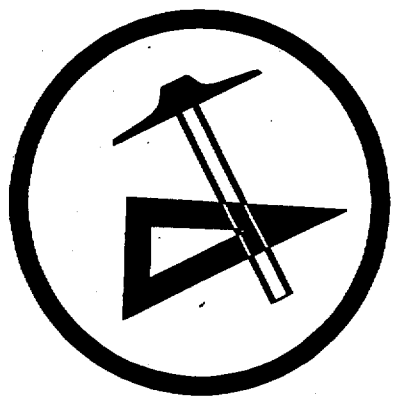


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RAYTHEON SERVICES NEVADA



OQA AUDIT NO.

YMP-91-04

140012

ADD: Bill Belke Encl.

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WM-11
N403

Originated by: Dana, SAIC

WBS 1.2.9.3

QA

JUL 01 1991

Richard L. Bullock
Technical Project Officer
for Yucca Mountain
Site Characterization Project
Raytheon Services Nevada
101 Convention Center Drive
Phase II, Suite P-250
Las Vegas, NV 89109

OFFICE OF QUALITY ASSURANCE (OQA) AUDIT YMP-91-04 OF RAYTHEON SERVICES
NEVADA (RSN) SUPPORT OF THE YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
(YMP)

Please be advised that a team of auditors from the Yucca Mountain Quality Assurance Division of the OQA will conduct an external quality assurance (QA) audit of the YMP QA Program at the RSN offices in Las Vegas, Nevada, July 29-August 2, 1991. The audit will be conducted in accordance with the enclosed audit plan.

Observers from the State of Nevada, the U.S. Nuclear Regulatory Commission, or other interested parties may also accompany the audit team. The total number of auditors/observers is anticipated to be 14 or fewer people.

You are hereby requested to arrange for appropriate space to hold meetings, provide cognizant personnel to support the audit, and provide audit team access to appropriate current RSN documentation and records.

If you have any questions, please contact either James Blaylock at 794-7913 or Stephen R. Dana at 794-7176.

Original Signed By
James Blaylock

for Donald G. Horton, Director
Office of Quality Assurance

OQA:JB-4480

Enclosure:
Audit Plan YMP-91-04

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For
THE YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

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APPROVAL.	1	0	N/A
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TABLE OF CONTENTS	2	0	N/A
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3.0 DESIGN CONTROL	4	0	N/A
4.0 PROCUREMENT DOCUMENT CONTROL	3	0	N/A
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18.0	AUDITS	4	0	N/A
19.0	COMPUTER SOFTWARE	1	0	N/A
20.0	SCIENTIFIC INVESTIGATIONS	1	0	N/A
	APPENDIX A - RSN QA PROGRAM BASIS	2	0	N/A

SECTION 1

ORGANIZATION

1.0 GENERAL

The Raytheon Services Nevada (RSN) Organization is described herein.

1.1 ORGANIZATION STRUCTURE

Raytheon Services Nevada is responsible to the DOE Yucca Mountain Site Characterization Project Office (YMPO) for providing architecture and engineering services to support the investigations at Yucca Mountain. Responsibilities include Title I and II Design of surface and subsurface facilities, Title III Inspection of Mining, Drilling, Facilities Construction, Nondestructive Testing, Materials Testing, Field Surveying, Microfilming of YMP Records, and Engineering Support Services. RSN is responsible for the establishment and implementation of a Quality Assurance Program. RSN may delegate to others, such as contractors, agents or consultants, the work of establishing and implementing the QA Program or any part thereof, but retains the overall responsibility for the program.

The overall organizational structure, lines of communication, authorities and duties of persons and organizations affecting quality is established in this document. The Quality Assurance Program provides for the achievement of quality by the line organization and the verification of quality by the QA organization. While the line organizations are responsible for performing the activities properly, the QA organization will verify the proper performance of work through implementation of appropriate controls. The organizational structure is defined in Figure 1 of this Section. The responsibilities and authority of key personnel are as follows:

- 1.1.1 General Manager, RSN has the responsibility for establishing, administering, and enforcing the overall QA program.
- 1.1.2 Deputy General Manager reports to the General Manager and is responsible for the QA program as it applies to the engineering support.
- 1.1.3 The YMP Technical Project Officer (TPO) is responsible to the Yucca Mountain Site Characterization Project Office Project Manager for directing activities in support of the project in accordance with this QAPD and implementing procedures. The TPO

has responsibility for approval of the QAPD, changes thereto, and interpretation thereof. All technical implementing procedures will be the responsibility of the TPO. The TPO will be the prime interface with other participants. The Yucca Mountain Project organization will consist of Field Operations, Systems Engineering, Design, and Administration.

- 1.1.4 The Design Department is responsible for providing for the design of the Site Characterization Facility (SCF) and other facilities as assigned by the Project Office. Designs will produce analyses, drawings and specifications as appropriate to the assigned project.

The Design Department will provide qualified personnel to accomplish the requirements above and will have a group to manage the criteria flow, set and monitor schedules and to review drawings and specifications to set criteria.

- 1.1.5 Systems Engineering will provide qualified personnel to: manage interfaces, control configuration, control computers and software, and manage and control the technical procedures.

- 1.1.6 Field Operations is responsible for providing qualified personnel to control field changes, provide material testing, monitor construction, provide geophysical logging, consult on drilling operations, and provide geological and hydrological services.

- 1.1.7 Project Administration will provide qualified personnel for budgetary control, long-range planning, Planning and Control Systems (PACs), record processing including the Project Microfilm Center, and general clerical support as required.

- 1.1.8 The Integrated Data System Project Manager has the responsibility for the Integrated Data System (IDS), including the Data Acquisition Systems, Information Resources, and Scientific Information Systems.

- 1.1.9 The Program Support Manager has responsibility for Management Information Systems, Finance and Administration, Planning and Analysis, Human Resources, Subcontracts, Outside Training and Productivity.

- 1.1.10 The Environmental, Safety and Health Manager has the responsibility for assuring that Environmental, Safety and Health considerations are incorporated in Designs and complied with at Facilities.

- 1.1.11 The Manager, Quality Assurance, RSN (MQA/RSN) reports to the General Manager and has been delegated the responsibility for establishing, maintaining and managing the overall RSN Quality Assurance Program.

The Manager, Quality Assurance, RSN has delegated the responsibility for the Yucca Mountain Project (YMP) Quality Assurance Program to the Manager, Quality Assurance, YMP.

- 1.1.12 The Manager, Quality Assurance, YMP (MQA/YMP) reports directly to the MQA/RSN and has the management responsibility and authority to direct and control quality assurance functions to ensure that Program quality assurance objectives are consistently met. The MQA/YMP has direct access to, and maintains liaison with, the TPO, other managers and management of other affected organizations. This reporting relationship provides the organizational freedom and authority to identify quality problems; initiate, recommend, or provide solutions; and prevent or control further processing, delivery, or use of nonconforming items or activities, until disposition is obtained.

The MQA/YMP is responsible for coordination, integration, and overview of Program quality assurance activities and for ensuring that appropriate quality management, policy, training, and verification controls are in place. The MQA/YMP has appropriate management and quality assurance knowledge and experience and has no responsibilities that prevent his full attention to quality activities. This position has sufficient freedom from cost and schedule when opposed to quality considerations.

The responsibilities of the MQA/YMP are to:

- a. Establish integrated Program quality assurance policies and requirements in controlled documents.
- b. Coordinate development of the YMP quality assurance program documents including the QAPD, and quality assurance procedures.
- c. Provide quality assurance guidance and direction to affected organizations.
- d. Serve as the focal point for YMP quality assurance activities; provide coordination within RSN and assure that Program activities affecting quality are conducted in accordance with the RSN QA Program Requirements.

- e. Overview Program quality assurance activities by conducting verifications and selectively participating in verification activities, such as assessments, readiness reviews, or audits, and issues schedules for audits and surveillances.
- f. Review controlled documents for inclusion of quality assurance requirements.
- g. Assure development and implementation of a quality assurance indoctrination program for all Program personnel.
- h. Establish and maintain the indoctrination and training requirements for QA personnel as well as maintaining their qualification and training records.
- i. Maintain effective communication with Project and upper management personnel relative to the status of the quality assurance program; status of resolution of issues, trends, and significant conditions adverse to quality.
- j. Manage the QA staff.
- k. Ensure that QA personnel who perform activities affecting quality are qualified by experience, education or training to perform assigned tasks.
- l. Verify the adequacy and effectiveness of organizations and subtier organizations QA programs.
- m. Reviews and approves the QAPD, revisions to and the interpretation thereof.

1.1.13 Quality Assurance Sections The MQA/YMP is assisted in the execution of duties by three QA sections (i.e., Quality Assurance Engineering, Quality Control, and Auditing) that report to the MQA/YMP. These sections have the responsibility to direct and control quality assurance functions as delegated by the MQA/YMP.

1.2 DELEGATION OF WORK

When RSN delegates work to other program participants, a qualified individual or organization from within the delegating office shall be accountable for the quality of the delegated work.

1.3 RESOLUTION OF DISPUTES

Should disputes involving quality arise at any given organizational level, the dispute shall be elevated to the MQA/YMP and the other responsible manager(s), and if necessary to the General Manager. If a dispute between RSN and another project participant cannot be resolved, the dispute will be elevated to the DOE YMP Director, Quality Assurance (DQA) for resolution.

1.4 RESOLUTION OF ALLEGATIONS

Allegations of inadequate quality shall be resolved in accordance with appropriate DOE Administrative Procedures.

1.5 STOP WORK PROVISIONS

Provisions for issuing and lifting Stop Work Orders/Requests shall be developed and implemented by the MQA/YMP. Provisions shall include the following factors:

- a. Criteria and methodology for Stop Work and for lifting Stop Work Orders/Requests.
- b. Exact definition of work being stopped.
- c. Authorities and responsibilities.

1.6 PROGRAM APPLICABILITY

This Quality Assurance Program Description applies to all items and activities of all organizations affecting quality. The organization structures and responsibilities are clearly established in this plan and implementing procedures so that the results described below are obtained.

- 1.6.1 Quality is achieved and maintained by those who have been assigned responsibility for performing the work.
- 1.6.2 Quality achievement is verified by persons or organizations not directly responsible for performing the work. Verification of conformance to established requirements (acceptance) is accomplished by the QA organization unless specifically exempted in this Quality Assurance Program Description. Design verification is accomplished by the Design organization.

1.7 ORGANIZATION INTERFACES

If more than one organization is involved in the execution of activities affecting quality, then the responsibility and authority of each organization will be established clearly and documented.

1.7.1 The external interfaces between organizations and the internal interfaces between organizational units and changes thereto are documented. All interface responsibilities will be defined and documented. The interfaces between RSN, and the other Nevada Test Site (NTS) Support Contractors, the Project Office, and the Participating Organizations are briefly described below. Specific interfaces are described in DOE Administrative Procedures and RSN Implementing Procedures.

- 1.7.1.1 Reynolds Electrical and Engineering Company (REECo) - RSN is responsible for inspection and surveillance of drilling, mining, and construction performed by REECo and its subcontractors. RSN may purchase equipment through REECo and utilizes their calibration facility for the calibration of measuring and test equipment.
- 1.7.1.2 Lawrence Livermore National Laboratory (LLNL) - RSN receives direction through the Project Office to support LLNL in site investigations. RSN provides LLNL support in site package design, handling, and fabrication as part of the on-site waste package characterization program.
- 1.7.1.3 Los Alamos National Laboratory (LANL) - RSN receives direction through the Project Office to support LANL in site investigations. RSN receives direction pertaining to the IDS from LANL.
- 1.7.1.4 Sandia National Laboratories (SNL) - RSN receives direction through the Project Office to support SNL in site investigations.
- 1.7.1.5 Science Applications International Corporation/ Technical & Management Support Services (SAIC/T&MSS) is the integrating contractor for the Project Office and interfaces with RSN in providing broad technical, operational, and managerial support for Yucca Mountain Site Characterization Project activities.
- 1.7.1.6 United States Geologic Survey (USGS) - RSN receives direction through the Project Office to support USGS in site investigations. Additionally, RSN provides USGS with Geology/Hydrology personnel who work in

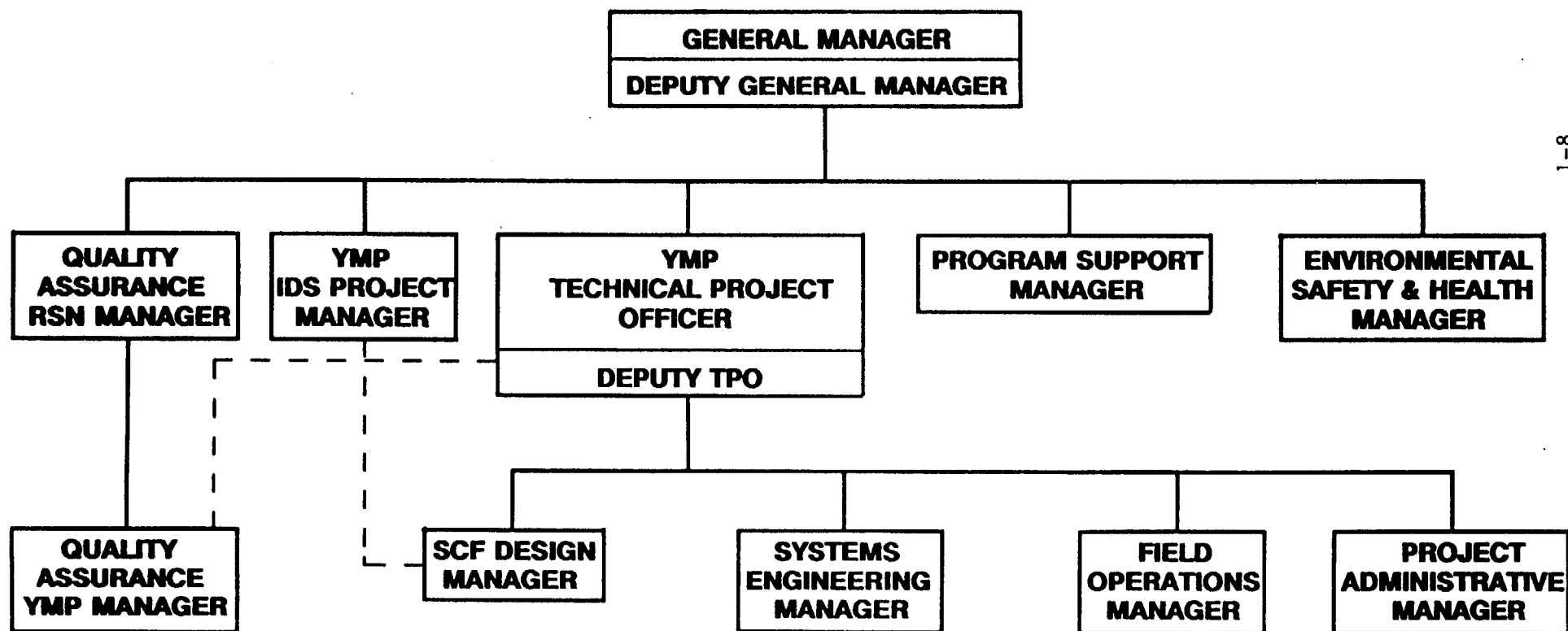
accordance with the USGS QAPD and Procedures. RSN Quality Assurance is not responsible for audit or surveillance of these activities.

