

# LICENSING THE CALIFORNIA LOW-LEVEL WASTE DISPOSAL FACILITY -- CHARTING A NEW COURSE

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## ABSTRACT

The California Department of Health Services plans to make a licensing decision for the proposed Ward Valley low-level waste disposal facility in the Spring of 1991. The licensing review has been the first in the country to address the 10 CFR Part 61 requirements for a new disposal facility and to employ the corresponding NRC regulatory guidance. Therefore, DHS has had to pioneer some new approaches to the licensing process.

Three key approaches have been developed that other states entering a licensing review process may want to consider. First, the licensing team found that although regulatory guidance exists, the license application ultimately must be evaluated against the regulations themselves. Second, the development of a matrix of Part 61-based regulatory findings to be made in the SER, at the beginning of the review process, helps ensure the completeness of the review. Third, an early attempt to outline the points to be addressed in justifying each finding can help focus the technical review and interrogatory process from the very beginning.

## INTRODUCTION

Nearly a decade has passed since the U. S. Nuclear Regulatory Commission (NRC) set forth the comprehensive regulations for near-surface disposal of radioactive waste contained in 10 CFR Part 61. In that time, many states, disposal site operators, and contractors have looked to those regulations for guidance on how to carry out site selection studies, to characterize sites, and to design facilities for low-level waste disposal. In several cases, the regulations have also guided the preparation of license applications for new disposal sites. Part 61 has formed the basis for new Agreement State regulations and has also been used by regulators of the three currently operating sites for license renewals and amendments. However, California is the first state to reach the point of actually applying the regulations to evaluate a license application for a new facility and to develop the basis for a decision on issuing the license.

To assist in understanding how to apply the requirements of Part 61, NRC has issued a series of regulatory guidance documents relating to the various elements of the waste disposal system. These have included guidance on waste classification, waste form, site selection and characterization, design and operations, closure and long-term care, financial assurances, and quality assurance. All of these guidance documents need to be considered in a licensing review. However, the two of most direct application are

NUREG-1199, Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility (1), and NUREG-1200, Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility (2). These two documents have formed the backbone of the process of preparing and reviewing the license application for a disposal facility in California.

## THE CALIFORNIA LICENSE APPLICATION

The process of developing a new disposal facility for low-level radioactive waste generated in California and the Southwest Compact has been underway for several years under the direction of the California Department of Health Services (DHS). As in several other states, DHS has responsibility for overseeing the project development as well as issuing the facility license and regulating site operations. DHS has adopted Part 61 in its regulations with only a few changes to reflect California's situation.

After some initial screening work by DHS to identify regions of interest in the state, US Ecology was selected to complete site selection and characterization studies, prepare a facility design and operating procedures, and compile the license application. DHS also formed an interagency review panel comprised of representatives from the various state agencies with a regulatory, permitting, or advisory role to assist in review of US Ecology's activities. After receiving guidance from DHS on facility design based

on the results of a study of design alternatives performed by Ebasco, US Ecology submitted a license application for a near-surface disposal facility at the Ward Valley site in the Fall of 1989. The Ward Valley site is located in the Mojave Desert about 20 miles west of Needles, California, on land to be transferred from the Bureau of Land Management (BLM) to the State of California. The site will occupy 1000 acres, of which 70 acres will be used for the disposal area and another 20 acres for the support facilities.

The application was composed of 11 volumes, containing over 7000 pages of information. The applicant provided the types of information outlined in NUREG-1199 wherever appropriate, although there were some deviations from the format and content in the guidance to reflect the unique conditions of the Ward Valley site. During the course of the licensing review, the review record was expanded to include another 4000 pages of responses to interrogatories and supplemental reports.

The license application was accompanied by a four-volume Proponent's Environmental Assessment. The latter formed the basis for a joint Environmental Impact Statement/Environmental Impact Report (EIS/R) prepared by DHS and BLM to evaluate the environmental impacts and biologic assessments necessary for the transfer of land for the facility from BLM to the state. The EIS/R development was handled separately from the license application review and will not be covered in this paper. This paper also does not address the activities relating to negotiation of a land lease and obtaining other permits and approvals.

