

**SUMMARY OF U.S. NUCLEAR REGULATORY COMMISSION AND  
U.S. DEPARTMENT OF ENERGY MEETING ON  
EXPLORATORY STUDIES FACILITY CONCERNS  
September 17, 1993, Bethesda, MD**

On September 17, 1993, representatives of the Nuclear Regulatory Commission, U.S. Department of Energy (DOE), and the State of Nevada Nuclear Waste Project Office participated in a meeting on concerns related to the Yucca Mountain exploratory studies facility (ESF). The purpose of the meeting was for DOE representatives to gain an understanding of concerns addressed in an NRC letter of August 20, 1993, regarding the ESF. The meeting agenda is included as Attachment 1 and the list of attendees is Attachment 2 to this summary. Copies of meeting handouts are included in Attachment 3.

In the opening remarks DOE stated that its main purpose was to fully understand NRC statements in its letter of August 20, 1993. The NRC staff presented a brief summary of the basis for NRC's letter and the information needed by the NRC staff to resolve its concerns. The NRC noted that the design control process involves more than ESF design and construction activities. It also includes integration of the ESF with other parts of the program including preliminary geologic repository operations area design and site technical testing, such as surface-based tests, that support design decisions. In addition, the design control program needs to ensure that controls are in place that work to address how conditions identified during construction that differ from design assumptions are feedback into the design, and how design changes are provided to Principal Investigators and incorporated into studies. The State of Nevada representative had no opening comments.

Opening remarks were followed by presentations by DOE representatives on its understanding of and approach to responding to each item in the NRC staff's letter. All parties agreed that a detailed discussion of DOE's process for design control and changes to the ESF should be part of the scheduled October 4-5, 1993, Technical Exchange on the ESF. It was also agreed that detailed discussion of the technical bases for concerns be deferred until the Technical Exchange. The State of Nevada representative recommended that DOE provide timely information on changes to the ESF by notifying parties of changes that are being considered before their finalization.

In its closing comments, the NRC stated that it does not have a clear understanding of the DOE design control process and how it works. The NRC believes that DOE needs to explain what items related to ESF design are quality affecting and to provide rationale for the conclusion that some items are not. The NRC also provided meeting participants and attendees with an amplification of the concerns contained in its letter. That draft list (See Attachment 3) is comprised of items related to the ESF that NRC would expect DOE to have in place during site characterization and construction of the ESF.

The State of Nevada recommended that the NRC conduct its own audits of DOE's ESF program. The State believes that greater confidence is gained when the regulator conducts the audits. In response to that request the NRC stated that through its current program of observing DOE audits it has found that the audits conducted by DOE are identifying the deficiencies that the NRC would expect to find. Therefore, this process has given the NRC confidence in DOE's audit program such that it does not believe an independent audit by the NRC staff would identify any additional issues. The NRC further stated that it has independently verified the DOE's audit process by conducting its own audit of a DOE project participant, the U.S. Geological Survey, in September 1991. The State of Nevada representative requested that the NRC take the recommendation of an independent audit under consideration, which the NRC staff agreed to do.

Also, the State, in its closing remarks, requested that the NRC staff reconsider its lifting of Site Characterization Analysis Objection 1 concerning the adequacy of the ESF design and design control process. The State believes that serious design control deficiencies exist and that Objection 1 should be reinstated. The NRC stated that the reason for its August 20, 1993, letter was to obtain information to assist it in determining what action it should take. The NRC further stated that once DOE provides its response to the August 20, 1993, letter, it would be in a better position to determine what future actions it would take.

DOE representatives agreed to improve communication to help assure the availability of sufficient information related to the ESF. DOE also agreed to provide a description of the flow-down of information for ESF design and, in the future, to provide timely information related to an enhanced ESF design. Specific actions to accomplish this would be discussed at the ESF technical exchange and in the response to the August 20, 1993 letter.

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## DOE/NRC Meeting on ESF

9/17/93

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## DOE/NTL Meeting ON EEF

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702-794-793

301-504-2547

301-504-2537

301-504-2532

301-504-345

202-646-6699

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DISCUSSION POINTS FROM 9/15/93 ESF PRE-MEETING

Items from NRC letter of August 20, 1993:

- 1) DOE should have in place a design control process under which the design, rationale for the design, information needed for the design, etc. are integrated. Construction includes drilling boreholes to be used for design.
- 2) The staff would expect to see a discussion of deficiencies identified during recent audits, a discussion of the root cause determined for each, a description of the corrective actions taken to rectify the deficiencies, and the steps DOE will establish to help ensure the problems do not reoccur.
- 3) DOE needs to answer the questions: 1) What are the documents that are needed to conduct a review and understand the complete ESF design. 2) How are these documents integrated? 3) What is the control mechanism in place to assure that ESF design documents are integrated with study plans? 4) How are ESF design documents integrated with study plans, etc. that discuss plans to gather information needed as input to design? 5) How are ESF construction sequences and schedules integrated with other schedules for gathering of information needed for ESF design and testing?