1.7.1.7 Yucca Mountain Site Characterization Project Office (YMPO) - The Project Office manages and provides technical direction of the activities of RSN through the issuance of technical and programmatic direction and QA programmatic direction. RSN is responsible to the Project Office for technical activities assigned in the YMP Work Breakdown Structure Dictionary (WBS), and project-specific technical plan.

1.7.2 From an overall Yucca Mountain Site Characterization Project standpoint, the above interfaces are exchanges of technical requirements of work to be performed and liaison until completion of work. The Yucca Mountain Site Characterization Project DOE Administrative Procedures (APs) provide the implementing interface controls utilized by RSN while RSN's implementing procedures describe the methods of conducting inter-organizational interfaces.

Figure 1-1

RAYTHEON SERVICES NEVADA PROJECT ORGANIZATION CHART*



1-8

*This organization chart includes only those organizations which are either full time to YMP or support YMP on a full time basis.

SECTION 2

QUALITY ASSURANCE PROGRAM

2.0 GENERAL

The RSN organization has developed this document as its program description of the Quality Assurance Program that it will implement. The RSN Quality Assurance Program consists of the RSN QAPD and the Quality Assurance Procedures and Project Procedures and instructions which comply with the OCRWM QARD requirements that are applicable to the RSN activities for the Yucca Mountain Site Characterization Project.

2.1 SCOPE

The scope of activities that constitute the RSN QA program is described in implementing procedures and instructions and includes ESF Surface and Subsurface Design; IDS Design; Field Surveillance and Inspections of Construction; Drilling and Mining; Materials Testing; Field Surveying; and Microfilming YMP Project Records. Additional activities may be included at the direction of the YMP Project Office. Figure 2-1 of this Section depicts the document hierarchy describing this program. The RSN QA program is implemented by line organization staff, management, and the quality assurance staff.

2.2 RSN QA PROGRAM

2.2.1 QA Requirements

The quality assurance requirements for the OCRWM Program are identified in the OCRWM QARD and its Appendix A, Amplifications of Quality Assurance Program Requirements for the Mined Geologic Disposal System (MGDS). Appendix A to this document lists the requirements documents upon which the RSN QA Program is based.

2.2.2 YMP APQs

The quality-related YMP Administrative Procedures (APQs) provide the implementing interface controls utilized between the Project Office and the RSN activities. RSN procedures and instructions will address the YMP APQs as necessary to implement its QA program. APQs used directly by RSN are identified in the implementing procedures.

2.2.3 RSN QAPD

The RSN QAPD describes the provisions established by RSN to implement the applicable requirements of the OCRWM QARD, the RSN organizational responsibilities and authorities for achieving and verifying quality, the interfaces between RSN and the Project Office, and the overall QA program. Provisions are described in the RSN QAPD to meet each applicable section of the OCRWM QARD. The RSN QAPD is reviewed by appropriate RSN management, and approved by MQA/YMP, MQA/RSN and the TPO prior to submittal to the Project Office for approval. The Policy Statement is signed by the General Manager.

2.2.4 Software Quality Assurance Plans

Software Quality Assurance Plans (SQAPs) are developed and approved in accordance with Section 19 of this QAPD.

2.2.5 RSN Implementing Procedures and Instructions

The RSN procedures and instructions will be consistent with the OCRWM QARD and this QAPD. They will delineate the specific administrative and quality assurance controls used to implement the QA requirements as well as provide instructions for RSN personnel performing activities affecting quality. Review and approvals of procedures and instructions are described in Sections 5 and 6 of this QAPD. RSN Project Procedures and Instructions are developed by the TPO; Quality Assurance Procedures and Instructions are developed by the MQA/YMP.

2.2.6 QA Requirements Matrix

Provision shall be established that demonstrate through a matrix system that the applicable requirements of the QARD are properly documented and covered by the QAPD, implementing procedures, and instructions.

2.2.7 Delegated Work

The delegation of work activities through consultants, sub-contracts, etc., is controlled as described in Section 1.2 of this QAPD. The RSN QA organization reviews and approves subcontractor QA program documents.

2.2.8 Quality Assurance Program Controls

Quality Assurance controls are applied to items and activities affecting quality that are performed by the RSN organization in accordance with DOE Administrative Procedures. The RSN QA

Program invokes controls over activities through procedures and instructions. Verification of the effectiveness of the controls is accomplished by internal audits and surveillances, external audits, surveys of RSN suppliers, and document reviews by the QA organization.

2.2.9 Readiness Reviews

Management performs readiness reviews as deemed appropriate. Readiness reviews are used to ensure that specified prerequisites and programmatic requirements of major scheduled/planned activities have been satisfied prior to starting that activity.

2.2.10 Determination of Importance and Graded QA for Items and Activities

The determination of importance of items and activities and the application of the "graded" approach to QA will be consistent with the OCRWM QARD and DOE Administrative Procedures.

2.2.11 "Qualified" Data

The QA Program provides for the acceptance of data or data interpretations for use in licensing activities that were not generated under the controls of the YMP Quality Assurance Program. Once accepted, these data are classified as "qualified" for licensing purposes. Specific methods of acceptance of these data are described in DOE Administrative Procedures consistent with the requirements of NUREG 1298.

2.2.12 Personnel Selection, Indoctrination and Training

Personnel assigned to perform activities that affect quality will receive appropriate indoctrination and training prior to performing work. Procedures will address the performance of indoctrination, training, and qualification activities. Management and supervisory personnel determine the extent and need of training for personnel based on the scope, complexity and nature of the activity and on the education, experience and proficiency of the person. Proficiency shall be maintained and additional training may be required at the discretion of management. The Program Support staff verifies the education and work experience of personnel. Management establishes job descriptions for each job position in the quality program. Personnel selected for these positions shall have the education, experience, and training commensurate with the functions identified in the position description. Initial qualification shall be documented.

- 2.2.12.1 Verification personnel such as Lead Auditors and Inspectors will be qualified in the principles, techniques, and requirements of the verification activity being performed (e.g., Audits, Inspections) in accordance with approved procedures and instructions which reflect the requirements established in the OCRWM QARD and ANSI/ASME NQA-1. Qualification records for these personnel will be maintained.
- 2.2.12.2 Classroom training will be performed in accordance with approved lesson plans. Other forms of training include group instructions, on the job training, and procedural reading assignments. All training is documented.
- 2.2.12.3 Records associated with indoctrination and training shall reflect attendance sheets, objective and content of the program material presented, and date(s) of attendance as applicable.

2.2.13 Management Assessments

Management assessments of the QA Program shall be conducted at least annually. The assessment will be performed by management above or outside the QA organization by, or at the direction of, the Technical Project Officer. The management assessment will determine the effectiveness of the system and management controls that are established to achieve and assure quality, and the adequacy of resources and personnel provided to the QA program. These evaluations are performed, documented, and reported to upper management. Any conditions adverse to quality identified in these assessments will be documented and tracked.

2.2.14 Management Information Reporting and Tracking

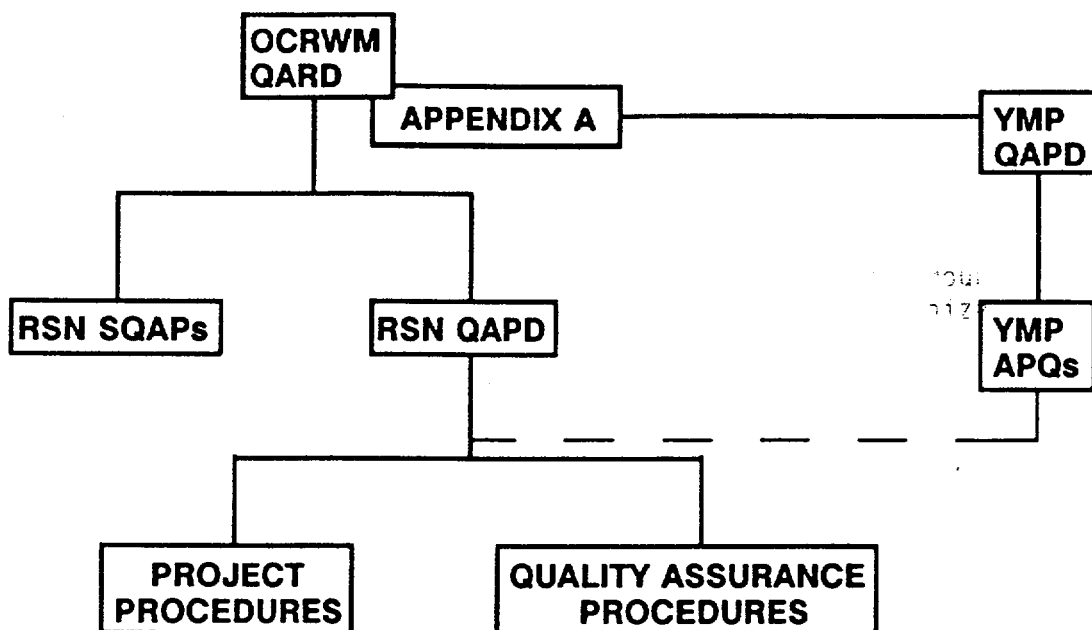
Communication and information systems will be established to ensure timely reporting, dissemination, and tracking of quality assurance management information such as the status of QA program implementation, status of resolutions of significant conditions adverse to quality, and summaries of management and QA overview results. This information may be found in reports, meetings, results, audits and surveillances, trending reports, etc. and will be furnished to RSN upper management and to the Project Office at least quarterly.

2.2.15 Surveillance

Surveillances shall be conducted to assess the quality of items and activities. These shall be conducted in accordance with procedure(s) which meet the requirements of the QAPD.

Figure 2-1

**QUALITY ASSURANCE PROGRAM
RSN DOCUMENT HIERARCHY**



SECTION 3

DESIGN CONTROL

3.0 GENERAL

RSN is responsible for the Surface and Subsurface Design of the SCF, the Integrated Data System (IDS) and other facilities as assigned by DOE. Design activities are accomplished in accordance with written procedures which comply with the requirements of the documents specified in Appendix A of this QAPD. These procedures describe the systems engineering process by which Design activities, from conceptual design through final design are planned, controlled, and implemented; and describe the control of design inputs, interfaces, outputs, changes and deficiencies.

3.1 SCOPE OF DESIGN CONTROL

The Site Characterization Facility Design is uniquely affected by considerations of the waste isolation characteristics of natural barriers and ultimately affects those barriers. Therefore, RSN has adopted design-related definitions specified by the Quality Assurance Requirements Document. The terms Design, Design Information, and Design Activities are used in this program description as follows:

3.1.1 Design

The design incorporates specifications, drawings, criteria, performance requirements and configuration of the natural and engineered structures, systems, components and barriers of the Mined Geological Disposal System. The act of defining the above technical requirements at each developmental stage of final design (that is, from conceptual design through final design). Design control measures are exercised at each stage of the design.

3.1.2 Design Information

This includes data collection and analysis activities that are used in supporting design development and verification. This includes general plans and detailed procedures for data collection and analyses and related information such as tests results and analyses. Data analysis includes the initial step of data reduction as well as broad-level system analysis, such as performance assessments, which integrate many other data and analysis of individual parameters.

3.1.3 Design Activities

Activities related to the design process, including data collection and analysis activities that are used in supporting design development and verification.

3.2 RSN CONTROL OF DESIGN ACTIVITIES

3.2.1 Systems Engineering

RSN will comply with the DOE Systems Engineering approach for control and management of design activities.

3.2.2 Design Inputs

Conventional design uses inputs such as applicable codes and standards, tables of material properties, etc. RSN implements procedures for selection and approval of, and changes to, inputs in that category.

3.2.2.1 Site Characteristics and Test Requirements Inputs

RSN reviews such inputs and returns comments to the Project Office with any requests for modification.

Data that will be needed to be qualified to support a license application but was not collected under the controls of a QA program meeting the QA program requirements of 10 CFR 60 Subpart G or this document shall be qualified in accordance with Section 2.2.1.0 of this QAPD prior to use in support of license application activities.

Methods for technical information flow to and from the Project technical data base and the Project Reference Information Base (RIB) are delineated in approved procedures.

3.2.2.2 Basis for Design

RSN develops Basis for Design Documents (BFD) which identify the Site characteristics and test requirements inputs and regulatory requirements inputs applicable to the RSN design of the SCF and IDS.

3.2.3 Design Process

Design activities are conducted by RSN. Quality affecting computer programs used in design or developed for the IDS are

controlled in accordance with Section 19 of this document. RSN is required (1) to prescribe its design processes at the level of detail necessary to permit the design to be performed in a correct manner; and (2) to ensure that such activities are documented in a timely manner and in sufficient detail to support facility design, construction, and operation; and (3) to permit verification that the design meets the established requirements.

