



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 2, 1995

MEMORANDUM TO: John H. Austin, Chief
 Performance Assessment
 and Hydrology Branch, DWM

Michael J. Bell, Chief
 Engineering and Geosciences
 Branch, DWM

FROM: Joseph J. Holonich, Chief
 High-Level Waste and Uranium
 Recovery Projects Branch, DWM

John O. Thera for

SUBJECT: COMPLIANCE DETERMINATION METHODS FOR REVISION 1 TO THE
 LICENSE APPLICATION REVIEW PLAN

Our recent efforts to update the Operating Plan and to conform Compliance Determination Method (CDM) development with DOE's HLW Findings has resulted in a list of FY 95 CDMs (Enclosure 1). This list was developed based on input from and in coordination with your section leaders and contains all CDMs that will be started and/or completed in FY 95. The attached CDM schedule should be one factor in your individual inputs for the current budget process. In addition, you need to assess CNWRA's participation in the development of these CDMs and task CNWRA accordingly to insure completion of the CDMs by the required dates. Those CDMs listed for completion in FY 95 will be included in Revision 1 of the LARP. Therefore, I am requesting those CDMs, as a minimum, be completed and have final NRC approval by September 31, 1995. The current plan is to issue Revision 1 to the LARP in November 1995, but this plan may be revisited as part of the budget process.

The CDMs being included in Revision 1 of the LARP are not, however, limited to those on the attached list. Partially completed work should, if possible, also be included. For example, Revision 1 could include the completed Seals portion of 4.3 on Shafts and Ramps, as well as the MPC review plan placed into the appropriate LARP Sections. All work in progress should be evaluated for inclusion into Revision 1 and will need to be completed by August 31, 1995. Please provide me with a list of partially completed CDMs that you will be including in Revision 1 to the LARP.

Contact: Sandra L. Wastler
 415-6724

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 PDR WASTE
 WM-11 PDR

*426.1
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 NRC*

J. Austin/M. Bell

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In addition, I am providing a copy of CNWRA's January 17, 1995 report entitled " Crosswalk of Regulatory and Institutional Uncertainties with LARP Review Plans" (Enclosure 2), which correlates the institutional and regulatory uncertainties with the LARP review plans. As you are aware, a total of 54 uncertainties have been identified in the regulation, 27 of which required regulatory guidance to resolve. The guidance for resolution of these uncertainties is to be provided in the associated CDM. If more than one CDM is associated with an uncertainty, then the uncertainty should be addressed in only one of the associated CDMs and referenced in the remainder. The CNWRA document should be used to determine which of your CDMs should address a specified uncertainty.

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415-6724

DISTRIBUTION:

Central File	DWM r/f	MBell(ENGB)	JGlenn (LLDP)	JSurmeier
JHolonich (HLUR)	JAustin (PAHB)	NMSS r/f	DWM t/f	JThoma
SWastler	PUBLIC	HLUR r/f	On-site Reps	LSS
MDelligatti				426.1

DOCUMENT NAME: S:\DWM\HLUR\SLW\STRT-CDM.SLW

OFC	HLUR	HLUR	E	HLUR	E			
NAME	SWastler SLK	JThoma J01		JHolonich J01				
DATE	2/2/95	2/2/95		2/2/95		1/95		1/95

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ACNW: YES NO

IG : YES NO

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DOCUMENT NAME: S:\DWM\HLUR\SLW\STRT-CDM.SLW

OFC	HLUR		HLUR	E	HLUR	E			
NAME	SWastler-JLK		JThoma J01		JHolonich J17				
DATE	2/2/95		2/2/95		2/2/95		1/95		1/95

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ACNW: YES ___ NO X
 IG : YES ___ NO X
 LSS : YES ___ NO X

