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11/13/84

Selected NRC Products
High-Level Waste Program

Supplement to NRC Staff
Presentation on High-Level
Waste Prelicensing Consultation
and Guidance Process

Prepared for Civilian Radioactive
Waste Management Information Meeting
December 14, 1983

SELECTED NRC PRODUCTS
HIGH-LEVEL WASTE PROGRAM

INTRODUCTION

The purpose of this list is to identify selected NRC High-Level Waste Program products and provide a summary of current and planned documents issued by the NRC staff. The list is not intended to be directive in nature but rather to offer a collection of products generated by the HLW program in order to provide timely guidance/advice for prelicensing and eventual licensing phases. It is necessary to use a variety of documents to provide such guidance because of: a) variability in the nature of the technical issues in HLW; b) the site specific nature of many of the issues; c) the evolving nature of issues with time as the exploratory site investigations are carried out; and d) variability in what is an appropriate level of detail that must be addressed in guidance.

The National Waste Policy Act (NWPA)-1982 has established by law, schedules for certain accomplishments in the HLW program. For many reasons DOE will meet the milestones while, in some cases, they may be unable to meet the schedule. Due to the uncertainties in investigative results and changes of priorities and schedules, the flexibility in the form of guidance is also needed. The variety of existing document and procedural forms allows the staff to take a flexible approach in assuring efficient, timely and complete guidance in the prelicensing and licensing phases. It permits interested parties who have limited time and who cannot, practically speaking, follow the great amount of detail that is the subject of the prelicensing guidance process to be informed of how the process is working. This summary offers a listing of generic as well as site-specific products which have been or are being planned. The document will be reviewed and reissued on a periodic basis.

The summary is divided into three major components: Regulations; Licensing Guidance Process; and NRC Review Plans. Copies of the referenced documents can be obtained from the USNRC Public Document Room.

I. REGULATIONS

While there are a number of NRC and other Federal Agencies rules and regulations which pertain to the prelicensing and licensing actions, this list includes only those products produced by the HLW Program.

1. 10 CFR 60-Disposal of High-Level Radioactive Wastes in Geologic Repositories.

TITLE	ISSUE DATE
o Licensing Procedures for HLW in Geologic Repositories	February 1981
o Technical Criteria for HLW in Geologic Repositories	June 1983
- Unsaturated Zone	March 1984*
- Definition of High-Level Waste	June 1984*
- NEPA/EA Issues	September 1984*
- Site Characterization and State/ Tribal Participation	September 1984*

II. LICENSING GUIDANCE PROCESS

This section is divided into six areas: Site Characterization Analysis (SCA) and Semi-Annual update reviews; Regulatory Guides; Staff Technical Positions; Technical Meetings; Environmental Assessments Reviews; and Contractor Reports (Research and Special Studies).

A. SITE CHARACTERIZATION ANALYSIS AND SEMI-ANNUAL REPORTS

The SCAs are issued by NRC as a NUREG document as a result of the staff evaluations of the DOE's Site Characterization Plans (SCPs). An SCP is issued before an exploratory shaft is sunk at any candidate site. Follow up will be provided by semi-annual reports issued by the staff. The NRC reports would be in response to the DOE's semi-annual reports which are also required under the NWPA-1982 (Section 113).

TITLE	ISSUE DATE
1. BWIP Site Characterization Analysis NUREG-0910	April 1983

*Projected Issue Date

B. REGULATORY GUIDES

Regulatory Guides are drafted by the staff to establish a standard approach to licensing. They are not directives but reflect acceptable procedures or actions which would be considered acceptable by the staff.

The current plans are to only issue standard content and format documents as Regulatory Guides.

TITLE	DESCRIPTION	ISSUE DATE
1. Regulatory Guide 4.17**	Site Characterization Format and Content Guide (draft)	April 1982
2. Regulatory Guide ___	Safety Analysis Report Format and Content Guide	September 1984

C. STAFF TECHNICAL POSITIONS

Staff Technical Positions have been divided into two types: Generic Technical Positions - dealing with issues which relate to licensing activities for repositories independent of the technology or site selected; and Site Technical Positions which give site specific guidance/advice.