Design processes are required to provide for planned, documented, controlled analyses, and to include the following features:

- a. Legible analysis documents in a form suitable for reproduction, filing, and retrieval.
- b. Sufficient detail as to purpose, method, assumptions, design input, references, and units to enable an individual technically qualified in the subject to review and understand the analysis and verify adequacy of the results without recourse to the originator.
- c. Provisions for ensuring that calculations are identifiable for retrieval (e.g., by subject, originator, reviewer, and date; or by other unique identifying data).

3.2.4 Design Verification

RSN is responsible for the verification of its designs. One or more of the following methods shall be used for design verification: design reviews, the use of alternate calculations or the performance of qualification tests. Procedures for design verification shall require the identification of the reviewers, the area or features reviewed, and the resolution methods for resolving comments.

Design verification procedures assure the following:

- a. Criteria for determining the method of verification are established.
- b. Responsibilities of the persons performing the verification or validation are defined.
- c. Areas or features to be verified are specified.
- d. Extent of documentation is defined.

3.2.4.1 Technical Reviews

- a. Technical reviews shall be performed when the information or document under review is within the state of the art and is based on accepted standards, criteria, principles, and practices.
- b. Technical reviews shall be used when documents, activities, material, or data require technical evaluation for applicability, correctness, adequacy, completeness, and assurance that established requirements are satisfied.
- c. Technical reviews shall be performed by individuals with sufficient technical knowledge of the area under review.
- d. Results shall be documented.

3.2.5 Design Change Control

Changes to RSN completed design-related documents, including design input documents, are justified and processed using the same methods applied to the preparation of the original document. Changes, with the exception of minor changes as described in Section 6.0, are reviewed and approved by the organizations that reviewed and approved the original design document except where a department was originally responsible for approving the design document is no longer responsible. In these cases, the RSN Project management will designate a new responsible organization to review the document changes.

The impact of design changes on procedures and training is evaluated.

3.2.6 Design Deficiency Control

Deficiencies in approved design-related documents generated by RSN and in design information used by RSN are controlled and resolved in accordance with Section 16. The impact of such design document deficiencies on work previously performed using the affected document, is evaluated and corrective measures, if necessary, are applied.

SECTION 4

PROCUREMENT DOCUMENT CONTROL

4.0 GENERAL

Procurement is accomplished in accordance with written procedures which comply with the applicable requirements of the documents specified in Appendix A of this QAPD. Procurement of items is accomplished through REEC or another procuring organization. Procurement of services is accomplished through RSN Procurement. Procedures for the procurement of items and services describe the process by which procurement planning is accomplished; the process by which procurement documents and revisions are prepared, reviewed, approved and controlled, the contents of procurement packages, and the responsibilities for executing procurement document control activities. In addition, these procedures will describe the involvement of the RSN Quality Assurance organization.

4.1 PROCUREMENT DOCUMENT PLANNING, PREPARATION, REVISION, REVIEW, AND APPROVAL

Procedures are established and implemented for the control of procurement documents. The procedures define the methods and responsibilities for procurement planning and for preparation, review, and approval of procurement documents and changes thereto. Procurement planning includes identifying the need for a specific service, determining the specific work to be accomplished, identifying appropriate technical and quality requirements, and identifying sources for the work.

4.2 PROCUREMENT DOCUMENT CONTROL

RSN initiates procurement packages including the following, as appropriate, in the procurement document package:

4.2.1 A Statement of the scope of work to be performed by the supplier.

4.2.2 Technical requirements:

- a. Reference to, and/or inclusion of, specific plans, drawings, specifications, codes, standards, regulations, procedures, or instructions that describe the services to be furnished.
- b. Identification of acceptance requirements for monitoring and evaluation of supplier performance.

- c. Technical acceptance/rejection criteria.

4.2.3 Quality Assurance Program requirements:

- a. Quality Assurance requirements addressing applicable elements of the program commensurate with the scope, complexity, and safety implications of the work, as determined by the procurement requestor.
- b. Permission for the supplier to work under the umbrella of the purchaser's quality assurance program, at purchaser option, when appropriate to the nature of the procurement, provided that the scope of the activity is adequately addressed therein. When these circumstances apply, the procurement documents will specify which parts of the purchaser's QA program are applicable to the supplier's work efforts.
- c. Requirement for the supplier to incorporate appropriate provisions of the Quality Assurance Program in subtier procurement documents.

- 4.2.4 At each tier of procurement, the right of purchaser or designated or authorized parties, access to supplier facilities and records for verification, such as inspection and/or audit.

- 4.2.5 Documentation required of the supplier, including submittal of schedules, nature of documentation (i.e., information, review, or approval) and as appropriate, designation of retention items and disposition requirements for those records maintained by the supplier.

- 4.2.6 Requirements for reporting and review or approval of nonconformance dispositions.

4.3 PROCUREMENT DOCUMENT REVIEW

- 4.3.1 Documented technical and quality assurance review of procurement document packages are performed to ensure that the documents include all necessary requirements and provisions. These reviews are performed by qualified QA and technical personnel who have access to pertinent background information.

- 4.3.2 Procurement documents and changes are reviewed to verify that the procurement documents:

- a. Have been prepared in accordance with applicable procedural requirements.

- b. Reflect adequate and appropriate quality assurance requirements.
 - c. Include applicable regulatory, design basis, and related technical information, and that these requirements are correctly stated.
- 4.3.3 Procedures include provisions for analysis of exceptions requested or specified by the supplier, to assess potential impact of such exceptions on intent of the procurement documents or on quality of the service.

4.4 PROCUREMENT DOCUMENT CHANGES

Changes to procurement documents, other than minor changes as described in Section 6, receive the same degree of control as utilized for the original documents.

c. Instructions for Quality Assurance personnel

5.3 CHANGE CONTROL

All changes to instructions, procedures, plans, and drawings are required to be processed in accordance with approved procedures.

5.4 QUALITY ASSURANCE RECORDS

Controlled documents shall delineate those documents generated as a result of implementation or which are designated as Quality Assurance records.

SECTION 5

INSTRUCTIONS, PROCEDURES, PLANS AND DRAWINGS

5.0 GENERAL

RSN conducts quality affecting activities in accordance with approved procedures, instructions, plans, or drawings that are appropriate to the work or activity and are consistent with the requirements of the documents identified in Appendix A and this QAPD. They shall include or reference appropriate quantitative or qualitative acceptance criteria as required for determining that described activities have been satisfactorily accomplished.

5.1 PREPARATION, DISTRIBUTION, AND CONTROL

5.1.1 Instructions, procedures, plans, or drawings (as applicable) shall be prepared by either the RSN Yucca Mountain Project Line Organization or the Quality Assurance Organization, which ever is responsible for implementing the activity. Instructions, procedures, plans and drawings shall be available prior to the start of quality affecting activities.

5.1.2 These documents shall be reviewed, approved, distributed, and controlled as described in Section 6 of this document.

5.2 RESPONSIBILITY FOR DEVELOPMENT OF INSTRUCTIONS, PROCEDURES, PLANS AND DRAWINGS

Technical Project Officer has the responsibility for the development of the following documents:

- a. Project Procedures
- b. Software Quality Assurance Plans for the SCF
- c. Technical documents including drawings and specifications
- d. Instructions for Project personnel

The MQA/YMP has the responsibility for the development of the following documents:

- a. Quality Assurance Procedures
- b. The Quality Assurance Program Description

SECTION 6

DOCUMENT CONTROL

6.0 GENERAL

Procedures ensure that Program documents affecting quality are prepared, reviewed, approved, issued and revised in a prescribed and controlled manner.

This section describes provisions established to control the preparation, revision, review, approval, and issuance of documents affecting quality.

The documents which shall be controlled are only those documents which specify quality requirements or prescribe activities affecting quality such as instructions, procedures, plans and drawings.

6.1 RSN DOCUMENT CONTROL

6.1.1 Document Preparation, Review, Approval, and Revision

Documents that specify quality and/or technical requirements or prescribe activities affecting quality are prepared; reviewed for adequacy, completeness, and correctness prior to approval and issuance; approved; and issued and distributed and revised in accordance with written procedures. Procedures for preparation and revision of plans, manuals, procedures, instructions, and other documents address, as a minimum, the following requirements:

- a. Identification of the individuals or organizations responsible for the preparation, revision, review, approval, and release of the document. The QA organization reviews and where applicable, concurs with controlled documents that contain or implement quality assurance requirements.
- b. Review of documents affecting quality by individuals or organizational elements with responsibility for implementation to assure technical adequacy.
- c. Review of documents affecting quality by individuals other than the preparer of the document.

- d. Access by reviewing organizations to pertinent background data or information to assure a complete review.
- e. Resolution of review comments for which resolutions are considered mandatory by the reviewing organization, prior to approval and issuance of the document. Review comments and resolutions are to be documented and maintained in accordance with approved procedures.
- f. Independent review to assure technical adequacy including the correct translation of design requirements.

Changes to documents, other than those defined as minor changes, are considered major changes and shall be reviewed and approved by the same organizations that performed the original review and approval, unless other organizations are specifically designated by the organization responsible for the document.

Minor changes to documents, such as inconsequential editorial corrections or clarifications, are not subject to the same review and approval as the original documents. To avoid possible omission of a required review, the types of minor changes that are not subject to such review and approval, and the authority for such a decision, is clearly delineated in approved procedures.

6.1.2 Issuance and Distribution

Document issuance and distribution are controlled to ensure that correct, applicable, and current documents are available to the personnel performing prescribed activities, prior to commencing work and at the location where work is performed. Approved procedures delineate the responsibility and authority for such releases. Documents which require verification that are released prior to verification are identified as such and controlled and authorized for release by signature approval, with the described bases for release.

Document control procedures include the following provisions:

- a. Identification and marking of documents.
- b. Use of receipt acknowledgment document transmittal forms.
- c. Maintenance of controlled document distribution lists.
- d. Marking, removal, or destruction of obsolete or superseded controlled documents.

- e. Maintenance of an index (controlled document list) giving revision status for controlled documents.**
- 6.1.3 Controlled document recipients are responsible for acknowledging document receipt; ensuring that the latest authorized documents are available at the workplace; and that obsolete or superseded documents are so identified, destroyed, or returned.**

SECTION 7

CONTROL OF PURCHASED ITEMS AND SERVICES

7.0 GENERAL

Procedures, which comply with the requirements of the documents specified in Appendix A, ensure that purchased services are controlled in accordance with specified requirements. Services are procured through RSN. Items are procured through REECO or another procuring organization. The extent of RSN responsibility in procurement of items is described in DOE Administrative Procedures. Procedures describe RSN involvement in the procurement of items through REECO or another procuring organization.

7.1 RSN CONTROL OF PURCHASED SERVICES

Procedures are established to control purchased services. The system for control of purchased services includes:

a. **Procurement planning**

Procurement planning is accomplished and documented as early as practicable to provide appropriate interface compatibility and to ensure a systematic approach to the procurement process. Planning is performed to determine what is to be accomplished; how is it to be accomplished; when is it to be accomplished; and who is to accomplish it. Requirements for supplier quality assurance programs are specified in the solicitation package.

b. **Supplier selection**

For RSN Procurement Services the Program Support Manager is responsible for soliciting bids and awarding contracts. Source selection officials are responsible for evaluating bid offers and proposals.

Procurements are subject to the Federal Acquisition Regulations (FAR) and Department of Energy Acquisition Regulations (DEAR). Supplier's quality assurance programs are evaluated either before or after contract placement and any quality deficiencies are corrected prior to initiating quality-affecting work.

It is recognized that some of the research and analysis required for site characterization requires the services of specialists, or of institutions or agencies whose work does not

ordinarily involve formal quality assurance activities. In these instances, selection is based on technical capability, and establishment of quality assurance measures appropriate to the services to be performed at the outset of their work.

c. Bid Evaluation

The bid evaluation process determines the extent of the supplier's ability to meet the procurement document requirements. Based on the type of procurement, bid evaluations consider the following subjects:

- Technical considerations.
- Quality assurance requirements.
- Personnel of potential supplier.
- Past performance of potential supplier.

d. Supplier performance evaluation

Methods and criteria for evaluating supplier performance for RSN procurement activities are delineated in approved procedures.

Interfaces with the supplier are established as necessary to ensure that the performance measurement methods are appropriate, adequate, and understood by each involved organization. The methods used include establishment and evaluation of performance objectives; review of supplier's records and nonconformance controls; and performance of reviews, audits, and surveillances. This documentation is evaluated to determine the supplier's quality assurance program effectiveness.

e. Supplier generated document control

Supplier generated documents are submitted in accordance with the requirements delineated in the procurement documents. These documents are reviewed, and evaluated as necessary, to ensure conformance to the procurement requirements. As a minimum, RSN ensures the supplier provides documentation that identifies the procurement requirements met, as well as documentation identifying procurement requirements that have not been met.

f. Change control

Changes to procurement documents of purchased services are evaluated in the same manner and with the same criteria as the original procurement documents.

g. Acceptance of services

Services are accepted by one or more of the following methods:

1. Results of audits or surveillances, as appropriate.
2. Technical verification of data produced.
3. Review of objective evidence for conformance to the procurement document requirements.
4. Evaluation of suppliers certificates of conformance for services to ensure validity and documentation of results.

h. Control of Nonconformances

The disposition of services not meeting procurement document requirements are accomplished, through approved procedures. These procedures include provisions for: evaluation of the nonconforming condition; submittal of the nonconformance document to RSN by the supplier, as directed by RSN; RSN disposition of supplier's recommendation of corrective action; verification of the implementation of the disposition; and maintenance of supplier submitted nonconformance documents.

7.2 RSN CONTROL OF ITEMS

Procedures consistent with the DOE Administrative Procedures describe RSN interfaces and responsibilities in the Control of Items. The system for control of purchased items includes:

a. Procurement Planning

RSN prepares Technical Requirements Packages which establish the technical and quality assurance requirements for procurements. The packages consist of drawings and specifications, which are developed in accordance with Section 3.0 of this QAPD. The Technical Requirements Packages are reviewed for adequacy by Technical and Quality Assurance personnel and approved for release by the line organization.

b. Bid Evaluation

Technical and Quality Assurance personnel will evaluate proposals. If the selected proposal results in changes to the design documents, these will be controlled in accordance with Section 3.0 of the QAPD.

c. Supplier Selection

RSN will provide technical assistance to the procuring organization in the evaluation of supplier's facilities and capabilities.

d. Verification Activities

RSN will participate in verification activities at the supplier's facility to the extent specified in the Technical Requirements Package.

e. Supplier Submittals

Where required in the procurement documents, RSN will review and approve supplier submittals.

f. Nonconformances

RSN will review and approve Nonconformances to design documents. Changes to the design document will be controlled in accordance with Section 3.0 of this QAPD.

g. Changes

Changes to procurement documents shall be subject to the same degree of control as used in the preparation of the original document.

h. Receipt Inspection and Final Acceptance

When required in the procurement documents, RSN will conduct technical receipt inspection or post installation testing of items.

