

APPLICABILITY OF 10 CFR PART 60  
REQUIREMENTS TO THE YUCCA MOUNTAIN  
EXPLORATORY SHAFT FACILITY

TECHNICAL OVERSIGHT GROUP REPORT

DECEMBER 1988

REVIEW CONDUCTED BY THE TECHNICAL OVERSIGHT GROUP

FOR

UNITED STATES DEPARTMENT OF ENERGY

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

OFFICE OF FACILITIES SITING AND DEVELOPMENT

WASHINGTON, D.C.

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Applicability of 10 CFR Part 60 Requirements  
to the Yucca Mountain Exploratory Shaft Facility

Technical Oversight Group  
Approval of the Technical Oversight  
Group Report

M. Lugo (Chairman)

D. Michlewicz

H. Minwalla

A. Papadopoulos

B. Bermanis

D. Wagg

P. Kumar

*Miguel Lugo*  
*D. Michlewicz*  
*H. Minwalla*  
*A. Papadopoulos*  
*B. Bermanis*  
*D. Wagg*  
*P. Kumar*

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## 1.0 INTRODUCTION

The Office of Facilities Siting and Development (OFS) arranged to conduct a technical review of the Generic Requirements for a Mined Geologic Disposal System (GR) OGR/B-2, Appendix E, as required by the Systems Engineering Management Plan for the Office of Geologic Repositories (SEMP) OGR/B-7. That review was conducted by a Technical Review Group (TRG) to ensure that the applicable requirements of 10 CFR Part 60 were properly incorporated in Appendix E, "Generic Requirements for Exploratory Shaft Facility (ESF) Design, Construction, and Operations." The results of that review were documented in a report, "Flowdown of 10 CFR 60 Requirements Into Appendix E of the Generic Requirements for a Mined Geologic Disposal System (GR) OGR/B-2", dated September 1988 (WESTON letter HQW.880927.0026, Jenkins to Lahoti, dated September 30, 1988).

After a preliminary review of the draft report, the DOE requested that certain follow-up actions be taken, as noted in a letter from Lahoti to Cline, received on October 25, 1988 (Attachment A). Since several of the members from the original TRG were no longer available, and since the requested actions required more of a regulatory perspective, it was suggested to the DOE that a new group be formed with more participation from regulatory personnel, as indicated in a note from Cline to Lahoti, dated October 27, 1988 (Attachment B).

## 2.0 SCOPE

The scope of this review was to review the work previously done by the TRG regarding the flowdown of 10 CFR Part 60 requirements into the GR Appendix E, with the following objectives in mind:

1. Evaluate the checklist used by the TRG in determining the applicability of 10 CFR Part 60 requirements to the ESF.
2. Evaluate the TRG rationale for applicability or non-applicability of the Part 60 requirements, expanding the rationale, as needed.
3. Consider the Part 60 Statements of Consideration to ensure that the TRG conclusions are valid.
4. Give particular attention to the applicability of 10 CFR Part 60.21(c)(1)(ii)(D) and 60.140(d)(2).

These objectives are in accordance with the actions requested by the DOE in Attachment A. The group, however, did not evaluate the adequacy of the GR Appendix E with respect to the inclusion of the applicable Part 60 requirements. As reflected in the above objectives, the group review focused on the applicability of Part 60 requirements to the ESF. Draft results were provided to the TRG to allow that group to evaluate the GR Appendix E and develop the appropriate comment resolution sheets, a draft mark-up of the GR Appendix E, and subsequent baseline change proposals. These items are being submitted to the DOE separate from this report, but consistent with the conclusions indicated in Section 5.0.

### 3.0 TECHNICAL OVERSIGHT GROUP

The technical review was performed by a multi-discipline group of personnel qualified in their specific disciplines to act as the Technical Oversight Group (TOG).

As required by the Quality Assurance Plan for High Level Waste Repositories (OGR/B-3), review team members were selected based on the individual's background and expertise. Each team member's qualifications were certified and documented by the team member's supervisor on a "Proficiency Report Form" and presented to the TOG Chairman (Attachment C).

Based on the above qualifications, and taking into consideration availability of personnel, the TOG was made up of the following WESTON Technical Support Team personnel:

Mike Lugo (Chairman)	Licensing
Dave Michlewicz	Safety Assessment
Homi Minwalla	Licensing
Aris Papadopoulos	Engineering
Hank Bermanis	Licensing
Derrick Wagg	Engineering
Frasanna Kumar	Engineering

The last three team members indicated above were also part of the TRG and were selected to provide background and continuity in the review.

### 4.0 TECHNICAL REVIEW PROCESS

As was the case with the TRG review, the TOG review was conducted in accordance with the provisions of Criterion 3, "Design Control", of 10 CFR Part 50 Appendix B, as implemented by the 10 CFR Part 60 Subpart G QA requirements. Specifically, the review was performed in accordance with the DOE/HQ Quality Implementing Procedure (QIP) 3.2, "Technical Reviews."

To meet the requirements of OGR/B-3 QIP 2.1, "Indoctrination and Training", reviewers were required to complete an indoctrination session prior to commencement of the review. This session was conducted by Mike Lugo (TOG Chairman), who explained the purpose of the review and the review process (Attachment D), and Derrick Wagg (TRG Co-Chairman) who explained the Technical Review Procedure (QIP 3.2) and outlined the documentation necessary to meet the requirements of this procedure (Attachment E). The QIP 3.2 indoctrination material used was the same one used for the TRG indoctrination, at which Mr. Wagg was present. All reviewers received this training and signed the appropriate attendance record (Attachment F). At the commencement of the review, the TOG members reviewed and agreed upon a list of the basic assumptions and criteria to be used in determining the applicability of the requirements (Attachment G). This list was consistent with the assumptions and criteria used during the TRG review.

Each TOG member was asked to evaluate each Part 60 requirement, form an independent opinion regarding whether or not it imposed requirements on the design, construction, or operation of the ESF, and compare such opinion with the findings of the TRG, as contained in the September 1988 TRG Report. In parallel, Hank Bermanis (also a member of the TRG) was asked to expand the rationales for applicability provided in the TRG Report, reflecting the discussions that took place at the TRG review meetings (Attachment H). These expanded rationales formed the basis for the discussions at the subsequent TOG meetings. After numerous meetings and discussions, the TOG members reached a consensus regarding Part 60 applicability, and documented in the form of a table (Attachment I). The TOG Report was then prepared by the TOG Chairman and provided to each TOG member for concurrence. Each member was given the opportunity to file any written disagreements with the group consensus. One such disagreement was filed and is included in Attachment J.

## 5.0 CONCLUSIONS

For consistency in review and documentation, all the Part 60 requirements were divided into 157 requirements. Of these, 46 were found to impose requirements on ESF design, construction, or operations, and hence were determined to be applicable. The applicability table provided in Attachment I also identifies, for those requirements found to be applicable, the extent to which each requirement was addressed in the GR Appendix E. It indicates that, of the 46 applicable requirements, 32 were adequately addressed and 14 not adequately addressed (3 were partially addressed). This information, which was outside the scope of the TOG review, was provided by the TRG, based on the draft conclusions of the TOG. More detailed information regarding the adequacy of the GR Appendix E is being provided under a separate report by the TRG.

Item 1 from Section 2.0 above is addressed in Attachment G and items 2-4 are addressed in Attachment I. With respect to 60.21(c)(1)(ii)(D), the TOG determined it to be applicable to the extent that ESF components are found to be important to waste isolation. However, with respect to the shaft location, DOE would not be required to re-evaluate alternatives because of the time when the regulations were promulgated as compared to the time when evaluations and decisions were made relative to shaft location. 60.140(d)(2) was found not to be applicable since it did not specifically stipulate requirements that would need to be imposed on the ESF, but rather addressed requirements pertaining to particular capabilities or characteristics of the performance confirmation program.

**ATTACHMENT A**

**DOE Letter Requesting Review**

# memorandum

RECEIVED 3-30pm 10/25/88  
J.

DATE

COPY TO  
IN OF

RW-223

SUBJECT: Technical Review for the Flowdown of 10CFR60 Requirements into the GR Appendix E

TO: K. Michael Cline, Weston

REFERENCE: Letter to Ram B. Lahoti from John Jenkins, Weston dated September 30, 1988

We have reviewed the recommendations by the Technical Review Board contained in the Report titled "Flowdown of 10CFR60 requirements into Appendix E of the Generic Requirements for a mined Geologic Disposal System (GR), OGR/B-2," volumes I & II, and suggest that the following actions be taken before we can approve the comment resolution sheets:

1. The report should include the checklist used by the Board members to evaluate the applicability of 10 CFR Part 60 criteria to ESF.
2. The rationale presented in the report for applicability or non-applicability of 10 CFR Part 60 requirements needs to be beefed up.
3. In addition to 10 CFR Part 60, the Board needs to consider the statement of considerations and ensure that the conclusions reached in the report are still valid.
4. As a minimum, the Board needs to revisit 10 CFR Part 60.21(C)(i)(ii)(D) and 60.140(d)(2) for their applicability to ESF.

The proposed revisions as documented on the Technical Review comment sheets contained in Attachment J of the Report should be revised if necessary, based on our comments, and resubmitted to our office as required by QIP Procedure 3.2.

We also request that you prepare a change proposal outlining the recommended changes along with the replacement pages to Appendix E of OGR/B-2 for formal submission to the Change Control Board for their approval. The revised report and this change proposal should be submitted to the Underground Facilities Branch no later than October 31, 1988.

Any questions on this matter should be addressed to Manny Comar of my staff.



Ram B. Lahoti, Chief  
Underground Facilities Branch

cc: M. Frei, RW-22  
S. Kale, RW-20  
R. Stein, RW-30  
M. Comar, RW-223  
R. Lahoti, RW-223  
S. Brocoun, RW-221  
D. Stucker, RW-223  
J. Jenkins, WESTON ✓  
D. Siefken, WESTON

**ATTACHMENT B**

**WESTON Recommendation Regarding  
Review Group Membership**

**TO:** Ron Lahoti c/o John Robson  
**cc:** M. Comar

**FROM:** K.M. Cline

**DATE:** October 27, 1988

**SUBJECT:** Action Plan for Review of 10 CFR 60 Flowdown to Appendix E

After reviewing your memo to reconvene the review board we realized that four of the members are no longer available (i.e., two from CER, and two from HQ); therefore, we recommend a new review board. This will be consistent with QIP 3.2 (Review Procedure). The new board will be led by Weston Licensing instead of Weston Engineering. For this meeting we recommend the following team:

- M. Comar (HQ) - Engineering
- M. Lugo (Weston) - Licensing - Lead
- H. Berman's (Weston) - Licensing
- D. Michlewicz (Weston) - Preclosure Safety
- A. Papadopoulos (Weston) - Preclosure Safety
- C. Dell/H. Minwalla (Weston) - Licensing
- D. Fenster (Weston) - Geosciences (as necessary)
- D. Wagg/P. Kumar (Weston) - Engineering (as necessary)

Because of the many commitments we also recommend that this review be completed by November 4, 1988.

