-II authorized methods for payload control (TRAMPAC). The latest draft Rocky Flats Waste Recertification Program Plan (DOE/WIPP 89-025, October 1989) was received as this report was being prepared and has not been reviewed in detail. However, the plan for this category of waste contemplates an unannounced audit process administered by the WACCC. The audit will include quality assurance and record keeping activities but will focus on

activities associated with initially packaging and certifying the waste. This appears to be an acceptable audit process but more information is needed concerning the actual scope and duration of the audit.

In addition, substantially more detail is needed concerning the plan to recertify that portion of the 1200 drums, less that determined to be low level in the re-assay process, to be shipped to WIPP. This portion of the plan should include a re-examination of each drum and its original certification by individuals not involved in the original certification. At least a significant number of randomly selected drums should be recertified by different people. Finally, the validation/recertification of this category of waste must be observed to the extent deemed appropriate by the states involved, and measures should continue to be taken to provide the opportunity for independent oversight in the development and implementation of the recertification program.

The third category of waste subject to this plan involves approximately 8800 drums of waste certified by RFP prior to shipment to INEL; this waste has been stored at INEL since 1985. The purpose of the draft RWMC/SWEPP Compliance Plan for TRUPACT-II Authorized Methods for Payload Control (TRAMPAC) is to provide the methodology for examining each of these drums to make sure it can be shipped to WIPP in accordance with TRAMPAC criteria. Unfortunately, the TRAMPAC criteria were developed somewhat independently from the WIPP/WAC criteria, and it is possible that waste may be certifiable for acceptance at WIPP but not meet the criteria for TRUPACT-II shipment. As this plan is finalized, it could serve as a basis to integrate the WIPP/WAC with

the TRAMPAC requirements so that one certification process satisfies both. In any event, DOE should make certain that compliance with WIPP/WAC will also provide compliance with TRAMPAC.

Because each container now stored at INEL and intended for shipment to WIPP must be re-examined to insure compliance with TRAMPAC, and because that process will begin in the very near future, the plan for the validation/recertification of RFP certified waste at INEL should be developed in conjunction with the TRAMPAC compliance plan. It appears that the draft TRAMPAC compliance plan contemplates an examination of the data generated when the waste was originally certified by the RFP, a 100% real time radiography (RTR) examination of each container and a random sampling process, all conducted at the SWEPP site. There should be an integration between the TRAMPAC compliance plan and the RFP recertification plan. An opportunity should be provided for comment on the proposed plans by the EEG and/or other appropriate state representatives, and arrangements should be made for independent observation of the implementation of the plans, if requested. Before going forward with a plan to validate or recertify RFP waste, DOE should be satisfied that appropriate groups and state representatives are in essential agreement with the plan's scope and methodology. This, plus a thorough briefing concerning the basis for DOE's confidence in RFP's certification processes, are necessary to blunt public skepticism concerning RFP's waste certification processes.

III. CONCEPT AND TIMING OF THE WIPP DEMONSTRATION TEST PLAN; RELATIONSHIP BETWEEN THE PERFORMANCE ASSESSMENT AND OPERATIONS DEMONSTRATION

A. Operations Demonstration: An operations demonstration is necessary and will begin with the waste to be used in the test phase. The object of the performance assessment portion of the test plan is to develop the necessary information to determine the conditions under which the waste will be stored or disposed of to achieve regulatory compliance and the overall suitability of WIPP as a permanent repository for TRU/Mixed-TRU waste. Until the information from the PA becomes available to begin to make such decisions, an operations demonstration, conducted on the basis of assumptions about how the waste will be stored, seems premature. It has been continually stressed that the PA will involve an iterative, step by step learning process. The operational activities associated with receiving and placing the waste underground will be significantly influenced by what is learned in the PA concerning the behavior of the waste and the geologic repository. Because of uncertainties associated with the results of the PA and thus with any measures that may be necessary to counter unexpected or adverse conditions, flexibility needs to be maintained concerning the commencement of waste acceptance at capacity or near capacity rates. Essentially, I agree with NAS's observations and recommendation 6 of the Review Comments on DOE document DOE/WIPP 89-011: Draft Plan for the Waste Isolation Pilot Plant Test Phase: Performance Assessment and

Operations Demonstration, July 19, 1989. At this juncture, the operations demonstration process should obviously make every effort to maximize what can be learned from emplacement of the waste needed for the PA. A plan should be developed to determine how best to maximize from an operational standpoint the experience gained with the waste to be used in the PA.

