

QUALITY ASSURANCE PROGRAM PLAN  
EXPLORATORY SHAFT FACILITY (ESF)  
CONSTRUCTION MANAGER

Presented To  
U.S. DEPARTMENT OF ENERGY  
NATIONAL WASTE TERMINAL STORAGE PROGRAM OFFICE  
By  
PARSONS-REDPATH  
A JOINT VENTURE

The Ralph M. Parsons Company  
Pasadena, California

J.S. Redpath Corp.  
Tempe, Arizona

8404100137 B40314  
PDR WASTE  
WM-16 PDR

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## Introduction

The Salt Exploratory Shaft Facility (ESF) is a Department of Energy (DOE) program consisting of the construction of an exploratory shaft, followed by development of a test and evaluation facility which may be the basis for construction of a nuclear waste repository.

The Quality Assurance (QA) Plan is in compliance with 10CFR50, Appendix B requirements, ANSI/ASME NQA-1, and the applicable elements of DOE QA Standards, Executive Orders, and Directives. IF NRC licensing and/or ASME Code requirements are invoked, the specific sections of the existing Parsons-approved Nuclear Quality Assurance Programs will be made applicable. The Program Plan will use the Joint Venture partner's proven practices in establishing controls at predetermined points during the design, procurement, fabrication, construction, and operation and maintenance of the facility. Quality-associated requirements will flow down to subcontractors and vendors who will be required to have QA programs which meet applicable requirements of this Plan. Quality program plans will be submitted prior to implementation for review and, when approved, will become commitments which vendors/subcontractors must adhere to.

Program philosophy is to use QA classification levels based on the consequences of possible failure to determine performance requirements on the project. The same basic QA program will be tailored for activities of all quality levels. The level of traceability, the frequency of surveillance, review and audits, and the extent of evaluation and source inspection will be at the highest needed degree of application.

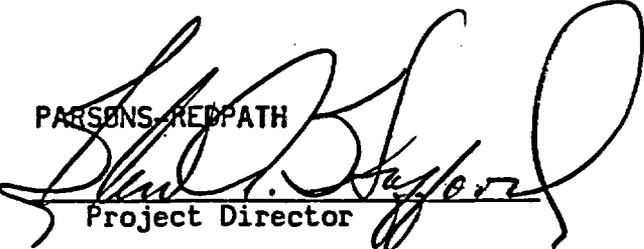
## POLICY

It is the policy of the Parsons-Redpath Joint Venture, as described in this Quality Assurance Plan, to satisfy requirements of applicable Federal, National and Department of Energy standards, orders, and directives. It is also Parsons-Redpath policy to apply an approach to quality which acknowledges that, in addition to health and safety of the general public and workers, and the safety, operability, performance, and security of the facility, an adequate level of quality is also needed to ensure operational reliability and maintainability. The Joint Venture considers Quality Assurance an essential element of all project activities. It is Management policy to ensure that QA has the necessary organizational freedom and authority to develop and implement the QA program stated herein and bring to the appropriate level of management attention any quality-related problems requiring resolution.

PURPOSE/SCOPE

This QA Plan describes the program for the Construction Manager (CM) portion of the Salt (ESF) Project. The purpose of the Plan is to provide awareness of and establish confidence that the level of quality for each element of ESF is consistently achieved to the level required for satisfactory quality of construction and to license identifiable elements of the facility (e.g., the liner/shaft) at some future time. The Plan may also be expanded to cover any other activities that may be assigned to the CM. Elements of this QA Plan will be incorporated into appropriate P-R plans, manuals and procedures, and will be "flowed down" to subcontractors to the DOE to ensure compliance with NQA-1 and other contractual requirements. Specifically, QA and QC manuals will contain elaborations on and procedures for implementing requirements of this Plan.

