NOV 13 1992

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MEMORANDUM FOR: Raymond F. Fraley, Executive Director
Advisory Committee on Nuclear Waste and
Reactor Safeguards

THROUGH: Abraham L. Eiss, Advisory Committee on Nuclear
Waste Liaison
Special Issues Group
Office of Nuclear Material Safety and
Safeguards

FROM: B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety and
Safeguards

SUBJECT: TRANSMITTAL OF REVIEW OF U.S. DEPARTMENT OF ENERGY REQUEST TO LIFT SITE CHARACTERIZATION ANALYSIS OBJECTION 1

Five copies of the results of the staff's review of information provided by the U.S. Department of Energy to resolve Site Characterization Analysis Objection 1 are enclosed for the Advisory Committee on Nuclear Waste (ACNW). This information is in preparation for the December 1992 ACNW meeting. If you require additional information about this review, please contact Ms. Charlotte Abrams of my staff at 504-3403.

/s/

B. J. Youngblood, Director
Division of High-Level Waste Management
Office of Nuclear Material Safety and
Safeguards

Enclosure:
As stated

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NOV 02 1992

Dr. John W. Bartlett, Director
Office of Civilian Radioactive Waste Management
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

Dear Dr. Bartlett:

SUBJECT: U.S. DEPARTMENT OF ENERGY REQUEST TO LIFT SITE CHARACTERIZATION ANALYSIS OBJECTION 1 AND RELATED COMMENTS AND QUESTIONS

The U.S. Nuclear Regulatory Commission staff identified in its Site Characterization Analysis (SCA) transmitted to Mr. Sam Rousso by my letter of July 31, 1989, SCA Objection 1 related to the Title I design control process and adequacy of the Title I design for the Exploratory Shaft (now Studies) Facility (ESF). The design control process, as described in the Site Characterization Plan and Design Acceptability Analysis, did not consider all applicable 10 CFR Part 60 requirements and did not integrate available technical data on the location of a potential fault at the proposed site for the exploratory shaft. In addition, the ESF Title I design did not demonstrate that the underground test facility and test durations would permit all subsurface tests to be conducted without interference for the time periods required.

On March 3, 1992 (letter from Roberts to Holonich) the U.S. Department of Energy (DOE) requested closure of SCA Objection 1 and related comments 12, 16, 34, 35, 57, 72, 127, 128, 130, and 132, and Questions 28 and 61 on the basis of information contained in that letter and two DOE documents: the Exploratory Studies Facility Alternatives Study (ESFAS) and the Calico Hills Risk-Benefit Analysis (CHRBA). Based on the staff's review of the information provided by DOE in the relevant portions of the ESFAS and CHRBA reports, the NRC staff considers Objection 1, Comments 12, 16, 35, 57, 72, 127, 128, and 132, and Question 61 resolved. SCA Comments 34 and 130 and Question 28, in addition to other ESF-related comments and questions not addressed in the referenced submittals (Comments 74, 82, 119, and 121 and Question 58), remain unresolved open items. The NRC staff will continue to track these open items.

Based on the information provided by DOE, the NRC staff has concluded that Objection 1 concerning the adequacy of the ESF design control process and ESF design can be lifted based on the following:

- DOE has demonstrated that the quality assurance aspects of an acceptable design control process are being applied to design activities.

- DOE has demonstrated that it is integrating currently available technical data into decisions related to the ESF design.

- The Title II design has been expanded to address the requirements of 10 CFR 60.21.

- The ESF proposed test space has been expanded to avoid possible interference between tests.

The enclosure to this letter provides a more detailed discussion of the results of the NRC staff's review of the information provided by DOE to resolve Objection 1 and related SCA comments and questions. Table 1 of the enclosure indicates the current status of each of the related comments and questions.

The NRC staff urges DOE to continue to work toward resolution of all remaining SCA open items. The NRC staff is prepared to meet with DOE as necessary to ensure that the enclosed information related to Objection 1 is fully understood. NRC will continue to evaluate DOE's activities related to the ESF, ESF design control process, and applicable requirements through the staff's review of ESF design reports and participation in design reviews and quality assurance audits.