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ENCLOSURE 1

FY 95

CDMs Development in Ops Plan (start or end CDM in 95)	Start Date	End Date	Responsible Lead	Comment
(1) 3.2.3.4 GW Conditions and EBS		01/95	08/95	DJB
(2) 3.2.1.10 Evidence of Ext Erosion		94	03/95	<i>KIM - in tech review, need OGC/Programmatic</i>
(3) 1.4 Certification of Safeguards		94	TBD	KLK
(4) 1.5 Physical Security		94		KLK being combined in 1.4
(5) 2.7 Nuclear Material Control/Acct		94		KLK being eliminated
(6) 4.3 Shafts and Ramps		94	09/95	KIM - partially done
(7) 3.2.2.11 Pot for Water Table Rise				DJB not needed in 95
(8) 3.2.1.5 Structural Deformation		95	08/95	KIM
(9) 3.2.1.6 Historical Eqs		95	08/95	KIM
(10) 3.2.1.4 Evid.of Dissolution		95	08/95	KIM
(11) 5.1 Description of EBS		95	08/95	JOT
(12) 5.2 Comp w/Design Crit for WP		95	08/96	JOT
(13) 5.3 Comp w/Design Crit for UnFac		96	08/96	JOT
(14) 5.4 Comp w/EBS Perf Obj		95	08/97	JOT
(15) 3.4 Natural Barriers		95	09/95	NAE
(16) 3.2.1.8 Occ of MorFreq/High Mag Eq		95	TBD	KIM
(17) 3.2.1.7 Corr of Eq with Tec Proc		95	TBD	KIM

()	4.1.5 Interf btwn Struc/Sys/Comp	?	?96/97	KIM	needs for MPC review in 97
()	4.2 Asses of Compl w/Design Sur Fac	?	?	KIM	
()	8.3 Perf Conf for EBS	96	96/97	JOT	needs for MPC rev in 97
()	3.2.1.1 Nature&Rates of Phys Proc	95	03/95	KIM	- addition for 95 HLW Finding
()	3.2.1.2 Minimum Waste Emplacement	95	03/95	KIM	- addition for 95 HLW Finding
()	Design Basis	?	?		- KIM needs for seis hzrd rev
()	2.5 Radioactive Material Descrip	?	?	JOT	for MPC review in 97*

*Raj indicated that he had the responsibility/Thoma had been told he had responsibility = neither has technical staff qualified to prepare the CDM.

ENCLOSURE 2

Center for Nuclear Waste Regulatory Analyses

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(210) 522-5160 • FAX (210) 522-5155

January 17, 1995
Contract No. NRC-02-93-005
Account No. 20-5702-221

Nuclear Regulatory Commission
✓ **Attn: Ms. Sandra Wastler**
Division of Waste Management
Two White Flint North (7E-69)
11545 Rockville Pike
Washington, DC 20852

Subject: Submission of Intermediate Milestone 20-5702-221-500 (Crosswalk of Regulatory and Institutional Uncertainties with LARP Review Plans)

Dear Ms. Wastler:

Attached is subject intermediate milestone 20-5702-221-500. This submittal relates both the regulatory and institutional uncertainties to the established review plans to support uncertainty resolution as the review plans are prepared.

The list of regulatory and institutional uncertainties is consistent with those found in SECY 91-225 and CNWRA 90-003. Since some of the uncertainties have been resolved, revision of the list may be possible. The list might additionally be revised to eliminate the duplication of uncertainties resulting from the organization of the previous regulatory structure. Suggested revisions are as follows.

Uncertainties that may have been resolved:

Page No.	Uncertainty Topic	Reason
1	Detailed content of application not in 10 CFR 60.21	Addressed in FCRG
1	Criteria used to accept the License Application for docketing	Addressed in CDM acceptance review language
4	Applicability of siting criteria to performance objectives	Resolved by staff position, SP 60-002—Performance Objectives Relating to Isolation of Waste
6	Applicability of Thermal Load Requirements to Performance Objectives	Resolved by staff position, SP 60-002—Performance Objectives Relating to Isolation of Waste



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January 17, 1995

Page No.	Uncertainty Topic	Reason
7	Waste package containment timeframe	Resolved by staff position, SP 60-001—Clarification of the 300-1,000 Years Period for Substantially Complete Containment of High-Level Wastes Within the Waste Packages under 10 CFR 60.113(a)(1)(ii)(A)
8	Commission implementation of flexibility provisions of 10 CFR 60.113(b)...	May no longer be considered an uncertainty

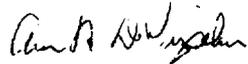
Uncertainties which are duplicates:

Page No.	Uncertainty Topic
2	Regional groundwater flow system
4	Three uncertainties relating to anticipated and unanticipated processes and events

The Uncertainties not directly related to 10 CFR Part 60 (page 8) may also be considered for deletion.

Please contact me at (210) 522-6072, or Robert Brient at (210) 522-5537 if you have any questions concerning this matter.