1. SITE TECHNICAL POSITIONS (STP)

STP's provide a format for establishing the staff's positions on site specific issues. The set of STP's for a given site provides a means of tracking and tracing positions taken by the staff. "Umbrella" STP's are generated in each technical review area (hydrogeology, etc.) for each site. Umbrella STP's constitutes what the staff considers to be a systematic and comprehensive identification of issues which need to be resolved for licensing. The process by which site issues are identified by the staff is explained in BWIP SCA NUREG 0960 Volume 1 Appendix C. Other detailed STP's are issued as appropriate throughout the pre-licensing period. They establish acceptable methods of analysis, minimum information needs, or acceptable methods of data gathering and form the basis for tracking issues over time.

**Under Revision to reflect NWPA-1982 and Experience of Prelicensing Consultation

The concept of STP's was developed to provide maximum flexibility in completing a series of technical positions that have sufficient formality to record staff positions and to notify the prospective licensee (DOE). STP's (other than "Umbrella" STP's) will be initiated by the need for documentation of a staff concern or in response to a major question raised by the licensee,

a) Umbrella STP's (FY 84-FY 85)

The Umbrella STP's are scheduled to be issued during the FY84-FY85 period. These are coordinated with DOE/NRC workshops in individual program areas. The exact dates for issuing these positions have not been established at this time.

TITLE	ISSUE DATE
BWIP	
(i) geology/geophysics	
(ii) geochemistry	
(iii) waste package	
(iv) repository design	
(v) hydrogeology	
NTS	
(i) geology/geophysics	
(ii) geochemistry	
(iii) waste package	
(iv) repository design	
(v) hydrogeology	
SALT	
(i) geology/geophysics	
(ii) geochemistry	
(iii) waste package	
(iv) repository design	
(v) hydrogeology	

TITLE	ISSUE DATE
b) Other STP's	
BWIP	
(i) System Performance Issue Document	
(ii) Hydrology Testing Strategy (Draft)	July 1983
(iii) Others as Identified	
NTS	
(i) System Performance Issue Document	
(ii) Others as Identified	
SALT	
(i) System Performance Issue Document	
(ii) Waste Package (Draft)	January 1984*
(iii) Others as Identified	

2. GENERIC TECHNICAL POSITIONS (GTP)

The specific issues that must be addressed in a potential licensing case will be site specific. Therefore, the principal mechanism for documenting guidance is through the site specific guidance described in the SCA section 1.a. above and in section 1.D. (technical meetings). Notwithstanding this, some issues can be grouped in generic non-site specific catagories. From the experience gained in the consultation process at various sites the staff is identifying areas where it would be useful to document guidance in this generic fashion. For the most part this would involve repetition of staff positions already developed and documented. The following lists generic positions already developed or under development. Also listed are technical areas where the staff is tentatively considering developing GTP's

TITLE	ISSUE DATE
a. General Technical Positions.	
(i) Overall Repository System Release Performance Objectives.	

*Projected Issue Date

	TITLE	ISSUE DATE
(ii)	Waste Package Containment Requirements NUREG-0997 (Draft).	_____
(iii)	Engineered Barrier System Release.	_____
(iv)	Pre-Waste Emplacement Groundwater Travel Time.	_____
(v)	Retrievability -- Design Considerations and Information Needs.	_____
(vi)	Borehole and Shaft Seals -- Design Considerations and Information Needs (Draft) FR Vol. 48 No. 138 p. 31761	July 1983
(vii)	Quality Assurance Programs for Site Characterization. (Draft) FR Vol. 48 No. 141 p. 33386	July 1983
(viii)	Design Information Requirements -- SCP/Conceptual Design Phase. (Draft)	FY 1984*
(ix)	Design Information Requirements -- Licensing Review Phase.	

b. Specific Technical Positions (selected topics covered generally in a. above, however, for which further elaboration is appropriate).