If you have any questions regarding the staff's review, please contact me or Mr. Joseph Holonich of my staff. I can be reached at (301) 540-3352 or Mr. Holonich can be reached at (301) 504-3387.

Sincerely,
Original signed by
Robert M. Bernero

Robert M. Bernero, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated
cc: R. Loux, State of Nevada
T. J. Hickey, Nevada Legislative Committee
C. Gertz, DOE/NV
M. Murphy, Nye County, NV
M. Baughman, Lincoln County, NV
D. Bechtel, Clark County, NV
D. Weigel, GAO
P. Niedzielski-Eichner, Nye County. NV
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Distribution for letter to Dr. John Bartlett, Director, Office of Civilian Radioactive Waste Management, SUBJECT: U.S. DEPARTMENT OF ENERGY REQUEST TO LIFT SITE CHARACTERIZATION ANALYSIS OBJECTION 1 AND RELATED COMMENTS AND QUESTIONS

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ENCLOSURE

TABLE 1

STATUS OF SCA OPEN ITEMS PERTAINING TO THE SSF OR OBJECTION 1

SCA OPEN ITEM		STATUS
COMMENTS AND QUESTIONS ADDRESSED IN INFORMATION PROVIDED BY DOE		
COMMENT	12	Resolved
	16	Resolved
	34	Open
	35	Resolved
	57	Resolved
	72	Resolved
	127	Resolved
	128	Resolved
	130	Open
	132	Resolved
QUESTION	28	Open
	61	Resolved
COMMENTS AND QUESTIONS REFERENCED IN OBJECTION 1 BUT NOT ADDRESSED IN INFORMATION PROVIDED BY DOE		
COMMENT	74	Open
	82	Open
	119	Open
	121	Open
QUESTION	58	Open

Section 8.4.2.3.1 Exploratory Shaft facility testing, operations, layout constraints, and zones of influence, pp. 8.4.2-93/147

SCA OBJECTION 1

The exploratory shaft facility (ESF) is intended to become an integral part of the repository if the site is found acceptable. However, the SCP and its references do not demonstrate the adequacy of the ESF Title I design control process, and the adequacy of the ESF Title I design which is the basis for the SCP. For example, neither the design nor the subsequent Design Acceptability Analysis (DAA) considers some of the applicable 10 CFR 60 requirements. Also, the process used to integrate currently available technical data into decisions regarding the shaft location appears to have overlooked evidence of a potential fault near the location of the exploratory shafts. In addition, it has not been demonstrated that the underground test facility and currently identified test durations will permit all tests to be conducted for time periods required without interference. Furthermore, resolution of the problems identified in Title I design may result in considerable corresponding modifications to the SCP.

EVALUATION OF DOE RESPONSE

- Objection 1 addresses two fundamental concerns: adequacy of the Title I design control process and adequacy of the Title I design. Objection 1 is supported by six bases, some of which are in turn based directly on related SCA Comments and/or Questions.

- NRC staff concluded (March 2, 1992, letter from Bernero to Bartlett) that DOE had demonstrated the QA aspects of an acceptable design control process which will be applied to the Title II design of the ESF and other design activities.

- DOE has revised its process for controlling the ESF design and integrating all available technical data and has incorporated the revised process into DOE procedures.

- The ESFAS indicates that the Title II design addresses the requirements of 10 CFR 60.21(c)(1)(ii)(D).

- DOE has expanded the proposed test space from 400,000 square feet in the SCP to 800,000 square feet dedicated to subsurface testing in its Title I design. Given that the area of the main test level has substantially increased, sufficient space should be available to avoid interference between tests.

- The NRC staff considers this objection resolved.

The following is a discussion of the NRC staff's evaluation of each basis for Objection 1:

- The first basis contains two supporting items (a and b). A portion of item (a) deals with early performance confirmation testing, and (b) deals with consideration of seal testing in ESF design. Based on information provided by DOE, these two supporting items can be considered resolved. The remaining portion of item (a) is related to the overall performance confirmation testing program. DOE maintains that "the performance confirmation program described in the SCP, and to be developed more fully as site characterization proceeds, is in accordance with the requirements of Subpart F of Part 60." The NRC staff considers that DOE has not provided enough supporting information to establish this position. The staff will continue to track this portion of the first basis through Comment 119, which remains open.