Very truly yours,


Aaron R. DeWispelare
Element Manager

AD\ls
enclosures

cc: M. Linehan
S. Fortuna
B. Stiltenspole
M. Knapp
J. Holonich
K. Kalman
R. Johnson
W. Patrick
CNWRA Directors
CNWRA Element Managers
R. Brient
S. Rowe (SwRI)

CORRELATION OF REGULATORY AND INSTITUTIONAL UNCERTAINTIES WITH LARP REVIEW PLANS

As a part of the systematic regulatory analysis of 10 CFR Part 60, Regulatory and Institutional Uncertainties were identified and presented in SECY 91-225¹ and CNWRA 90-003². Identification of these uncertainties was based on the following: a Regulatory Uncertainty exists "...when there is a lack of clarity in the quoted statement, when an essential requirement has been omitted, or when requirements which either detract from the regulatory program or do not contribute to the regulatory program are included in the regulation." An Institutional Uncertainty exists "...when there is a lack of certitude regarding the roles, missions, actions, and schedules of agencies which have regulatory requirements that affect the high-level waste regulatory program, their impacts, or their integration with the Nuclear Regulatory Commission (NRC) regulatory program."³

Regulatory and Institutional Uncertainties, their proposed uncertainty reduction methods, and their reduction status are documented in the User's Guide for Regulatory Program Database (RPD) Version 2.0 Including Open Item Tracking System (OITS).⁴

The purpose of this crosswalk is to relate regulatory and institutional uncertainties to specific regulatory requirements from 10 CFR Part 60 and to individual review plans in the LARP. In so doing, developers of Compliance Determination Methods (CDMs) will be able to provide guidance for resolution of these uncertainties. The crosswalk lists the uncertainties by LARP chapter, and provides: (i) the Uncertainty Topic, (ii) the Associated Review Plan—those review plans affected by the uncertainty, (iii) the Text of the uncertainty, and (iv) the Associated Citation—the source of the uncertainty.

¹ Nuclear Regulatory Commission. 1991. *Second Update of the Regulatory Strategy and Schedules for the High-Level Waste Repository Program*. SECY-91-225. Washington, DC: Nuclear Regulatory Commission.

² Weiner, R.F., Patrick, W.C., and Romine, D.T. 1990. *Identification and Evaluation of Regulatory and Institutional Uncertainties in 10 CFR Part 60 Volume 1—Evaluation*. CNWRA 90-003. San Antonio, TX: Center for Nuclear Waste Regulatory Analyses.

³ *Ibid.*

⁴ DeWispelare, A.R., Cooper, J.H., Mackin, P.C., and Marshall R.L. 1994. *User's Guide for Regulatory Program Database (RPD) Version 2.0 Including Open Item Tracking System (OITS)*. San Antonio, TX: Center for Nuclear Waste Regulatory Analyses.