Please call me regarding this memo on (202)-646-6654.

**ATTACHMENT C**

**Proficiency Review Report Forms**

# PROFICIENCY REVIEW REPORT

Review Date 11/3/88

Name Miguel A. Lugo

Title Licensing Section Manager

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

**Activities** Based upon a review of Mr. Lugo's education and employment history he is fully qualified to perform the following activities: review and interpretation of statutory/regulatory requirements and documents; evaluations of nuclear facility design requirements, design analyses, safety analyses, and performance assessments; review and evaluation of management, quality assurance and programmatic documents; participation in quality assurance audits.  
Mr. Lugo has a BE and MS in Civil Engineering and a total of 14 years experience in the nuclear industry. This includes 7 years of licensing support to DOE's HLW program and 7 years of design and analysis of nuclear power plant structures. He is a Professional Engineer registered in New York and a DOE certified quality assurance auditor. Mr. Lugo is presently the Licensing Section Manager for the WESTON Technical Support Team providing support to DOE-HQ for the HLW program.

Proficiency Review Conducted and Certified by

Signature [Signature]

Title

Mgr. Regulatory Compliance  
Reg - CRU-116

Date 11/8/88

NOTE: This report should be completed on an annual basis.

# PROFICIENCY REVIEW REPORT

Review Date: 11/2/88

Name: DAVID MICHEWICZ

Title: MANAGER - SAFETY ASSESME

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

Activities: MANAGEMENT, PREPARATION AND TECHNICAL REVIEW OF ANALYSES AND DOCUMENTS RELATED TO: NUCLEAR LICENSING AND SAFETY, NUCLEAR FACILITY DESIGN, PERFORMANCE OF NUCLEAR WASTE DISPOSAL FACILITIES, NUCLEAR FACILITY SITE EVALUATION AND ENVIRONMENTAL ASSESSMENT.

Proficiency Report Conducted and Certified by

Signature: [Signature]

Title: John K. [Signature]

Date: 11/3/88

William C. [Signature]

NOTE: This report should be completed on an annual basis.

# PROFICIENCY REVIEW REPORT

Review Date 11/2/88

Name Homi Minwalla

Title Licensing Engineer

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

Activities Review of his education and experience indicates that he is  
qualified to review requirements set out in 10 CFR 60.46; they apply to  
Appendix E of the Generic Requirements Document.

His educational background and experience are in the fields of  
Electrical Engineering (with coursework in nuclear reactor design), and  
Law, both of which were undertaken at the University of Minnesota. He has  
been employed by a law firm and a nuclear consulting firm. His responsibilities  
as a Licensing Engineer within the Licensing Section, Regulatory Compliance  
Department at Roy F. Weston, Inc., have included reviewing and commenting on  
revisions to federal regulations and generic technical position papers developed  
by the NRC; interfacing with appropriate DOE staff; interpreting regulations  
(10CFR60,960,961), 40CFR191; developing strategies to meet the requirements of  
the regulations; and providing guidance on data and information needs for  
preparation of a license application.

Proficiency Report Conducted and Certified by

Signature [Handwritten Signature]

Title Licensing Section Mgr.

Date 11/2/88

NOTE This report should be completed on an annual basis

## PROFICIENCY REVIEW REPORT

Name Aris Papadopoulos Review Date Nov 2, 1988  
Title Engineer

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

Activities Based upon a review of Mr. Papadopoulos's education and employment history, he is fully qualified to perform the following activities: Nuclear Licensing, Nuclear Safety, Nuclear Facility design requirements and analyses, High level waste Repository licensing, and design and design requirements.

Mr. Papadopoulos holds an MS degree in Mechanical/Nuclear Engineering from the University of Utah, and has 17 years experience in the commercial nuclear power, and high level waste areas.

From 1971 to 1976 Mr. Papadopoulos was employed by United Engineers and Constructors where he was involved in safety analysis for the firm's nuclear projects.

From 1976 to 1986 he was employed by NUS Corporation as consulting engineer in the areas of reactor licensing, safety analysis, NRC regulation, and high level waste management projects (ALWI).

Since 1986, he has worked as an independent consultant for Science Applications International Corp. in the nuclear utility area, and has been a member of the Weston Technical Support Team as a member of the licensing group and more recently the engineering group in support of the BERNUM program.

Proficiency Report Conducted and Certified by

Signature

[Signature]

Title

Manager, Surface  
Facilities Engineering

Date

November 2 1988

NOTE: This report should be completed on an annual basis.

# PROFICIENCY REVIEW REPORT

Review Date 31 AUGUST 1988

Name H. L. Bermanis

Title ENGINEER

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

**Activities** Mr. Henry L. Bermanis is fully qualified to serve as a reviewer on the 10 CFR 60/Appendix E Technical Review Group, on the basis of his education and employment history.

Mr. Bermanis holds a BS degree in Physics and is a registered nuclear engineer.

Mr. Bermanis has over 33 years of nuclear engineering experience. For 15 years he worked as a reactor physicist on various advanced reactors for the General Electric Company. For 17 years he was the Manager of Licensing for all commercial nuclear power plants at United Engineers & Constructors. For the last 5 years, while still with UE&C, he has held various positions in the licensing group of the Technical Support Team for the DOE's Office of Civilian Radioactive Waste Management program. During that time he has interpreted the regulations pertaining to geologic repositories and their governing statutes, with particular emphasis on the Nuclear Waste Policy Act, as amended, the Atomic Energy Act, as amended, Title 10 Chapter I Part 60 of the Code of Federal Regulations, and NRC regulations and guidelines derived therefrom. He has served as a technical reviewer of the design of the Exploratory Shaft Facilities for the salt and tuff repository projects, and as a member of the MRS Integration Task Force.

Proficiency Report Conducted and Certified by

Signature [Signature]

Title

LICENSING SECTION MANAGER

Date 8/30/88

NOTE: This report should be completed on an annual basis.

# PROFICIENCY REVIEW REPORT

Name NERRICK WAGG

Review Date Sept. 2/89  
Title MINING ENGINEER

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

AGREES BASED UPON A REVIEW OF MR. WAGG'S EDUCATION AND EMPLOYMENT HISTORY, HE IS FULLY QUALIFIED TO SERVE ON THE 10CFR60/APPENDIX E TECHNICAL REVIEW GROUP. MR. WAGG HAS OVER 25 YEARS' EXPERIENCE IN SENIOR ENGINEERING AND MANAGEMENT RELATING TO PRODUCTION MINING AND MINE DEVELOPMENT IN THE UNITED KINGDOM, CANADA, AND THE UNITED STATES CURRENTLY AS PART OF THE WESTON TECHNICAL SUPPORT TEAM TO THE OFFICE OF CIVILIAN RADIO-ACTIVE WASTE MANAGEMENT. MR. WAGG IS RESPONSIBLE FOR REVIEWING AND EVALUATING VARIOUS TECHNICAL DOCUMENTS PREPARED BY THE PROJECT OFFICE TO SUPPORT THE DESIGN OF A MIXED GEOLOGIC DISPOSAL SYSTEM FOR THE PERMANENT DISPOSAL OF HIGH LEVEL RADIOACTIVE WASTE. HE ALSO PROVIDES TECHNICAL GUIDANCE ON MINING RELATED ACTIVITIES SUCH AS OCCUPATIONAL SAFETY, SHAFT AND UNDERGROUND FACILITY DESIGN AND CONSTRUCTION AND VENTILATION SYSTEMS

Proficiency Report Conducted and Certified by

Signature [Signature]

Title MR. DESIGN

Date Sept 2/89

NOTE: This report should be completed on an annual basis.

# PROFICIENCY REVIEW REPORT

Review Date Aug. 31, 1988

Name N. Prasanna Kumar

Title Mining Engineer

The proficiency review is based on the experience, knowledge and training of the individual. The activities the individual is capable to perform are listed below.

**Activities** Based upon a review of Mr. N. Prasanna Kumar's education

and employment history, he is fully qualified to serve on the 10 CFR 60/  
Appendix E of CR Technical Review Group. Mr. Kumar holds an M.S. Degree

in Mining Engineering from the University of Arizona. He was employed by  
Hindustan Steel Ltd., India, as a Design Engineer and Senior Design

Engineer for the steel plant mines. Subsequently, Mr. Kumar was  
employed by Magna Copper Company's San Manuel Mine in Arizona as a

Design Engineer responsible for underground and shafts facilities design.

Prior to joining Jacobs Engineering Group, Inc. (part of Roy F. Weston OCRWM

Technical Support Team), Mr. Kumar was employed by Anaconda Minerals Company  
in various capacities including Design Engineer, Chief Design and

Construction Engineer, and Special Projects Engineer. Duties included  
facility design and construction, supervision, preparation and review of

feasibility reports, specifications, etc. With Jacobs Engineering,

Mr. Kumar has been involved with preparation and reviews of various

OCRWM program-related documents/drawings related to repository facilities.

Proficiency Report Conducted and Certified by

Signature [Signature]

Title Project Manager, Jacobs Engineering

Date 8/31/88

NOTE: This report should be completed on an annual basis.

**ATTACHMENT D**  
**Purpose of Review and**  
**Review Process**

**TECHNICAL OVERSIGHT GROUP (TOG) REVIEW OF  
10 CFR PART 60 APPLICABILITY TO ESF**

**PURPOSE**

Review the work previously done by the Technical Review Group (TRG) regarding the flowdown of 10 CFR Part 60 requirements into the GR Appendix E, with the following objectives in mind:

- o Evaluate the checklist used by the TRG in determining the applicability of 10 CFR Part 60 requirements to the ESF.
- o Evaluate the TRG rationale for applicability or non-applicability of the Part 60 requirements, expanding the rationale, as needed.
- o Consider the Part 60 Statements of Consideration to ensure that the TRG conclusions are valid.
- o Give particular attention to the applicability of 10 CFR Part 60.21(c)(1)(ii)(D) and 60.140(d)(2).

These objectives are in accordance with the DOE memorandum from R. B. Lahoti to K. M. Clive, dated 10/25/88.

**EVALUATION PROCESS**

1. The evaluation is to be performed in accordance with QIP 3.2 "Technical Reviews."
2. An indoctrination session will be given to the TOG in accordance with QIP 2.1 "Indoctrination and Training."
3. The TOG will review the conclusions of the TRG contained in the Technical Review Report (September 1988).
4. In parallel, H. Bermanis (member of the TRG) will expand the rationales provided in the report, with assistance from other TRG members, as needed.
5. The TOG and members of the TRG will meet to discuss the expanded rationales and reach a consensus.
6. The TOG will document its recommendations in the form of an expanded version of the applicability table contained in the TRG Report. The recommendations will be signed by each member of the TOG and submitted to the appropriate DOE-HQ (OFSD) Branch Chief.