	TITLE	ISSUE DATE
(i)	Natural Disruptive Events in Probalistic Licensing Assessments	_____
(ii)	Human Induced Disruptive Events.	_____
(iii)	Economic or Technological Factors Related to Natural Resources.	_____

*Projected Issue Date

TITLE		ISSUE DATE
(iv)	Underground Testing/Coupled Thermal Effects.	_____
(v)	Documentation of Computer Codes. FR Vol. 48 No. 138 p. 31761	June 1983
(vi)	Benchmarking and Quality Assurance for Computer Codes.	_____
(vii)	Post-Emplacement Monitoring. NUREG/CR-3219 (Draft)	May 1983
(viii)	Geochemical Aspects of Repository Performance. FR Vol 48 No. 117, p. 27619	August 1983

D. DOCUMENTED TECHNICAL MEETINGS

The purpose of the technical meetings is to assure that an information flow is maintained between the NRC and DOE which facilitates the accomplishment by each agency of its responsibilities relative to site investigation and site characterization. Technical meetings are held to: review and consult on interpretation of data; identify potential licensing issues; agree on the adequacy of methods and approaches for aquisition of information and data as well as available data. Schedules of activities pertaining to these technical meetings will be made publicly available to all interested parties. A written report agreed to by both NRC and DOE will be prepared for each meeting including agreements reached. The meetings are open to State/Tribal representatives and allows public attendance as observers.

BWIP WORKSHOPS AND TECHNICAL MEETINGS

MEETING	DATE
Exploratory Shaft and Underground Testing.	November 29-December 1, 1983
Performance Assessment	August 29-September 1, 1983
Hydrology Testing	July 11-15, 1983
Hydrology Meeting	June 7-10, 1983

MEETING	DATE
Site Issue Meeting	June 13-16, 1983
Geology and Geologic Stability	April 12-15, 1983
Repository Design	October 5-7, 1982
Hydrologic Modeling of Pasco Basin	September 27-28, 1982
Waste Package	August 9-12, 1982
Geochemistry	August 9-12, 1982
Underground Testing Plans for the SCR	June 9-10, 1982
Hydrology	July 21-27, 1982
Repository Design	July 6-11, 1982
Hydrogeology	January 12-13, 1982
Site Technical and Program Review	September 22-24, 1981
Site Technical and Program Review	July 7-18, 1980

NTS WORKSHOPS AND TECHNICAL MEETINGS

MEETING	DATE
Waste Package	October 18-19, 1983
Geology	October 4-6, 1983
Hydrogeology	September 20-21, 1983
Conceptual Design	January 24-25, 1983
Hydrology	January 18-19, 1983
Geochemistry	May 17-19, 1982
Site Technical and Program Review	March 31-April 2, 1983

MEETING	DATE
Site Technical and Program Review	February 22 - March 5, 1981
Site Technical and Program Review	September 24-25, 1979
Geochemistry and Hydrology	March 2, 1979

SALT WORKSHOPS AND TECHNICAL MEETINGS

MEETING	DATE
Repository Design, Exploratory Shaft, and In-Situ Testing	October 25-26, 1983
Waste Package Design and Performance	August 9-10, 1983
NRC Guidance on SCP Content	June 27-28, 1983
DOE Salt Project Overview	April 19-20, 1983
Review of the DOE Site Screening in Salt, Paradox Basin	August 1981
Survey of Salt Dome Investigations	January 1981

E. ENVIRONMENTAL ASSESSMENT REVIEWS

Under the NWPA, an EA for each site nomination is a principal document in support of site screening decisions. As such, we anticipate that it will be a major technical review of investigations conducted to date at all of the sites being investigated by the DOE. Accordingly, we would also expect that sufficient information will be provided (a) to establish the accuracy, reliability and applicability of the data and (b) to support interpretations of data made in applying the siting guidelines. Therefore, either by directly presenting them in the EA itself, or by reference to other documents and information sources, the EA will constitute a comprehensive data review and DOE data interpretations of it in terms of basic features that will determine site suitability (i.e. the selection factors established in siting guidelines).

The NRC staff intends to review and comment on each EA issued by DOE.

