

YUCCA MOUNTAIN PROJECT OFFICE

QUALITY ASSURANCE SURVEILLANCE REPORT

OF

SANDIA NATIONAL LABORATORIES

SURVEILLANCE NUMBER YMP-SR-90-039

CONDUCTED SEPTEMBER 4 THROUGH SEPTEMBER 7, 1990

ACTIVITIES SURVEILLED:

EXPLORATORY SHAFT ALTERNATIVES ANALYSIS STUDY

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Date: 16 Oct 1990

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Yucca Mountain Project Office

Date: 10/19/90

1.0 INTRODUCTION

Surveillance No. YMP-SR-90-39 was conducted from September 4 through September 7, 1990, at Sandia National Laboratories (SNL) in Albuquerque, New Mexico. This Surveillance continued the evaluation of the Exploratory Shaft Alternatives Analysis Study that began during Yucca Mountain Project Office (Project Office) Audit No. 90-04. Evaluation of the activity, as determined by the surveillance substantiated the determination from the audit that the activity is at risk from the form and paucity of the engineering documentation for assumptions used in the activity (as required in QA Criterion 3 in the SNL Quality Assurance Program Plan). Since the activity is still in progress and remaining work is needed to incorporate the results of the Calico Hill Risk Benefit Analysis, there is opportunity to change and strengthen the documentation. This is recommended on the basis that the basic methodology used for the activity is defensible. No Standard Deficiency Reports (SDRs) or Observations were issued as a result of this Surveillance

2.0 PURPOSE AND SCOPE

The scope of this Surveillance was to complete the evaluation of the Exploratory Shaft Facility (ESF) Alternatives Analysis (WBS 1.2.6.1.1) started during the annual Project Office audit (No. 90-04) of SNL. Since the last tasks of the alternatives analysis study have not been completed, verification was completed via a Surveillance rather than as a continuation of the audit.

The purpose of the verification was to determine the compliance with Quality Assurance (QA) requirements from the SNL QA Program, as applied to this activity. In addition, from a technical perspective, the following two aspects of the study were to be evaluated: (1) the adequacy of the methodology used in the Analysis Study, and (2) the adequacy of the application of the methodology to the specifics encountered in the alternatives analysis.

The U.S. Nuclear Regulatory Commission's (NRC'S) NUREG/CR-5411, "Elicitation and Use of Expert Judgment in Performance Assessment for High-Level Radioactive Waste Repositories," was used as a reference for evaluation of the activity during completion of the Surveillance report.

3.0 SURVEILLANCE TEAM

The Surveillance Team was composed of the following members:

Martha J. Mitchell, Science Applications International Corporation (SAIC),
Team Leader
Forrest D. Peters, SAIC
Stephen P. Hans, SAIC
Robert White, Project Office

The following observer attended the surveillance:

James Blaylock, U.S. Department of Energy (DOE) Project Office

The following individuals comprised a team representing the NRC:

John Buckley, NRC, Team Leader
Dinesh Gupta, NRC
Randal Barnes, Consultant

4.0 SUMMARY OF SURVEILLANCE RESULTS

As indicated in the report of Audit 90-04, the alternatives study is in progress and records have not been finalized. It is not possible to make an effectiveness statement based on the final records and report. No programmatic deficiencies were found in completed documents, such as Interface Task Memo ITM-10 or the Design Investigation Memoranda, which control the activity. On an interim basis, the following conclusions have been drawn by the Surveillance Team:

1. A pilot study was completed for the alternatives study that demonstrated the methodology to be used in the activity. It would have been more effective if (a) a prototype plan had been used during the activity, and (b) a trial of the instructions to (the panel) and an evaluation of the information contained in the transcripts had been made. This would have also helped to delineate those activities that were management in content from those that were technical in nature.
2. One of the technical concerns arising from the Surveillance activity concerns the differentiation between technical and managerial decision aspects of the study, as formulated in the methodology and as executed in the performance of the study. The Surveillance Team believes that establishing and maintaining this difference is important to the study. Expert judgment depends on the expertise and prior knowledge base of the individuals chosen for the study. Technical or engineering background may be sufficiently different from the view of the Project by top management that these functions require clear

separation in the evaluation process. SNL staff appear to have problems explaining how the managerial decisions are conceptually differentiated from the technical decision areas in the study design.

3. The Quality Assurance Grading Package for the Alternatives Analysis Study was completed prior to the formation of the Quality Review Board (QRB). To date the grading package for the alternatives study has not had Project Office approval. It is recommended that this approval be completed as soon as possible.
4. From the standpoint of QA program Criterion 3 requirements for documentation, only three transcripts of group or panel meetings were available to the Surveillance Team. The meetings from which these transcripts were taken were not sufficiently formal and structured to identify assumptions and to differentiate these assumptions from facts, requirements, or constraints. In addition, since many of the panel activities included graphic information, such as the development change and use of influence diagrams, transcripts without this information (as it is developed) are difficult to follow and potentially misleading since they do not reflect the conditions of the materials at the time of the conversations.
5. As part of the Surveillance, it was determined that regulatory input was used by the teams that established influence diagrams of the panels. One of the potential weaknesses in the activity concerns the use of these influence diagrams. These are given to the panel members to use in the scoring process for the alternatives. These influence diagrams include information derived from regulations such as 10 CFR 60.21 and other information that was not considered an absolute "go" or "no go" screening criterion to be the alternatives. There is no assurance that this information is actually used in the decision process by the panel members. It is important to establish what is and is not used by the panel members during the screening and scoring process. An undocumented assumption that the material is used as provided to the panels is insufficient.
6. The methodology developed for this activity is defensible and, as developed to this point, is consistent with NUREG/CR-5411, which specifically applies to performance assessment activities. The activity at SNL has performance assessment aspects and interfaces, but is not in itself performance assessment. From the technical and programmatic standpoint, employment of the methodology to the particular application evaluated here is indeterminate at this time due to the incomplete status of the activity. The weakness of the activity has been discussed previously in this report.

7. The review method chosen by SNL is appropriate for the final report of this activity as it is described by the participant and outlined in the planning documents.

Because of the risks identified in the activity, and because the design of the activity allowed for the evolution of the methodology used and the use of the application of the methodology, the Surveillance Team strongly recommends that a surveillance be conducted of the various phases of the activity that remain to be completed. This includes panel meetings and other working session and preliminary documentation from these meetings.

5.0 PERSONNEL CONTACTED

Aldred Stevens, SNL
Al Dennis, SNL
Ray Finley, SNL
Les Shepard, SNL

6.0 SYNOPSIS OF DEFICIENCY DOCUMENTS AND OBSERVATIONS

No deficiency documents were issued as a result of the Surveillance.

7.0 REQUIRED ACTION

No further action is required on the part of SNL.