SECTION 8

IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, COMPONENTS, AND SAMPLES

8.0 GENERAL

RSN is not responsible for the identification and control of materials, parts, and components. RSN will specify requirements for identification and control of materials, parts, and components in design documents, where appropriate. RSN is responsible for the collection and testing of samples. Responsibilities for the collection of samples are defined in DOE Administrative Procedures. RSN will conduct tests on samples as required by the project participants. RSN procedures will provide for the following:

- a. Accountability of samples while in RSN possession, including auditable records of transfers of accountability between RSN and other participants.
- b. Traceability of samples to the applicable RSN documents, such as documentation which identifies the location, depth and other information requested by the Principle Investigator.

8.1 SAMPLE IDENTIFICATION

Samples will be identified by placing identification directly on the sample when possible, on the sample's containers, or on labels or tags attached to the samples or the sample's containers. Sample identification shall be verified prior to release for testing or analysis.

8.2 SAMPLE TRACEABILITY

Identification systems shall assure traceability of samples to the appropriate documentation such as drawings, specifications, purchase orders, technical reports, drilling location and logs, (including well bore and depth), test records, installation and use records, inspection documents, and nonconformance reports. Controls are established to preclude the inadvertent use of incorrect or defective samples. Traceability of samples from initial acquisition through final disposition is required. Measures shall be taken to preclude the use of samples that cannot be identified.

SECTION 9

CONTROL OF PROCESSES

9.0 GENERAL

Quality affecting processes in support of Engineered Items and Scientific Investigations shall be controlled in accordance with written procedures or instructions.

9.1 CONTROL OF SPECIAL PROCESSES

9.1.1 Scope of RSN Special Processes

Nondestructive Testing is the only special process that RSN performs.

9.1.2 Requirements for Special Processes

- 9.1.2.1 Special processes shall be controlled by instructions, procedures, drawings, checklists, travelers, or other appropriate means which shall ensure that process parameters, including acceptance criteria, are identified and controlled, and that special environmental conditions are maintained.
- 9.1.2.2 Personnel implementing these processes shall be appropriately indoctrinated and trained as required by Section 2 of this QAPD.
- 9.1.2.3 Special process procedures and personnel shall be qualified and/or certified in accordance with applicable codes, standards, and specifications, such as SNT-TC-1A, 1980, as appropriate. The qualification process shall utilize the actual working procedure where possible.
- 9.1.2.4 Special process equipment shall be checked out (e.g., calibrated, inspected, etc.), qualified, and certified in accordance with specified requirements. These requirements shall implement the requirements of applicable codes, standards, and specifications.

9.1.3 Quality Assurance Overview

As a minimum the quality assurance organization shall monitor the development and implementation of special process qualification activities through the conduct of audits and surveillances.

9.1.4 Evidence of Accomplishment of Special Processes

Provisions for recording evidence of acceptable accomplishment of special processes shall be established.

SECTION 10

INSPECTION

10.0 GENERAL

RSN is responsible for the inspection of facilities which it designs. The requirements of this section apply to engineered items and do not apply to scientific investigations. The MQA/YMP is responsible for the Title III Inspection of surface and subsurface facilities, and drilling activities. Inspections are conducted in accordance with procedures or instructions which meet the applicable requirements of the QARD. The inspection procedures and instructions shall meet the applicable portions of ASME NQA-1 Basic Requirement 10 and Supplement IOS-1 and the following:

10.1 INSPECTION PLANNING

Inspection planning shall provide:

- a. Criteria for determining when inspections of each work operation are to be conducted.
- b. Identification of required procedures, drawings, and specifications including revisions.
- c. Specification of necessary measuring and test equipment, including accuracy requirements.

Field Operations and Quality Assurance will develop inspection plans.

10.2 PERSONNEL QUALIFICATIONS

Personnel performing inspections shall be qualified in accordance with Section 2 of this QAPD including Supplement 2S-1 and Appendix 2A-1 of NQA-1. Inspection personnel shall not report directly to the immediate supervisors who are responsible for performing the work being inspected.

10.3 RECORDS

Inspection records shall include:

- a. Characteristics inspected and objective evidence of the results.

- b. Identification of the inspection criteria or reference documents used to determine acceptance.
- c. Identification of the measuring and test equipment used during the inspection.

SECTION 11

TEST CONTROL

11.0 GENERAL

This section applies to prototype, qualification, production, proof, construction, pre-operational, and operational tests performed by RSN in support of the project. Testing procedures and instructions shall comply with the applicable requirements of the documents specified in Appendix A of this QAPD.

11.1 GENERAL DISCUSSION

Tests required to verify conformance of an item to specified requirements and to demonstrate that items will perform satisfactorily in service will be planned and executed. Characteristics to be tested and test methods to be employed will be specified. The test procedures will be implemented by trained and appropriately qualified personnel in accordance with Section 2 of this QAPD including Supplement 2S-1 and Appendix 2A-1 of NQA-1.

11.2 TEST REQUIREMENTS

Test requirements and acceptance or rejection criteria, including required levels of precision and accuracy, will be provided or approved by the organization responsible for the design of the items to be tested, unless otherwise designated. Required tests, including, as appropriate, prototype qualification tests, production tests, proof tests prior to installation, construction tests, pre-operational tests, and operational tests will be controlled. Test requirements and acceptance or rejection criteria will be based upon specified requirements contained in applicable design or other pertinent technical documents.

11.3 TEST PROCEDURES

11.3.1 Test Instructions, Procedures and Drawings Instructions, procedures, and drawings for tests shall be prepared in accordance with the requirements of Section 5 of this document and Supplement 11S-1 of NQA-1. Test procedures or instructions shall contain criteria for determining when a test is required and how the test is performed. The determination of when a test is required is made by the organization requesting the test.

- 11.3.2 Test Prerequisites Test procedures shall include or reference test objectives and provisions for assuring that prerequisites for the given test have been met, that adequate instrumentation is available and used, that necessary monitoring is performed, and that suitable environmental conditions are maintained. Prerequisites shall include the following, as applicable: (1) calibrated instrumentation, (2) appropriate equipment, (3) completeness of item to be tested, (4) trained or appropriately qualified personnel, (5) condition of test equipment and the item to be tested, (6) suitable and controlled environmental conditions, and (7) provisions for data acquisition and storage.
- 11.3.3 Potential Sources of Error The potential sources of uncertainty and error in test procedures which must be controlled and measured to assure that tests are well controlled shall be identified.
- 11.3.4 Alternatives In lieu of specifically prepared written test procedures, appropriate sections of related documents, such as American Society for Testing and Materials (ASTM) methods, Supplier manuals, equipment maintenance instructions, or approved drawings or travelers with acceptance criteria, can be used. Such documents shall include adequate instructions to assure the required quality of work.

11.4 TEST RESULTS

Test results shall be documented and their conformance with acceptance criteria evaluated by a responsible authority to assure that test requirements have been satisfied.

11.5 TEST RECORDS

Test records shall, as a minimum, identify the following:

- Item tested
- Date of test
- Tester or data recorder identification
- Type of observation
- Results and acceptability
- Action taken in connection with any deviations noted
- Person evaluating results

- **Records of nonconformances**
- **Record of measuring and test equipment used for testing**

SECTION 12

CONTROL OF MEASURING AND TEST EQUIPMENT

12.0 GENERAL

This section establishes the RSN requirements for the control and use of Measuring and Test Equipment (M&TE). M&TE is controlled in accordance with the requirements of Appendix A of this QAPD.

Maintaining Accuracy of Equipment

Measures will be established to ensure that tools, gages, instruments, and other measuring and test equipment used in activities that affect quality are properly controlled, calibrated, and adjusted at specified periods to maintain accuracy within necessary limits.

12.1 PURPOSE OF EQUIPMENT

Measuring and test equipment are devices or systems used to measure, gage, test, or inspect either to control or to acquire data to verify conformance to a specified requirement, or to establish characteristics or values not previously known.

Specific requirements for control of measuring and test equipment are listed below:

12.1.1 Selection

Selection of measuring and test equipment will be controlled to assure that such equipment is of proper type, range, and accuracy to accomplish the function of determining conformance to specified tolerance requirements. Each device will have a unique identification number. This number will be recorded on the data sheet, log, etc., along with the measurement taken, to ensure traceability of the measurement to the device that was used to take the measurement.

12.1.2 Calibration

Measuring and test equipment will be calibrated against certified equipment having known valid relationships to the National Institute of Standards and Technology or other nationally recognized standards and will be calibrated, adjusted, and maintained at prescribed intervals. If no nationally recognized standards exist, the basis for calibration will be

documented. Calibrating standards should have equal or greater accuracy than equipment being calibrated. Calibrating standards with the same accuracy may be used if it can be shown to be adequate for the requirements and the basis of acceptance is documented and authorized by responsible management. The management authorized to perform this function shall be identified.

12.1.3 Control

The method and interval of calibration for each item will be defined, based on the type of equipment, stability characteristics, required accuracy, precision, intended use, degree of usage and other conditions that affect measurement control. Measuring and test equipment must be labeled, tagged, or otherwise documented in a fashion which indicates the due date of the next calibration and to provide traceability to calibration data. If measuring and test equipment is found to be out of calibration, an evaluation will be made and documented of the validity of previous results obtained and of the acceptability of items previously inspected, tested or data gathered since last calibration. Devices that are out of calibration will be tagged or segregated and will not be used until they have been recalibrated. If any measuring or test equipment is found to be out of calibration consistently, then it shall be repaired or replaced. A calibration will be performed when the accuracy of equipment is suspect.

12.1.4 Commercial Devices

Calibration and control measures are not required for rulers, tape measure, levels, and other devices, if normal commercial equipment provides adequate accuracy.

12.1.5 Handling and Storage

Measuring and test equipment will be handled and stored properly to maintain accuracy.

12.1.6 Records

Records will be maintained and equipment will be marked suitably to indicate calibration status. Calibration records will identify the calibration procedure (including revision) utilized to perform the calibration.

SECTION 13

HANDLING, STORAGE AND SHIPPING

13.0 GENERAL

RSN has the responsibility for handling, storage and shipping of equipment and of samples (during testing). RSN will meet the applicable requirements of the documents specified in Appendix A of this QAPD.

13.1 GENERAL REQUIREMENTS

Measures will be established to control the packaging, handling, storage, shipping, cleaning, and preservation of material and equipment to prevent damage, loss or deterioration. Handling, storage and shipping of items will be conducted in accordance with established work and inspection instructions, drawings, specifications, shipment instructions, or other pertinent documents or procedures specified for use in conducting the activity. Specific requirements are listed below.

13.1.1 General Equipment and Protective Environments

When required for particular items, special equipment (e.g., containers, shock absorbers, and accelerometers) and special protective environments (e.g., an inert gas atmosphere, specific moisture content levels, and temperature levels) shall be specified and provided, and their existence shall be verified.

13.1.2 Specific Procedures

When they are required for critical, sensitive, perishable, or exceptionally expensive articles, specific procedures for handling, storage, packaging, shipping, and preservation shall be used.

13.1.3 Inspection and Testing of Special Tools and Equipment

Special handling tools and equipment shall be utilized and controlled as necessary to ensure safe and adequate handling. Special handling tools and equipment shall be inspected and tested in accordance with procedures and at specified time intervals to verify that the tools and equipment are maintained adequately.

13.1.4 Operators of Special Equipment

Operators of special handling and lifting equipment shall be experienced or trained to use the equipment.

13.1.5 Marking and Labeling

Instructions for marking and labeling for packaging, shipment, handling, and storage of items shall be established as necessary to adequately identify, maintain, and preserve the item, including indication of the presence of special environments or the need for special controls.

13.2 GEOTECHNICAL SAMPLES

RSN is responsible for handling and shipping samples submitted to the materials testing laboratory for testing. RSN does not have responsibility for long-term storage of geotechnical samples.

13.2.1 Geotechnical Sample Handling and Shipping

Samples shall be controlled during handling and shipment to preclude damage or loss and minimize deterioration. Controls shall be established for appropriate packaging, handling, and modes of transportation, with consideration being given to type of containers, time constraints on perishable materials (that is, shelf life), and any other environmental or safety considerations applicable to the samples. Measures shall be taken to avoid sample contamination during handling and shipment. Where multiple organizations are involved, appropriate procedures shall describe interface and custody responsibilities. Sample identification shall be verified and maintained when samples are handled, transported, or transferred to RSN or from RSN to another organization.

SECTION 14

INSPECTION, TEST AND OPERATING STATUS

14.0 GENERAL

RSN is responsible for indicating the status of inspections and tests for which it has responsibility.

14.1 INDICATION OF STATUS

The requirements of this section apply to engineered items and do not apply to scientific investigations. The status of inspection and test activities will be identified either on the items or in documents traceable to the items where it is necessary to assure that required inspections and tests are performed and to assure that items which have not passed the required inspections and tests are not inadvertently installed, used, or operated.

14.2 METHODS OF INDICATING STATUS

Status will be maintained through indicators, such as physical location and tags, markings, travelers, stamps, inspection records, or the other suitable means in accordance with the applicable requirements of the documents specified in Appendix A of this QAPD. Procedures describing status indicators and their use will contain actual examples of each type indicator.

14.3 APPLICATION AND REMOVAL OF STATUS INDICATORS

The authority for application and removal of status indicating tags, markings, labels, and stamps will be specified in procedures.

SECTION 15

CONTROL OF NONCONFORMING ITEMS

15.0 GENERAL

Control of nonconforming items is in accordance with written procedures which are prepared and approved by the QA organization. These procedures describe the methods used to identify, document, track, segregate, review, disposition, and notify affected organizations of nonconforming or defective items.