  With respect to item b, the DOE has proposed a large area for testing that will provide flexibility for additional seal tests. In addition, seals for ramps may prove to be more effective than those for shafts. NRC staff will also continue to track concerns related to sealing under SCA Comment 74 and Question 28.

- The second basis contains six supporting items (a - f) dealing with a variety of ESF design considerations. These six items are all related to SCA Comments or Questions. Two items, (a) and (e), were discussed as Question 63 and Comment 131 of the SCA. These open items were previously resolved in NRC's evaluation of DOE's response to the SCA (Letter from Bernero to Bartlett, July 31, 1991). Item (d) is addressed in detail by Comment 132 which the NRC staff considers resolved (See enclosed NRC staff review of information provided to resolve Comment 132). Based on the information provided by DOE related to Comment 127, the NRC staff considers item (f) resolved. The NRC staff recognizes that item (b) is a special case of item (c) and can be considered as fully addressed by item (c). Insufficient information was provided by DOE to warrant resolution of item (c). However, NRC concerns related to this item are fully covered by Comment 130, which remains open. Based on the foregoing the staff considers this basis resolved.

- The third basis contains nine supporting items (a - i)

dealing with test space, test interference, and operational interference. Two of these items, (b and h), are considered resolved based on the information provided by DOE. Although the remaining items (a, c - g, and i) are not specifically addressed by the information provided by DOE, the Title I design now describes 800,000 square feet of space dedicated to subsurface testing (with an additional 3,280,000 square feet available for test expansion) compared to 400,000 square feet in the SCP dedicated test area. Considering that the main test level (MTL) area has been substantially increased, sufficient space should be available to allow DOE to take the test space and interference concerns into consideration. In view of these changes, the NRC staff considers that these items support resolution of Objection 1. The NRC staff will continue to track these items during its review of the Title II design and other DOE documents related to in situ testing.

- The fourth basis deals with potential impacts of long-term performance confirmation testing (for the waste package) on ESF design. This issue was addressed in the ESFAS. Based on the increase in size of the MTL, the change from shaft accesses to ramps for transportation of waste packages, and DOE's commitment in its responses to the SCA (December 1990) to consider the impact of in situ waste package testing, the NRC staff considers this basis to be adequately addressed.

- The fifth basis deals with justification of some of the ESF design criteria and contains three supporting items (a - c). The information provided by DOE does not specifically address this basis, but items (b) and (c) were previously resolved in the NRC evaluation of DOE's response to the SCA (July 1991). Item (a) is restated as SCA Comment 121, which deals with seismic design criteria, and will be tracked by the NRC staff as an open item under that comment number.

- The sixth basis deals with the sufficiency of planned subsurface drifting and exploration. Based on information provided by the DOE, this basis appears to have been satisfactorily addressed. DOE has expanded underground drifting from 10,000 feet to approximately 76,000 feet of proposed drifts and has provided bases in the ESFAS and CHRBA for the extent and direction of drifting. The increased drifting will provide underground access to most major geologic features.

- In a letter of March 2, 1992 (Bernero to Bartlett), the NRC staff laid out rationale for the lifting of SCA Objection 2 which dealt with DOE's quality assurance (QA) program. At that time the NRC staff concluded that "DOE has demonstrated the QA aspects of an acceptable design control program which will be applied to the Title II design of the [Exploratory]

Studies Facility and other quality-related design activities." The NRC staff has committed to monitor implementation of these QA aspects through future audits and surveillances.

- Information provided by DOE included a discussion of waste isolation with respect to the location and number of accesses. In that discussion consideration was given to the importance of fewer accesses favorably located so as to contribute to waste isolation. The ESFAS also favored ramps over shafts to reduce uncertainty with respect to waste isolation.

- Based on the information provided by DOE, the NRC staff considers Objection 1 resolved. The NRC staff will continue to track issues related to this objection through its review of DOE's Title II design process.