REGULATORY/INSTITUTIONAL UNCERTAINTIES

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
ALL LARP CHAPTERS			
Detailed Content of Application not in 10 CFR 60.21	All	Although 10 CFR 60.21 describes general requirements for what should be included in the general information and Safety Analysis Report in the license application, more detailed guidance is required so DOE can prepare a complete application.	10 CFR 60.21
LARP CHAPTER 2			
Inconsistent Text in 10 CFR 60.23	2.2	10 CFR 60.23 uses the terms "environmental report" and "Site Characterization Report," which is inconsistent with Nuclear Waste Policy Act (NWPA) and with other July 3, 1989, changes to 10 CFR Part 60. It should be made clear that these terms are intended to be "environmental impact statement" and "Site Characterization Plan," respectively.	10 CFR 60.23
Criteria Used to Accept the License Application for Docketing	2.3, 2.4	It is uncertain whether 10 CFR Part 60 and other regulations adequately describe the means used to qualify a License Application for docketing. Adequate criteria are needed by both the DOE and the NRC to determine the acceptability of the application for docketing.	10 CFR 60.24 (a)
LARP CHAPTER 3			
Use of the Phrase "Quaternary Period"	3.2.1.1, 3.2.1.5, 3.2.1.9, 3.2.1.10, 3.2.2.1, 3.2.3.1	10 CFR Part 60 and the accompanying statements of consideration appear inconsistent in the treatment of the phrase "Quaternary Period." In addition, the technical literature has proposed many different chronological time periods for this period of geologic time.	10 CFR 60.122(b)(1), 10 CFR 60.122(c)(11), 10 CFR 60.122(c)(15), and 10 CFR 60.122(c)(16)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 3 (Cont'd)			
Geologic Setting	3.2.1.1, 3.2.2.1, 3.2.3.1	The definition of the term "geologic setting," as used throughout 10 CFR 60.122 and defined in 10 CFR 60.2, is ambiguous. A rulemaking (Generic Technical Position, Guidance for Determination of Anticipated Processes and Events and Unanticipated Processes and Events) is currently underway and will include clarification of the definition of the term.	10 CFR 60.122(b)(1)
Extreme Erosion	3.2.1.10	The meaning of "extreme erosion" in this regulatory context needs to be clarified as to whether it means (1) the highest rate of erosion of a potential site area that might be anticipated based on the rates of erosion experienced within the area during the Quaternary Period, or (2) the rate, which, if it were to occur in the foreseeable future, would cause the performance objectives of the geologic repository to be breached and against which the projected erosion rates based on Quaternary data are to be evaluated.	10 CFR 60.122(c)(16)
Regional Groundwater Flow System	3.2.2.7, 3.2.2.8	The term "regional groundwater flow system" can refer to differing geographical regions depending on the geologic process of interest and the intended breadth of an investigation. A clarification of the intended breadth of the investigations meant to consider "regional groundwater flow system" will allow the DOE to respond appropriately to the regulation in the License Application.	10 CFR 60.122(c)(3) and 10 CFR 60.122(c)(4)
Regional Groundwater Flow System	3.2.2.8, 3.2.2.7	The term "regional groundwater flow system" can refer to differing geographical regions depending on the geologic process of interest and the intended breadth of an investigation. A clarification of the intended breadth of the investigations meant to consider "regional groundwater flow system" will allow the DOE to respond appropriately to the regulation in the License Application.	10 CFR 60.122(c)(4) and 10 CFR 60.122(c)(3)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 3 (Cont'd)			
Sorption of Radionuclides	3.2.3.5	The term "sorption of radionuclides" refers to only one of several possible geochemical processes. The regulatory intent needs to be clarified to ensure a complete and accurate assessment of all the geochemical conditions affecting radionuclide migration.	10 CFR 60.122(c)(8)
Air-filled Pore Spaces	3.2.3.7	Clarification needs to be provided as to whether "air-filled pore spaces" is meant to be interpreted literally as (1) those spaces filled with a mixture of nitrogen, oxygen, and other minor constituents, or (2) "gas-phase-filled pore spaces." The latter interpretation would require pores filled with methane, carbon dioxide, and various mixtures of earth-derived and barrier system-derived gases to be considered as potential transport mechanisms for the movement of radionuclides.	10 CFR 60.122(c)(24)
Taking into Account the Degree of Resolution	3.2.5, 3.3, 5.4	The intended meaning of the phrase "taking into account the degree of resolution of the investigations" should be clarified so that the DOE has clear guidance on the NRC requirement to adequately investigate aspects of the given adverse condition necessary to support the license application.	10 CFR 60.122(a)(2)(i)
Not to Affect Significantly	Section 3.2 (all), 5.4, 6.1, 6.2, 6.3	The meaning of the phrase "not to affect significantly" in 60.122(a)(2)(iii)(A) should be clarified in order for the DOE to demonstrate that the activity or condition in question does or does not exceed the level of effect considered important to the ability of a geologic repository to meet the performance objectives.	10 CFR 60.122(a)(2)(iii)(A)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 3 (Cont'd)			
Adequately Evaluated	Section 3.2 (all), 5.4, 6.1, 6.2, 6.3	The high-order criteria for adequacy of evaluations should be defined to guide the DOE in determining what types of evaluations are appropriate and how extensive and intensive they should be. Since the technical means of evaluating the 24 different potentially adverse conditions will vary considerably, evaluation criteria should be specific to the particular adverse condition. The different evaluation criteria will be critical to the NRC assessment of the completeness of the individual technical evaluations which will be presented by DOE in the license submittal.	10 CFR 60.122(a)(2)(ii)
Not Likely to Underestimate its Effect	Section 3.2 (all), 5.4, 6.1, 6.2, 6.3	The meaning of the term "not likely to underestimate its effect" is unclear. The criteria for acceptability of a given estimated value, in order for the value to be judged acceptable within the definition "not likely to underestimate its effect," should be provided to DOE to allow an appropriate DOE assessment.	10 CFR 60.122(a)(2)(ii)
Adequately Investigated	3.2.5, 3.3, 5.4,	The criteria for "adequate investigation," should be defined sufficiently to guide the DOE in determining what types and scopes of investigations are appropriate.	10 CFR 60.122(a)(2)(i)
Treatment of Combinations of Potentially Adverse Conditions	3.2.5, 3.3, 6.1, 6.2, 6.3	There is an inconsistency in the treatment of combinations of potentially adverse conditions between 10 CFR 60.21(e)(1)(ii)(C) and 10 CFR 60.122. The former allows combinations of adverse conditions to be used in scenario development while the latter allows only one adverse condition to be compared to a combination of favorable conditions. Thus, synergistic effects of adverse conditions would not be considered when evaluating the site during the site selection and validation process.	10 CFR 60.21(e)(1)(ii)(C) and 10 CFR 60.122

