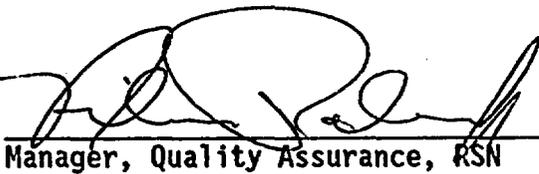


**APPROVAL**

**RAYTHEON SERVICES NEVADA**

**QUALITY ASSURANCE PROGRAM DESCRIPTION  
For  
THE YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT**

Approved by:  Date: 10/31/91  
Manager, Quality Assurance, YMP

Approved by:  Date: 10/31/91  
Manager, Quality Assurance, RSN

Approved by:  Date: 10-31-91  
Technical Project Officer/  
Yucca Mountain Operations Manager

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## 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 and quality assurance implementing procedures will be approved by the TPO. The TPO is responsible for reviewing implementing technical and quality assurance procedures. The TPO will be the prime interface with other participants. The Yucca Mountain Project organization will consist of Field Operations, Systems Engineering, Site Characterization Design, and Administration.
- 1.1.3.1 The Site Characterization 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 Site Characterization Design Department will provide qualified personnel to accomplish the requirements above and to manage the criteria flow, set and monitor schedules and to review drawings and specifications to established criteria.
- 1.1.3.2 The Systems Engineering Department will provide qualified personnel to: manage interfaces, control configuration, control computers and software, and manage and control the project procedures.
- 1.1.3.3 The Field Operations Department 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.
- 1.1.3.4 The Project Administration Department 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.
- 1.1.4 Full-time Matrix Support Organizations
- RSN organizations that provide full-time support to YMP are described in implementing procedures.

- 1.1.4.1 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.

- 1.1.4.1.1 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. Approves all technical and quality assurance procedures.
- 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.

1.1.4.1.1.1 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 Audits and Surveillance) that report to the MQA/YMP. These sections have the responsibility to direct and control quality assurance functions as defined in implementing procedures.

1.1.5 As-Needed Matrix Support Organizations

RSN organizations that provide matrix support on an as needed basis are described in implementing procedures.

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 sub-contractors. 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.
- 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.

# RAYTHEON SERVICES NEVADA YMP ORGANIZATION CHART \*

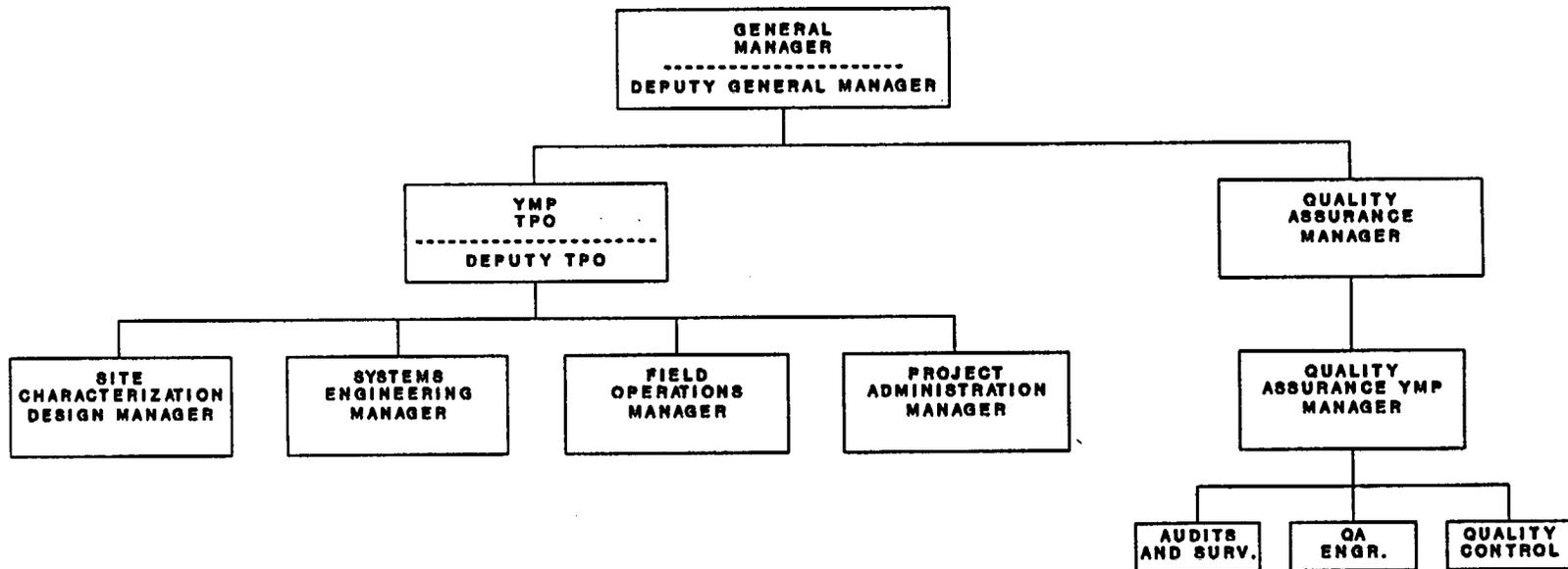


FIGURE 1-1

\* SEE IMPLEMENTING PROCEDURES FOR MATRIX ORGANIZATIONS

## 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.

#### 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; 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 which pertain to RSN's scope of work. 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 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 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.
- 2.2.12.4 After the initial personnel qualification evaluation, the job proficiency of personnel who perform activities affecting quality will be evaluated and documented at least annually. Proficiency evaluations may be performed in conjunction with periodic or day-to-day employee performance evaluations. Proficiency evaluations will be performed by managers or supervisors who have responsibility for the activities being performed or verified.