#### LICENSE REVIEW PLAN

The license review plan developed for California prior to receipt of the application set forth a review process that is rather similar to that defined by NRC in NUREG-1274 (3). The basic activities that were expected to be necessary were the following:

- Completeness review and request for any additional information needed
- Detailed technical review of the application, following the standard review plans in NUREG-1200
- Interrogatories to the applicant, requesting further information, clarification, or justification of information and conclusions in the application, and review of the responses
- Preparation of a draft and final Safety Evaluation Report (SER), using the suggested format and content of NUREG-1200
- Public hearing on the license, if requested.

These basic steps did indeed provide the framework for the review. However, actual implementation of these steps

required a number of innovations along the way, as discussed in the remainder of this paper.

#### COMPLETENESS REVIEW

Before initiating a detailed technical review of the license application, a completeness review by the Department and its technical review contractor, Roy F. Weston, Inc. (WESTON), was performed to ensure that the basic components of information were present. The completeness review was primarily directed toward an efficient review process. However, it also supported the finding of a complete application to satisfy the January 1, 1990, milestone of the Low-Level Radioactive Waste Policy Amendments Act of 1985.

To keep the time and effort required for this step to a minimum, a checklist review was performed to compare headings in the application with the headings and suggested contents in NUREG-1199, as well as the "areas of review" listings in the standard review plans in NUREG-1200. Each section was also reviewed to determine if justifications were presented for the conclusions in the application. This review simply identified if the necessary information was present and made no attempt to evaluate the adequacy or validity of the information or justifications to support licensing findings. This led to a request for additional information, which was submitted on December 8, 1989, and the application was certified complete. A detailed technical review was then initiated by the Department and WESTON. The application was printed for distribution in April 1990.

#### DETAILED TECHNICAL REVIEW

Upon receipt of a complete application, assignments were made to begin the detailed technical reviews. Reviewers selected for this task were senior technical staff with considerable skills and experience in licensing, site evaluations, safety assessments, and related areas of expertise. This was done in the expectation that senior staff would be able to quickly evaluate the adequacy of data in the application to support regulatory findings, to prepare the SER, and ultimately, to provide expert testimony.

In addition, an integration team, consisting of a small group of experts with many years of experience in low-level waste management, was formed to provide an overall perspective on the review and to coordinate, consolidate, and integrate the results of the individual technical discipline reviews. Initially, this group performed primarily a review function. However, as the licensing review progressed, its role gradually expanded to the point where the group had primary responsibility for preparing a major part of the SER.

For the initial technical review, the reviewers were directed to follow the guidance of NUREG-1200 to assess the adequacy and validity of the data and conclusions in the

license application. Based on this review, a first round of interrogatories seeking further information, clarification, or justification was prepared by each reviewer. These were reviewed by section leaders and then consolidated and reviewed by the technical integration group before being submitted for response by the applicant. Subsequent rounds of interrogatories were developed in a similar manner but were structured to discuss the reasons why DHS and the WESTON team took issue with data or conclusions provided by the applicant. These later rounds of interrogatories were much less voluminous than the first round, due in part to a decision to pursue only those issues that were determined to be health and safety-related. The reduction in volume was also partly the result of the reviewers having gained a sharper focus on what was needed to make and support their respective findings, as discussed in the rest of this paper.

Site visits and technical meetings with the applicant were also conducted by the Department and the WESTON team to clarify information in the application. A public hearing was held to obtain public input into the licensing review and additional public hearings are planned for this Spring to get public comment on the proposed license and license conditions.

### REGULATORY FINDINGS MATRIX

As a prelude to preparing the SER, a regulatory findings matrix was developed to identify all 10 CFR Part 61 requirements for which a regulatory finding would need to be made. Each finding was then related to the standard review plan(s) (SRP) from NUREG-1200 in which it should be addressed. A portion of this matrix is depicted in Table I.