Items that NRC believes it would need during its ongoing precicensing reviews include: The ESF design (that DOE is using to control its program), integrated with the GROA conceptual design and needed surface information (locations of site penetrating drillholes, etc. needed to provide information for design decisions). The level of detail of information provided would depend on the type of document being provided. The staff would expect to have information presented on the following aspects of the repository design at a level of detail consistent with Regulatory Guide 4.17. This would include:

- a) Drawings depicting the layout of ramps, drifts and ESF test areas.
- b) A description of the GROA design to level sufficient to show interface with ESF.
- c) A description of the interfaces between the ESF and GROA.
- d) A discussion of how the various Title II design packages are integrated with one another and their relationship to the overall design.
- e) A description of the design basis for the ESF including assumptions, the bases for assumptions, and logic behind decisions related to the design and design process.
- f) A discussion of what investigation contained in the SCP and what study described in Study Plans submitted to the NRC will be affected as a result of the current design to the design as identified through the integration process between the ESF design and study

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plans. Also discuss how DOE will document these results in implementing documents such as study plans. Finally, identify what study plans are considered on the critical path for completion of ESF design *and the sequencing of those studies with ESF design activities.*

The staff would also expect to be provided changes related to Study Plans that result from changes to the ESF design. The information would be consistent with the Level of Detail Agreement, and notification of any changes, additions, deletions of site disturbing activities 90 days prior to initiation of work.

Finally, through the observation of design reviews, quality assurance audits, and technical review activities, the staff would expect to get information on the detailed design that supports the information provided at the SCP level, including appropriate references. Some types of information the staff would expect to evaluate at this level would be the sequencing of surface based testing and design work, complete design drawings and calculations, and records to verify the acceptable implementation of the design control process.

- 4) DOE has not provided timely information such that the staff is able to evaluate changes in the ESF design as they occur. Although the SCP Progress reports can be used to present a summation of changes that have occurred during that reporting period or changes that would be timely to report in the Progress Reports, they do not allow the staff an opportunity to be provided real time changes. In addition, the NRC's On-site Representatives allow the staff to maintain cognizance of ongoing design work. But they are not the formal mechanism through which DOE is to communicate changes from the SCP baseline design to the staff. That approach is covered in the Site-specific agreement as being between the Director, HLPD and the DOE associate Director for Systems and Compliance.

DOE is responsible for notification of any major changes to the design, design process, and supportive tests. Supportive documents such as study plans, etc. should be revised and submitted 90 days prior to the initiation of major site disruptive work. Unless DOE has submitted a description of the design changes to the ESF, the staff would not be able to conduct its review of that study plan. DOE should provide this information in a timely manner such that the staff will have sufficient time to review that change by the time the study plan is submitted.

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**DOE-NRC MANAGEMENT MEETING  
ON ESF DESIGN PROCESS**

**DOE's UNDERSTANDING OF NRC CONCERNS  
IN THE AUGUST 20, 1993 LETTER**

*PRESENTED BY*

**EDGAR H. PETRIE,**

**DEPUTY DIRECTOR ENGINEERING AND DEVELOPMENT DIVISION**

*AND*

**DONALD G. HORTON,**

**DIRECTOR OFFICE OF QUALITY ASSURANCE**

**BETHESDA, MD  
SEPTEMBER 17, 1993**

**DOE-NRC MANAGEMENT MEETING  
ON ESF DESIGN PROCESS**

**DOE's UNDERSTANDING OF NRC CONCERNS  
IN THE AUGUST 20, 1993 LETTER**

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DIRECTOR OFFICE OF QUALITY ASSURANCE**

**BETHESDA, MD  
SEPTEMBER 17, 1993**

# **PURPOSE OF MEETING**

**To develop a mutual understanding of the concerns addressed in the NRC letter of August 20, 1993 regarding the ESF**

- DOE letter response will be provided within the 90 days requested by NRC**
- Specific resolution of the concerns are not expected to be provided at this meeting**

# **PURPOSE OF MEETING**

(CONTINUED)

## **Method to achieve purpose of meeting**

- **All recognized concerns are extracted from the letter and presented**
- **The issues identified by DOE as needing to be addressed to resolve each concern are presented and discussed**
- **Discussion of these issues (clarification) is expected to provide a mutual understanding of the depth and breadth of the concern, and aid in providing a mutually acceptable basis for resolution of the concern**