**ATTACHMENT E**

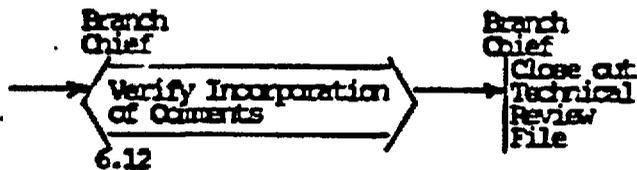
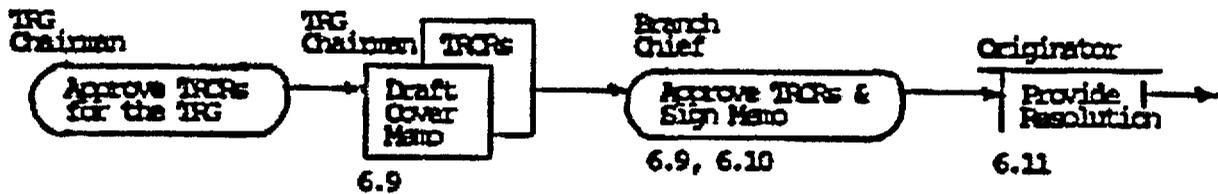
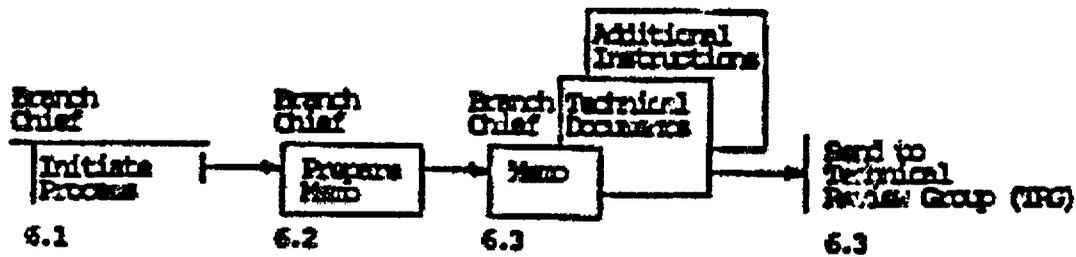
**Review Procedure and  
Required Documentation**

**TRAINING HANDOUTS FOR  
TRAINING ON QIP 3.2, TECHNICAL REVIEWS  
SEPTEMBER 1, 1988**

**CER CORPORATION  
Norman C. Frank, P.E.**

TECHNICAL REVIEW

A documented single or multi-discipline review performed by qualified personnel who are independent of the original work performed.



QIP 3.2 FLOW CHART

HEADQUARTERS - OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

TECHNICAL REVIEW COMMENTS AND RESOLUTION (QIP 3.2)

Date ①

Page 1 of ②

Document Title Generic Requirements for Exploratory Shaft Facility (ESF)

Design, Construction, and Operations

Document No., Revision and Date OGR/E-2, Appendix E, Revision 3, 3/5/87

Reviewer ③

Organization ④

Page/Paragraph

⑤

Comments and Rationale

⑥

Proposed Revision

⑦

Date ⑧ Signed ⑨ Date \_\_\_\_\_ Signed \_\_\_\_\_  
Reviewer Branch Chief

Resolution

Date \_\_\_\_\_ Signed \_\_\_\_\_ Date \_\_\_\_\_ Signed \_\_\_\_\_  
Reviewer Branch Chief

HEADQUARTERS - OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

TECHNICAL REVIEW COMMENTS AND RESOLUTION (QIP 3.2)

Date 9/1/88

Page 1 of 1

Document Title Generic Requirements for Exploratory Shaft Facility (ESF)  
Design, Construction, and Operations

Document No., Revision and Date OGR/B-2, Appendix E, Revision 3, 3/5/87

Reviewer Technical Review Group

Organization DFSD

Page/Paragraph

E-4, Performance Criteria, 1.a.

Comments and Rationale

10 CFR 60, Part ~~40~~<sup>41</sup> requires ... This is not included for the ... covered by this paragraph. Criteria need to be specified to assure ...

Proposed Revision Sample Wording - Be Specific

- I. Expand the referenced paragraph to say:  
1.a. Underground openings ... (added text) ... conditions
- II Delete the words, "If it can be demonstrated that" in the fourth line.
- III Replace existing paragraph with the following paragraph:

Date \_\_\_\_\_ Signed \_\_\_\_\_ Date \_\_\_\_\_ Signed \_\_\_\_\_  
Reviewer Branch Chief

Resolution

Date \_\_\_\_\_ Signed \_\_\_\_\_ Date \_\_\_\_\_ Signed \_\_\_\_\_  
Reviewer Branch Chief

**ATTACHMENT F**

**Indoctrination and Training  
Attendance Record**

**INDOCTRINATION AND TRAINING SESSION**

**ATTENDANCE RECORD**

Date: October 31, 1988 Time: 1:30 PM Location: WESTON Large Conf. Room

Session Topic: Technical Review Process for Review of 10 CFR Part 60  
Applicability to ESF and Flowdown to GR Appendix E

Purpose/ Objective: To inform the members of the Technical Oversight Group (TOG) of:

- 1) The goals of the technical review and the technical methods to be used in achieving the goals.
- 2) The documentation necessary to meet the requirements of QIP 3.2

Documents: (1) 10 CFR Part 60, including Statements of Consideration  
 (2) Draft Report by TRG, 9/88  
 (3) GR Appendix E

Instructor: Derrick Wagg Mike Lugo  
 Derrick Wagg, Roy F. Weston, Inc. Mike Lugo, Roy F. Weston, Inc.

Name	Position	DOE Employee or Company	Signature
Mike Lugo	Licensing Section Manager	Roy F. Weston, Inc.	<i>Mike Lugo</i>
David Michlewicz	Safety Assistant	Roy F. Weston, Inc.	<i>David Michlewicz</i>
Homi Minwalla	Licensing Eng	Roy F. Weston, Inc.	<i>Homi Minwalla</i>
Aris Papadopoulos	Engineer	Roy F. Weston, Inc.	<i>Aris Papadopoulos</i>
Derrick Wagg	*	Roy F. Weston, Inc.	
HANK BERMANIS	*	Roy F. Weston, Inc.	
Prasanna Kumar	*	Roy F. Weston, Inc.	

\* PREVIOUSLY TRAINED UNDER TRG

Record Attested by:

OCRWM QA Manager

Date

**ATTACHMENT G**

**Basic Assumptions and Criteria for  
Determining Part 60 Applicability**

**BASIC ASSUMPTIONS AND CRITERIA FOR  
DETERMINING PART 60 APPLICABILITY TO THE ESF**

1. Basic assumptions to be considered when reviewing the requirements.
  - a) Portions of the ESF will eventually become part of the geologic repository.
  - b) The ESF design shall not jeopardize the integration of the ESF into the geologic repository.
  - c) The four Permanent Items in the ESF, namely, 1) Underground Openings 2) Shaft Liners 3) Operational Seals and 4) Ground Support shall be designed and constructed to be incorporated into the Repository and must be designed to have a maintainable life and quality as specified for the Repository.
  - d) Any component of the ESF, or any activities relating to that component, which could have an effect on waste isolation shall be subject to the requirements of 10 CFR 60 Subpart G.
  - e) Project is currently conducting an analysis for identifying items important to safety or waste isolation in the ESF. In view of this, adopt a conservative approach on the applicability of requirements relevant to important to safety or waste isolation.
  - f) The ESF shall be designed to accommodate the Site Characterization Program and the Performance Confirmation Program.
  - g) ESF temporary surface facilities are not expected to be part of the repository permanent facility.
  - h) The two Exploratory Shafts will become future permanent ventilation intake shafts for the waste emplacement area.
2. Basic criteria to be used to review the applicability of the requirements.
  - a) Does the requirement impose restrictions on the design, construction or operation of the ESF?
  - b) Does the requirement impact the design of any structures, systems, or components which may affect the waste isolation capability of the site?
  - c) Does the requirement impose restrictions which, if not considered, may affect the future licensability of the site?
  - d) Is the ESF component which is subject to the requirement, to be redesigned or replaced in the final repository design and construction?
  - e) Does the requirement impose programmatic constraints on the ESF program.

**ATTACHMENT H**

**Expanded TRG Rationales  
for Applicability**

## FLOWDOWN OF PART 60 REQUIREMENTS TO ESF

### Comments on Applicability

**NOTE:** Those paragraphs of Part 60 which do not provide direct technical guidance to the design, construction, or operation of the ESF are here identified as not applicable. Those that do apply have the corresponding Section of Appendix E of the Generic Requirements Document identified; when marked with an asterisk, denotes new input to Appendix E proposed by the TRG. The TRG included a reading of the Statement of Consideration for Part 60 in its review of the regulation. A listing of the assumptions and criteria which guided the decisions of the TRG is appended to these comments.

#### SUBPART A

##### 60.1

This is an administrative para; it identifies the purpose and scope of Part 60, and does not provide direct technical guidance to the ESF design, construction, or operation.

##### 60.2

The definitions given in this section, of some of the terms used in Part 60, do not themselves provide technical guidance for the design of the ESF. Since they do introduce the subsequent discussions, they apply indirectly to the ESF, and the Technical Review Group (TRG) used these definitions in their review of the regulation.

##### 60.3

The para stipulates the need for a Commission license prior to the receipt of waste at the site, and construction authorization prior to initiation of construction of the repository. It addresses administrative requirements and does not provide direct technical guidance to the ESF.

##### 60.4

Provides address of DRC Director, NRC. Does not provide direct technical guidance to ESF.

##### 60.5

Does not permit interpretation of Part 60 except b, General Guidance. Does not provide direct technical guidance to ESF.

##### 60.6

Provides for exemption from rule. Does not provide direct technical guidance to ESF.

##### 60.7

Does not prevent or control radioactive materials. Does not provide direct technical guidance to the ESF.

60.8

Waiver of Paperwork Reduction Act. Does not provide direct technical guidance to ESF.

60.9

Forbids discrimination against certain employees. Does not provide direct technical guidance to ESF.

60.10

Requires complete and accurate information. Does not provide direct technical guidance to ESF.

SUBPART B

60.15(a)

Directs DOE to conduct site characterization prior to license application. Does not provide direct technical guidance for ESF.

60.15(b)

Requires that in situ tests be conducted at waste emplacement depth. Applies to Appendix E, Sect. 6.0 C(X)†

60.15(c)

This para directs DOE to characterize alternate sites. This requirement has been cancelled by the Nuclear Waste Policy Amendments Act, and should be deleted from Part 60. Does not apply to the ESF.