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 3 (Cont'd)			
Applicability of Siting Criteria to Performance Objectives	Section 3.2 (all), 5.4, 6.1, 6.2, 6.3	The phrase in 10 CFR 60.122, "to meet the performance objectives relating to isolation of the waste," could be interpreted to mean that the siting criteria in 10 CFR 60.122 apply only to the overall system performance objective in 10 CFR 60.112 or to the subsystem performance objectives in 10 CFR 60.113, as well.	10 CFR 60.122 and 10 CFR 60.112
Relationship of Subsystem Performance Objectives in 10 CFR Part 60 to the U.S. Environmental Protection Agency (EPA) Standards	3.3, 3.4, 4.5.2, 5.4, 6.1, 6.2, 6.3	Compliance with 10 CFR Part 60 subsystem performance objectives is not necessarily sufficient to constitute compliance with the EPA overall system performance objective. This has been identified as a regulatory uncertainty, because there is not a direct and complete linkage between the subsystem performance objectives and overall system performance objective (EPA Standard).	10 CFR 60.112 and 10 CFR 60.113
Anticipated & Unanticipated Processes and Events	3.4, 6.1, 6.2, 6.3	The terms "anticipated processes and events" and "unanticipated processes and events" require further definition to permit uniform interpretation of the regulatory requirement.	10 CFR 60.112
Anticipated Processes and Events	3.4, 5.4, 6.1, 6.2, 6.3	The term "anticipated processes and events" requires further definition to permit uniform interpretation of the regulatory requirement.	10 CFR 60.113(b), 10 CFR 60.2, and 10 CFR 60.112
Unanticipated Processes and Events	3.4, 5.4, 6.1, 6.2, 6.3	The term "unanticipated processes and events" requires further definition to permit uniform interpretation of the regulatory requirement.	10 CFR 60.113(c), 10 CFR 60.2, and 10 CFR 60.112
Amendments to 10 CFR 60.112 to Conform to EPA Standard	3.4, 6.1, 6.2, 6.3	It is uncertain what amendments will have to be made to 10 CFR 60.112 to conform to the forthcoming revision of the EPA Standard, 40 CFR Part 191. Since 10 CFR 60.112 refers to conformation to EPA Standards, any changes in those Standards must be addressed to ensure that performance objectives of 10 CFR 60.112 are met.	10 CFR 60.112