Perhaps an unspoken concern, at least in the limited experience of this member, is the belief that the current operations demonstration plan may provide a method for the temporary storage of waste, until the PA process is far enough along to make some final decisions concerning the use of WIPP to solve obvious problems existing in the management of TRU/Mixed-TRU waste. Stated simply, there is too much waste and no readily acceptable place to put it. Until sufficient information is available to demonstrate regulatory compliance of WIPP and to demonstrate its safety as a long term disposal site, issues concerning the temporary or interim storage of waste will be present.

In this regard, the NAS representative that met with the panel at its first meeting said, perhaps unofficially, that although the question had not been asked he did not oppose placing waste underground so long as it was recognized that the waste was not necessarily put there on a permanent basis. Common sense virtually compels the conclusion that waste is better stored underground at WIPP than it is above the surface, and this appeared to be the position of the NAS representative. Although the subject has been covered in part in the supplemental environmental impact statement, a detailed and thorough analysis needs to be done of the costs and benefits of continuing to store TRU and mixed-

TRU waste at interim sites not developed to assure the safe handling of such waste. There would appear to be certain beneficial effects from the use of WIPP as an interim storage facility in terms of an operations demonstration. These benefits alone would not justify such use but could be achieved through a well considered, conservative plan for using a portion of the facility for interim storage. The subject should be addressed with the regulatory agencies, including appropriate participation by those groups (EEG and NAS) long involved in evaluating WIPP and its proposed use.

B. Performance Assessment. The plans associated with the performance assessment to demonstrate regulatory compliance do not appear to take into consideration the difference in the regulatory scheme for radioactive waste (40 CFR 191, Subpart B) and hazardous waste (40 CFR 268). These differences are illustrated, for example, by different definitions of "disposal". With respect to radioactive TRU waste, "disposal of waste in a mined geologic repository occurs when all of the shafts to the repository are backfilled and sealed." 40 CFR 191.02(l). On the other hand, for hazardous waste, "land disposal" means placement in the land and includes placement in a salt bed formation, underground mine or cave. 40 CFR 268.2(a). An estimated 50% to 60% of the defense generated waste to be emplaced at WIPP is mixed, containing both hazardous constituents and TRU radioactive waste. The regulatory process needs to address these facts about the waste WIPP must contend with to fulfill its mission.

The Environmental Protection Agency is currently considering DOE's no migration petition, filed pursuant to 40 CFR 268.6. Until the no migration petition is approved, mixed waste apparently will not be put underground at WIPP. If the no migration petition is not approved or is delayed, current plans for the PA will have to be modified. The term of a no migration petition may be only 10 years, and this could pose downstream problems for waste emplaced at WIPP in reliance on the no migration petition exemption. Even if the no migration petition is granted, what appears to be an inconsistent regulatory approach, or perhaps better termed a non-approach, to the regulation of TRU/Mixed-TRU waste creates potentially fertile ground for future problems. An effort should be made to reconcile or harmonize what appear to be conflicting regulatory approaches. DOE should probably not assume that the no migration petition will be granted in a timely fashion and should therefore begin to develop contingency plans for the PA, specifically including an early approach to EPA to develop a way to begin the presently planned experiments at WIPP as soon as operational readiness is achieved.

A combination of lab scale, bin-scale and alcove tests are clearly necessary to develop the information for a satisfactory performance assessment, and just as importantly, to gather data necessary to predict the net behavior of the rooms for long term disposal purposes. The performance assessment/experimental program must adequately address the concerns, and seek solutions, raised by the presence of hazardous constituents, particularly volatile organics, in the waste intended for disposal at WIPP. An increased effort should be made

to insure that as much pertinent and uniform data as possible is gathered for these purposes from all available sources, including the WIPP/WAC and TRAMPAC compliance process and an ongoing update of the Preliminary Nonradionuclide inventory for CH-TRU waste.