PARSONS REDPATH



Project Director

Dated: June 1983, *afk.*

## ESF QUALITY ASSURANCE PROGRAM

### 1. ORGANIZATION

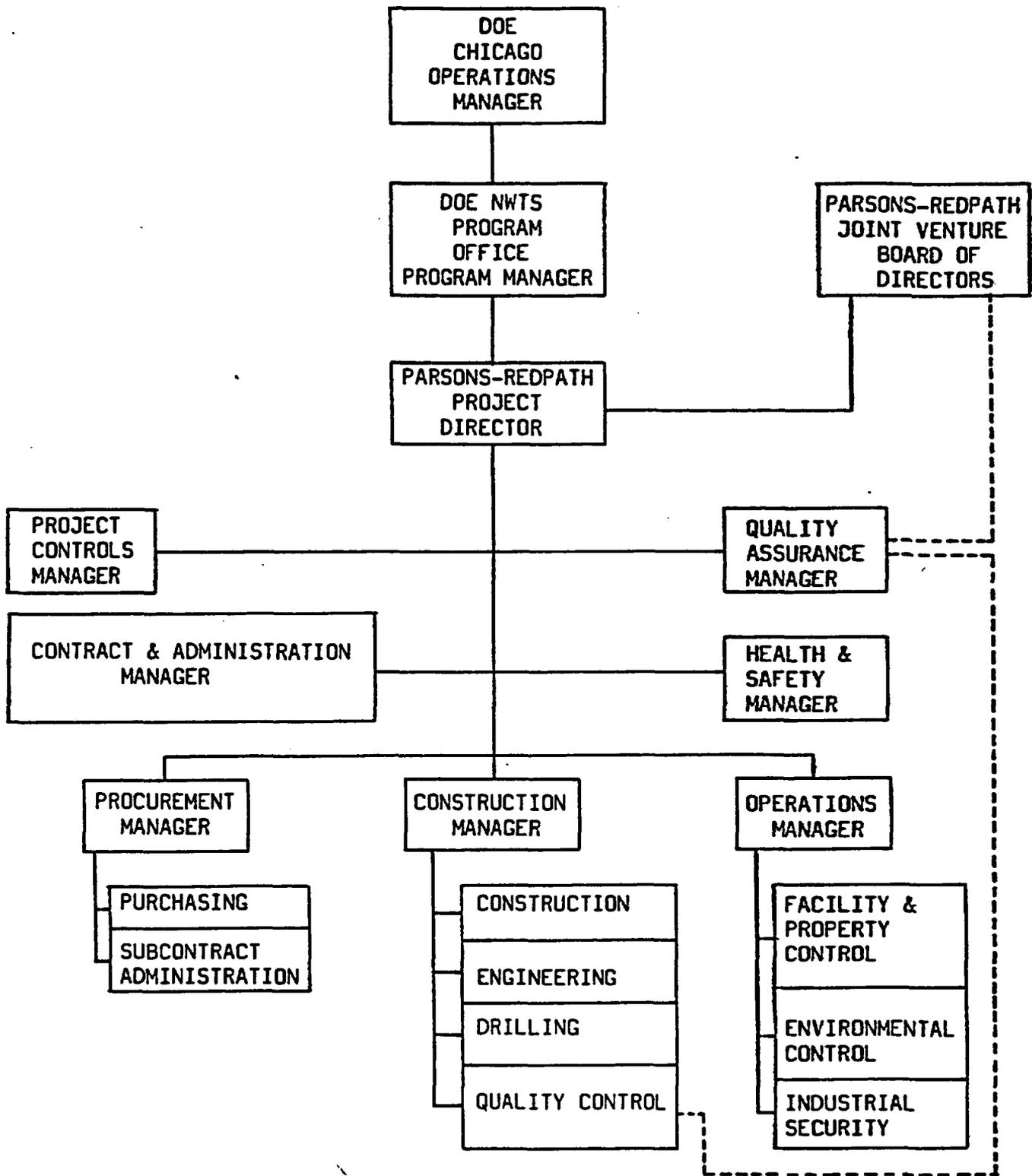
#### A. Organization Structure

- (1) The Exploratory Shaft Facility (ESF) Project organizational structure, relationships, and communication lines pertinent to the QA function are shown in Figure 1.
- (2) Parsons-Redpath (P-R) and subcontractor management shall assure that persons or organizational elements that establish QA programs and verify activities affecting quality will have sufficient authority, access to work areas and materials, and organizational freedom to:
  - (a) Identify quality-related problems.
  - (b) Initiate, recommend, or provide solutions to quality-related problems through designated channels.
  - (c) Verify implementation of problem solutions.
  - (d) Assure that further item processing, delivery, installation, or use is controlled until proper disposition of a non-conformance, deficiency, or unsatisfactory condition has occurred.