Section 8.3.1.2 Overview of the geohydrology program: Description of the present and expected geohydrologic characteristics required by the performance and design issues

Section 8.3.1.2-2a Current representation and alternative hypotheses for unsaturated-zone hydrologic system conceptual models for the geohydrology program

SCA COMMENT 12

The hypothesis that liquid-water flow in the Calico Hills unit is restricted to the rock matrix and the hypothesis that matrix properties of the altered Calico Hills nonwelded zeolitized unit are probably largely isotropic (because chemical alteration can be expected to destroy preferred orientations of rock properties) are not stated in Table 8.3.1.2-2a and no definite activities to test them are found in the plan.

EVALUATION OF DOE RESPONSE

- Comment 12 points out that the Yucca Mountain Site Characterization Plan does not identify test activities for two ground water flow hypotheses. These hypotheses are:

  1. Liquid-water flow in the Calico Hills unit is restricted to the rock matrix.

  2. Matrix properties of the altered Calico Hills nonwelded zeolitized unit are probably largely isotropic.

- Page 6 of the DOE communication (Roberts to Holonich) dated March 3, 1992, identifies areas of the CHRBA that address this comment. In this communication, it is stated that the proposed tests for the Calico Hills unit "are expected to provide information on variations of hydrologic properties and processes with scale validation of models for flow and transport, and monitoring of in situ conditions." Further, the underground testing strategies proposed in the CHRBA are for specific test strategies in the Calico Hills nonwelded unit, some of which may be combined with surface based test activities. It is also stated that Table 2.3-9 of the CHRBA (pages 2.3-18 to 2.3-21) describes testing activities, that when executed within the Calico Hills nonwelded unit, will test hypotheses of liquid flow in that unit.

- The information provided in the CHRBA demonstrates that investigation of these hypotheses is part of the Yucca Mountain characterization plan.

- The NRC staff considers this comment resolved.

Section 8.3.1.2.2.4.6	Activity: Calico Hills Test in the Exploratory Shaft Facility
Section 8.4.2.1.6.1	Characterization of the Calico Hills Nonwelded Unit

SCP COMMENT 16

The SCP does not contain a plan to adequately characterize the hydrologic properties of the Calico Hills unit, which has been designated the primary barrier to ground water flow and radionuclide transport.

EVALUATION OF DOE RESPONSE

- Comment 16 was primarily focused on the need to understand the effects that fractures and faults have on flow paths and travel times, and the conditions under which fracture flow may occur in the Calico Hills unit. Studies (ESFAS and CHRBA) were initiated by DOE to identify an optimal testing strategy to characterize the hydrologic properties of the Calico Hills unit. The document "Responses to NRC Point Papers on Site Characterization Plan/Consultation Draft" dated December, 1988, stated that for these studies considerable weight was given to a testing strategy that would confirm or reject the hypothesis that water movement in the Calico Hills nonwelded unit has a predominantly vertical component of flow through the matrix and continues downward directly to the water table wherever it intersects the Calico Hills nonwelded unit. The CHRBA identifies data needs and contains many alternative strategies for testing the Calico Hills unit. Some of these strategies are identified in Table 2.3-9 (pages 2.3-18 through 2.3-21). It should also be noted, that all of the testing strategies include additional testing approaches not described in the Yucca Mountain Site Characterization Plan.

- The original intent of Comment 16 was to call attention to the need for adequate characterization of Calico Hills unit hydrologic properties. The CHRBA demonstrates that adequate characterization of Calico Hills unit hydrologic properties is part of the plan to characterize Yucca Mountain .

- The NRC staff considers this comment resolved.

Section 8.3.1.3.1.1 Activity: Development of an integrated drilling program

Section 8.3.1.4.2.1 Study: Characterization of the vertical and lateral distribution of stratigraphic units within the site area

SCA COMMENT 34

Discussions of the integrated drilling program are unclear as to how data from various holes will be used in support of different studies; how uncertainty in core retrieval and data analysis will be handled; and how the large volume of existing information will be used to plan the drilling program.