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

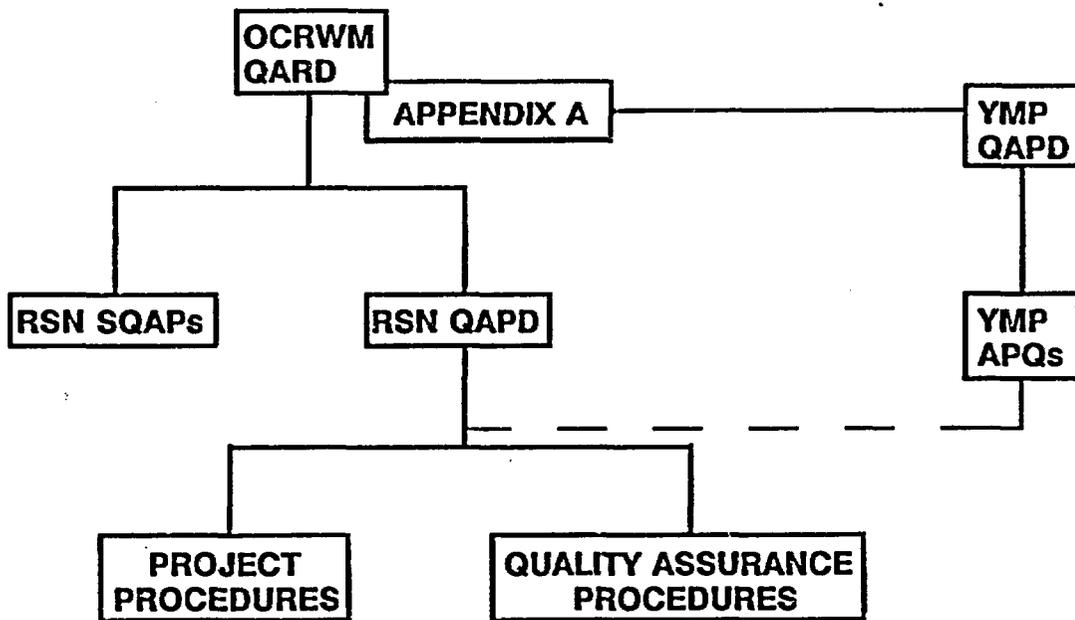
Communication and information systems will be established to ensure timely reporting, dissemination, and tracking of quality assurance management information such as the status of QA program implementation, status of resolutions of significant conditions adverse to quality, and summaries of management 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, 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.

### 3.2.3 Design Process

Design activities are conducted by RSN. Quality affecting computer programs used in design 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 requirements of the documents specified in Appendix A of this QAPD. Procurement of items is accomplished through REECo 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 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 procedural requirements.
  - b. Reflect adequate 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.

## 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 shall be prepared by either the RSN Yucca Mountain Project Line Organization or the Quality Assurance Organization, whichever 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
- 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 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 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 of services, RSN 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 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 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.
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

RSN will review and approve supplier submittals which pertain to the design of the item.

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. Acceptance

RSN will accept items by receipt inspection, post installation testing or other methods as specified in procurement documents.

## 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. 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. Nondestructive testing services are provided as matrix support by the RSN Quality Assurance Division at the Nevada Test Site.

##### 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. The qualification process shall utilize the actual working procedure.

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

The quality assurance organization reviews and approves special process procedures. Additionally, the quality assurance organization shall monitor the development and implementation of special process qualification activities through the conduct of source and field verification, 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 requirements of the QARD. The inspection procedures and instructions shall meet ASME NQA-1 Basic Requirement 10 and Supplement 10S-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.
- d. Identification of hold points.

Quality Assurance with input from the technical organization 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.

10.4 INSPECTION HOLD POINTS

Mandatory inspection hold-points will be established as necessary. When such hold or witness points are established, work may not proceed without the specific consent of the responsible representative. These hold or witness points will be indicated in documents controlling the activity. Consent to waive any specified hold or witness point will be documented before work can be continued beyond the designated hold or witness point.

## 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. The TPO is responsible for establishing and implementing the calibration program.

#### 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.

12.2 QUALITY ASSURANCE OVERVIEW

The quality assurance organization will assure the effectiveness of the calibration program by surveillance and audits.

## 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 a record collection center. RSN is responsible for microfilming and submitting records to OCRWM for archiving. RSN is not responsible for permanent storage of records. 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 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, including superseded 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 direct responsibility). 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 evaluate and track the responses; to verify satisfactory implementation of corrective and preventive actions taken to resolve audit findings; and to assure that any adverse trends are identified and reported to management for review, assessment and appropriate action. 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 RSN USE OF EXISTING SOFTWARE IN THE DESIGN OF THE SCF FOR YMP

A software quality assurance plan will be developed to describe the use of existing software in the design of SCF based on the 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.

#### 19.2 ADDITIONAL SOFTWARE APPLICATIONS

If additional software which falls outside the scope of Section 19.1 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.