These persons or organizations shall have direct access to responsible management at a level where appropriate actions can be affected. They shall have the required authority and organizational freedom to effectively accomplish QA tasks, including sufficient independence from cost and schedule considerations to preclude conflict of interest situations. Their tasks will be appropriately described in manuals and procedures for the respective organizations.

#### B. Responsibilities

- (1) The Parsons-Redpath Project Director will:
  - (a) Establish Construction Management QA policy and objectives.
  - (b) Delegate to subordinate management personnel the responsibilities to develop, implement, and assure compliance with the P-R QA program.
  - (c) Resolve product quality, program implementation, or other quality-related problems when necessary agreement among subordinate managers cannot be reached or when adequacy of funding is impacted.



\_\_\_\_\_ Administrative Direction  
 - - - - - Functional Direction

FIGURE 1. PROJECT MANAGEMENT RELATIONSHIPS

(2) The Quality Assurance Manager will:

- (a) Assure P-R QA Policy, objectives, and guidance are developed, implemented and appropriately documented.
- (b) Develop and implement P-R QA procedures.
- (c) Verify that the responsible managers develop, implement, and assure compliance with procedures which govern their respective elements of the QA program.
- (d) Resolve quality-related issues that cannot be resolved at peer or lower management levels, or present issues to the Project Director or the P-R Joint Venture Board of Directors, as needed for resolution.
- (e) Review A/E design drawings and specifications to ensure that design of the ESF (and its elements) adequately incorporate provisions of governing QA directives.
- (f) Generate, approve, or concur on P-R QA generic and programmatic documentation, including subcontractor QA plans and manuals.
- (g) Verify subcontractor and program participant organizations comply with QA program requirements.
- (h) Verify that cognizant personnel properly identify, describe, and resolve quality-related problems.
- (i) Maintain liaison with DOE/NPO, Architect Engineer (A/E), subcontractor, and other Government agency QA and project management personnel to assure adequate implementation of and compliance with the ESF QA program.
- (j) Provide the DOE Program Manager, through the P-R Project Director, with any observations and corrective action recommendations resulting from QA activities that concern safety and health practices or that may impact licensability of the end product.

(3) The P-R Procurement Manager will assure the CM QA program and other project requirements (as identified by P-R managers) are included in appropriate requests for proposals/bids, contracts, subcontracts, and purchase orders.

Responsibilities include the following:

- (a) Review material requirements to insure that adequate QA and technical requirements are incorporated.
- (b) Assure vendor surveys are performed to determine whether or not a vendor can perform to an acceptable level of quality.

- (c) Assure qualified people perform "source" inspections and witness tests on manufactured items to determine that the product meets specification requirements, as well as checking vendors' quality programs for conformity to submitted plans (and procedures).
  - (d) Assist field personnel when material is received in an unsatisfactory condition in determining cause and responsibility for the damage to aid in the dispositioning process.
  - (e) Maintain a filing and records system to support all procurement inspection and acceptance functions.
  - (f) Assure that vendor subcontracts require that all deliverables (i.e., inspection reports, test results, material certifications, etc.) are specified and will accompany the delivered product.
- (4) The P-R Project Controls Manager will assure implementation of appropriate quality-related measures in procedures governing records management, and cost and schedule control.

Responsibility areas include to:

- (a) Establish and maintain the critical path management (CPM) system.
  - (b) Prepare and report on performance estimates and progress to the Project Director and DOE.
  - (c) Alert the Project Director to possible schedule slippages or cost overruns so that corrective measures can be taken.
  - (d) Prepare project budgets and measure budget performance, record and update commitments and expenditures, and maintain the project estimate at completion.
  - (e) Develop a management plan for and coordinate all design change control and configuration control actions to assure sufficiency and accuracy of documentation.
  - (f) Prepare and implement a Project Records Management Plan to assure adequacy records are generated, processed, and stored to meet project requirements.
- (5) The P-R Health and Safety Manager will assure that appropriate Health and Safety correspondence is provided to the QA Manager.