60.15(d)

Provides guidance for site characterization with minimum site perturbation. Applies to App. E, Sect. 6.0 C(R)†

60.16

Prohibits sinking of exploratory shafts until NRC's comments on Site Characterization Plan (SCP) have been considered by DOE. Applies to App. E, Sect. 6.1 C(D)†

60.17

Very briefly identifies the contents of the SCP. Although the ESF will be used to provide most of the information requested here, this para does not provide technical guidance for the ESF design, construction, and operation. For example, 60.17(c) requires a conceptual design to be described in the SCP; however, the actual content of the SCP is based on Regulatory Guide 4.17, as modified by agreements reached between the NRC and DOE staffs after extensive discussions. The I&G considers 60.17 to be merely a reporting requirement, not the trigger which imposes a need for a conceptual design; that need is established by DOE Order 4700. Does not apply directly to ESF

#### 60.18

Identifies NRC's activities for the review of the SCP, and other administrative concerns, and does not provide technical guidance for ESF. Although this para defines Commission actions aimed at the review of DOE's site characterization work, para 60.18(g) notes the requirement for DOE to submit to the NRC semiannual progress reports. Insofar as the ESF construction, or operation may contribute to such reports, para 60.18(g) may apply to the ESF.

#### 60.21

This paragraph deals with the contents of the License Application, and its accompanying Safety Analysis Report. Although the ESF will serve as the test facility which will provide the data base for the License Application, the TRG considered that the data requirements as such do not provide technical guidance for the ESF. Rather, the data requirements will be identified in the SCP, and the test details will be detailed in the corresponding Study Plan.

In evaluating whether 60.21 provides technical guidance for the design, construction, and operation of the ESF, the TRG took note of the "Comparative Safety Analyses" section of the Statement of Consideration for Part 60 (60-SC-16, June 30, 1983). In 60.21(c)(ii)(D), the regulation requires that the Safety Analysis Report include a comparative evaluation of alternatives to the major design features that are important to waste isolation. The Commission responds to comments that a safety analysis be directed at the specific design being proposed, by reserving the right to the requested information. If the Commission finds, on the basis of its review of the evaluated alternatives, "...that the adoption of some alternative design feature would significantly increase its confidence that the performance objectives would be satisfied, and that the costs of such an approach are commensurate with the benefits, it should not hesitate to insist that the alternative be so adopted."

Against that position it can be argued that the DOE is not required to find the best site nor the best design, and the NRC is not charged with finding the optimum assurance of waste isolation; both are, however, required to provide acceptable approaches. It should be left to the discretion of the DOE, for example, where and how to construct the ESF, provided that the proposed design meets the performance objectives. In exercising this responsibility, the DOE will evaluate alternative design features of the repository, including the ESF. If such considerations require certain data to be obtained through use of the ESF, then this requirement will be identified in appropriate Study Plans which, in turn, might make demands on the design of the ESF. The TRG concluded that this reasoning does not constitute a direct technical guidance for the ESF and that 60.21, in its entirety, does not directly apply to the ESF, although there is an obvious indirect or implied impact.

60.22

Directions for filing the License Application are provided. This para does not apply to the ESF.

60.23

Directions for eliminating duplications among various licensing documents are provided. This para does not apply to the ESF.

60.24

Directions for updating the License Application are provided. This para does not apply to the ESF.

60.31

This para contains criteria which the Commission will use to determine whether to issue a Construction Authorization; it does not provide technical guidance to the ESF, therefore does not apply.

60.32

Restrictions on the Construction Authorization are identified. This para does not provide direct guidance for the ESF and does not apply.

60.33

Guidance for amending the Construction Authorization. As in 60.32, this para does not apply to the ESF.

60.41 through 60.46

These paragraphs pertain to the NRC criteria for issuing the license, the conditions and specifications of the license, any changes involving previously unreviewed safety concerns, and amendments to the license. None of these provide technical guidance for the ESF and do not apply to the ESF.

60.51 and 60.52

These paragraphs pertain to the permanent closure of the repository and to the subsequent termination of the license. They clearly do not pertain to the ESF.

SUBPART C

60.61 through 60.65

These paragraphs deal with the participation of state governments and Indian tribes in the licensing review process. They do not provide technical input to the ESF and do not apply to the ESF.

## SUBPART D

### 60.71

This para deals with records pertaining to the licensed activity at the site; i.e., the receipt, handling, and disposition of radioactive material. These records do not pertain to the ESF either before or after it becomes a part of the Geologic Repository Operations Area (GROA).

### 60.72

This para requires that certain construction records of the GROA be kept. Since the ESF is assumed to become a part of the GROA, this para applies to the ESF. (6.1 PC (4)(a))

### 60.73

This para requires the prompt notification of the Commission of any deficiency found in the characteristics of the site, and in the design and construction of the GROA. During site characterization this para is redundant with 60.18(g) which also requires the reporting of pertinent site characteristics. After the ESF becomes a part of the GROA, this requirement will be redundant with 10CFR21, which imposes the same requirements but on a broader scale and with civil penalties for its violation. Although redundant with other Commission regulations, this para does apply to the ESF.

### 60.74

This para requires that tests be performed as the Commission deems necessary. No technical guidance is provided to the ESF either before or after it is incorporated into the GROA. This para does not apply to the ESF.

### 60.75

Provision is made for NRC staff access to DOE records and facilities. This para is administrative in nature, does not offer technical guidance, and does not pertain to the ESF.

## SUBPART E

### 60.101

This is an introductory para to the technical criteria. It does not provide technical guidance and therefore does not apply to the ESF.

### 60.102

This para offers definitions and related administrative statements. It offers no technical guidance applicable to the ESF.

### 60.111(a)

This para requires that the GROA be designed so that until permanent closure the radiation levels in uncontrolled areas be maintained within the limits shown in 10CFR20 or EPA standards. Since there are no plans to bring radioactive materials into

the ESF, this para would not apply to the ESF; however, after the ESF becomes a part of the GROA, this para will apply to the ESF. The design, construction, and operation of the ESF shall bear in mind its later utility. (6.0 PC(5)(g)\*)

#### 60.111(b)

This para requires that the design of the GROA not preclude the retrieval of the emplaced waste, if so directed by the Commission, until the permanent closure of the repository. The ESF would contribute to the retrieval operation by conveying ventilation supply air to the retrieval area. Analyses need to be performed, at the time when retrieval becomes necessary, to determine if any part of the GROA becomes important to safety during retrieval (See NUREG-1318, 4.2(d) and 5.2(d)). This para therefore applies to the ESF. (6.0 PC(6)(e)\*)

Para 60.111(b)(2) reserves for the Commission the right to allow backfilling or permanent closure of part or all of the GROA before the end of the retrievability period. This para provides guidance for the NRC, and does not apply to the ESF.

#### 60.112

This para defines the overall performance objective for the repository, and therefore applies to the ESF when it becomes part of the GROA. (6.0 PC(6)(f)\*)

#### 60.113(a)

This para imposes general provisions on the waste isolation capability of the repository; 60.113(a)(1) defines the acceptable performance of engineered barrier systems. When the ESF becomes part of the GROA, this para applies. (6.0 PC(6)(c))

60.113(a)(2) applies to the geologic setting; it is a siting criterion with regard to groundwater travel time, and therefore does not apply to the ESF.

60.113(b) and (c) provide the Commission some leeway regarding groundwater travel time, and future objectives regarding unanticipated processes and events. These paragraphs do not at this time provide technical criteria and do not apply to the ESF.

#### 60.121

The land ownership requirements identified in this para are not technical criteria and do not apply to the ESF.

#### 60.122

The siting criteria discussed in this para do not pertain to the design, construction, or operation of the ESF, whether before or after the ESF becomes a part of the GROA.

#### 60.130

This is a general introductory statement of the design of the GROA provided in paragraphs 60.131 through 60.134, and it

applies to the ESF. Pertinent references to these design criteria for the GROA are found in a number of places in Appendix E to the Generic Requirements Document.

60.131(a)

This para discusses the design features which could be used to maintain concentrations of radioactive material in the air below specified limits. Compliance with the specified criteria is a function of equipment design, therefore not directly applicable to the ESF.

60.131(b)

This para applies only to items important to safety. The stated requirements can, therefore, only apply to the ESF after incorporating it into the GROA plus the finding then that an item is important to safety.

60.131(b)(1) requires protection of items important to safety from effects of natural phenomena. (6.0 C(G))

60.131(b)(2) requires protection of equipment important to safety from dynamic effects of equipment failure. (6.0 C(H))

60.131(b)(3) requires that items important to safety maintain their safety capability in case of fires and explosions. (6.0 C(D), 6.0 C(I), 6.0 C(L), 6.0PC(5))

60.131(b)(4) provides for emergency capability for items important to safety, with concurrent full control over radioactive material. (6.0 C(J), 6.0 C(M))

60.131(b)(5) requires that utility services important to safety be able to perform their safety functions under normal and abnormal conditions. This does not apply to the ESF because before incorporation into the GROA there are no items important to safety in the ESF, and because upon joining the GROA, the utility services used in the ESF are planned to be replaced with utilities designed for the revised functions.

60.131(b)(6) requires that items important to safety permit periodic inspection, testing, and maintenance. This could apply to the ESF. (6.0 PC(6)(h))\*

60.131(b)(7) requires appropriate controls to avoid accidental criticality of the fissile waste material. This does not apply to the ESF because nothing on the ESF is capable of causing a criticality excursion.

60.131(b)(8) calls for instrumentation or controls for items important to safety. This requirement does not apply to the ESF because the four ESF items to be incorporated into the GROA do not include instrumentation or controls.

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60.131(b)(8) calls for instrumentation or controls for items important to safety. This requirement does not apply to the ESF because the four ESF items to be incorporated into the GROA do not include instrumentation or controls.

60.131(b)(9) requires compliance with pertinent mining regulations, so that items important to safety could perform as designed. This applies to the ESF. (6.0 PC(3)(e) and 6.0PC(5)(a))

60.131(b)(10) pertains to hoists in the ESF which are important to safety. There are none, therefore this para does not apply to the ESF.

#### 60.132

This para applies to surface facilities which will be used for handling and storing radioactive wastes. At no time will this include the permanent ESF items; therefore, this para does not apply to the ESF.

#### 60.133

This para contains design requirements for the underground facility, and therefore applies to the ESF.

60.133(a) contains general requirements. (6.0 C(( ))

60.133(b) requires sufficient design flexibility to accommodate specific site conditions. (6.0 PC(1)(k))

60.133(c) calls for underground design which does not preclude the ability to retrieve the waste. (6.0 PC(6)(e))

60.133(d) requires control over underground water or gas intrusion. (6.6 PC(1)(f))

60.133(e) requires safe underground openings which will permit safe operations and maintenance of the retrievability option. (6.6 PC(1)(a), 6.0 PC(6)(e), and 6.6 PC(1)(d))

60.133(f) requires underground excavation which limits the potential for creating preferential pathways for groundwater. (6.0 C(E), 6.6 PC(1)(c), 6.6 PC(1)(d), and 6.6 PC(1)(e))

60.133(g) applies to the ventilation system for the GRUA. This system is not one of the ESF permanent items; therefore, this requirement does not apply to the ESF.

60.133(h) requires that engineered barriers be designed to assist the geologic setting in meeting its postclosure performance objectives. (6.0 PC(6)(c))

60.133(i) requires that the performance objectives will be met, taking into account the response of the geologic setting to the thermal loads resulting from waste emplacement. (6.0 PC(6)(i))

#### 60.134

This para requires that the seals for shafts and boreholes not become postclosure preferential pathways that compromise the performance of the repository. Design of permanent seals will

meet this requirement.