The matrix was designed to ensure a complete and defensible licensing decision. It recognized that some regulatory requirements could be addressed in a single standard review plan, while others would require contributions from elements addressed in several review plans. For example, the requirement in 10 CFR 61.50(a)(7) relating to depth to the water table can be addressed completely in SRP 2.4.2, Groundwater Hydrology. On the other hand, the requirement of 10 CFR 61.50(a)(11) relating to nearby facilities or activities that could adversely impact on meeting the performance objectives or masking the monitoring program requires findings from SRP's 2.1.1 (Facility Location), 2.4.1 (Surface Water Hydrology), 2.7.1 (Geologic Resources), 2.7.2 (Water Resources), and 2.9 (Preoperational Monitoring).

This matrix proved to be very valuable in guiding our approach to preparing the safety evaluation report (SER). Each one of the topics addressed in a SRP was considered in terms of whether it addressed a regulatory requirement on a standalone basis or contributed (along with others) to

compliance. Because of the strong systems approach that permeates the Part 61 requirements, the latter led to identification of a large number of additional findings to be made beyond those specifically identified in NUREG-1200. This meant that each SRP writeup in the SER was longer, but it made it much easier to integrate a complete basis for a finding that the regulatory requirement was completely satisfied.

### SAFETY EVALUATION REPORT

Upon completion of the initial technical review of the license application and responses to the first round of interrogatories, efforts were initiated to prepare a preliminary draft SER. This effort, coupled with the regulatory matrix, quickly identified the need for two major changes in the structure of the SER to better meet DHS's needs.

First, NUREG-1200 suggests that each SRP present a summary of the corresponding parts of the license application and then make a series of findings. In some cases, it is intuitively obvious that the information included in the summary directly and fully supports a finding of compliance with a regulatory requirement. However, particularly in those SRPs where several findings need to be made, it may not be so obvious which information in the summary supports each of the respective findings. In still other cases, a mere presentation of data and information will not provide a sufficient basis for a finding; instead, an independent analysis that considers the combination of a number of factors may be necessary.

DHS was concerned that the SER needed to clearly justify the bases for its licensing decision in a way that would be understandable to non-technical, as well as technical audiences. Therefore, DHS believed that it was more appropriate to start by stating a finding that a particular regulatory requirement was either completely or partially satisfied. This was followed by a technical justification that summarized the pertinent data and analyses evaluated under that SRP that support the finding. No summary of the respective portion of the application was provided. As an example, under SRP 2.1.1 (Site Location), a finding was made that the lack of nearby facilities and activities in the vicinity of the site contributes to compliance with the requirement in 10 CFR 61.50(a)(3) that the site be located such that projected population growth and future development are not likely to affect the ability of the disposal facility to meet the performance objectives of 10 CFR 61, Subpart C. The basis for this finding then discussed the availability of water resources, land ownership, federal, state and county restrictions on development in the area, and other factors that would make the area unattractive for development.

The second major change was the creation of a second volume of the SER, which ultimately became the main



**TABLE I**  
**Sample Regulatory Findings Matrix**

REGULATORY REQUIREMENT	STANDARD REVIEW PLAN SECTION			
	SRP 4.1 - WASTE RECEIPT/ INSPECTION	SRP 4.2 - WASTE HANDLING/ STORAGE	SRP 4.3 - WASTE DISPOSAL OPERATIONS	SRP 4.4 - OPERATIONAL MONITORING
STANDARDS FOR LICENSE ISSUANCE				
61.23(b) - Protection of general population	X	X	X	X
61.23(c) - Protection of intruders			X	
61.23(d) - Radiation protection	X	X	X	X
61.23(e) - Long term stability	X		X	
61.23(f) - Technical requirements of Subpart D	X	X	X	X
PERFORMANCE OBJECTIVES				
61.40 - General requirement	X	X	X	X
61.41 - Protection of general population	X	X	X	X
61.42 - Protection of intruders			X	
61.43 - Protection of workers	X	X	X	X
61.44 - Site stability	X		X	
TECHNICAL REQUIREMENTS				
61.50(a)(2) - Site monitorability				X
61.51(a)(6) - Water/waste contact minimization		X	X	
61.52(a)(1) - Class A waste segregation		X	X	
61.52(a)(2) - Intruder protection for Class C		X	X	
61.52(a)(4) - Waste emplacement			X	
61.52(a)(5) - Void space minimization			X	
61.52(a)(6) - Dose rate minimization			X	
61.52(a)(7) - Markers and surveys			X	
61.52(a)(8) - Buffer zone			X	X
61.52(a)(9) - Ongoing closure/stabilization			X	
61.52(a)(10) - Operations/closure compatibility			X	
61.52(a)(11) - Radioactive waste only	X			
61.53(b) - Plans for corrective measures				X
61.53(c) - Operational monitoring				X
61.55(a)(2) - Waste classification	X			
61.56(a) - Waste characteristics	X			
61.56(b) - Waste stability	X			
61.57 - Labeling	X			