Includes being responsible to:

- (a) Establish and enforce a program for providing a safe workplace free of health and safety hazards, fires and potential for property loss.
- (b) Regularly inspect drilling, construction and mining work in progress to identify hazards or unsafe practices requiring corrective action by cognizant supervisors.

- (c) Conduct safety training as required to assure safety program objectives are met.
  - (d) Prepare and submit periodic safety reports to the Project Director and DOE, including safety measurement analysis.
  - (e) Assure adequate first aid is provided to all site personnel.
  - (f) Assure adequate fire protection is available for all phases of work.
  - (g) Develop and implement an emergency response and reporting system.
  - (h) Coordinate accident/incident investigation and reporting requirements.
- (6) The P-R Construction Manager will assure drilling operations, surface and subsurface construction, field engineering, and quality control procedures are consistent with the QA program (as well as other contractual requirements) and properly implemented.

Also, is responsible to:

- (a) Direct and manage construction resources, including drilling surface construction and mining subcontractors in addition to P-R construction personnel.
  - (b) Provide technical liaison with the architect-engineer through DOE and the Project Integrator, Battelle.
  - (c) Coordinate field engineering functions. This includes civil, electrical, mechanical, drilling and mining disciplines and encompasses design reviews, design change coordination and dispositioning of nonconformances. In addition, assures maintenance of "red-line" drawings to document "as-built" condition of the facility.
  - (d) Administer the quality control function and verify product conformance with drawing/specification requirements and personnel compliance with procedural requirements. Details for this effort will be contained in the P-R QC manual. The QC activities are performed under the functional overview of the P-R QA Manager to preserve the necessary independence of QA as well as assure the proper quality emphasis is provided to the project.
- (7) The P-R site and facilities Operations Manager will assure the maintenance, operation, and property management programs are developed and implemented in compliance with the QA Program and other contractual requirements.

Responsibilities also include:

- (a) Establishing and maintaining control systems for vehicles as well as materials and other items to assure accountability and efficiency of use.
  - (b) Control and implementation of the project environmental assurance program; this includes acquisition of related permits and licenses.
  - (c) Development and application of the project industrial security system; this will assure site physical security and optimize the system for controlling property losses due to theft, vandalism or sabotage.
  - (d) Implementation of project operating and maintenance activities with associated quality-related functions when the construction goals are progressively attained.
- (8) The P-R Contract & Administration Manager is responsible to supervise and coordinate prime contract administration, financial services, and industrial relations. As manager for project office operations, duties also include:
- (a) Maintenance of P-R payroll records and payroll distribution.
  - (b) Operation of the project accounting system.
  - (c) Supervision of the steno/clerical personnel.
  - (d) Administration of the Equal Employment Opportunity (EEO) Program and Affirmative Action Program (AAP) as well as maintenance of the project labor relations program.
  - (e) Review all CM invoicing prior to submittal to DOE for payment.
  - (f) Serve as liaison between DOE and the CM with regard to all prime contract matters.
  - (g) Prepare all CM request for contract changes and modifications due to new developments and alterations in the CM scope of work.

## 2. QUALITY ASSURANCE PROGRAM

### A. Program Documentation

- (1) The documented Quality Assurance Program will comply with 10 CFR 50, Appendix B and ANSI/ASME NQA-1-1979 as amended for the construction and related procurement activities for the project. Written operating procedures shall be established for discrete P-R program activities to supplement this Plan. These documents will describe policies and practices to be implemented in identifying, controlling, and verifying activities that relate to product (including software and hardware) as well as performance quality. The degree of application of the quality assurance program shall be commensurate with the technical (as well as safety and health)

aspects, complexity, or relative importance of each task/activity. This "graded" application of QA coverage will be consistent with the categorical definitions contained in 2.B below. Operating procedures will be reviewed and approved by the QA Manager prior to implementation. They shall provide for any special controls, processes, personnel qualifications, reporting and documentation, test equipment, tools, and skills needed to reach the required level of quality and for necessary verification measures of quality, such as inspections or tests.