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 4			
Design Radiation Dose Criteria	4.2, 4.3, 4.4, 4.5.1, 4.5.2, 5.5, 8.4	Regulations referenced by 10 CFR 60.111(a) provide different radiation dose criteria for both normal operations and accidents. These differences need to be reconciled to provide clear performance objectives for both conditions.	10 CFR 60.111(a)
Utility Service Testing	4.2, 4.3, 4.4	Additional guidance is needed regarding on-line operability testing of auxiliary and redundant systems. On-line operability testing should be explicitly required for redundant, auxiliary and backup elements of the utility systems. This uncertainty needs to be addressed to ensure adequacy of design and operation of systems important to safety under normal and accident conditions.	10 CFR 60.131(b)(5)
Nonperiodic Inspection, Testing and Maintenance	4.2, 4.3, 4.4	10 CFR 60.131(b)(6) provides for designing "to permit periodic inspection, testing and maintenance as necessary, to ensure their continued functioning and readiness." Regulatory guidance needs to be provided to require designing for maintenance that is nonperiodic. Guidance regarding nonperiodic (i.e., corrective) maintenance should clarify for DOE the overall maintainability required in the design of structures, systems and components important to safety.	10 CFR 60.131(b)(6)
Conveyances Used in Radioactive Waste Handling	4.2, 4.3	Additional or more generic guidance is needed for the design of waste conveyances to assure that the performance objectives will be met if the waste transfer system includes transfer methods other than shafts and hoists (e.g., ramps and vehicles).	10 CFR 60.131(b)(10)
Criticality Control Time Period	4.2, 4.3, 4.4, 4.5.2, 5.2	The criticality control requirements in 10 CFR Part 60 could be interpreted to apply just to the time period of operations before repository closure, or to apply in the post-closure time frame, as well.	10 CFR 60.131(b)(7)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 4 (Cont'd)			
Secondary Effects from Nonradiological Accidents	4.3, 4.4	<p>It is uncertain how the NRC is going to determine compliance with mining regulations as they relate to nonradiological accidents whose secondary effects are radiological accidents.</p> <p>The uncertainty needs to be addressed to ensure adequate oversight of all potential sources of radiological accidents as well as worker health and safety in the geologic repository operations area.</p>	10 CFR 60.131(b)(9)
Reference to Applicable Mine Safety Requirements	4.3, 4.4	The reference in 10 CFR 60.131(b)(9) to the applicable mine safety requirements does not reflect the reorganization and renumbering of mine safety requirements in 30 CFR, Chapter I which occurred after 10 CFR Part 60 was issued.	10 CFR 60.131(b)(9)
Reference Clarification	4.3, 4.4, 4.5.2	Criteria are needed to determine the lowest level of referenced regulations which are to be incorporated in order to determine the extent of applicability of referenced regulations.	10 CFR 60.111(b)
Worker Safety, Mine Safety, and Nonradiological Safety	4.4, 4.5.2	<p>The NRC intent needs to be clarified as to whether and to what extent, the term "safely" as used in this paragraph applies to: 1) radiological safety, 2) nonradiological "mining" safety (i.e., primarily personnel safety in overall construction and nonradiological operations), 3) nonradiological incidents that have the potential to cause radiological accidents, or 4) a combination of the above.</p> <p>NRC needs to address the application of the term "safely" as applied to underground openings, deleterious rock movement and worker safety in the underground facility in order to provide guidance to DOE that will help ensure adequacy of design and operation in the underground facility at the geologic repository operations area.</p>	10 CFR 60.133(e)(1)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 4 (Cont'd)			
Applicability of Thermal Load Requirement to Performance Objectives	4.4, 5.3	The thermal load requirement in 10 CFR 60.133(i) could be interpreted to apply to only the pre-closure performance objectives in 10 CFR 60.111, or to the post-closure performance objectives in 10 CFR 60.112 and 10 CFR 60.113, as well.	10 CFR 60.133, 10 CFR 60.111, 10 CFR 60.112, and 10 CFR 60.113
Facilitate Versus not Prevent Waste Retrieval	4.3, 4.4, 4.5.2	The NRC intent needs to be clarified as to whether the geologic repository is to be designed to facilitate waste retrieval, or only that the design must not preclude waste retrieval (i.e., not make retrieval impossible). DOE needs guidance regarding what design action, if any, is intended by the regulation, particularly with respect to the waste package and its handling equipment, in order to respond with an acceptable design and to permit NRC to evaluate the DOE compliance demonstration effectively.	10 CFR 60.111(b)(1)
Definition of "Substantially Increase the Difficulty of Retrieving"	4.3, 4.4, 4.5.2	There appears to be an inconsistency between the phrase "substantially increase the difficulty of retrieving such emplaced waste" in 10 CFR 60.46(a)(1) and the intent of 10 CFR 60.111(b), as expressed in NUREG-0804. This apparent inconsistency may place an unnecessary regulatory burden on both the NRC and DOE in that it would require license amendments under 60.46(a)(1) for changes which "substantially increase the difficulty of retrieving" while the basic requirement of 60.111(b) is only that retrieval be possible.	10 CFR 60.46(a)(1)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 5			
Solid Waste Form	5.2	<p>It is uncertain if the statement in 10 CFR 60.135(c)(1) regulation, "all such radioactive wastes shall be in solid form," applies to spent fuel rods where fission product gases are contained and generated.</p> <p>Clarification of the Commission's intent regarding permanent disposal of the radioactive gases contained in spent fuel rods is needed to achieve consistent interpretation and compliance.</p>	10 CFR 60.135(c)(1)
Substantially Complete Containment	5.4	<p>The term "substantially complete containment" needs interpretation and clarification that is sufficiently specific to permit Engineered Barrier System (EBS) designers to respond with an acceptable design, and to provide NRC technical reviewers with a clear-cut basis for the development of EBS evaluation criteria.</p>	10 CFR 60.113(a)(1)(i)(A)