EVALUATION OF DOE RESPONSE

- Resolution of this item is dependent upon the DOE's having addressed each of the comment's five "recommendations".

- Only one of the five comment recommendations (the third bullet) has been addressed by the DOE. This third recommendation is: "Angled drillholes should be considered as a means to identify and characterize vertical/near vertical features."

- The CHRBA (DOE, 1991, p. 2.3-1) identifies angle boreholes as a potential technique to be employed for characterization of the Calico Hills (CHn) nonwelded tuff. The DOE's technique evaluation subgroup consistently rated angle drillholes in deference to vertical drillholes in the acquisition of rock information, including fracture and fault zone properties (CHRBA, Tables 2.3-2, 2.3-3 and 2.3-4. pp. 2.3-3 through 2.3-5).

- In its deliberations, the DOE subgroup recommended (DOE, 1992, p. 2.3-10) that "because of the uncertainty as to the feasibility of dry-drilled angle holes" the multiple-angle-hole clusters category be eliminated, but did recommend that the single (isolated) angle hole category be retained.

- The sections of the CHRBA (DOE, 1992) referenced in DOE (1992, p. 8) provide relative ratings of various investigative techniques, not recommended techniques.

- Except for consideration for CHRBA-related investigations (DOE, 1991) the above referenced CHRBA sections do not imply or suggest that angled drill holes will be considered when composing other site characterization strategies.

- However, the DOE indicates in another document (DOE, 1992, p. 8) that angled drill holes will be considered in composing site characterization strategies.

- Sufficient bases have been provided by the DOE (1992, pp. 7-8) for the NRC staff's resolution of the comment's third recommendation which addresses the use of angled drillholes. The staff considers this portion of the comment resolved.

- As indicated in the staff's evaluation of the DOE's response to this comment (NRC, 1991), resolution of the remainder of the SCA Comment 34 (bullets 1, 2, 4 and 5) must await DOE confirmation of the integrated program and the NRC staff evaluations of Study Plan 8.3.1.9.2.1. Activity 8.3.1.2.2.4.10, the C-Hole Complex study and unspecified related study plans.

- The NRC staff considers this comment (exclusive of the third SCA Recommendation) open.

Section 8.3.1.4.2 Investigation: Geologic Framework of the Yucca Mountain Site

Section 8.3.1.4.3 Investigation: Development of three-dimensional models of rock characteristics at the repository site.

Section 8.4.2.1 Rationale for planned testing

SCA COMMENT 35

The program of drifting in the north, combined with systematic drilling and feature sampling drilling, appears unlikely to provide the lithologic and structural information necessary to adequately investigate potentially adverse conditions at the site or insure that observations made and data collected will be representative of conditions and processes throughout the repository block. Also, it has not been demonstrated that the proposed site characterization plan provides for a sufficient amount of underground drifting to collect data necessary for designing the repository and analyzing repository performance.

EVALUATION OF DOE RESPONSE

- The response to this comment indicates that the underground excavations will now comprise 76,000 feet of drifts as opposed to 10,000 feet that was reported in the SCP. The ESFAS indicated that 19,000 feet of drifting would occur in the Calico Hills unit. Access to features such as the Solitario Canyon fault, Ghost Dance fault, Drill Hole wash, the imbricate normal fault zone to the east of the repository, and the vitric-zeolitic facies transition will result from this increased excavation.

- The ESFAS and the CHRBA provided the bases used to determine the extent and direction of the drifting.

- The NRC staff considers this comment resolved.

Section 8.3.1.15.1.5	Study: Excavation investigations, pp. 8.3.1.15-45/52
Section 8.3.1.15.1.8	Study: In situ design verification, pp. 8.3.1.15-70/76
Section 8.3.2.2.5	Information need 1.11.5, p. 8.3.2.2-63
Section 8.4.2.3.4.4	Exploratory shaft facility underground construction an operations - blasting, pp. 8.4.2-180/195

SCA COMMENT 57

Studies relating to design verification do not consider investigating the effects of underground excavation in the tuff using alternate excavation methods.