Nonconforming items are those items (i.e., material, equipment, system, structure, or component) that do not comply with established requirements, such as in drawings, specifications, and procurement documents. The description of a nonconforming item is documented on a nonconformance report.

Personnel assigned approval authority for dispositions of nonconforming items are identified and the quality assurance organization responsibilities are described in these procedures.

Nonconforming items are evaluated to determine the degree of significance. If conditions are determined to be significant, by the criteria provided in Section 16, these conditions will be processed as significant conditions adverse to quality and documented in corrective action reports in accordance with Section 16.

15.1 IDENTIFICATION OF NONCONFORMING REPORTS

Nonconforming items are identified by marking, tagging, or other methods that do not adversely affect the end use of the item. Identification is legible, recognizable, and includes the nonconformance report number. When identification of each nonconforming item is not practical, the receptacle or segregated storage area is identified. The authority for application and removal of the nonconformance status indicator is specified in approved procedures.

NOTE: When items of nonconformances are identified by RSN personnel at subcontractors' facilities, these conditions are documented in accordance with QA program requirements and brought to the attention of that subcontractor.

Typically, use or installation of nonconforming items may not proceed until the nonconforming condition is dispositioned and the specified actions are completed. If only a specific part of the item is in

nonconformance, that specific part is identified and work may proceed on the remaining non-affected parts. In certain cases, it is anticipated that use or installation of nonconforming items will need to continue prior to implementation of the disposition. In such cases, the approval and justification for use or continuance of installation as delineated in approved procedures, are obtained.

15.2 SEGREGATION

Nonconforming items are segregated by placement in designated hold areas until dispositioned. When segregation is impractical, due to physical configuration, other precautions are employed to preclude inadvertent use.

15.3 DISPOSITION OF NONCONFORMING ITEMS

15.3.1 Control

Nonconformance characteristics are reviewed and subsequent dispositions of nonconforming items are proposed and approved in accordance with documented procedures. The processing, delivery, installation, or use of nonconforming items are controlled, pending evaluation and approved disposition, by authorized personnel. Nonconformance documentation is distributed to affected organizations.

15.3.2 Responsibility and Authority

The responsibility and authority for the evaluation and disposition of nonconforming items are procedurally defined.

15.3.3 Personnel

Individuals performing evaluations to determine a disposition have competence in the specific area being evaluated, a sufficient understanding of requirements, and access to pertinent background information to make a proper evaluation. The person or organization assigned the responsibility of Dispositioning the Nonconformance shall ensure the following:

- Nonconformance documentation adequately identifies and describes the Nonconformance.
- If a change to reflect the as-built condition is appropriate, then the Disposition addresses action to change the existing design documents, test plans or procedures, reports, etc. Any document change shall reference the NCR and shall also be cross-referenced on the Nonconformance Report.

- The signature of personnel or organizations authorized to approve the Disposition is documented.

15.4 DISPOSITION

The organization responsible for dispositioning the nonconforming item ensures that the disposition identifies and documents the correction as repair, rework, use-as-is, or reject. In the case of use-as-is or repair dispositions, technical justification is required. Nonconformances affecting design requirements are subject to the same design controls as those applied to the original design. The design documentation (i.e., as-built records), if required, are revised to reflect the accepted deviation.

15.5 REPAIRED OR REWORKED ITEMS

Repaired or reworked items are reexamined in accordance with the original acceptance criteria unless the disposition has established other acceptance criteria.

15.6 CORRECTIVE ACTION

The action to correct the nonconforming condition is verified and documented in a timely manner. The QA organization concurs with the corrective action to ensure applicable QA requirements are satisfied and verifies proper implementation and closeout of the corrective action by signatory concurrence on the nonconformance report.

SECTION 16

CORRECTIVE ACTION

16.0 GENERAL

Conditions adverse to quality are identified promptly, documented and corrected as soon as practical. Approved procedures which are reviewed and concurred with by the QA organization describe the methods used to identify, document, track, review, disposition, and notify affected organizations of conditions adverse to quality.

Examples of conditions adverse to quality are those programmatic deficiencies such as defective software, procedures, records, activities, or such actions which result in failure to comply with procedures, plans, and other established requirements. Items identified as nonconforming are identified and processed in accordance with Section 15.

16.1 IDENTIFICATION OF CONDITIONS ADVERSE TO QUALITY

Conditions adverse to quality are documented and the documented deficiency receives a unique report number.

16.2 EVALUATION

Conditions adverse to quality are evaluated to determine the degree of significance. If the condition is determined to be significant, it is identified and processed in accordance with the requirements of Corrective Action Report described in this Section.

16.3 CORRECTIVE ACTION

The QA organization concurs with the corrective action to assure QA requirements are satisfied.

16.4 CORRECTIVE ACTION COMPLETION

The QA organization follows up on the corrective action to verify proper implementation and to closeout the corrective action.

16.5 CORRECTIVE ACTION REPORT

A Corrective Action Report (CAR) is required for significant conditions, i.e., those determined to be repetitive in nature, or any condition adverse to quality that, were it to remain uncorrected, could adversely

affect safety or waste isolation. CARs will be promptly identified and corrected in accordance with written procedures. These procedures which are developed by the QA organization, describe the process by which CARs are identified and evaluated to determine cause, generic implications to the Program, corrective action, and action to preclude recurrence. Provisions for reporting CARs to the Project Office QA organization are also prescribed.

16.5.1 Corrective Action

CARs cited within RSN are reported to cognizant management and the Project Office QA organization. A corrective action report is issued for significant conditions adverse to quality. Deficiencies or Nonconformance Reports will be evaluated to determine whether these are significant conditions adverse to quality. If so, a CAR will be issued.

Cognizant managers are responsible for determining the cause of the condition, the generic implications to the Program, and the corrective action including the action to be taken to preclude repetition. The determinations made and corrective actions taken are documented and reported to the Project Office Director QA. The RSN QA organization is responsible for concurrence with the proposed corrective action, verification of the implementation, and closeout of the corrective action by signatory concurrence on the corrective action request.

16.6 CONTROL OF DEFICIENCIES

Methods and responsibilities for the analysis for trends; processing, control, and resolution of deficiencies (both items and conditions adverse to quality); and handling of significant conditions adverse to quality are established.

16.7 TREND ANALYSIS

Quality information, such as audit reports, surveillance reports, nonconformance reports, corrective action reports, and other deficiency documents, shall be analyzed to identify adverse quality trends and help identify root causes. Trend analysis shall be performed in a manner and at a frequency that shall provide for prompt identification of adverse quality trends. Quality trends shall be evaluated and the significant results reported to the organization responsible for corrective action and upper-management for review and assessment. Trend analysis shall be performed by the quality assurance organization.

SECTION 17

QUALITY ASSURANCE RECORDS

17.0 GENERAL

The Quality Assurance (QA) Records Program for RSN is accomplished in accordance with written procedures which comply with the requirements of the documents specified in Appendix A of this QAPD. These documents describe the integrated set of activities for creating, identifying, collecting, controlling, processing, organizing, distributing, temporary storing, preserving, retrieving, and disposing of RSN QA records. These documents identify responsibilities of the Quality Assurance organization and other organizations.

This section describes provisions established by RSN to implement QA Records program activities.

17.1 RSN QA RECORDS SYSTEM

RSN has established a Local Records Center (LRC) that serves as record collection center. RSN submits documents to the LRC for subsequent turnover to the Project Office Central Records Facility (CRF). The LRC is established in accordance with the applicable portions of YMP/88-15, Records Management Plan and is described and operated in accordance with approved procedures.

Controlled documents and technical baseline documents, as appropriate, specify records to be generated, supplied, or maintained.

17.2 RECORD DEFINITION

RSN Quality Assurance procedures and Project procedures define minimum QA records to be generated as a result of implementation. In general, the following documents are considered QA records:

- a. Individual documents that have been executed, completed, and approved that furnish evidence of the quality and completeness of data (including raw data) and activities affecting quality.
- b. Documents prepared and maintained to demonstrate implementation of quality assurance program requirements.
- c. Procurement documents subject to quality assurance controls.
- d. Other documents, such as procedures, plans, drawings,

correspondence, specifications, technical data, books, maps, papers, photographs, and data sheets subject to quality assurance controls.

- e. Other materials that provide data and document quality, regardless of physical form or characteristic including magnetic media.

A complete record is a document that will either receive no more entries or whose revision would normally consist of reissue of the document; and when applicable is signed and dated by the originator and by personnel authorized to approve the document, except as noted in 17.3 below.

17.3 RECORD GENERATION

Design specifications, procurement documents and other documents specify the QA records to be generated, supplied or maintained by suppliers, subcontractors and the construction contractor.

Documents designated to become records are to be legible, identifiable, accurate, complete, reproducible, microfilmable, and appropriate to the work accomplished. Documents are considered valid records only if stamped, initialed, or signed and dated by authorized personnel, or otherwise authenticated in accordance with approved procedures. These records may be originals or reproduced copies. Authentication may take the form of a statement by the responsible individual or organization. Handwritten signatures are not required if the document is clearly identified as a statement by the reporting individual or organization.

Complete records are suitably protected by the record initiator prior to turnover to the RC.

17.4 RECEIPT OF RECORDS

A receipt-control system is established at the RSN LRC that is structured to permit a current and accurate assessment of the status of records.

The LRC provides for protection from damage, deterioration, or loss, during the time that the records are in its possession.

17.5 RECORD IDENTIFICATION

Records or indexing systems provide sufficient information to permit identification between the record and its applicable items or activities.

The records are indexed and the indexing system or systems include the location of the record within the records system or systems.

17.6 RECORDS STORAGE AND RETRIEVAL

Records are controlled by RSN from time of completion until the time of submittal to the CRF. Records are controlled from when they are initiated to protect their integrity. Temporary storage, preservation, safekeeping, and retrievability of completed records is performed in accordance with requirements applicable to the storage of records delineated in the QARD.

17.7 RECORDS CLASSIFICATION

All RSN quality assurance records are classified as lifetime records.

17.8 CORRECTED RECORDS

Records are corrected in accordance with approved procedures. These procedures provide for review or approval by the record-originating organization. Corrections to records include dates and identifications of the persons authorized to make such corrections.

SECTION 18

AUDITS

18.0 GENERAL

This section describes provisions for implementing the quality assurance audit program.

18.1 AUDIT PROGRAM IMPLEMENTATION

Procedures describe the methods and responsibilities applicable to audit activities to determine compliance with requirements and to assess programmatic compliance and implementation effectiveness of the RSN Quality Assurance Program. The audit program includes technical and programmatic verifications.

The MQA/YMP is responsible for the development, implementation, and maintenance of the RSN audit program in accordance with the requirements of the documents specified in Appendix A. The RSN QA organization plans and conducts audits of the RSN activities as well as activities performed by subcontractors.

18.1.1 Audit Process

Procedures for audit activities address accomplishment of the planning and scheduling of audit activities to ensure that Program-deliverable products and processes are evaluated commensurate with importance in achieving defined objectives and schedule completion dates assigned to the products or processes. Internal audits are scheduled to ensure that all applicable elements of the QA program are audited at least once a year.

18.2 AUDIT SCHEDULING

Quality Assurance develops, maintains, and implements an audit schedule for RSN that covers applicable quality assurance program elements.

After award of a subcontract by RSN, a determination of whether an external audit is required is made based on the criteria of the QARD. External audits are scheduled as appropriate.

Suppliers' quality assurance programs are evaluated on at least an annual basis. Supplier audits are performed on a triennial basis, unless the annual evaluation indicates the need for an audit prior to

the end of a triennial period. The need for audit of a supplier is also evaluated when major changes to contract scope or work methodology occurs. Pre-award surveys may serve as the first audit, if the scope and conduct of the pre-award survey addresses contract requirements.

18.3 AUDIT TEAMS

Audit team leaders are required to be certified lead auditors in accordance with the requirements of procedures which meet the QARD.

Members of the audit team are independent with respect to activities they will audit (i.e., no audit team member audits an activity for which they have no direct responsible). Management personnel of audited activities are prohibited from participating in the selection of audit team members who will audit their activities.

Audit team members, collectively, have the necessary programmatic and technical expertise in the work being audited, by virtue of prior experience and/or specific, documented orientation or training.

Audit teams normally include members from appropriate technical disciplines, who will verify adequacy of technical processes employed to ensure the validity and correctness of technical work.

The Auditor and Lead Auditor training and qualification program is administered by the QA organization. Lead Auditors are certified in accordance with this program.

18.4 AUDIT PREPARATION

As a minimum, preparation for individual audits includes: preparation of an audit plan and an audit checklist or procedure; study of auditee procedures applicable to the activities to be audited; evaluation of relevant surveillance results; results of previous audits of the same activities; relevant corrective action history; review of trend data; and review of the current status of the work.

The scope of each audit is based on an evaluation of the activities to be audited. The evaluation considers:

- a. Results of previous audits.
- b. Impact of significant changes in personnel, organization, or quality assurance program.

The scope of an audit may include verification of product quality and technical adequacy of work being done, as well as programmatic compliance and implementation effectiveness. Attributes are selected for

verification from the governing procedures and technical requirements documents and are included in audit checklists.

18.5 AUDIT PERFORMANCE

Audits shall be performed in accordance with written procedures or checklists. Audit team members regularly communicate the status of assigned activities, as well as problems and potential problems to the audit team leader. The audit team leader ensures problems that require immediate attention are relayed to the audited organization's representatives in a timely manner. Regular discussions with the audited organization's representatives are held to provide the status of audit activities and promote effective communications between auditor and auditee. Audit performance includes documentation of the evidence examined and conditions observed, so that a sound basis exists for reported conclusions.

Results of the audit are presented to the audited organization's representatives by the audit team leader (and team members) in a post audit conference.

18.6 AUDIT REPORTING

The audit report includes the following information, as appropriate:

- a. A description of the audit scope.
- b. Identification of audit team members.
- c. Identification of personnel contacted during audit.
- d. A summary of audit results, including a statement describing the effectiveness of the quality elements audited.
- e. A clear description of each audit finding that will allow the audited organization to understand the finding and take corrective action.