- (2) The P-R QA Manager shall generate and maintain documents describing the generic (i.e., overall) QA program, policy statements, guidance, and implementing procedures. In addition, the QA Manager shall review and approve the contents of task or activity-specific QA plans and procedures; this applies to pertinent P-R and subcontractor documents.
- (3) Support subcontractors which participate in program activities shall develop and maintain appropriate QA plans and implementing procedures in perspective with their program involvement. These documents will be appropriately subject to approval/disapproval and audit by P-R construction management personnel and the QA Manager.

#### B. Quality Assurance Levels

Quality Assurance Levels shall be established for ESF systems, structures, materials and components as part of the design process. Quality Assurance Levels I, II, and III are defined below, along with their applicability.

- (1) Quality Assurance Level I items shall include physical systems, portions of systems, structures, components, and materials whose failure might cause or increase the severity of a release of radioactive, hazardous or toxic materials to the environment. These include systems, structures, components, and materials that are vital to the safe shutdown or isolation of the process or system. They also include systems that directly affect operability, performance and security or safety of the facility.

NOTE: Though no radioactive, hazardous, or toxic materials are involved in the exploratory shaft, the shaft may become part of the nuclear waste repository. therefore, the shaft liner and seals shall be considered Quality Assurance Level I.

- (2) Quality Assurance Level II items shall include physical systems, portions of systems, structures, components or materials that are important to the operation of the system. These include items whose failure may cause the operation, performance, security or safety of the facility to be interrupted for an unacceptable period of time.

NOTE: The headframe and hoist system, emergency hoist system, ventilation system, and standby emergency and uninterruptible power generation system shall be Quality Assurance Level II.

- (3) Quality Assurance Level III items shall include physical systems, portions of systems, components or materials that provide a service or function to the facility, but are not essential to the safe operation of the facility.

NOTE: Quality Assurance Level III also applies to commercial off-the-shelf items for which existing commercial quality control practices shall be adequate.

#### C. Conformance Verification

- (1) The P-R QA Manager shall verify the adequacy and effectiveness of ESF project and subcontractor QA and quality-related activities. The various QA functions will be assessed by auditing, surveillance, and monitoring actions. Qualified "home office" support or consultants may be employed to assist the QA Manager as required; however, the QA Manager shall be responsible for the adequacy and effectiveness of work performed by such organizations.
- (2) Construction management personnel shall verify the effective implementation of quality-related program elements by participating in audits (under the guidance of the P-R QA Manager) and through surveillance of work being done. These assessment results will be evaluated, remedial action taken when appropriate, and pertinent summaries sent to the QA Manager for visibility of program status and effectiveness of operation. The QA Manager will establish standard evaluation and reporting formats for audit and surveillance activities.
- (3) Subcontractor personnel shall regularly assess the adequacy of their own QA programs and take any necessary actions to assure effective implementation of and compliance with those programs.

#### D. Resolution of QA Issues

The P-R QA Manager will refer appropriate issues to the Project Director for action or resolution assistance. If the Project Director is unavailable, and where timely action is needed, the QA Manager is assured direct access to the P-R Joint Venture Board of Directors to obtain resolution of the quality-related problem.

#### E. Training

- (1) The P-R QA Manager has the overview responsibility to assure that P-R or subcontractor personnel performing quality-related functions are adequately instructed about the purpose, scope and details of those activities to properly accomplish them. If training problems are encountered, the QA Manager will assist in providing the needed training or request appropriate management assistance in getting personnel properly trained.
- (2) CM and subcontractor QA programs shall provide for indoctrination, training, and certifications, as necessary, of personnel performing activities affecting quality (e.g., inspections, tests, nondestructive examinations) to assure that acceptable proficiency levels are achieved and maintained. There shall also be QA provisions to assure personnel performing QA requirements conformance verifica-

tions are adequately trained (and certified, if appropriate) for such activities. Reevaluation of personnel proficiency levels for "certified" activities affecting quality are required on at least an annual basis. Records of the scope, methods and frequencies of training and certification actions will be maintained by the subcontractors and made available to P-R representatives for review.