60.135

This para pertains to criteria for the waste packages and their components, and therefore do not apply to the ESF.

60.137

This para introduces the requirements for complying with the performance confirmation program. The design of the GROA must permit the conduct of the confirmation program. Should the ESF be required to conduct the confirmation program, such design aspects must comply with this paragraph. (6.9 PC(2), and 6.0 PC(6)(j)\*)

60.140 through 60.143

These two paragraphs pertain to the performance confirmation program. If the ESF permanent items are required to accommodate the performance confirmation test facilities, their design will have to meet the requirements of 60.137. The ESF does not, however, affect the performance confirmation test program; it might merely provide the facility for its emplacement. The compliance with these paragraphs with respect to the performance confirmation tests will be provided in the appropriate study plans and test programs. These two paragraphs do not apply to the ESF.

SUBPART G

60.150

This paragraph merely introduces Quality Assurance and defines its scope; it therefore does not apply directly to the ESF.

60.151 and 152

This requirement is implemented by the Department on the basis of an evaluation as to the applicability to a given structure, system, or component of the QA program, depending whether that item is important to safety, to waste isolation, or is an activity that is part of site characterization. This paragraph does not directly apply to the ESF but may be brought to apply on the basis of the prescribed analyses. (6.1 PC(6))

SUBPART H

60.160 through 162

These paragraphs address personnel qualifications for perform-  
ing licensed operations on items important to safety. Prior to incorporation into the GROA, there will be no such items in the ESF; after incorporation, the ESF permanent items are of a structural nature which are not "operated". These paragraphs therefore do not apply to the ESF.

**ATTACHMENT I**

**Applicability of Part 60  
Requirements to the ESF  
(TOC Conclusions)**

## 10 CFR PART 60 APPLICABILITY TO THE ESF

These sections of 10 CFR Part 60 that do not impose requirements on the design, construction, or operation of the Repository Shaft Facility (ESF) are identified below as not applicable. Those that do impose requirements are identified as applicable and have the corresponding section of Appendix E of the Generic Requirements Document (R/B-2) identified (when marked with an asterisk (\*), it denotes new input to Appendix E).

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
1.	60.1		X	This section does not impose any requirements on the ESF since it is only a procedural paragraph stating the purpose and scope of Part 60.
2.	60.2		X	The definitions given in this section do not in themselves impose requirements on the ESF, but rather set the framework to understanding and applying the Part 60 requirements. While the definitions are considered to be not applicable, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
3.	60.3		X	This section does not impose requirements on the ESF since it only addresses the procedural requirements that a Commission license be obtained prior to receipt of any nuclear material at the geologic repository operations area and that construction shall not commence until a construction authorization has been obtained.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
4.	60.4		X	This section does not impose requirements on the ESF since it only provides the address of the NRC Director of NMSS, for the purpose of communications pertaining to Part 60.
5.	60.5		X	This section does not impose requirements on the ESF since it serves only to stipulate that the only binding interpretation of Part 60 is by NRC General Counsel.
6.	60.6		X	This section does not impose requirements on the ESF since its purpose is to indicate that possible exemptions from Part 60 can be provided by the Commission.
7.	60.7		X	This section does not impose requirements on the ESF since it is only a procedural provision allowing for the use of certain nuclear material for purposes of site characterization without having to obtain a license. Furthermore, since the DOE has decided not to use such nuclear material during site characterization, this provision is not really relevant.
8.	60.8		X	This section does not impose requirements on the ESF since it is only a procedural provision waiving the OMB clearance requirements of the Paperwork Reduction Act of 1980.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
9.	60.9		X	This section does not impose requirements on the ESF since it is only a procedural provision forbidding discrimination against employees for engaging in certain protected activities, as defined in the Energy Reorganization Act of 1974, as amended. The provisions of this section are only applicable to NRC licensees, applicants for NRC licenses, and contractors or subcontractors of NRC licensees or applicants. The DOE, at this time, is neither a licensee nor an applicant.
10.	60.10		X	This section does not impose requirements on the ESF since it is only a procedural provisions requiring that information provided to the NRC be complete and accurate. The provisions of this section are only applicable to NRC licensees or applicants for NRC licenses. The DOE, at this time, is neither a licensee nor an applicant.
11.	60.15(a)		X	This section does not impose requirements on the ESF since it is only a procedural provision requiring the DOE to conduct a program of site characterization prior to submittal of a license application.
12.	60.15(b)	X 6.0 C(X)*		This section imposes requirements on the ESF since it stipulates that site characterization must include a program of in situ testing at waste emplacement depth. Therefore, access to such depths must be provided, hence the need for the ESF.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
13.	60.15(c)		X	This section does not impose requirements on the ESF since this section has been superseded by the Nuclear Waste Policy Amendments Act of 1987. This section requires characterization of alternate sites; however, the NWPA has mandated that the DOE shall only characterize the Yucca Mountain site.
14.	60.15(d)	X 6.0 C(R)*		This section imposes requirements on the ESF since it places certain constraints on the site characterization program. This section calls for: a) investigations to have limited adverse impacts on waste isolation (ESF construction and operations are integral parts of site characterization), b) the number of boreholes and shafts to be limited to those necessary, c) boreholes and shafts to be located where future shafts or pillars will be located, and d) the ESF to be coordinated with the geologic repository operations area.
15.	60.16	X 6.1 C(D)*		This section imposes requirements on the ESF since it places certain constraints on the start of ESF construction. One is that the SCP must be issued for public comment and the other is that NRC comments on shaft sinking need to be considered.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX B</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
16.	60.17(a)		X	This section does not impose requirements on the ESF since it only briefly identifies the contents of the SCP, referring specifically to plans and descriptions that need to be provided in that document. Although the ESF will be used to obtain most of the information called for in these plans, this section itself does not place any requirements on the ESF.
17.	60.17(b)		X	This section does not impose requirements on the ESF since it only identifies what descriptive information regarding the waste form and waste package must be provided in the SCP.
18.	60.17(c)		X	This section does not impose requirements on the ESF since it only identifies that the SCP shall contain a conceptual design of the geologic repository.
19.	60.18		X	This section does not impose requirements on the ESF since it only addresses certain procedural aspects of NRC's review of DOE's site characterization program activities. It identifies NRC activities associated with review of the SCP, DOE submittal of semi-annual reports and other procedural aspects.

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

20.

60.21(a)

X

This section does not impose requirements on the ESF since it only addresses which documents need to be part of or accompany the license application.

21.

60.21(b)(1)

X

This section does not impose requirements on the ESF since it only requires that a general description of the geologic repository be included in the general information that is part of the license application.

22.

60.21(b)(2)

X

This section does not impose requirements on the ESF since it only requires that schedules for construction, waste receipt, and waste emplacement be included in the general information that is part of the license application.

23.

60.21(b)(3)

X

This section does not impose requirements on the ESF since it only requires that a safeguards certification be included in the general information that is part of the license application.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
24.	60.21(b)(4)		X	This section does not impose requirements on the ESF since it only requires that a description of the physical security plan be included in the general information that is part of the license application.
25.	60.21(b)(5)		X	This section does not impose requirements on the ESF since it only requires that a description of the site characterization activities actually conducted (as compared to what was described in the SCP) be included in the general information that is part of the license application.
26.	60.21(c)(1)(i)		X	This section does not impose requirements on the ESF since it only requires that a description of the site be provided in the SAR, identifying certain specific parameters that should be included as part of the description. Although the ESF will be used to obtain most of the information that would be used in describing the site, this section itself does not place any requirements on the ESF.

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

27.

60.21(c)(1)(11)  
(A)-(C),(F)

X

These sections do not impose requirements on the ESF since they only require that certain site assessments be performed and included in the SAR. These assessments include: a) an analysis of the geology, geophysics, hydrogeology, geochemistry, climatology, and meteorology of the site; b) analyses of favorable and potentially adverse conditions; c) an evaluation of postclosure repository performance; and d) an explanation of measures used to support the models used in these assessments. These assessments basically pertain to analyses of site conditions or performance and do not directly relate to the ESF.

28.

60.21(c)(1)(11)(D) X  
6.0 PC(6)(k)\*

Generically, this paragraph imposes requirements on the ESF since it requires a comparative evaluation of alternatives to the major design features that are important to waste isolation. However, with respect to the present Yucca Mountain exploratory shafts, these requirements need to be qualified, as indicated below.

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

28.  
(Continued)

In response to public comments that a safety analysis be directed at the specific design being proposed, rather than alternatives, the Statements of Consideration for the Part 60 final technical rule (48 FR 28194, 6/21/83) indicates that "if the Commission finds, on the basis of its review, that the adoption of some alternative design feature would significantly increase its confidence that the performance objectives would be satisfied, and that the costs of such an approach are commensurate with the benefits, it should not hesitate to insist that the alternative be so adopted." Also, in a subsequent revision to Part 60 (51 FR 27158, 7/30/86), in discussing the newly added requirement in 60.16 that the DOE defer sinking of the shaft until NRC's comments have been considered, the Statements of Consideration indicate that the "Commission has stressed the importance of evaluating alternatives to major design features that are important to waste isolation, see 10 CFR 60.21(c)(1)(ii)(D), and in the case of the design and location of the

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

28.  
(Continued)

shafts this can only be done prior to their sinking." Therefore, for any ESF permanent component determined to be important to waste isolation, such a comparative evaluation would need to be performed. However, with respect to the Yucca Mountain exploratory shaft location, it should be noted that the 60.21(c)(1)(ii)(D) requirement did not become effective until 7/21/83 and that the NRC interpretation that this requirement also be applied to the shaft location (as indicated above) was published on 7/30/86. The evaluations and decisions pertaining to the Yucca Mountain exploratory shaft location were made by the DOE prior to 1983, when there was no requirement for a comparative evaluation of waste isolation capability. Alternatives to the location of the Yucca Mountain exploratory shafts may be considered by the DOE, despite the fact that the pertinent regulations were not promulgated prior to the time when the evaluations and decisions regarding such locations were made.



NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

29.

60.21(c)(1)(11)(E) X  
6.1 PC(1)(g)\*

This section imposes requirements on the ESF since it requires that an analysis be performed and included in the SAR to determine which structures, systems, and components are important to safety. In the event that any of the ESF permanent components were determined to be important to safety, they would have to be designed to the appropriate criteria in 60.131(b) and the proper QA controls provided. Therefore, for the ESF, this analysis needs to be done now (using certain assumptions regarding eventual repository operations and system functions) to enable incorporation of such criteria and controls, if necessary.

30.

60.21(c)(2)

X

This section does not impose requirements on the ESF since it only requires that a description of the repository design, including the design criteria, be provided in the SAR. Since the ESF will be part of the repository, the design description and design criteria will also include the ESF, but this section itself does not place any requirements on the ESF.

31.