The audit report is signed by the audit team leader prior to transmittal and distribution. The audit report is issued to the audited organization for appropriate action. Copies of the audit report are also distributed to other affected organizations as well as the management of the auditing organization. Deficiencies require responses from the designated representative(s) of the affected organization, with specified action dates.

18.7 FOLLOW UP ACTION

Management of the audited organization investigates audit findings, schedules corrective action, and notifies the auditing organization in writing of actions planned or taken.

Management of the cognizant organizational elements of the auditing organization, including QA and the audit team leader, review the audit response to determine:

- a. Adequacy of cause determinations.
- b. Acceptability of commitments for correcting the deficient (and similar) conditions (past and present).
- c. Acceptability of committed actions to preclude recurrence of the deficient conditions, and of the schedule for completing such actions.
- d. Adequacy of the evaluation of impact of the deficient work performed and the generic implications on the Program.
- e. Appropriateness of corrective action responsibility assignments.

Follow-up is performed by the auditing organization, to verify satisfactory implementation of corrective and preventive actions taken to resolve audit findings. Verification of corrective and preventive action implementation is documented to support close-out of findings.

SECTION 19

COMPUTER SOFTWARE

19.0 GENERAL

RSN will comply with the requirements of Section 19 of DOE/RW-0214.

19.1 SOFTWARE DEVELOPED FOR THE IDS BY RAYTHEON MISSILE SYSTEMS DIVISION

RSN is responsible for developing a software product which implements the applicable design requirements contained within the LANL Functional Requirements Document and complies with the quality provisions specified in Section 19 of the QARD (DOE/RW-0214). RSN will generate a Software Development Plan (SDP), a Software Quality Assurance Plan (SQAP) and a Systems/Interface Requirements Document (SIRD) for the IDS. RSN will review these documents to ensure compliance with Section 19 of the QARD. These documents will be provided to LANL for approval prior to the initiation of any quality-affecting software activities. ~~The development process and resulting software products will be consistent with the established methods, procedures and standards in place at Raytheon Missile Systems Division. Any tailoring required to this process, due to Yucca Mountain Project specific requirements, will be detailed within the SDP which is subject to LANL approval.~~ All software for the IDS including new development, previously developed software, modified software, or third party software will be addressed within the SDP and SQAP.

19.2 RSN USE OF EXISTING SOFTWARE IN THE DESIGN OF THE SCF FOR YMP

A separate software quality assurance plan will be developed to describe the use of existing software in the design of SCF based on the applicable requirements of Section 19 of the QARD. Procedures will be developed to describe how this will be accomplished. This software quality assurance plan will be submitted to DOE for approval prior to the initiation of any quality-affecting software activities.

19.3 ADDITIONAL SOFTWARE APPLICATIONS

If additional software which falls outside the scope of Sections 19.1 and 19.2 is developed or used by RSN, software quality assurance plans will be developed and submitted to DOE or the cognizant organization for review and approval prior to the initiation of any quality-affecting software activities.

SECTION 20

SCIENTIFIC INVESTIGATIONS

20.0 GENERAL

RSN participation in Scientific Investigations is limited. RSN performs a support function for the Principal Investigators (PIs). RSN prepares plans for specific investigations from criteria supplied by the PI with the approval of the Project Office. These plans are known as drilling programs or mining programs. These programs contain a description of the work to be performed, and the equipment required to perform the work. RSN also supplies personnel to work under the direction of PI personnel. RSN may also provide the services of support subcontractors when directed by the PI.

Document	Rev/Issue Date
8. "OCRWM Quality Assurance Requirements Document" (QARD) Appendix A - Amplifications of Quality Assurance Program Requirements for the Mined Geologic Disposal Systems (MGDS) and Appendix E, "Glossary" (DOE/RW-0214).	Current
9. YMP Administrative Procedures Manual (YMP/APM-1). See implementing procedures for specific applicability.	Current
10. YMP/88-15, Records Management Plan.	Current
11. SNT-TC-1A, American Society of Non-destructive Testing Recommend Practice.	June, 1980

APPENDIX A

RSN QA PROGRAM BASIS

This document contains the program requirements for the RSN Quality Assurance Program. The regulations, NUREGs, and NRC and OCRWM QA related documents and the leading industry standard NQA-1 as listed below represent the basis for the RSN QA Program. These basis documents are implemented by this QAPD and related procedures.

Document		Rev/Issue Date
1.	10 CFR 60, "Disposal of High-Level Nuclear Waste in Geologic Repositories" Subpart G, "Quality Assurance."	Current
2.	10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plant and Fuel Reprocessing Plants."	Current
3.	"NRC Review Plan for High-Level Waste Repository Quality Assurance Program Descriptions".	Rev. 2
4.	NUREG - 1318, Technical Position on Items and Activities in the High-Level Waste Geologic Repository Program Subject to Quality Assurance Requirements.	April 1988
5.	NUREG - 1297, "Peer Review for High-Level Nuclear Waste Repositories."	February 1988
6.	NUREG - 1298, "Qualification of Existing Data for High-Level Nuclear Waste Repositories."	February 1988
7.	ASME NQA-1, "Quality Assurance Program Requirements for Nuclear Facilities" including the amplifications identified in Sections 1 through 19 and Appendix A of the QARD.	1989 Edition

Document

Rev/Issue Date

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QAP-1.1(Y)	1	Organization		06-25-91
		<u>SECTION 2 - QUALITY ASSURANCE PROGRAM</u>		
QAP-2.1(Y)		Development of the Quality Assurance Program Description	0	02-22-91
QAP-2.1(Y)	1	Development of the Quality Assurance Program Description		05-10-91
QAP-2.2(Y)		Training and Indoctrination of Quality Assurance Personnel	0	02-22-91
QAP-2.2(Y)	1	Training and Indoctrination of Quality Assurance Personnel		06-25-91
QAP-2.3(Y)		Qualification of Audit Personnel	0	02-22-91
QAP-2.4(Y)		Stop Work Order	0	02-22-91
QAP-2.6(Y)		Training Qualification and Certification of QC Inspection Personnel	0	04-05-91
		<u>SECTION 3 - DESIGN CONTROL</u>		
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QAP-3.1(Y)	1	QA Review of Design Output Documents		04-05-91
		<u>SECTION 4 - PROCUREMENT DOCUMENT CONTROL</u>		
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		<u>SECTION 5 - INSTRUCTIONS, PROCEDURES, PLANS AND DRAWINGS</u>		
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QAP-6.2(Y)		Review of Documents	0	02-22-91
		<u>SECTION 7 - CONTROL OF PURCHASED ITEMS AND SERVICES</u>		
QAP-7.1(Y)		Supplier Selection	0	02-22-91
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QAP-7.1(Y)	2	Supplier Selection		05-09-91
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		<u>SECTION 15 - CONTROL OF NONCONFORMING ITEMS</u>		
QAP-15.1(Y)		Control of Nonconforming Items	0	04-05-91
		<u>SECTION 16 - CORRECTIVE ACTION</u>		
QAP-16.1(Y)		Deficiency Reporting	0	02-22-91
QAP-16.2(Y)		Corrective Action	0	02-22-91
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		<u>SECTION 17 - QUALITY ASSURANCE RECORDS</u>		
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		<u>SECTION 19 - COMPUTER SOFTWARE</u>		
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OCRWM AUDIT CHECKLIST NO. _____

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3 AUDIT ITEM NO.	4 QUALITY REQUIREMENT REFERENCE(S)	5 QUALITY REQUIREMENT/GUIDELINE	6 RESULTS S,X,N/A	7 SUMMARY OF INVESTIGATION	8 PERSON CONTACTED
				9 AUDITOR SIGNATURE 10 DATE	

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1 ORGANIZATION

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WASHINGTON, D.C.

¹⁴ CAR NO. _____
DATE: _____
SHEET: _____ OF _____
QA
WBS NO.: _____

CORRECTIVE ACTION REQUEST

¹ Controlling Document ² Related Report No.

³ Responsible Organization ⁴ Discussed With

¹⁰ Response Due ¹¹ Responsibility for Corrective Action ¹² Stop Work Order Y or N

⁵ Requirement:

⁶ Adverse Condition:

⁷ Recommended Action(s):

⁸ Initiator Date: ⁹ Severity Level -
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OQA _____

¹⁵ Verification of Corrective Action:

¹⁶ Corrective Action Completed and Accepted: ¹⁷ Closure Approved By:
QAR _____ Date _____ OQA _____

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¹⁵ Verification of Corrective Action:

¹⁶ Corrective Action Completed and Accepted:

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¹⁷ Closure Approved By:

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SHEET: _____ OF _____

CORRECTIVE ACTION REQUEST
(continuation sheet)

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW		Date: _____
1	Audit Team Member:	
Requested Start Time:		Expected End Time:
Person(s) To Be Interviewed:		
Subject:		
2	Audit Team Member:	
Requested Start Time:		Expected End Time:
Person(s) To Be Interviewed:		
Subject:		
3	Audit Team Member:	
Requested Start Time:		Expected End Time:
Person(s) To Be Interviewed:		
Subject:		
4	Audit Team Member:	
Requested Start Time:		Expected End Time:
Person(s) To Be Interviewed:		
Subject:		
5	Audit Team Member:	
Requested Start Time:		Expected End Time:
Person(s) To Be Interviewed:		
Subject:		

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

INFORMAL REQUEST FOR INTERVIEW

Date: _____

1 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

2 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

3 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

4 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

5 Audit Team Member:

Requested Start Time:

Expected End Time:

Person(s) To Be Interviewed:

Subject:

**YUCCA MOUNTAIN PROJECT
AUDIT OBSERVER INQUIRY**

N-QA-084
4/89

Audit No. _____

Log No. _____

Name _____ Organization _____

YMP Requirement Reference _____

Question/Concern _____

Response _____

Observer's Acknowledgement

Cleared for Submittal to YMP Participant

Lead Auditor / Lead Technical Specialist

☐ *Incorporated in YMP Audit Checklist...Ref*

Audit Team Leader

**YUCCA MOUNTAIN PROJECT
AUDIT OBSERVER INQUIRY**

N-QA-084
4/89

Audit No. _____

Log No. _____

Name _____ Organization _____

YMP Requirement Reference _____

Question/Concern _____

Response _____

Observer's Acknowledgement

Cleared for Submittal to YMP Participant

Lead Auditor / Lead Technical Specialist

☐ Incorporated in YMP Audit Checklist...Ref _____

Audit Team Leader



Department of Energy
Yucca Mountain Project Office
P. O. Box 98608
Las Vegas, NV 89193-8608

QA RECEIVED

WBS 1. AUG 16 1990
QA

AUG 14 1990

Joseph C. Calovini
Technical Project Officer
for Yucca Mountain Project
Holmes & Narver, Inc.
101 Convention Center Drive
Phase II, Suite P-280
Las Vegas, NV 89109

YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) QUALITY ASSURANCE (QA) AUDIT
90-06 OF HOLMES & NARVER, INC. (H&N), SUPPORT OF THE YUCCA MOUNTAIN PROJECT

Enclosed is the report of QA Audit 90-06, which was conducted by the Project
Office at the H&N facilities in Las Vegas, Nevada, and at the Nevada Test Site
in Mercury, Nevada, from July 31 through August 2, 1990.

There were no Standard Deficiency Reports or observations identified by the
audit team.

If you have any questions, please contact either James Blaylock at 794-7913 or
Frank J. Kratzinger at 794-7163 of the Yucca Mountain Project QA staff.

Donald G. Horton
Donald G. Horton, Director
Quality Assurance
Yucca Mountain Project Office

QA:JB-4488

Enclosure:
Audit Report 90-06

AUG 14 1990

cc w/encl:

D. E. Shelor, HQ (RM-30) FORS
J. W. Gilray, NRC, Las Vegas, NV
K. R. Hooks, NRC, Washington, DC
T. L. Verma, NRC, Washington, DC
R. R. Loux, NWPO, Carson City, NV
Englebrecht Tiesenhausen, Clark County, Las Vegas, NV
Steve Bradhurst, Nye County, NV
M. J. Regenda, FSN, Las Vegas, NV
C. O. Wright, H&N, Las Vegas, NV
H. P. Nunes, LANL, Los Alamos, NM
D. W. Short, LLNL, Livermore, CA
C. C. Warren, MACTEC, Las Vegas, NV, 402
M. A. Fox, REECO, Las Vegas, NV
R. R. Richards, SNL, 6310, Albuquerque, NM
N. D. Cox, SAIC, Las Vegas, NV, 517/T-06
J. B. Harper, SAIC, Las Vegas, NV, 517/T-38
F. J. Kratzinger, SAIC, Las Vegas, NV, 517/T-06
J. S. Martin, SAIC, Las Vegas, NV, 517/T-06
S. P. Nolan, SAIC, Las Vegas, NV, 517/T-22
C. H. Prater, SAIC, Las Vegas, NV, 517/T-06
R. L. Weeks, SAIC, Las Vegas, NV, 517/T-06
D. H. Appel, USGS, Denver, CO

PROJECT OFFICE QUALITY ASSURANCE AUDIT REPORT FOR

THE YUCCA MOUNTAIN PROJECT OFFICE AUDIT OF

HOLMES & NARVER, INC.

AUDIT NUMBER 90-06

CONDUCTED JULY 31 - AUGUST 2, 1990

Prepared by:

Frank J. Frattinetti
Frank J. Frattinetti
Audit Team Leader

Date:

8/9/90

Approved by:

for Donald G. Horton
Donald G. Horton, Director
Quality Assurance
Yucca Mountain Project Office

Date:

8-9-90

ENCLOSURE

EXECUTIVE SUMMARY

This was a limited scope audit of Holmes & Narver, Inc. (H&N) activities associated with the following criteria:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 8.0 Identification and Control of Items, Samples, and Data
- 12.0 Control of Measuring and Test Equipment
- 13.0 Handling, Shipping, and Storage
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

The activities audited for implementation of the requirements for Criteria 1, 12, 16, 17, and 18 were found to be satisfactory and effectively implemented by H&N.