volume. The regulatory findings matrix clearly revealed that in many instances the findings of several SRPs needed to be combined and integrated to reach a finding of full compliance with a particular Part 61 requirement. Moreover, several Part 61 requirements are not addressed explicitly in any of the NUREG-1200 SRPs. For example, none of the SRPs suggests findings of compliance with the standards for license issuance that are defined in 10 CFR 61.23.

DHS took the position that the licensing decision must be based on the regulations, using the regulatory guidance to evaluate the supporting information. Therefore, the main volume of the SER was structured to track Part 61 and the California regulations, making a finding of compliance with each of the regulatory requirements. Again, each finding was supported with a justification of its basis that integrated information from the SRP evaluations and, in some cases, additional information from the application or independent analysis. This volume of the SER was structured to provide a standalone presentation of findings and corresponding justifications. While the SRP-by-SRP evaluations presented in the second volume of the SER were very useful and provided the bases for the justifications for the master findings in the main volume, the SRP volume could potentially have been eliminated from the final SER with no loss of defensibility for the licensing decision.

### IMPACT OF THE SER MODIFICATIONS

The changes made in the format and content of the SER have had three major effects. First, the main part of the SER now focuses on compliance with the regulations, rather than the regulatory guidance, as the basis for a licensing decision.

Second, the SER presents a concise justification for each finding that includes all of the pertinent facts and analyses. This approach prevents any need to restate the license application and create an unnecessarily large document.

Finally, and perhaps most important, this approach focuses the technical review and interrogatory process on what is directly needed for a licensing decision. It helps prevent the reviewers from expending unnecessary time and effort on issues that are not relevant to the findings of regulatory compliance. For example, the project ecologist will focus on the results of studies of root depths and the presence of burrowing animals that could affect the integrity of the disposal unit cover and provide another transport pathway, rather than becoming embroiled in discussions of the sampling procedures used to characterize the full range of species on the site. The exercise of identifying the key

points to justify a finding and saying just what it is about a particular site condition or design feature that supports the finding has been a challenge for all of our reviewers. However, all agree that the end result is much more defensible than a simple reiteration of facts and figures.

### CONCLUSIONS

Three new approaches were developed in the California low-level waste disposal licensing review that may be considered by other states that are making plans for their own licensing reviews. First, the review is strongest if its primary focus is on the regulations themselves. Regulatory guidance is helpful in breaking the regulatory review into pieces for the various technical specialists, but ultimately the results have to be integrated to determine compliance with the regulations. In California's case, this resulted in the primary part of the SER being based specifically on Part 61, while a second volume tracked the general SRP structure of NUREG-1200.

To support the regulatory focus, a regulatory findings matrix should be prepared at the beginning of the review process to ensure completeness of the review. This matrix will also provide a roadmap to aid the integration of the bases for each regulatory finding from the individual standard review plan evaluations.

Finally, early in the review process, reviewers should be directed to outline the kinds of points that need to be included to justify each regulatory finding. This will focus the technical review and interrogatory process and streamline the licensing review. The outcome will be a licensing decision that is defensible, easily understandable, concise, and the result of an efficient, timely review process.

### REFERENCES

1. "Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility, Revision 1," NUREG-1199, U.S. Nuclear Regulatory Commission (January 1988).
2. "Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility, Revision 1," NUREG-1200, U.S. Nuclear Regulatory Commission (January 1988).
3. C.L. Pittiglic, Jr., "Review Process for Low-Level Radioactive Waste Disposal License Application Under Low-Level Radioactive Waste Policy Amendment Act," NUREG-1274, U.S. Nuclear Regulatory Commission (August 1987).