F. CONTRACTOR REPORTS

In establishing the basis for guidance, the NRC staff periodically requires assistance from contractors. Reports giving details of the results of such assistance are published as NUREG/CR documents. Some NUREG/CR reports are a reflection of results of experimental programs whereas others are technical evaluations utilizing existing expertise and data. The following lists divide these Reports into the five technical review areas and also differentiates between reports produced for the Office of NMSS and those produced for the Office of Research.

1. Performance Assessment

TITLE	NUMBER	DATE
a) NMSS		
o Evaluation of Engineered Barrier Performance	NUREG/CR- ___	February 1984*
o A Summary of Repository Siting Models	NUREG/CR-2782	July 1982
o Benchmark Problems for Repository Siting Models	NUREG/CR-3097	December 1982
o SWIFT Self Teaching Curriculum	NUREG/CR-1968	March 1982
o Review and Evaluation of Draft EPA Standard for HLW Disposal	NUREG/CR-3235	April 1983
o A Summary of Computer Codes for Radiological Assessment	NUREG/CR-3209	March 1983
o Repository Site Definition in Basalt, Pasco, Basin, WA	NUREG/CR-2352	March 1982

*Projected Issue Date

TITLE	NUMBER	DATE
b) RES		
o SWIFT Model - Coupled Groundwater, Heat and Solute Transport	NUREG/CR-0424	1978
o DNET Report and User's Guide - Geomechanics and Fluid Flow in Salt	NUREG/CR-2343	January 1982
o NWFT Model - Solute Transport	NUREG/CR-1190	1980
o DVM Method of Solving Convective Dispersion Equation - Solute Transport	NUREG/CR-1376	1980
o Pathways Model - Environmental Radionuclide Transport	NUREG/CR-1636 (Vol. 1)	1981
o Dosimetry and Health Effects	NUREG/CR-2166	1981
o Calculations of Radionuclide Releases from Hypothetical Nuclear Waste Repositories in Basalt, Bedded Salt and Tuff	SAND 82-1557	1982
o Repository Site Data Report for TUFF: Yucca Mountain, Nevada	NUREG/CR-2937	October 1983
o Sandia's Waste-Isolation and Transport Model (SWIFT)	NUREG/CR-2324	November 1981

2. Hydrogeology

TITLE	NUMBER	DATE
a) NMSS		

TITLE	NUMBER	DATE
o An Appraisal of Nuclear Waste Isolation in the Vadose Zone in Arid and Semi-Arid Region (with emphasis on the Nevada Test Site).	NUREG/CR-3158	October 1983
o Selected hydrologic and Geochemical Issues in Site Characterization for Nuclear Waste Disposal	NUREG/CR-2983	January 1983
b) RES		
o Field and Theoretical Investigation of Mass and Energy Transport in Subsurface Materials at Waste Disposal Sites	U of AZ TR	February 1982
o Geomorphic Controls on the Management of Nuclear Waste	NUREG/CR-3276	____
o Unsaturated Flow and Transport Through Fractured Rock-Related to High-Level Waste Repositories	NUREG/CR-3206	March 1983
o Pressure Testing of Fractured Rocks - a Methodology Employing Thru - Dimensional Cross-Hole Tests	NUREG/CR-3213	July 1983
o Prediction of Far Field Dispersion	_____	___
o Field and Theoretical Investigation of Fractured Crystalline Rock	_____	___
o Mixing Cell Method of Transport Analysis	_____	___

TITLE	NUMBER	DATE
o Practical Guide and Illustration of Cross-Hole Pressure Testing of Fractured Rock	_____	____

3. Geochemistry

TITLE	NUMBER	DATE
a) NMSS		
o Selected Hydrologic and Geochemical Issues in Site Characterization for Nuclear Waste Disposal	NUREG/CR-2983	January 1983
o Status of Geochemical Problems Relating to Burial of High-Level Radioactive Waste	NUREG/CR-3062	March 1983
b) RES		
o Valance Effects on Adsorption	NUREG/CR-2863 ORNL-5905	January 1983
o Mobile Anionic and Non-ionic Species	PNL TR*	March 1983
o Amorphous Iron Hydroxide Controls on Uranium Actinide and Technetium Mobility Identified in Field and Lab	AAEC ORNL TR	March 1983
o Method for Characterizing Geochemical Retardation in the Field	AAEC TR	October 1982
o Uncertainties in Geologic Disposal of HLW - Groundwater Transport of Radionuclide and Radiological Consequences	NUREG/CR-2506	July 1983