60.21(c)(3)

X

This section does not impose requirements on the ESF since it only requires that a description and analysis of structures, systems, and components important to safety be provided in the SAR. Since the ESF will be part of the repository, the description will also include the ESF (if found to be important to safety), but this section itself does not place any requirements on the ESF.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
32.	60.21(c)(4)		X	This section does not impose requirements on the ESF since it only requires that a description of the QA program to be applied to items important to safety or waste isolation be provided in the SAR. For those ESF items important to safety or waste isolation, this QA program will also be applied, but this section itself does not place any requirements on the ESF.
33.	60.21(c)(5)		X	This section does not impose requirements on the ESF since it only requires that a description of the radioactive materials to be received at the repository be provided in the SAR.
34.	60.21(c)(6)		X	This section does not impose requirements on the ESF since it only requires that an identification and justification for the selection of those variables, conditions, or other items that are determined to be probable subjects of license specifications be provided in the SAR. License specifications will not be invoked until after a license has been received and hence are not relevant to the ESF now.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
35.	60.21(c)(7)		X	This section does not impose requirements on the ESF since it only requires that a description of the radiological control and monitoring program be provided in the SAR.
36.	60.21(c)(8)		X	This section does not impose requirements on the ESF since it only requires that a description of the controls to be applied to restrict access and land use, including a conceptual design of postclosure monuments, be provided in the SAR. The section applies to "the applicant," and therefore not relevant prior to submittal of the license application.
37.	60.21(c)(9)		X	This section does not impose requirements on the ESF since it only requires that plans for coping with radiological emergencies and for decontamination and dismantlement of surface facilities be provided in the SAR. ESF surface facilities are not permanent components, and therefore will not be used as part of the GROA.
38.	60.21(c)(10)		X	This section does not impose requirements on the ESF since it only requires that a description of the nuclear material control and accounting program be included in the SAR.

NO.

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39.

60.21(c)(11)

X  
6.0 C(T)

This section imposes requirements on the ESF since it implies that considerations must be provided in the design to facilitate permanent closure. This section actually requires that a description of the design considerations intended to facilitate permanent closure and decontamination and dismantlement of surface facilities be provided in the SAR. With respect to the surface facilities, this would not impose requirements on the ESF since the ESF surface facilities are not permanent components; also, this requirement is already covered by 60.132(e). However, this is the only place in Part 60 that indicates that the facility must be designed to facilitate permanent closure. This has direct implications on the ESF since such provision would need to be incorporated in the design.

40.

60.21(c)(12)

X

This section does not impose requirements on the ESF since it only requires that a description of the plans for retrieval and alternate storage be included in the SAR. Although the ESF should be designed to not preclude the ability to retrieve the waste, if it became necessary, this section only addresses the description of retrieval plans. The actual requirement for retrievability is already addressed under 60.111(b).

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
41.	60.21(c)(13)		X	This section does not impose requirements on the ESF since it only requires that an identification and evaluation of the natural resources of the geologic setting be provided in the SAR. This is a function of the site characterization program combined with performance assessment.
42.	60.21(c)(14)		X	This section does not impose requirements on the ESF since it only requires that an identification of those items requiring research and development be provided in the SAR, along with a description of those programs designed to resolve safety questions, and a schedule of when these questions would be resolved. This section would in part be satisfied through a performance confirmation program plan. However, the ESF requirements that would be imposed by such a program are already covered by 60.137 and selected sections of Subpart F.
43.	60.21(c)(15)		X	This section does not impose requirements on the ESF since it only requires that certain information concerning activities at the geologic repository operations area be provided in the SAR. This includes information of an organizational nature as well as plans for operations and uses of the repository.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
44.	60.22		X	This section does not impose requirements on the ESF since it only provides procedures for filling and distributing the license application.
45.	60.23		X	This section does not impose requirements on the ESF since it only provides directions for eliminating repetition among various licensing documents.
46.	60.24		X	This section does not impose requirements on the ESF since it only provides directions for updating the license application and accompanying documents.
47.	60.31		X	This section does not impose requirements on the ESF since it only contains criteria that the Commission will use to determine whether to authorize construction. It actually addresses an NRC action.
48.	60.32		X	This section does not impose requirements on the ESF since it only identifies the conditions that will be included as part of the construction authorization. This section does not take effect until such time as a construction authorization has been issued.



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49.	60.33		X	This section does not impose requirements on the ESF since it only identifies procedures for filing an application for amendment of the construction authorization and the considerations the Commission will use in approving such application.
50.	60.41		X	This section does not impose requirements on the ESF since it only identifies the standards the Commission will use in issuance of the license, specifically stipulating the findings that must be made.
51.	60.42		X	This section does not impose requirements on the ESF since it only identifies the minimum conditions that will be included as part of the license. This section does not take effect until such time as a license has been issued.
52.	60.43		X	This section does not impose requirements on the ESF since it only addresses the license specifications that will be used to establish conditions on the license. The section identifies the categories for items to be included as license conditions and does not take effect until such time as a license has been issued.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
53.	60.44		X	This section does not impose requirements on the ESF since it only addresses certain constraints on changes to the geologic repository operations area and to procedures, as well as to conducting tests and experiments not described in the license application. This section does not take effect until such time as a license has been issued.
54.	60.45		X	This section does not impose requirements on the ESF since it only identifies procedures for filing an application for amendment of a license and the considerations the Commission will use in approving such application.
55.	60.46		X	This section does not impose requirements on the ESF since it only identifies which particular activities require a license amendment, and which procedures should be used for filing such amendments.
56.	60.51		X	This section does not impose requirements on the ESF since it only addresses the requirement to submit an application to amend the license prior to permanent closure, and identifies the information that should be contained in such an application.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
57.	60.52		X	This section does not impose requirements on the ESF since it only addresses the procedures for filing an application for an amendment to terminate the license, indicating the findings that the Commission must make prior to granting such termination.
58.	60.61		X	This section does not impose requirements on the ESF since it only addresses provisions for exchange of information and for interactions between the NRC and State governments and affected Indian tribes.
59.	60.62		X	This section does not impose requirements on the ESF since it only addresses provisions for exchange of information and for interactions between the NRC and State governments and affected Indian tribes.
60.	60.63		X	This section does not impose requirements on the ESF since it only addresses provisions for exchange of information and for interactions between the NRC and State governments and affected Indian tribes.
61.	60.64		X	This section does not impose requirements on the ESF since it only addresses provisions for exchange of information and for interactions between the NRC and State governments and affected Indian tribes.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
62.	60.65		X	This section does not impose requirements on the ESF since it only addresses provisions for exchange of information and for interactions between the NRC and State governments and affected Indian tribes.
63.	60.71		X	This section does not impose requirements on the ESF since it only addresses general recordkeeping and reporting requirements that pertain to licensed activities (i.e., the receipt, handling, and disposition of radioactive waste). This section does not take effect until a license has been granted.
64.	60.72(a)	X 6.1 PC(4)(a)		This section imposes requirements on the ESF since it requires that certain construction records be maintained for the geologic repository operations area (GROA). Since the ESF will be incorporated into the GROA in the future, ESF construction records must also be maintained to support repository licensing.
65.	60.72(b)	X 6.1 PC(4)(a)		This section imposes requirements on the ESF since it requires that certain construction records be maintained for the geologic repository operations area (GROA). Since the ESF will be incorporated into the GROA in the future, ESF construction records must also be maintained to support repository licensing.

No.

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NOT  
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RATIONALE

66.

60.73

X

This section does not impose requirements on the ESF since it requires that the Commission be formally notified of any deficiencies found in the characteristics of the site and the design and construction of the geologic repository operations area, and such formal notification is not appropriate during the informal consultation period prior to submittal of the license application. Such notification requirements are normally appropriate only for applicants or licensees. Furthermore, the deficiencies addressed in this section (safety hazards, deviations from the license application, and deviations from the construction authorization or license) are of no relevance prior to submittal of the license application.

67.

60.74

X  
6.0 PC(1)  
6.0 PC(3)

This section imposes requirements on the ESF since it requires that the DOE perform, or allow the Commission to perform, such tests as the Commission deems appropriate. This would require that the design and layout of the ESF be flexible enough to accommodate such tests, when they are identified. This also includes performance confirmation tests. While items (1), (3), and (4) of 60.74(a) relate to testing that can only be done once radioactive wastes are present at the repository, item (2) calls for testing of the geologic repository, including its structures, systems, and components. This does not preclude testing during site characterization.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
68.	60.75		X	This section does not impose requirements on the ESF since it only addresses inspection and access requirements pertaining to the geologic repository operations area, which by definition, refers to the time period when waste handling activities are being conducted. This is also the case for the requirement to provide office space for an NRC inspector; i.e., during operations, not site characterization. Inspection and access provisions pertaining to site characterization are covered under 60.18(h).
69.	60.101		X	This section does not impose requirements on the ESF since it only provides an introduction to the technical criteria of Subpart E, by reiterating the nature of the findings that the Commission must make at the time of issuance of the construction authorization and the license, and providing and explanation of the concept of reasonable assurance as applied to the geologic repository.
70.	60.102(a)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
71.	60.102(b)(1)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
72.	60.102(b)(2)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
73.	60.102(b)(3)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
74.	60.102(b)(4)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
75.	60.102(c)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
76.	60.102(d)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX B	NOT APPLICABLE	RATIONALE
77.	60.102(e)(1)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
78.	60.102(e)(2)		X	This section does not impose requirements on the ESF since it only provides a functional overview of Subpart E, expanding on the definitions contained in 60.2. While the concepts in this section do not in themselves impose requirements, they were used in the evaluation of Part 60 applicability and should be kept in mind when implementing the applicable Part 60 requirements in the design of the ESF.
79.	60.111(a)	X 6.0 PC(6)(g)*		This section imposes requirements on the ESF since it requires that the GROA be designed to maintain radiation exposures and radiation levels, and releases of radioactive materials to unrestricted areas within the limits set forth in Part 20 and applicable EPA standards. Since the ESF will be incorporated into the GROA, its design has to enable the

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
79. (Continued)				GROA to meet this performance objective, or should not preclude it from doing so. Therefore, the design, construction, and operation of the ESF must bear in mind its later utility.
80.	60.111(b)(1)	X 6.0 PC(6)(e)*		This section imposes requirements on the ESF since it requires that the GROA be designed to preserve the option of waste retrieval until the time of permanent closure. Since the ESF will be incorporated into the GROA, its design has to enable the GROA to meet this performance objective, or should not preclude it from doing so. The ESF may contribute to waste retrieval by conveying ventilation supply air to the retrieval area. Therefore, the design, construction, and operation of the ESF must bear in mind its later utility.
81.	60.111(b)(2)		X	This section does not impose requirements on the ESF since it only reserves for the Commission the right to allow backfilling or permanent closure of part or all of the GROA before the end of the retrievability period. This is a Commission option rather than a requirement on the GROA (or ESF).