The activities audited for implementation of the requirements for Criterion 2 were found to be satisfactory and effectively implemented in the areas of selection, indoctrination, and training of personnel and the procedures for maintaining records of personnel qualification evaluations, indoctrination, training, and proficiency evaluation. However, the implementation of the procedures for Management Assessment and Readiness Review was marginally effective. In the case of the Management Assessment (MAP-H&N-89-01) it was found that one committee member, out of a total of eight, was not appointed by a letter from the Technical Project Officer. In addition, it was uncertain whether the report was issued within the specified time period. In the case of the Readiness Review (RR-H&N-89-01) there was inattention to detail in that: (1) several approval signatures were missing, and (2) two identical checklists in the design area were evaluated by two different people with no evidence as to how the differences in comments were resolved (Procedure YMP-280 allows the Team Chairperson to submit the final record).

Criteria 8 and 13 could not be evaluated for effectiveness, since no QA Level I or II work has been performed by H&N.

1.0 INTRODUCTION

This report contains the results of a Quality Assurance (QA) limited scope audit of Yucca Mountain Project Office (Project Office) activities performed by Holmes & Narver, Inc. (H&N). The audit was conducted at the H&N facilities in Las Vegas, Nevada and the Nevada Test Site, in Mercury, Nevada on July 31 through August 2, 1990. The audit was conducted in accordance with the requirements of QMP-18-01, Revision 3, "Audit System for the Waste Management Project Office." The QA program requirements to be verified were taken from the Project Office Quality Assurance Plan (YMP/88-9), Revision 4.

2.0 AUDIT SCOPE

The following program elements were audited to assess compliance with the H&N Quality Assurance Program Plan (QAPP), Revision 4, and to verify the implementation of the QA program as it relates to the Yucca Mountain Project:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 8.0 Identification and Control of Items, Samples, and Data
- 12.0 Control of Measuring and Test Equipment
- 13.0 Handling, Shipping and Storage
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

3.0 AUDIT TEAM PERSONNEL

The Audit Team consisted of the following personnel:

<u>Responsibility</u>	<u>Individual</u>
Audit Team Leader	Frank J. Kratzinger
Auditors	Neil D. Cox Charles C. Warren Richard L. Weeks
Auditors-in-Training	Don Hendrix John S. Martin Steve P. Nolan
Observer, NRC	Tilak L. Verma

4.0 SUMMARY OF AUDIT RESULTS

4.1 Statement of Program Effectiveness

The following is the Audit Team's summation of the effectiveness of the criteria audited. This summation is the result of measuring the implementation of the H&N Yucca Mountain Project procedures.

The activities audited for implementation of the requirements for Criteria 1, 12, 16, 17 and 18 were found to be satisfactory and effectively implemented by H&N.

The activities audited for implementation of the requirements for Criterion 2 were found to be satisfactory and effectively implemented in the areas of selection, indoctrination, and training of personnel and the procedures for maintaining records of personnel qualification evaluations, indoctrination, training, and proficiency evaluation. However, the implementation of the procedures for Management Assessment and Readiness Review was marginally effective. In the case of the Management Assessment (MAP-H&N-89-01) it was found that one committee member, out of a total of eight, was not appointed by a letter from the Technical Project Officer (TPO). In addition, it was uncertain whether the report was issued within the specified time period. In the case of the Readiness Review (RR-H&N-89-01) there was inattention to detail in that: (1) several approval signatures were missing, and (2) two identical checklists in the design area were evaluated by two different people with no evidence as to how the differences in comments were resolved (Procedure YMP-280 allows the Team Chairperson to submit the final record).

Criteria 8 and 13 could not be evaluated for effectiveness, since no QA Level I or II work has been performed by H&N.

4.2 Summary of Technical Activities

There were no technical activities conducted since the last audit.

4.3 Summary of Findings

There were no findings generated during this audit.

5.0 AUDIT MEETINGS

5.1 Preaudit Conference

A preaudit conference was held with the H&N TPO and his staff at 10:00 a.m. on July 31, 1990. The audit scope and proposed agenda for the audit were presented and the Audit Team was introduced. A list of the attendees for this meeting is provided in Enclosure 1 to this report.

5.2 Personnel Contacted During the Audit

See Enclosure 1.

5.3 Postaudit Conference

The postaudit conference was held at 1:00 p.m. on August 2, 1990. The results of the audit were presented to the TPO and his staff. A list of the attendees for this meeting is provided in Enclosure 1 to this report.

6.0 SYNOPSIS OF STANDARD DEFICIENCY REPORTS AND OBSERVATIONS

There were no Standard Deficiency Reports or Observations generated during this audit.

7.0 RECOMMENDED ACTION

The following actions are recommended:

1. A letter should be written by the TPO confirming the appointment of the Management Assessment Committee member whose letter was missing from the record.
2. Required approval signatures should be obtained for the Readiness Review.
3. Documented evidence should be obtained to demonstrate the resolution of comments for the checklists identified for the Readiness Review.

ENCLOSURE 1

H&N AUDIT 90-06
PERSONNEL CONTACTED

NAME	ORGANIZATION	TITLE	CONTACTED		
			PRE-AUDIT	DURING AUDIT	POST-AUDIT
Calovini, Joseph C.	H&N	TPO	X	X	X
Cox, Neil D.	SAIC	Auditor	X	X	X
DeKlever, Richard C.	H&N	Sr. Eng. II	X	X	X
Diaz, Mario R.	YMP	Project Office QA	X		X
Hendrix, Don	CER	Auditor-in-Training	X	X	X
Kratzinger, Frank J.	SAIC	Audit Team Leader	X	X	X
Martin, John S.	SAIC	Auditor-in-Training	X	X	X
McDaniel, Gary R.	H&N	Admin. Sect. Chief	X	X	X
McNeely, John E.	H&N	Resident Engr. F.E.O.	X	X	
Moore, Sandra L.	H&N	Sr. Micro Oper. II		X	
Mouser, Evert R.	H&N	PE	X	X	
Musick, Ralph G.	H&N	PE	X		X
Nolan, Steve P.	SAIC	Auditor-in-Training	X	X	X
O'Donnell, Annice C.	H&N	Training Coordinator		X	
Patel, Bob K.	H&N	MTL Chief		X	
Sabol, Ronald P.	H&N	Sr. Proj. Eng. QA	X	X	
Schreiner, Randolph L.	H&N	System Sect. Chief	X	X	X
Smith, Twyla D.	H&N	Records Coordinator-Lead		X	
Tuthill, Harry R.	H&N	QA Supervisor	X	X	X
Verma, Tilak R.	NRC	Observer	X	X	X
Warren, Charles C.	MACTEC	Auditor	X	X	X
Weeks, Richard L.	SAIC	Auditor	X	X	X
Wright, Carl O.	H&N	Manager QA			X



Department of Energy

Yucca Mountain Project Office
P. O. Box 98608
Las Vegas, NV 89193-8608

WBS 1.2.9.3
QA

OCT 11 1990

Richard L. Bullock
Technical Project Officer
for Yucca Mountain Project
Fenix and Scisson of Nevada
101 Convention Center Drive
Phase II, Suite P-250
M/S 403
Las Vegas, NV 89109

YUCCA MOUNTAIN PROJECT OFFICE (PROJECT OFFICE) QUALITY ASSURANCE (QA) AUDIT
90-7 OF FENIX AND SCISSON OF NEVADA (FSN) SUPPORT OF THE PROJECT OFFICE
(NN1-1991-0061)

Enclosed is the report of QA Audit 90-07, which was conducted by the Project Office at the FSN facilities in Las Vegas, Nevada, during the period of September 25-28, 1990.

During the course of the audit, the audit team generated four observations. Responses to the observations are due within 20 working days of the date of this letter.

Please address your responses to me and concurrently send the original of each observation response to Nita J. Brogan, Science Applications International Corporation, Las Vegas, Nevada.

The subject audit is considered complete as of the date of this letter. If you have any questions, please contact either James Blaylock at 794-7913 or Frank J. Kratzinger at 794-7163 of the Project Office QA staff.

Donald G. Horton, Director
Quality Assurance
Yucca Mountain Project Office

QA:JB-188

Enclosures:

1. Audit Report 90-07
2. Observations 90-07-01
through -04

OCT 11 1990

Thomas L. Bullock

-2-

cc w/encs:

D. G. Horton, HQ (RW-3) FORS
Robert Clark, HQ (RW-3) FORS
D. E. Shelor, HQ, (RW-30) FORS
J. W. Gilray, NRC, Las Vegas, NV
K. R. Hooks, NRC, Washington, DC
R. R. Loux, NWPO, Carson City, NV
S. W. Zimmerman, NWPO, Carson City, NV
E. V. Tiesenhausen, Clark County, Las Vegas, NV
S. T. Bradhurst, Nye County, Las Vegas, NV
C. G. Walenga, CER, Arlington, VA
C. O. Wright, H&N, Las Vegas, NV
M. J. Regenda, FSN, Las Vegas, NV
D. J. Tunney, FSN, Las Vegas, NV
H. P. Nunes, LANL, Los Alamos, NM
D. W. Short, LLNL, Livermore, CA
M. A. Fox, REEC, Las Vegas, NV
R. R. Richards, SNL, 6310, Albuquerque, NM
N. J. Brogan, SAIC, Las Vegas, NV, 517/T-08
C. H. Prater, SAIC, Las Vegas, NV, 517/T-08
D. H. Appel, USGS, Denver, CO

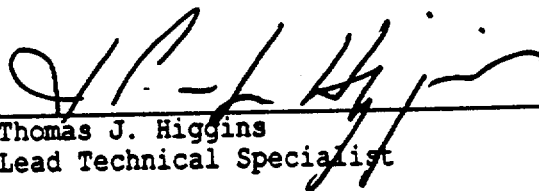
PROJECT OFFICE QUALITY ASSURANCE AUDIT REPORT FOR

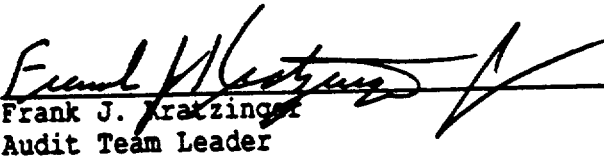
THE YUCCA MOUNTAIN PROJECT OFFICE AUDIT OF

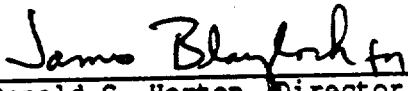
FENIX & SCISSON OF NEVADA

AUDIT NUMBER 90-07

CONDUCTED SEPTEMBER 25 - 28, 1990

Prepared by:  Date: 10/4/90
Thomas J. Higgins
Lead Technical Specialist

Prepared by:  Date: 10/4/90
Frank J. Grazzinger
Audit Team Leader

Approved by:  Date: 10/9/90
Donald G. Horton, Director
Quality Assurance
Yucca Mountain Project Office

EXECUTIVE SUMMARY

The Yucca Mountain Project Office (Project Office) Quality Assurance (QA) conducted a limited scope audit of Fenix & Scisson of Nevada (FSN) activities associated with the following criteria:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation Control and Design Control
- 5.0 Instructions, Procedures, Plans, and Drawings
- 6.0 Document Control
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

The activities audited for the above criteria (except Software QA) were all in compliance with the procedural requirements and appear to be effectively implemented.

All QA controls on Software Quality Assurance (SQA) have been approved by FSN and training has been accomplished to an adequate extent. However, there has been no effort, up to the time of this audit, to apply these controls to actual software items. Consequently, nothing can be said about the effectiveness of the SQA program. The Project Office's exception to the FSN QA Program in 1989, as a result of the lack of a SQA Program, cannot yet be removed, since the quality of this incipient SQA Program is indeterminate.

1.0 INTRODUCTION

This report contains the results of a Quality Assurance (QA) limited scope audit of Yucca Mountain Project Office (Project Office) activities performed by Fenix & Scisson of Nevada (FSN). The audit was conducted at the FSN facilities in Las Vegas, Nevada on September 25 - 28, 1990. The audit was conducted in accordance with the requirements of QMP-18-01, Revision 3, "Audit System for the Waste Management Project Office." The QA program requirements to be verified were taken from the FSN Quality Assurance Program Plan (QAPP), Revision 6.

2.0 AUDIT SCOPE

The following program elements were audited to assess compliance with the FSN QAPP, Revision 6, and to verify the implementation of the QA program as it relates to the Yucca Mountain Project:

- 1.0 Organization
- 2.0 Quality Assurance Program
- 3.0 Scientific Investigation Control and Design Control
- 5.0 Instructions, Procedures, Plans, and Drawings
- 6.0 Document Control
- 16.0 Corrective Action
- 17.0 Quality Assurance Records
- 18.0 Audits

3.0 AUDIT TEAM PERSONNEL

The Audit Team consisted of the following personnel:

<u>Responsibility</u>	<u>Individual</u>
Audit Team Leader	Frank J. Kratzinger
Auditors	Edward A. Cocoros Neil D. Cox Robert H. Klemens Kenneth T. McFall Richard L. Weeks
Auditors-in-Training	Cynthia H. Prater Craig G. Walenga
Lead Technical Specialist	Thomas J. Higgins
Technical Specialist	Edward M. Cikanek

Observers

James Conway
U.S. Nuclear Regulatory Commission (NRC)

John Buckley
NRC

Bruce Mabrito
NRC

Susan W. Zimmerman
State of Nevada

Englebrecht Von Tiesenhausen
Clark County, Nevada

4.0 SUMMARY OF AUDIT RESULTS

4.1 Statement of Program Effectiveness

The following is the Audit Team's summation of the effectiveness of the criteria audited. This summation is the result of measuring the implementation of the FSN Yucca Mountain Project procedures.

The activities audited for all the criteria reviewed (except Software QA) were in compliance with the procedural requirements and appear to be effectively implemented.

All QA controls on Software Quality Assurance (SQA) have been approved by FSN and training has been accomplished to an adequate extent. However, there has been no effort, up to the time of this audit, to apply these controls to actual software items. Consequently, nothing can be said about the effectiveness of the SQA program. The Project Office's exception to the FSN QA Program in 1989, as a result of the lack of a SQA Program, cannot yet be removed, since the quality of this incipient SQA Program is indeterminate.