EVALUATION OF DOE RESPONSE

- NRC's review of DOE's response to the SCA (July 1991) recommended that progress toward resolution of this comment would require DOE to submit Study Plan 8.3.1.15.1.8. This study plan has not been submitted.
- The ESFAS notes (page 4-4) that construction methods considered for the ESF included "drill and blast, machine excavation, and various combinations of the two."
- The ESFAS notes (page 6-6) that the excavation method for the MTL could be either drill and blast or mechanical mining.
- Appendix 3B of the ESFAS provides a list of 13 access construction cases of which drill and blast, blind drill and TBM have been considered.
- The information provided by DOE (page 16) contains statements regarding advantages and disadvantages of mechanical versus drill and blast excavation.
- Based on the information provided it is clear that DOE has considered alternate excavation methods.
- The NRC staff considers this comment resolved.

Section 8.3.3.1 Overview of seal program, p.8.3.3.1-1/9

SCA COMMENT 72

In view of the limited data available at this time, it would be prudent for DOE to assume that seals will be needed until and unless it can be shown that seals will not be required to meet the repository performance objectives. It is not clear in the SCP that this is the assumption under which the sealing program is going to proceed.

EVALUATION OF DOE RESPONSE

- The SCP did not include analyses to evaluate the need for seals in repository shafts and ramps. The NRC staff recommended that DOE plan its sealing program on the basis that seals will be needed until and unless it can be demonstrated otherwise. DOE's original response to NRC's SCA did not indicate a commitment to follow up on the NRC recommendation.

- Seal tests are listed as one of the planned "late tests" for the MTL test program (see pages 5-8 and 5-9 of the ESFAS) for all ESF options. Although no details of the seal tests are provided in the ESFAS, the information provided by DOE (page 10) indicates that DOE considers that seals may be required to meet repository performance objectives.

- The NRC staff considers this comment resolved.

Section: Design Acceptability Analysis, Chapter 3: Assessment of Alternative Shaft Locations

SCA COMMENT 127

The process used to integrate all available technical data into decisions regarding shaft location appears to have been inadequate because an apparent lack of data integration raised concerns about the suitability of shaft locations and about a process that has resulted in a possible violation of the criteria specified in the Design Acceptability Analysis (DAA) for set-back distances from faults.

EVALUATION OF DOE RESPONSE

- The response to this comment indicates that the CHRBA considered 24 locations from which shafts and/or ramps would access the Calico Hills resulting in eight strategies for characterizing the Calico Hills. All eight strategies were assessed for their impact on waste isolation.

- DOE revised its process for controlling the ESF design and incorporated the revised process into DOE procedures.

- The ESFAS resulted in a favored option that utilizes a two ramp configuration in which the criteria for set-back from faults is not considered applicable. DOE indicated that any major fault encountered during ramp construction will be evaluated for its impact on ESF design.

- The NRC staff considers this comment resolved.

Section: Design Acceptability Analysis

SCA COMMENT 128

Several applicable 10 CFR 60 requirements have not been considered in evaluating the acceptability of ESF Title I design.

EVALUATION OF DOE RESPONSE

- DOE lists in Table 2-1 some 10 CFR Part 60 regulatory requirements which were used as discriminators for the ESFAS. DOE states that "all 10 CFR 60 requirements were considered during the performance of the ESFAS and will continue to be considered during Title II design" (see page 19 of the information provided by DOE).

- The NRC staff proposes to evaluate whether or not design criteria based on 10 CFR Part 60 requirements have been developed for the Title II design during review of the Title II design.

- See evaluation for SCA Comment 130.

- The NRC staff recognizes that this comment is a special case of Comment 130; therefore, it will be tracked together with the more that general comment. Accordingly, the NRC staff considers this comment resolved.

Section: Design Acceptability Analysis

SCA COMMENT 130

Out of the fifty-two (52) 10 CFR 60 requirements considered applicable to ESF design by the DOE in reviewing the acceptability of Title I design, the DAA focuses on only 22 requirements that belong to three areas specifically outlined by NRC. Other requirements (e.g. retrievability, preclosure radiological safety, performance confirmation, and QA program) are said to be qualitatively evaluated (see p.2-1, second paragraph). The approach taken in the DAA raises questions about completeness and rigor in the design acceptability analysis, as detailed design criteria were not developed for all applicable requirements.