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
82.	60.111(b)(3)	X 6.0 PC(6)(e)*		This section imposes requirements on the ESF since it provides the reasonable length of time for which the retrievability option has to be maintained. Since the ESF will be incorporated into the GROA, it therefore has to be designed and constructed to maintain the retrievability option for that time period.
83.	60.112	X 6.0 PC(6)(f)* (Formerly 6.0 C(W))		This section imposes requirements on the ESF since it requires that the engineered barrier system and shafts be designed to meet the overall system postclosure performance objective pertaining to releases of radioactive materials to the accessible environment. This requirement specifically refers to shafts and the engineered barrier system, which by definition includes the waste package and the underground facility. Since the ESF will be incorporated into the GROA, the underground portion of the ESF, by definition, would be part of the engineered barrier system. The actual requirement on the ESF at this time is that it be designed to not preclude the geologic repository from being able to meet this requirement in the future.

NO.

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SECTION

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NOT  
APPLICABLE

RATIONALE

84.

60.113(a)(1)(1)

X  
6.0 PC(6)(c)

This section imposes requirements on the ESF since it requires that the engineered barrier system be designed such that containment of HLW will be substantially complete and that releases from the engineered barrier system shall be a gradual process resulting in small fractional releases to the geologic setting. The engineered barrier system includes the waste package and the underground facility, but excludes shafts, boreholes, and their seals. Since the ESF will be incorporated into the GROA, the underground portion of the ESF, by definition, would be part of the requirement on the ESF underground portion at this time is that it be designed to not preclude the engineered barrier system from being able to meet this requirement in the future.

85.

60.113(a)(1)(11)

X  
6.0 PC(6)(c)

This section imposes requirements on the ESF since it requires that the engineered barrier system be designed such that containment of HLW will be substantially complete and that releases from the engineered barrier system shall be a gradual process resulting in small fractional releases to the geologic setting. The engineered barrier system includes the waste package and the underground facility, but excludes shafts, boreholes, and their seals. Since the ESF will be incorporated into the GROA, the underground portion of the ESF, by definition,

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE, WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
85. (Continued)				would be part of the engineered barrier system. The actual requirement on the ESF underground portion at this time is that it be designed to not preclude the engineered barrier system from being able to meet this requirement in the future.
86.	60.113(a)(2)		X	This section does not impose requirements on the ESF since it only addresses a performance objective pertaining to pre-waste-emplacment ground-water travel time. This is actually a siting criterion applicable to the geologic setting.
87.	60.113(b)		X	This section does not impose requirements on the ESF since it only serves to provide the Commission some leeway with respect to the numerical limits set on the performance objectives for the engineered barrier system and the geologic setting, as stipulated in 60.113(a).
88.	60.113(c)		X	This section does not impose requirements on the ESF since it only reserves for the Commission the option to specify additional requirements that may be necessary to meet the overall system postclosure performance objective with respect to unanticipated processes and events. No actual requirements are specified at this time.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
89.	60.121		X	This section does not impose requirements on the ESF since it only addresses land ownership and control requirements applicable to the GROA and to the controlled area, which by definition pertains to the time when waste handling activities are being conducted, as well as during the period after permanent closure.
90.	60.122(a)(1)		X	This section does not impose requirements on the ESF since it only addresses favorable and potentially adverse conditions which are to be used as siting criteria applicable to the geologic setting. Although these siting criteria will be used in part to determine the suitability of the geologic setting, they do not in themselves provide criteria for the design, construction, or operation of the ESF.
91.	60.122(a)(2)		X	This section does not impose requirements on the ESF since it only addresses favorable and potentially adverse conditions which are to be used as siting criteria applicable to the geologic setting. Although these siting criteria will be used in part to determine the suitability of the geologic setting, they do not in themselves provide criteria for the design, construction, or operation of the ESF.

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NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
92.	60.122(b)		X	This section does not impose requirements on the ESF since it only addresses favorable and potentially adverse conditions which are to be used as siting criteria applicable to the geologic setting. Although these siting criteria will be used in part to determine the suitability of the geologic setting, they do not in themselves provide criteria for the design, construction, or operation of the ESF.
93.	60.122(c)		X	This section does not impose requirements on the ESF since it only addresses favorable and potentially adverse conditions which are to be used as siting criteria applicable to the geologic setting. Although these siting criteria will be used in part to determine the suitability of the geologic setting, they do not in themselves provide criteria for the design, construction, or operation of the ESF.
94.	60.130	X Throughout		This section imposes requirements on the ESF since it specifies that the design criteria in 60.131 through 60.134 are not exhaustive and DOE is to develop any other criteria, as appropriate. This section serves to introduce the design requirements for the GROA that are contained in the sections that follow. Some of these sections impose requirements on the ESF, and therefore reference to them is made throughout Appendix E to the Generic Requirements Document. With respect to the last sentence in this section, that

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
94. (Continued)				requirement is obviously not applicable to the ESF since it requires that all design bases must be consistent with the results of site characterization activities. The ESF would need to be designed based on available data and certain assumptions.
95.	60.131(a)		X	This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.
96.	60.131(a)(1)		X	This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
97.	60.131(a)(2)		X	This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.
98.	60.131(a)(3)		X	This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.
99.	60.131(a)(4)		X	This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits

NO.

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SECTION

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NOT  
APPLICABLE

RATIONALE

99.  
(continued)

specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.

100.        60.131(a)(5)

X

This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.

101.        60.131(a)(6)

X

This section does not impose requirements on the ESF since it only addresses design features that could be used to maintain concentrations of radioactive materials in restricted areas to within the limits specified in Part 20. Compliance with the specified criteria is a function of equipment design and operational procedures, which imposes future requirements on equipment and operations, but not on the ESF permanent components.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
102.	60.131(b)(1)	X 6.0 C(G)		This section imposes requirements on the ESF to the extent that any of the ESF permanent components are determined to be important to safety. If that is the case the particular permanent component would have to be designed so that natural phenomenon and environmental conditions do not interfere with necessary safety functions.
103.	60.131(b)(2)	X 6.0 C(H)		This section imposes requirements on the ESF to the extent that any of the ESF permanent components are determined to be important to safety. If that is the case the particular permanent component would have to be designed to withstand dynamic effects of equipment failure and similar events that could lead to loss of safety functions.
104.	60.131(b)(3)	X 6.0 C(D) 6.0 C(I) 6.0 C(L) 6.0 PC(5)		This section imposes requirements on the ESF to the extent that any of the ESF permanent components are determined to be important to safety. If that is the case the particular permanent component would have to be designed to perform its safety function during and after credible fires and explosions in the GROA. During ESF construction and operations, such a component would need to be protected so that it would be able to perform its safety function in the future.



<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
105.	60.131(b)(4)(i)	X 6.0 C(J)		This section imposes requirements on the ESF to the extent that any of the ESF permanent components are determined to be important to safety. If that is the case the particular permanent component would have to be designed so as to allow control of radioactive waste and radioactive effluents to be maintained, and to not preclude the prompt termination of operations and evacuation of personnel during an emergency.
106.	60.131(b)(4)(ii)		X	This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository operations and would not affect the design of ESF permanent components. The section requires that the GROA include onsite facilities and services for responding to radiological emergencies and that facilitate the use of available offsite services. While the ESF may contain similar facilities or services for other purposes (e.g., mining accidents), the services called for in this section would not be needed until repository operations are initiated.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
107.	60.131(b)(5)		X	<p>This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository operations and would not affect the design of ESF permanent components. The section requires that utility services important to safety shall be designed so that essential safety functions can be performed under both normal and accident conditions, including the use of redundant systems and emergency power capability. Since the utility services used in the ESF are planned to be replaced with utility services designed for the functions of the GROA, prior to incorporating the ESF into the GROA, these requirements would not apply at this time.</p>
108.	60.131(b)(6)	<p>X 6.0 PC(6)(b)*</p>		<p>This section imposes requirements on the ESF to the extent that any of the ESF permanent components are determined to be important to safety. If that is the case the particular permanent component would have to be designed to permit periodic inspection, testing, and maintenance, as necessary, to ensure its continued functioning and readiness.</p>

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

109.

60.131(b)(7)

X

This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository operations and would not affect the design of ESF permanent components. The section requires that systems for processing, transporting, handling, storage, retrieval, emplacement, and isolation of radioactive waste shall be designed to ensure that a nuclear criticality accident is not possible. Even once the ESF is incorporated into the GROA, there will be no radioactive waste emplaced in the ESF portion of the GROA. Furthermore, the systems referred to above are to be installed and used for repository operations, not before.

110.

60.131(b)(8)

X

This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository operations and would not affect the design of ESF permanent components. The section requires that instrumentation and control systems be provided to monitor the behavior of systems important to safety over the anticipated ranges for normal operation and for accident conditions. This requirement clearly applies to the operations period of the GROA, and not earlier.



( 1 )

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX B</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
111.	60.131(b)(9)	X 6.0 PC(3)(e) 6.1 PC(5)(a) 6.0 PC(4)(a)		This section imposes requirements on the ESF to the extent that any of the ESF permanent components are determined to be important to safety. If that is the case the design of the GROA (and the ESF) would have to include such provisions for worker protection (in accordance with Federal mining regulations) to ensure that items important to safety can perform their intended functions. While most of these provisions are things that would be instituted during repository operations, there may be a need to consider some of these aspects during design and construction of the ESF.
112.	60.131(b)(10)		X	This section does not impose requirements on the ESF since it addresses requirements for hoists important to safety that are used for radioactive waste handling. The Yucca Mountain project does not use hoists for handling waste; it uses ramps with transporters.
113.	60.132(a)		X	This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository surface facilities and would not affect the design of ESF permanent components. Even when the ESF is incorporated into the GROA, the ESF surface facilities will not be used for repository operations, as will the four permanent components.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
114.	60.132(b)		X	This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository surface facilities and would not affect the design of ESF permanent components. Even when the ESF is incorporated into the GROA, the ESF surface facilities will not be used for repository operations, as will the four permanent components.
115.	60.132(c)		X	This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository surface facilities and would not affect the design of ESF permanent components. Even when the ESF is incorporated into the GROA, the ESF surface facilities will not be used for repository operations, as will the four permanent components.
116.	60.132(d)		X	This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository surface facilities and would not affect the design of ESF permanent components. Even when the ESF is incorporated into the GROA, the ESF surface facilities will not be used for repository operations, as will the four permanent components.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
117.	60.132(e)		X	This section does not impose requirements on the ESF since it addresses requirements that are applicable only to repository surface facilities and would not affect the design of ESF permanent components. Even when the ESF is incorporated into the GROA, the ESF surface facilities will not be used for repository operations, as will the four permanent components.
118.	60.133(a)	X 6.0 C(C)		This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

119.

60.133(b)

X  
6.6 PC(1)(k)  
6.0 PC(1)(a)  
6.0 PC(1)(b)  
6.0 PC(1)(c)

This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.

120.