DOE and its contractors appear to be making progress in responding to NAS recommendations concerning the performance assessment/experimental test program. Scientific and public confidence in this program is obviously enhanced by input received from NAS, EEG and EPA together with the recognition that the process is an iterative one, which requires constant flexibility and openness in recognizing potential problems and developing solutions, so that regulatory compliance can be achieved and decisions made about permanent disposal. A formal mechanism should be established so that the personnel involved with performance assessment/experimental test program work closely with the personnel, from WIPP and the generator sites, responsible for WIPP/WAC and TRAMPAC compliance. This will provide for early identification and implementation of measures intended to remedy known or anticipated problems.

There should be a direct relationship between the results, even preliminary, from the performance assessment and the conduct of an operations demonstration. Planning for the performance assessment and the first receipt of waste, including the timing and volume of waste received, should be conducted so as to maximize the opportunity to test, verify and modify, if appropriate, the operational plan for waste receipt and emplacement.

Short term goals, such as compliance with 40 CFR 191 and reaching an early decision concerning permanent disposal, cannot predominate over the long term goal of establishing the conditions for WIPP's use as a final repository for TRU and mixed-TRU waste. The solutions to the gas generation and brine inflow issues, for example, may evolve and may permit a portion of the facility to be used as a final repository but nevertheless warrant modifications or changes in both the waste form and repository usage for another portion of the site. Regulatory issues may be resolved differently at one point in time than another, because of the continuing learning process. In terms of complying with 40 CFR 191, PA personnel should continue to consider NAS's suggestion to supplement the numerical predictions of a performance assessment with qualitative judgments. It may be necessary to continue aspects of the performance assessment/experimental program even after a final decision is made that certain portions of the repository can be used for permanent disposal.

IV. ADDITIONAL CONSIDERATIONS AND CONCLUSION

Progress appears to have been made by the DOE in recognizing the need for better coordination and integration among various people and groups with responsibility for WIPP. In order to make the transition from the site selection/construction phase of WIPP to its actual use to fulfill the congressionally mandated goal of providing a research and development facility to demonstrate the safe disposal of defense weapons production generated waste, DOE and its contractors are now required to focus realistically on the so-called institutional concerns and decide what needs to be done to put WIPP in use. Resolution of these institutional concerns should be enhanced by the progress made in meeting the concerns expressed by the NAS and EEG concerning the performance assessment/experimental program phase.

From an operational and technical standpoint, WIPP is about ready to begin receiving waste as the project moves from the construction phase to the test phase. Significant institutional and regulatory issues remain to be resolved but these issues do not go to the merits of WIPP's functional ability to serve as a valuable national resource of providing a place to store defense generated nuclear waste. Once operational readiness is achieved, there is no reason not to go forward with the test phase, which should be conducted to the maximum extent possible on site at WIPP. So long as the ability to retrieve the emplaced waste is maintained, WIPP should be put to use. If funds need to be set aside in order for public confidence to exist with respect to

retrievability, then that should be done. WIPP is a unique facility, whose very existence and current status are the result of the hard work and dedication of numerous groups both inside and outside the government. There are an infinite number of variables associated with the way WIPP may ultimately be used as a disposal site, and there will no doubt be troublesome issues that must be resolved in the course of making the decisions about that use. But those decisions are not being made in a vacuum or without the opportunity for oversight by groups representing the public interest, particularly the states directly involved. It is reassuring that not once during my involvement in this project did anyone suggest that a particular course of action should be taken for national security reasons. Clearly, there are national security issues at stake when one considers the disposal of defense-generated waste. But the history of WIPP's development clearly illustrates that decisions about its use will not be made in secret or without significant involvement of groups outside of DOE and its contractors. To this point, decisions about WIPP appear to have been made based on the best available technical and scientific input from numerous sources. This should continue as decisions are made about its future use as a repository for actual waste, for only in this manner will the proper decisions be made, in the national interest, about WIPP's ultimate suitability as a permanent repository.