# **CONCERNS IDENTIFIED IN NRC'S AUGUST 20, 1993 LETTER REGARDING ESF**

- 1) DOE should provide the "Rationale for proceeding with the M&O design activities and ESF construction while the design control process deficiencies are being investigated and corrected."**
- 2) DOE should provide "A detailed action plan providing for corrective actions for the M&O design deficiencies, including root cause analysis and verification of the effectiveness of corrective actions."**

# **CONCERNS IDENTIFIED IN NRC'S AUGUST 20, 1993 LETTER REGARDING ESF**

**(CONTINUED)**

- 3) DOE should provide "The date when a controlled baseline ESF design, integrated with a conceptual GROA design, will be formally provided to the NRC for review and comment."**

**DOE needs to provide in its Progress Report: 1) "...how the ESF is incorporated into the GROA."; and , 2) "...a complete summary of all design documents that have been, or need to be, formally submitted to the NRC for review, and a discussion of how these documents relate to one another to present a complete picture of the ESF and conceptual GROA design."**

# **CONCERNS IDENTIFIED IN NRC'S AUGUST 20, 1993 LETTER REGARDING ESF**

**(CONTINUED)**

- 4) DOE should provide "A detailed plan for the process DOE will use to keep the NRC staff informed in a timely manner of design changes which have the potential to impact ongoing testing activities, the ability to conduct proposed testing activities, or the ability of the site to isolate waste. In addition, DOE should discuss how the proposed changes will be responsive to the staff's SCA concerns related to site characterization and the ability to gather representative technical data in the ESF."**

**Other items in NRC letter identified 6 potential concerns**

- 5 were included in items 1 - 4 above**
- "The staff also has concerns which resulted from deficiencies identified during. . . independent design reviews. . .The deficiencies include . . . inadequate documentation of design bases, and questionable design details. They involve both the manner in which design activities were performed and apparent delays in the identification and correction of the deficiencies."**



# ITEM 1 OF NRC LETTER

## NRC Statement

**DOE should provide the following:**

**“Rationale for proceeding with the M&O design activities and ESF construction while the design control process deficiencies are being investigated and corrected.”**

# **ITEM 1 OF NRC LETTER**

(CONTINUED)

## **DOE's Approach to Address Item 1**

- **Explain the role the M&O had in development of the design being used by our construction forces**
- **Explain what portion of the present construction work is Quality Affecting**
- **Explain what portion of on-going design activities are Quality Affecting**

# ITEM 1 OF NRC LETTER

(CONTINUED)

- **Describe the process used to evaluate the significance of conditions adverse to quality and the process used to evaluate if a Stop Work condition exists**
  - **These items are evaluated in accordance with the following criteria of QAAP 16.1, Rev. 4, Corrective Action, to determine if the identified condition is a significant condition adverse to quality:**
    - › **A condition determined to be repetitive in nature**
    - › **A condition indicating a QA breakdown**
    - › **A condition that, were it to remain uncorrected, could have an adverse impact on waste form production, high-level nuclear waste transport, safety, or waste isolation**
  - **DOE evaluates the significant deficiencies against the following criteria contained in QAAP 16.1, to determine if a Stop Work order is appropriate.**

# ITEM 1 OF NRC LETTER

(CONTINUED)

## DOE's Approach to Address Item 1

- › Repetitive deficiencies affecting items or activities important to radiological safety, storage, transport, or disposal of high-level nuclear waste when previous corrective actions have not precluded recurrences
  - › Significant deficiencies that could affect activities important to radiological safety aspects of storage, transport, or disposal of high-level nuclear waste
  - › Activities affecting quality are being performed without approved procedures or by unqualified personnel
- These evaluations are conducted by:
- › DOE QA
  - › DOE Design Engineering Line organization

# ITEM 2 OF NRC LETTER

## NRC Statement

**DOE should provide the following:**

**“A detailed action plan providing for corrective actions for the M&O design deficiencies, including root cause analysis and verification of the effectiveness of corrective actions.”**

# ITEM 2 OF NRC LETTER

(CONTINUED)

## DOE's Approach to Address Item 2

- **Direct the M&O to develop and implement an action plan containing the following elements:**
  - **Description of each identified deficiency**
  - **Remedial corrective actions that have been or will be implemented**
  - **Steps to be taken to ensure long-term process improvement to preclude recurrence, including management controls**
  - **Root cause analysis**
  - **Process for verification of the effectiveness of corrective actions**
- **Conduct trend analyses**
- **Establish a QA improvement team to assist the M&O in improving the M&O QA program processes**

# ITEM 3 OF NRC LETTER

## NRC Statement

**DOE should provide the following:**

**“The date when a controlled baseline ESF design, integrated with a conceptual GROA design, will be formally provided to the NRC for review and comment.”**