60.133(c)

X  
6.0 PC(6)(e)\*

This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition,

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
120. (continued)				only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.
121.	60.133(d)	X 6.6 PC(1)(f)		This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
122.	60.133(e)	X 6.6 PC(1)(a) 6.0 PC(6)(e)* 6.6 PC(1)(d)		<p>This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.</p>
123.	60.133(f)	X 6.0 C(E) 6.6 PC(1)(c) 6.6 PC(1)(d)		<p>This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by</p>

**NO.**            **10 CFR 60**  
**SECTION**

**APPLICABLE.**  
**WHERE ADDRESSED**  
**IN APPENDIX E**

**NOT**  
**APPLICABLE**

**RATIONALE**

123.  
(continued)

definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.

124.            60.133(g)

X  
6.0 C(C)  
6.0 C(J)  
6.7 PC(3)(d)\*

This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.



( )

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
IN APPENDIX E

NOT  
APPLICABLE

RATIONALE

125.

60.133(h)

X  
6.0 PC(6)(c)

This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition, only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.

126.

60.133(i)

X  
6.0 PC(6)(i)\*

This section imposes requirements on the ESF since it addresses requirements that are applicable to the design of the underground facility of the GROA which could affect the design of ESF permanent components. Once the ESF is incorporated into the GROA, the underground portion of the ESF will be considered part of the underground facility. The underground facility consists of the underground structure, including openings and backfill materials, but excluding shafts, boreholes, and their seals. Consequently, this section is applicable, by definition,

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
126. (continued)				only to the underground portion of the ESF. Nevertheless, the DOE may choose to apply some of these criteria to the design and construction of the exploratory shafts, since some of the criteria to be considered will in many cases be similar.
127.	60.134(a)		X	This section does not impose requirements on the ESF since it only addresses requirements that are specifically applicable to the design of postclosure seals, so that they don't become preferential pathways that could compromise the isolation capability of the geologic repository. Although the design and construction of the ESF should take into consideration the sealing concept that will be used, this section is not the one that imposes that requirement on the shafts. That provision is covered by the requirement that the design must facilitate permanent closure, as stipulated in 60.21(c)(11).
128.	60.134(b)		X	This section does not impose requirements on the ESF since it only addresses requirements that are specifically applicable to the materials and emplacement method to be used for postclosure seals, so that they reduce the potential for pathways that could compromise the isolation capability of the geologic repository. Although the design and construction of the ESF should take into

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
128. (continued)				consideration the sealing concept that will be used, this section is not the one that imposes that requirement on the shafts. That provision is covered by the requirement that the design must facilitate permanent closure, as stipulated in 60.21(c)(11).
129.	60.135(a)		X	This section does not impose requirements on the ESF since it only addresses criteria that are specifically applicable to the waste packages.
130.	60.135(b)		X	This section does not impose requirements on the ESF since it only addresses criteria that are specifically applicable to the waste packages.
131.	60.135(c)		X	This section does not impose requirements on the ESF since it only addresses criteria that are specifically applicable to the waste packages.
132.	60.135(d)		X	This section does not impose requirements on the ESF since it only addresses criteria that are specifically applicable to the waste packages.
133.	60.137	X 6.9 PC(2) 6.0 PC(6)(j)*		This section imposes requirements on the ESF since it requires that the GROA be designed to permit the implementation of a performance confirmation program. Since the ESF will be incorporated into the GROA, the ESF must make provisions for such a testing

NO.	10 CFR 60 SECTION	APPLICABLE. WHERE ADDRESSED IN APPENDIX E	NOT APPLICABLE	RATIONALE
133. (continued)				program. Furthermore, 60.140(b) stipulates that this program shall have been started during site characterization, and hence the testing would need to be conducted in the ESF.
134.	60.140(a)		X	This section does not impose requirements on the ESF since it only describes the general purpose and scope of the performance confirmation program.
135.	60.140(b)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the on the ESF since it requires that the performance confirmation program shall have been started during site characterization. Hence, the design of the ESF would have to make provisions to accommodate such testing.
136.	60.140(c)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it requires that the performance confirmation program shall include in situ monitoring and in situ experiments. Hence, the design of the ESF would have to make provisions to accommodate such testing.
137.	60.140(d)(1)	X 6.0 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it places certain constraints on the conduct of the performance confirmation program, some or most of which will be performed in the ESF. The section requires that the performance confirmation

NO.

10 CFR 60  
SECTION

APPLICABLE.  
WHERE ADDRESSED  
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NOT  
APPLICABLE

RATIONALE

137.  
(continued)

program be implemented so that it does not adversely affect the capability of the natural and engineered elements of the geologic repository to meet the performance objectives. Hence, certain controls must be placed on the conduct of the tests in the ESF.

138.           60.140(d)(2)-(4)

X

This section does not in itself impose any requirements on the design, construction, or operation of the ESF since it only addresses requirements that are specifically applicable to the conduct or capabilities of the performance confirmation program. That is, the program must be capable of obtaining baseline data and analyzing any perturbances to that data that may be caused by site characterization, construction, or operations (60.140(d)(2)). It must also be able to monitor and analyze changes from the baseline condition of parameters that could affect the performance of the geologic repository (60.140(d)(3)). Furthermore, the performance confirmation program must provide an established plan for feedback and analysis of data, and implementation of appropriate action (60.140(d)(4)). All of these are characteristics or aspects of the program rather than requirements on the ESF.



<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
139.	60.141(a)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing.
140.	60.141(b)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing.
141.	60.141(c)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporateu into the GROA, make provisions to accommodate such testing.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
142.	60.141(d)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it requires that potential modifications to the design or to the construction methods may be needed as a result of the performance confirmation tests when compared with the original design bases and assumptions. While the ESF will most likely have been fully constructed by the time such test results are available, certain changes to the design may still be warranted.
143.	60.141(e)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing.
144.	60.142(a)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
145.	60.142(b)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies that the performance confirmation design testing shall be initiated as early as is practicable. While no specific time constraint is specified, it provides the expectation that such testing should not be unduly delayed. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing and the timing for initiation of each test would have to be properly considered in the testing schedule.
146.	60.142(c)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing.
147.	60.142(d)	X 6.1 PC(3) 6.9 PC(2)		This section imposes requirements on the ESF since it identifies the types of tests that must be carried out as part of the performance confirmation program. Since some if not most of the performance

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
147. (continued)				confirmation testing will be conducted in the ESF, even after it has been incorporated into the GROA, the design of the ESF would have to make provisions to accommodate such testing.
148.	60.143(a)		X	This section does not impose requirements on the ESF since it only addresses performance confirmation monitoring and testing that is specifically applicable to the waste packages. Since, even after the ESF has been incorporated into the GROA, the ESF portion of the GROA will not contain waste packages, and therefore no provisions would have to be made in the ESF to accommodate such tests.
149.	60.143(b)		X	This section does not impose requirements on the ESF since it only addresses performance confirmation monitoring and testing that is specifically applicable to the waste packages. Since, even after the ESF has been incorporated into the GROA, the ESF portion of the GROA will not contain waste packages, and therefore no provisions would have to be made in the ESF to accommodate such tests.
150.	60.143(c)		X	This section does not impose requirements on the ESF since it only addresses performance confirmation monitoring that is specifically applicable to the waste packages, and that will be conducted in the laboratory. Therefore no provisions would have to be made in the ESF to accommodate such monitoring.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE WHERE ADDRESSED IN APPENDIX E</u>	<u>NO. APPLICABLE</u>	<u>RATIONALE</u>
151.	60.143(d)		X	This section does not impose requirements on the ESF since it only addresses performance confirmation monitoring that is specifically applicable to the waste packages. Since, even after the ESF has been incorporated into the GROA, the ESF portion of the GROA will not contain waste packages, and therefore no provisions would have to be made in the ESF to accommodate such tests.
152.	60.150		X	This section does not impose requirements on the ESF since it is only an introductory paragraph defining quality assurance and identifying its scope. It only introduces the remaining sections on QA, but does not in itself impose requirements.
153.	60.151	X 6.1 PC(6)		This section imposes requirements on the ESF to the extent that any ESF structure, system, or component is determined to be important to safety, any barrier determined to be important to waste isolation, or any activity to be conducted in the ESF is either important to safety or waste isolation. These activities would include site characterization, construction, operations, performance confirmation, permanent closure, and decontamination and dismantlement of surface facilities. Therefore, certain controls would have to be placed on these items and activities, both before and after the ESF has been incorporated into the GROA.

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
154.	60.152	X 6.1 PC(6)		<p>This section imposes requirements on the ESF to the extent that any ESF structure, system, or component is determined to be important to safety, any barrier determined to be important to waste isolation, or any activity to be conducted in the ESF is either important to safety or waste isolation. These activities would include site characterization, construction, operations, performance confirmation, permanent closure, and decontamination and dismantlement of surface facilities. Therefore, certain controls would have to be placed on these items and activities, both before and after the ESF has been incorporated into the GROA. This section requires that the QA program should be based on the criteria of 10 CFR Part 50 Appendix B.</p>
155.	60.160		X	<p>This section does not impose requirements on the ESF since it only addresses requirements that are specifically applicable to training and certification of personnel. The section is intended to cover performance of licensed operations, and therefore would not be relevant at this time.</p>

<u>NO.</u>	<u>10 CFR 60 SECTION</u>	<u>APPLICABLE. WHERE ADDRESSED IN APPENDIX E</u>	<u>NOT APPLICABLE</u>	<u>RATIONALE</u>
156.	60.161		X	This section does not impose requirements on the ESF since it only addresses requirements that are specifically applicable to training and certification of personnel. The section is intended to cover performance of licensed operations, and therefore would not be relevant at this time.
157.	60.162		X	This section does not impose requirements on the ESF since it only addresses requirements that are specifically applicable to training and certification of personnel. The section is intended to cover performance of licensed operations, and therefore would not be relevant at this time.

**ATTACHMENT J**

**TOG Member's Statement**

TOG Member's Statement  
(Filed by D. Michlewicz)

In my opinion, the conclusions that 10 CFR 60.111(a) is applicable to the ESF but that 10 CFR 60.131(a) is not are inconsistent. 60.111(a) deals with radiological protection of the public in unrestricted areas and 60.131(a) deals with radiological protection of workers. They both pertain to essentially the same thing; compliance with 10 CFR 20 and, in the case of 60.111(a), 40 CFR 191, Subpart A, during the time when radioactive materials will be handled in the repository. Compliance with 10 CFR 20 is achieved through engineering measures and operational controls which are not subject to the requirements of 10 CFR 60, Subpart G, and which are not precluded by the design of the ESF. Rather, the configuration and design of the ESF may have to be considered in the repository design provisions for compliance with 10 CFR 20. If one were to stretch this relationship to an argument that such consideration imposes some requirement on the ESF, then a better case can be made for applicability of 60.131(a) than 60.111(a). This is because the ESF will be used for underground ventilation and, thus, may play a role in controlling concentration of any radioactive materials released into the underground air -- where the workers are. On the other hand, as far as public exposure is concerned, any radionuclides released from the underground can be controlled by filters and/or a stack. In fact, as far as public routine exposure is concerned, failure of the shaft resulting in termination of exhaust from the repository would result in termination of any radionuclide release.