TITLE	NUMBER	DATE
o Field Experiment Determinations of Distribution Coefficients of Actinide Elements in Alkaline-Like Environments	Topical Report	March 1983
o CHEMTRN User's Manual	LBL/PUB 3031	March 1983

4. Design

TITLE	NUMBER	DATE
a) NMSS		
o Evaluation of Engineered Barrier Performance	NUREG/CR ___	February 1984
o In-Situ Testing for Design and Construction	NUREG/CR-3065	March 1983
o Evaluation of Alternative Shaft Sinking Techniques	NUREG/CR-2854	March 1983
o Identification of Factors Which Influence Repository Design -Tuff	NUREG/CR-2614	March 1982
o Identification of Factors Which Influence Repository Design - Domal Salt	NUREG/CR-2613	March 1982
o Relationship of an In-Situ Test Facility to a Deep Geologic Repository for High-Level Nuclear Waste	NUREG/CR-2959	March 1983
o Assessment of Waste Retrieval Alternatives	NUREG/CR- ___	November 1983

TITLE	NUMBER	DATE
o Thermal Impact of Waste Emplacement and Surface Cooling Associated With Geologic Disposal of Nuclear Wastes	NUREG/CR-2910	March 1983
b) RES		
o Shaft or Borehole Plug-Rock Mechanical Interaction	U of AZ TR	December 1980
o Borehole Wall Damage Induced by Drilling	U of AZ TR	July 1982
o Polyaxial Testing of Borehole Plug Performance	U of AZ TR	July 1982
o Rock Mass Sealing Experimental Assessment of Borehole Plug Performance	NUREG/CR-3473	September 1983

5. Waste Package

TITLE	NUMBER	DATE
a) NMSS		
o Nuclear Waste Management Technical Support in the Development of Nuclear Waste Form Criteria for the NRC	NUREG/CR-2333 BNL/NUREG-51458	February 1982
o Review of DOE Waste Package Program National Waste Package Program	NUREG/CR-2482	Feb. 1982 Vol 1 April 1983 Vol 2 March 1983 Vol 3
o Waste Package Verification Tests - Packaging Material Testing	NUREG/CR-2755 BNL/NUREG-51544	February 1983

TITLE	NUMBER	DATE
o Review of Waste Package Verification Tests, Semiannual Report	NUREG/CR-3091	April 1983 Vol 1 August 1983 Vol 2
o Long-Term Performance of Waste Package Materials	BCL TR	September 1983 Annual Report
o Corrosion Study of HLW Container Materials	BNL/NUREG-51449	1981-1982
b) RES		
o Uncertainties in Source Term Estimation	_____	___
o Long-Term Performance of Materials used for HLW Package	NUREG/CR-3427 Vol. 1	July 1983

III. NRC REVIEW PLANS

Review Plans document the procedure which will be used by the staff in reviewing major documents submitted by the DOE. It identifies the questions that will be asked and the independent analysis that will be performed by the staff. The primary purpose of review plans is to standardize and organize the staff's review of licensing documents. It provides indirectly, guidance to the licensee in terms of the kinds of data and information that is expected in documents such as SCPs. It also provides useful information to interested parties about how NRC is doing its job. Draft review plans for SCAs, for Quality Assurance programs, and for Environmental Assessments have been written. Other review plans, such as the Review Plan for an application for a Construction Authorization will be prepared as needed:

TITLE	ISSUE DATE
Standard Review Plan for Site Characterization Analysis	April 1983
Standard Review Plan: Quality Assurance Programs for Site Characterization FR Vol. 48 No. 138 p. 31761	(draft) July 1983
Environmental Assessment Review Plan	(draft) FY 1984*

*Projected Issue Date