### 3. DESIGN CONTROL

- A. Measures shall be taken by P-R and subcontractor management to assure ESF objective requirements and project design baselines (prepared by the architect/engineer with DOE approval) are correctly translated into specifications, drawings, procedures, and instructions. These measures shall include provisions to assure appropriate quality requirements are specified in design documents and that deviations from such requirements are controlled. Evaluation and review procedures will be used to verify constructability of the design.
- B. Parsons-Redpath Construction Engineering personnel shall assure that necessary design interfaces are established for adequate communication among participating design organizations, and to verify establishment of procedures for review, approval, release, distribution, and control of documents involving design interface actions.
- C. The design control system shall provide for verifying the adequacy of design, such as: participating in design reviews with DOE, architect-engineer and technical integration personnel; performing design review, using alternate or simplified calculation methods; or performing a product-suitable testing program. The verification process shall be performed by individuals or groups other than those who performed the original design, yet may be from the same organization. Design control measures shall be tailored to fit individual task needs. Measures for consideration will include stress, thermal, hydraulic, accident, maintainability, and reliability analysis; compatibility of materials; accessibility for in-process inspection, maintenance, and repair; and delineation of acceptance/rejection criteria for inspections and test surveillance.
- D. Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design. Changes shall undergo the same management review cycle as the governing original design, unless otherwise directed in writing by the DOE Program Manager. A description of the change control system to be used by the CM is contained in the P-R Configuration Management Plan.

### 4. PROCUREMENT DOCUMENT CONTROL

- A. Design and regulatory requirements which are needed to assure adequate quality shall be suitably included or referenced in the documents for procurement materials, equipment, and services. Procurement documents shall require, to the extent necessary, subcontractors provide QA coverage consistent with this plan.
- B. The P-R Construction Engineering, QA Manager and designated subcontractor personnel shall verify through initial input to and review of procurement documents that their respective procurement documents

contain and appropriately flow down technical and quality provisions commensurate with items or services being procured. The procurement documents shall, in applicable cases, specify:

- (1) Measurable acceptance/rejection criteria.
- (2) Mandatory source inspection criteria and responsibilities.
- (3) Requirements for identification and control of special processes.
- (4) Supplier certification requirements.
- (5) Special shipping requirements.
- (6) Notification of procuring agency's (or their designee's) right of access to supplier's facilities/construction sites to perform contract-related inspections, surveillance, and audits of quality-related activities and records.

C. Subcontractor procurement documents shall be audited periodically by the P-R QA Manager to verify they contain adequate QA provisions.

#### 5. INSTRUCTIONS, PROCEDURES AND DRAWINGS

- A. The P-R QA Program will assure that P-R and subcontractor activities affecting quality are prescribed by appropriate documentation and the activities performed comply with documented requirements.
- B. Parsons-Redpath, subcontractor, and participating organization documentation, i.e., instructions, procedures, drawings, etc., shall include appropriate quantitative or qualitative acceptance criteria for determining that activities have been satisfactorily accomplished in accordance with those documents. This documentation shall accurately reflect the procurement requirements.

#### 6. DOCUMENT CONTROL

- A. The P-R QA Manager shall assure (through reviews, surveillance, and audits) that measures have been established to control the preparation, issue, and change of documents which prescribe quality requirements or activities affecting quality. The P-R Construction Procedures Manual will define measures to assure that correct and applicable documents are used for construction activities.
- B. Parsons-Redpath construction and subcontractor personnel shall assure that quality-related documents are reviewed for accuracy and approved for release by properly authorized people, and are distributed to and correctly used at locations where prescribed activities are performed and monitored.

#### 7. CONTROL OF PURCHASED ITEMS AND SERVICES

- A. Purchased items and services, whether procured directly by Parsons-Redpath or through subcontractors, shall conform with procurement document requirements. Methods to be used to control purchased items and services will be defined by the P-R Procurement Policies and Procedures Manual.