4.2 Summary of Technical Activities

Technical specialists reviewed FSN's participation in the Exploratory Shaft Facility (ESF) Alternative Study Task 4, Access Options, and in the production of Study Plan 8.3.1.14.2, Study Plan to Provide Soil and Rock Properties of Locations of Surface Exploratory Shaft Facilities.

The initial set of ESF Alternative Study options provided to Sandia National Laboratory for screening, as well as the subsequent development of the reduced set of 17 options (later 34 with the inclusion of the Calico Hills scenario) were found to be technically adequate. This work was documented in a clear manner with readily available references and support material.

Study Plan 8.3.1.14.2 was produced by FSN and is now at the Project Office for Project Office review and approval. The body of the document is very well done technically. However, the document is imperfect in that the list of references, which transmit technical specifications for the work to be accomplished, has mistakes. This condition is noted in Observation No. 90-07-03.

4.3 Summary of Findings

There were no findings generated during this audit. However, the following discrepancies, which would have been findings, were corrected during the audit:

1. A letter was sent by the FSN Technical Project Officer (TPO) rectifying the omission of principle investigators from the Study Plan, to the Director of Regulatory and Site Evaluation Division naming the principal investigators and commenting on their qualifications to perform as investigators on the Study Plan as required by Project Procedure PP-70-01.
2. A records package was resubmitted to the Central Records Facility (CRF) with the required attachment that was missing from the original submittal.
3. A records package, which consisted of two segments, was submitted to the CRF as two separate record packages. The records package was resubmitted to the CRF as one record package.
4. Master copies of six software items were taken from a bookshelf and placed in the fire-resistant compartment of a safe to comply with the intent of PP-80-01.

5.0 AUDIT MEETINGS

5.1 Preaudit Conference

A preaudit conference was held with the FSN TPO and his staff at 10:00 a.m. on September 25, 1990. The audit scope and proposed agenda for the audit were presented and the Audit Team introduced. A list of the attendees for this meeting is provided in Enclosure 1 to this report.

5.2 Personnel Contacted During the Audit

See Enclosure 1.

5.3 Postaudit Conference

The postaudit conference was held at 11:00 a.m. on September 28, 1990. The results of the audit were presented to the TPO and his staff. A list of the attendees for this meeting is provided in Enclosure 1 to this report.

6.0 SYNOPSIS OF STANDARD DEFICIENCY REPORTS AND OBSERVATIONS

6.1 Standard Deficiency Reports

There were no Standard Deficiency Reports generated during this audit.

6.2 Observations

The observations are contained in Enclosure 2 to this report and are summarized below:

No. 90-07-01 FSN has not conducted a readiness review nor has the first readiness review been scheduled.

Since it is a requirement of the QAPP to conduct readiness reviews, it is important to the Project Office in assessing the adequacy of the FSN QA program to know the specific major scheduled or planned activities where FSN will conduct a readiness review. These specific readiness reviews should be listed in the QAPP (or possibly the PP-10-09) to ensure that they are auditable for implementation purposes.

No. 90-07-02 Several Quality Assurance Plans (QAPs) provide responsibility statements for and require action by line personnel. It was established that, at least for design engineers, these applicable QAPs were not identified as training requirements and training was not provided. Also, it is unclear as to how other line personnel training requirements are affected.

- No. 90-07-03 FSN conducted an internal review of Study Plan 8.3.1.14.2 in accordance with FSN Design Control procedure DC-09 before this document was submitted to the Project Office. In spite of this review, the Study Plan's reference list contains national consensus standards that are not current, are no longer appropriate, or are incorrectly cited. In addition, the transmitted text contains errors introduced during the incorporation of resolved review comments. The quality of execution of this procedure for the review of the Study Plan was inadequate.
- No. 90-07-04 QAP-6.1(N) requires the FSN QAPP to be distributed to the TPO and other interfacing organizations for review and comment. The TPO serves as the interfacing organization and his review is considered to cover both the TPO's and the interfacing organizations' review responsibilities. This combination of reviews and responsibilities by the TPO is not stated in the FSN procedures. It would improve the clarity of the situation if the requirement for interfacing organizations review is modified and the dual review role of the TPO is plainly established.

7.0 RECOMMENDED ACTION

A written response is required for the observations contained in Enclosure 2 of this report. Responses are due within 20 working days from the date of the transmittal letter of this report.

ENCLOSURE 1

FSN AUDIT 90-07
PERSONNEL CONTACTED

<u>Name</u>	<u>Organization</u>	<u>Title</u>	<u>Pre-Audit</u>	<u>Contacted During Audit</u>	<u>Post-Audit</u>
Ali, Arshad	FSN	QA Engineer	X	X	
Bonabian, Saeed	FSN	Engr. Tech. Analyst		X	
Booth, Henry W.	FSN	Sr. QE Procedures	X	X	
Buckley, John	NRC	Observer	X	X	X
Bullock, Richard L.	FSN	TPO	X	X	X
Cikanek, Edward M.	Harza/T&MSS	Technical Specialist	X	X	
Cocoros, Edward A.	MACTEC/YMP	Auditor	X	X	X
Conway, James T.	NRC	Observer	X	X	X
Cox, Neil D.	SAIC/YMP	Auditor	X	X	X
Criddle, Ray	FSN	Computer Cert. TO		X	
Diaz, Mario R.	DOE/YMP	Project Office QA	X		
Diersen, Nickie E.	FSN	Personnel Admin.		X	
Douglass, Joann C.	FSN	Computer Cert. Rec.	X	X	X
Ferguson, J. Earl	FSN	Sr. Rec. Mgmt. Spec.	X	X	X
Greiner, Tom D.	FSN	Lead Elect. Eng.	X		
Grenia, Jim D.	FSN	Lead Proj. Dsgn. Eng.		X	
Hale, Paul B.	FSN	Sr. QA Specialist	X	X	X
Hardin, Mary J.	FSN	Executive Secy.		X	
Higgins, Thomas J.	SAIC/YMP	Lead Tech. Spec.	X	X	X
Hill, John A.	FSN	Lead Dftg. Coord.	X		
Hilsinger, Russell J.	FSN	Config. Control Spec.	X	X	X
Klemens, Robert H.	SAIC/YMP	Auditor	X	X	X
Kratzinger, Frank J.	SAIC/YMP	Audit Team Leader	X	X	X
Mabrito, Bruce	NRC	Observer	X	X	X
McFall, Kenneth T.	SAIC/YMP	Auditor	X	X	X
McKee, B. Jean	FSN	Design Records Mgmt.	X	X	X
Mirza, Mahmood B.	FSN	Config. Control Mgr.	X		X
Prater, Cynthia H.	SAIC/YMP	Auditor-in-Training	X	X	
Regenda, Mike J.	FSN	Manager QA	X	X	X
Rue, Joseph L.	FSN	Training Manager	X	X	X
Stanley, Bruce T.	FSN	Lead Mining Eng.	X	X	X
Straight, Harry W.	FSN	Sr. QA Engineer	X	X	X
Tamondons, Nick B.	FSN	Lead Mech. Engineer	X		
Tiesenhausen, E. V.	Clark County	Observer	X	X	X
Tunney, Dan J.	FSN	Director QA	X	X	X
Walenga, Craig G.	CER	Auditor-in-Training	X	X	X
Walker, Jan F.	FSN	Project Secretary		X	
Weeks, Richard L.	SAIC/YMP	Auditor	X	X	X
Wilson, Matt H.	FSN	Sr. Admin. Manager	X		X
Zimmerman, Susan W.	St. of Nev.	Observer	X	X	X

ENCLOSURE 2

8 Discussion: (continued)

important to DOE in assessing the adequacy of the FSN QA program to know the specific major scheduled or planned activities where FSN will conduct an internal or external readiness review. These specific readiness reviews should be listed in the QAPP (or possibly the PP-10-09) to ensure that they are auditable for implementation purposes.

YUCCA MOUNTAIN PROJECT OFFICE
1 YMPO OBSERVATION NO. 90-07-02

N-QA-012
4/89

Completed by Originating Organization	2 Noted During: FSN Audit 09-07		3 Identified By: C.G. Walenga/R.L. Weeks		4 Date: 9/27/90	
	5 Organization: FSN		6 Person(s) Contacted: J. Rue		7 Response Due Date is 20 Days from Date of Transmittal	
	8 Discussion: QAPP-002, Revision 6, Section 2.5.1.3 states in part, "Prior to assigning person to perform activities affecting quality, (personnel) will be indoctrinated as to the purpose, scope, methods of implementation, and applicability of the following documents (including changes thereto), as a minimum, as they relate to the work to be accomplished.... o Implementing Procedures and Work Instructions (applicable to the individual's responsibilities)..."					
Completed by Respondee	9 QAE/Lead Auditor		Date		10 Branch Manager	
	<i>Frank M. [Signature]</i> 10/3/90		<i>Cathleen [Signature]</i> 10/3/90		Date	
Completed by QA Org.	11 Response:					
	12 Signature: _____ Date: _____					
Completed by QA Org.	13 Response Receipt Acceptable ☐					
	Initiator	Date	QA/Lead Auditor	Date		
14 Remarks:						
Page <u>1</u> of <u>2</u>						

ENCLOSURE

8 Discussion: (continued)

Several QAPs provide responsibility statements for and require action by line personnel. It was established that, at least for design engineers, these applicable QAPs were not identified as training requirements and training was not provided. Also, it is unclear as to how other line personnel training requirements are affected.

YUCCA MOUNTAIN PROJECT OFFICE
1 YMPO OBSERVATION NO. 90-07-03N-QA-012
4/89

Completed by Originating Organization

2 Noted During:

FSN Audit 90-07

3 Identified By: E. M. Cikanek

4 Date:

9-27-90

5 Organization: FSN

6 Person(s) Contacted:

J. Grenia, B. Stanley

7 Response Due Date
is 20 Days from Date
of Transmittal

8 Discussion:

FSN conducted an internal review of Study Plan 8.3.1.14.2 in accordance with FSN procedure DC-09 before this document was submitted to the Project Office. In spite of this review, the Study Plan's reference list contains national consensus standards that are not current, are no longer appropriate, or are incorrectly cited. In addition, the transmitted text contains errors introduced during the incorporation of resolved review comments. The quality of execution of this procedure for the review of the Study Plan was inadequate. Specific examples are provided on the continuation page.

9 QAE/Lead Auditor

Date

Frank Weston 10/3/90

10 Branch Manager

Date

Catherine Hanston 10/3/90

Completed by Respondee

11 Response:

12 Signature:

Date:

Completed by QA Org.

13 Response Receipt Acceptable ☐

Initiator

Date

QA/Lead Auditor

Date

14 Remarks:

Page

1 of 2

8 Discussion: (continued)

Reference List examples:

- ASTM D-1586-67 as listed is outdated. The current version is ASTM D-1586-84.
- ASTM D-421-58 as listed is outdated. The current version is ASTM D-421-85.
- ASTM D-2166-66 is listed twice. The second listing uses the title "Uniaxial Compressive Strength of Rock Materials". The current version of this standard, ASTM D-2166-85, is titled "Unconfined Compressive Strength of Cohesive Soils."
- 19 of the ASTM references listed have some form of error - typographical or other.

Text example:

- Sections 2.2.2, para. 3
 - 4.2.2, item 1
 - 3.2.3, para. 3

In each of the referenced sections, there is mention of "sand cone penetration resistance" which does not exist. The reviewed draft mentioned "Dutch Cone Penetration Test" which is correct. Documentation of the review gives no indication that such a change was to be made.

YUCCA MOUNTAIN PROJECT OFFICE

1 YMPO OBSERVATION NO. 90-07-04

N-QA-012
4/89

Completed by Originating Organization

2 Noted During:

FSN Audit 90-07

3 Identified By: K. McFall

4 Date:

9/29/90

5 Organization: FSN

6 Person(s) Contacted: W. Straight

7 Response Due Date
is 20 Days from Date
of Transmittal

8 Discussion:

QAP-6.1(N), Rev. 3, Para. 6.1.1.6 requires the FSN QAPP to be distributed to the TPO and other interfacing organizations for review and comment. The TPO serves as the interfacing organization and his review is considered to cover both the TPO's and the interfacing organizations review responsibilities. This combination of reviews and responsibilities by the TPO is not stated in the FSN procedures. It would improve the clarity of the situation if the requirement for interfacing organizations review is modified and the dual review role of the TPO is plainly established.

9 QAE/Lead Auditor

Date

Frank McFall

10/3/90

10 Branch Manager

Date

William Straight

10/3/90

11 Response:

Completed by Respondee

12 Signature:

Date:

13 Response Receipt Acceptable ☐

Initiator

Date

QA/Lead Auditor

Date

Completed by QA Org.

14 Remarks:

Page

1 of 1

TENTATIVE AUDIT SCHEDULE - AUDIT 91-4

7/11/91

Monday	Tuesday	Wednesday	Thursday	Friday
8:30 TEAM/OBSERVER MEETING 10:30 PRE-AUDIT MEETING	J. MARTIN - 1 S. HANS - 3 B. KLEMMENS - 4/12 A. ARCEO - 5 C. WARREN - 16 J. MATRAS - 19	J. MARTIN - 2 S. HANS - 3 A. ARCEO - 6 B. KLEMMENS - 7 C. WARREN - 16/18 J. MATRAS - 19	J. MARTIN - 2 S. HANS - 3 & QA GRADING A. ARCEO - 17 C. WARREN - 18	PREPARE FOR POST-AUDIT MEETING 10:00 POST-AUDIT MEETING
11:30 - 12:30 LUNCH	11:30 - 12:30 LUNCH	11:30 - 12:30 LUNCH	11:30 - 12:30 LUNCH	
J. MARTIN - 1 S. HANS - 3 B. KLEMMENS - 4 A. ARCEO - 5 C. WARREN - 15 J. MATRAS - 19	J. MARTIN - 1 S. HANS - 3 A. ARCEO - 6 B. KLEMMENS - 7 C. WARREN - 16 J. MATRAS - 19	J. MARTIN - 2 S. HANS - 3 A. ARCEO - 17 C. WARREN - 18 J. MATRAS - 19	J. MARTIN - 2 FOLLOW-UP OPEN ISSUES	
4:00 CAUCUS	4:00 CAUCUS	4:00 CAUCUS	4:00 CAUCUS	

CRITERIA CONTACTS