EVALUATION OF DOE RESPONSE

- DOE states that "all 10 CFR 60 requirements ... will continue to be considered during Title II design." (see page 19 of enclosure to March 3, 1992, letter from Roberts to Holonich). No evidence is provided that design criteria based on 10 CFR Part 60 requirements are being developed for the Title II design.

- Resolution of this comment will be dependent upon NRC staff review of DOE's Title II design.

- The NRC staff considers this comment open.

Section: Design Acceptability Analysis

SCA COMMENT 132

The requirements of 10 CFR 60.21(c)(1)(ii)(D)[i.e. consideration of major design features],in particular, have not been adequately addressed in evaluating the acceptability of ESF Title I design.

EVALUATION OF DOE RESPONSE

- According to Section 6.2.1 of the ESFAS the major design features which were considered are:
  - Means of access
  - Location of accesses
  - Location of (core) MTL
  - Excavation method of openings
  - Total number of repository accesses

- The original SCA Comment noted that the requirements of 10 CFR 60.21(c)(1)(ii)(D) were not adequately addressed in evaluating the acceptability of ESF Title I design and recommended that the Title II design be expanded to fully address the 10 CFR 60.21 requirements. However, the consideration, description and evaluation of major design features is contained in the ESFAS. Therefore, the bases for the Title II design in addressing the requirements of 10 CFR 60.21 are contained in the ESFAS. (DOE has previously indicated that the preferred option will be used as the basis for Title II design.) The NRC staff considers that the ESFAS addresses the 10 CFR 60.21 requirements.

- The NRC staff considers this comment resolved. However, the adequacy of the Title II design with respect to all 10 CFR 60 requirements will be evaluated when the staff reviews the Title II design.

Section 8.3.3.2-2 Issue resolution strategy for Issue 8.12, Table 8.3.3.2-2, p. 8.3.3.2-13

SCA QUESTION 28

If it is decided that ES-1 will penetrate the Calico Hills unit, what will be the impacts on the current sealing program and issue resolution strategy for Issue 4.4?

EVALUATION OF DOE RESPONSE

- Areas where DOE says that the open item is addressed in the ESFAS relate primarily to seal testing in the MTL.
- Review of information provided by DOE for Question 28 did not change the status of Question 28.
- The NRC staff considers this question open.

Section 8.4.2.3.6.4 Design Flexibility pp. 8.4.2-218/219
Section 8.4.2.1.6 Conditionally planned subsurface characterization activities p. 8.4.2-32

SCA QUESTION 61

How will design changes (as outlined in 10 CFR 50, Appendix B, Item III, paragraph 4) be made in a timely and appropriate manner during the design and construction of the ESF?

EVALUATION OF DOE RESPONSE

- DOE had indicated earlier that design changes would be controlled by architectural-engineering procedures. DOE submitted Yucca Mountain Operations Project Procedure number PP-03-17, entitled "Configuration Change Control", as the appropriate procedure.

- Procedure PP-03-17 appears to be sufficient, from geotechnical engineering and QA standpoints, for keeping track of changes during the design and construction of the ESF.

- The NRC staff considers this question resolved.

REFERENCES:

1. Letter of March 3, 1992, from Mr. John P. Roberts of DOE to Joseph J. Holonich of NRC; submitting ESFAS/CHRBA Walk-through document for removing SCA Objection 1.

2. Exploratory Studies Facility Alternatives Study, Sand91-0025, September 1991 (ESFAS report.)

3. U.S. Department of Energy, Record Memorandum, Risk/Benefit Analysis of Alternative Strategies for Characterizing the Calico Hills Unit at Yucca Mountain, YMP/191-6, January 1991, (CHRBA report.)

4. Letter of July 31, 1991 from Mr. Robert M. Bernero of NRC to Dr. John W. Bartlett of DOE; transmitting NRC's evaluation of DOE's response to SCA Objections and Comments.