**DOE needs to provide in its Progress Report:**

**“ . . .how the ESF is incorporated into the GROA.”**

**“ . . .a complete summary of all design documents that have been, or need to be, formally submitted to the NRC for review, and a discussion of how these documents relate to one another to present a complete picture of the ESF and conceptual GROA design.”**

# **ITEM 3 OF NRC LETTER**

(CONTINUED)

## **DOE's Approach to Address Item 3**

- **DOE views the following to be characteristics of a properly integrated ESF/GROA design:**
  - **GROA requirements applicable to ESF considered and incorporated**
  - **Appropriate alternatives to major GROA design features important to waste isolation evaluated**
  - **The conceptual GROA design provides sufficient detail to allow evaluation against ESF design changes and potential impacts**
  - **Physical interfaces between the ESF and GROA identified**
  - **As ESF design matures, provide continuous evaluation for compatibility with GROA configuration and site characterization testing needs**



# **ITEM 3 OF NRC LETTER**

**(CONTINUED)**

- **ESF design packages selected for development in a systematic sequence**
- **As ESF design packages are developed, provide for continued integration with overall ESF design as depicted in an updated preliminary design (ESF Technical Baseline)**
- **Design changes made in a controlled manner**
- **Analyses conducted to determine potential impacts of ESF activities on waste isolation**
- **Test-to-test, ESF construction-to-test, ESF operations-to-test interference analyses conducted**
- **New site information incorporated into the evolving ESF/GROA design**
- **DOE will provide the information identified by NRC**

# ITEM 4 OF NRC LETTER

## NRC Statement

**DOE should provide the following:**

**“A detailed plan for the process DOE will use to keep the NRC staff informed in a timely manner of design changes which have the potential to impact ongoing testing activities, the ability to conduct proposed testing activities, or the ability of the site to isolate waste. In addition, DOE should discuss how the proposed changes will be responsive to the staff’s SCA concerns related to site characterization and the ability to gather representative technical data in the ESF.”**

# **ITEM 4 OF NRC LETTER**

**(CONTINUED)**

## **DOE's Approach to Address Item 4**

- **Provide detailed plan requested**

# **OTHER ITEMS IN NRC LETTER**

## **NRC Statement (B1) - Page 1, second paragraph**

**“The staff also has concerns which resulted from deficiencies identified during recent QA audits and. . .The deficiencies include inadequate procedures, failure to follow procedures. They involve both the manner in which design activities were performed and apparent delays in the identification and correction of the deficiencies.”**

## **NRC Statement (B2) - Page 1, second paragraph**

**“... the failure of the M&O to identify and correct these problems calls into question the effectiveness of the M&O management controls and QA program.”**

## **DOE's Approach to Address Items B1 and B2**

- DOE's approach to Items 1 and 2 above address these items**

# **OTHER ITEMS IN NRC LETTER**

(CONTINUED)

## **NRC Statement (B3) - Page 1, second paragraph**

**“... the NRC has expressed concerns regarding the ESF design and design control process, and stated that current information about ESF Title II and geologic repository operations area (GROA) conceptual designs is critical to the NRC staff’s understanding of how separate ESF design packages will be integrated.”**

## **NRC Statement (B4) - Page 2, top paragraph**

**“The staff has no clear understanding of the schedules for many of these proposed surface-based tests or of DOE’s plans for integrating the resulting data into its ESF Title II design. As a result, the sufficiency of certain aspects of the ESF design cannot be determined by the NRC staff.”**

# **OTHER ITEMS IN NRC LETTER**

(CONTINUED)

## **NRC Statement (B5) - Page 2, top paragraph**

**“The DOE decision to indefinitely delay the ESF design technical exchange scheduled for July 27-28, 1993, has also postponed the mechanism by which the NRC technical staff could: 1) understand how DOE is factoring the staff’s concerns into decisions related to the ESF; 2) discuss ESF design changes; and 3) make DOE aware of any potential concerns the staff may have related to ongoing ESF design work.”**

## **DOE’s Approach to Address Item B3, B4, and B5**

- DOE’s approaches to Items 3 and 4 above address these items**

# **OTHER ITEMS IN NRC LETTER**

(CONTINUED)

## **NRC Statement (B6) - Page 1, second paragraph**

**“The staff also has concerns which resulted from deficiencies identified during. . . independent design reviews. . . The deficiencies include . . . inadequate documentation of design bases, and questionable design details. They involve both the manner in which design activities were performed and apparent delays in the identification and correction of the deficiencies.”**

## **DOE’s Approach to Address Item B6**

- Resolution of NRC observer’s comments and other comments made during design reviews address this item**