Waste Package Containment Timeframe	5.4	<p>The 300 to 1,000-year waste package containment timeframe in 10 CFR 60.113 could be interpreted to mean the minimum period during which the waste package must remain substantially complete, or the maximum design lifetime for the waste package for which credit could be taken in demonstrating compliance.</p>	10 CFR 60.113(a)(1)(ii)(A)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 5 (Cont'd)			
Engineered Barrier System Radionuclide Release Rate Limit	5.4	The annualized radionuclide release rate limits in 10 CFR 60.113(a)(1)(ii)(B) are based on the inventory of radionuclides present at 1000 years following permanent closure of the repository. As such, for some radionuclides (e.g., Am-241 and Pu-240), the allowed releases from the engineered barrier system (EBS) can be several orders of magnitude greater than releases to the accessible environment permitted by the overall performance objective (i.e., the U.S. Environmental Protection Agency (EPA) Standards). The underlying purpose of the EBS release rate limit, together with other subsystem performance objectives, is to enhance the Commission's confidence that the EPA Standard will be met. For some radionuclides, it is unclear if the release rate limit does in fact enhance confidence that the EPA standard will be met.	10 CFR 60.113(a)(1)(ii)(B)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 5 (Cont'd)			
Criteria for Containment of Greater-Than-Class-C (GTCC) Low-Level Waste (LLW)	5.4	Notwithstanding the general applicability of 10 CFR Part 60 to waste types other than high-level waste (HLW) that might be emplaced in a repository, some of the specific 10 CFR Part 60 waste package design and performance requirements are applicable only to HLW and are inapplicable to GTCC LLW. Specifically, the waste package containment requirement of 10 CFR 60.113(a)(1)(ii)(A) is applicable only to HLW, whereas the release rate requirement of 10 CFR 60.113(a)(1)(ii)(B) is applicable to both HLW and GTCC LLW. The staff does not believe that it was the Commission's intent, in 10 CFR Part 60, to specify a performance requirement for GTCC LLW, for the post-containment period while specifying none for the containment period. Thus, in its present form, 10 CFR Part 60 is incongruous with respect to performance requirements for waste other than HLW.	10 CFR 60.113(a)(1)(ii)(A)
Commission Implementation of the Flexibility Provision in 10 CFR 60.113(b) for the Subsystem Performance Objectives	5.4	Flexibility in implementing the subsystem performance objectives of 10 CFR 60.113(a) is provided by 10 CFR 60.113(b), which states "On a case-by-case basis, the Commission may approve or specify some other radionuclide release rate, designed containment period or pre-waste-emplacment groundwater travel time, provided that the overall system performance objective, as it relates to anticipated processes and events, is satisfied." There is a concern that this provision may unadvisedly require the Commission, which is ultimately concerned with achievement of an overall safety goal, to become unduly involved in the subsystem balancing function that is appropriately the role of the system designer (e.g., the U.S. Department of Energy). It is also unclear how and when the Commission would implement this provision.	10 CFR 60.113(b)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 7			
Construction Problems	7.5	The term "construction problems" requires further definition in order to ensure documentation of all those problems of interest to the Commission, and to clearly identify appropriate recordkeeping requirements for the DOE.	10 CFR 60.72(b)(6)
Anomalous Conditions	7.5	The term "anomalous conditions" requires further definition in order to ensure documentation of all those conditions of interest to the Commission, and to clearly identify appropriate recordkeeping requirements for the DOE.	10 CFR 60.72(b)(7)
Substantial Safety Hazard	7.5	The term "substantial safety hazard" requires further definition in regard to the characteristics of the site and the design and construction of the geologic repository operations area. More specific guidance is needed to ensure that those hazards reported by the DOE satisfy the regulatory intent of the Commission.	10 CFR 60.73(a)
Significant Deviation	7.5	The term "significant deviation" requires further definition in regard to "design criteria and design bases stated in the application." More specific guidance will ensure that those deviations reported by the DOE satisfy the regulatory intent of the Commission.	10 CFR 60.73(b)
Compliance Demonstration/Determination Regarding Human Intruders and Record Archiving	7.9	In the absence of specific criteria, the phrase "that would likely be consulted by potential human intruders" does not lend itself to explicit definition and requires clarification so that realistic archiving can be accomplished.	10 CFR 60.51(a)(2)(ii)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
LARP CHAPTER 8			
Consideration of Performance Confirmation During Construction Authorization	None	The intent of the NRC needs to be clarified relative to the review and/or approval of the performance confirmation program (Subpart F of 10 CFR 60) to be performed during the construction phase. Performance confirmation should be considered as a part of the construction authorization process to maintain consistency within 10 CFR 60.31(a) (which references consideration of the programs and/or plans of Subparts E, G, H, and I) and to provide consistency with Subpart F (in particular, 60.140). Approval of the planned Performance Confirmation Program should be an aspect of NRC's considerations to authorize construction.	10 CFR 60.31
LARP CHAPTER 9			
Milestone for Land Ownership and Control	9.0	The implied interpretation that land use and control need not be established until construction authorization has been granted needs clarification. The NRC review and approval of the construction authorization (license) application will provide the only opportunity to evaluate a demonstration of adequate land ownership and control.	10 CFR 60.121(a)(1)
UNCERTAINTIES NOT ADDRESSED IN THE LARP			
Information Having Significant Implications	None	The term "significant implication" needs clarification in relation to the fields of public health and safety, and common defense and security. Clarification or definition will avoid unnecessary action by the DOE in minor matters and will ensure proper action for those matters of importance which satisfy the regulatory intent of the Commission.	10 CFR 60.10(b)

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
Responsibility for Public Document Room	None	As presently written, 10 CFR 60.22(d), when taken in the context of the balance of 60.22, can be interpreted to require DOE to be responsible for the contents of an NRC public document room. The intent of the regulation needs to be clarified.	10 CFR 60.22(d)
UNCERTAINTIES NOT ADDRESSED IN THE LARP (Cont'd)			
Unpublished Subpart I in 10 CFR Part 60	None	10 CFR 60.31(a)(5) requires the Commission to determine that DOE's emergency plan complies with the criteria in Subpart I, a reserved (unpublished) Subpart in 10 CFR Part 60. Subpart I needs to be published in order to provide emergency plan criteria.	10 CFR 60.31(a)(5)
Unpublished Subpart I in 10 CFR Part 60	None	10 CFR 60.31(a)(5) requires the NRC to ensure compliance of the DOE emergency plan with Subpart I of 10 CFR Part 60. 10 CFR 60.21(c)(9) requires the DOE to include plans for coping with radiological emergencies in the Safety Analysis Report. However, it is uncertain that this is possible, since Subpart I has not been published.	10 CFR 60 Subpart I
Topical Guidelines for the Licensing Support System (LSS)	None	Interim topical guidelines, drafted by the parties to the LSS negotiated rulemaking were adopted by the U.S. Nuclear Regulatory Commission (NRC) with the statement that the topical guidelines would be revised later and set forth as a regulatory guide. The interim topical guidelines, partially modeled after the Environmental Assessments prepared in connection with the U.S. Department of Energy's site selection process, need to be revised to describe all of the information which should be submitted to the LSS to support the high-level waste repository licensing process. This revision will clarify the list of topics for which the LSS participants should submit documentary materials for entry into the LSS under 10 CFR 2.1003.	10 CFR 2.1003

REGULATORY/INSTITUTIONAL UNCERTAINTIES (Cont'd)

UNCERTAINTY TOPIC	ASSOCIATED REVIEW PLAN	TEXT	ASSOCIATED CITATION
UNCERTAINTIES NOT ADDRESSED IN THE LARP (Cont'd)			
NRC's Role Regarding EPA's Implementation of the Resource Conservation and Recovery Act (RCRA)	None	EPA's RCRA regulations concern chemically hazardous wastes. Because RCRA created an overlapping regulatory authority with the Atomic Energy Act (AEA), EPA can regulate any high-level waste already regulated by NRC under 10 CFR Part 60 that is found to contain RCRA-defined chemically hazardous substances. As a consequence, it is not clear how the affected agencies (both EPA and NRC) would administratively implement their respective programs in the context of AEA and RCRA.	None