- B. The Project Director shall assure that governing measures to control purchased items and services are established and provide, as appropriate, for preaward surveys of subcontractor capability, objective evidence of quality furnished by suppliers, source inspections of subcontractor fabrication processes and products and examination of products upon delivery.
- C. Parsons-Redpath Construction (Engineering/QC) and subcontractor personnel shall assure that documented evidence exists to establish specified items conform to procurement requirements (or services were satisfactorily performed) prior to item installation or use. This documentary evidence shall be retained and available for review at a location designated by the subcontractor personnel and concurred in by the Project Director; the documentation shall be sufficient to identify specific requirements, e.g., codes, standards, or specifications to be met by the purchased items.
- D. The P-R QA Manager will review the Procurement Policies and Procedures Manual to verify compliance with NQA-1 requirements; and will verify conformance by participating in selected vendor surveys, conducting assessments of source inspection adequacy, assessing adequacy of receiving inspection activities, and determining the adequacy of the nonconformance control system as well as reviewing procurement records to verify documentation adequacy.

#### 8. IDENTIFICATION AND CONTROL OF ITEMS

- A. The Project Director shall assure measures are established by P-R construction and operations departments and by subcontractors for the identification and control of materials, parts and components (including partially fabricated assemblies). These measures shall assure that each item is identified by part number, serial number, heat lot number, or other appropriate information, either on the item or records traceable to the item. These identifiers and controls shall be designed to prevent the use of incorrect or defective items. Implementing measures will be contained in the P-R Construction Procedures and Property Control Manuals.
- B. The P-R QA Manager will verify compliance with item identification and control procedures through selected audits and surveillances of construction and property control activities and records.

#### 9. CONTROL OF PROCESSES

- A. Parsons-Redpath Construction and subcontractor personnel shall assure that processes affecting quality of items or services are controlled. Special processes that control or verify quality, such as those used in welding, soldering, heat treating, and nondestructive examination, shall be performed by qualified personnel using certified procedures in accordance with applicable codes, standards, specifications, special criteria, etc. Measures to assure compliance with NQA-1 process control requirements will be contained in the P-R Construction Procedures Manual.

- B. The P-R QA Manager shall periodically audit P-R and subcontractor systems for process control to assure proper scope and adequacy of operation.

## 10. INSPECTION

- A. Parsons-Redpath and subcontractor personnel shall establish the criteria for and perform inspections of activities affecting quality to verify conformance with specified requirements. Acceptance inspections shall be performed by qualified individuals other than those who performed the activity being inspected. If direct inspection of a processed item or service is not possible, or not advantageous for a valid reason, indirect control of the activity shall be achieved by monitoring processing methods, equipment operation, and personnel performance. If mandatory inspection hold points are required, they shall be specifically identified in appropriate planning, fabrication, or construction documents. These inspection points require witnessing or inspection by Parsons-Redpath or subcontractor qualified and designated representatives, as appropriate; work shall not proceed beyond mandatory inspection hold points without the consent of the designated representative or direction from the Project Director. Procedures to be used by P-R personnel to identify and perform inspections will be in the Construction Procedures Manual.
- B. The P-R QA Manager shall verify the effectiveness of P-R and subcontractor inspection systems by monitoring selected inspection operations and auditing inspection records for completeness and accuracy.
- C. Procedures for interface of CM and A/E personnel during the performance of "Title III" inspections will be contained in the Construction Procedures Manual.

## 11. TEST CONTROL

- A. The P-R Resident Construction Manager shall assure a test control program is established to demonstrate that systems, structures, and components will perform satisfactorily in accordance with design requirements, and that test personnel are properly qualified. Details will be contained in the Construction Procedures Manual.
- B. Parsons-Redpath Construction Engineering and subcontractor personnel shall develop and use test plans which define characteristics and methodology to validate item acceptability. Test procedures shall incorporate the requirements and acceptance limits contained in applicable design documents. The test program shall include, as appropriate, item proof tests prior to installation, pre-operational (i.e., qualification) tests, and operational tests during experiments as well as research and development projects. Test procedures shall include provisions for assuring that all prerequisites for a given test have been met, that adequate tests instrumentation is available and used, and that the test is conducted under suitable environmental conditions. Test results shall be documented and evaluated to assure test objectives have been satisfactorily met.

- B. The P-R QA Manager shall verify effective operation of systems governing item inspection, test and operating status. Periodic audits shall be conducted to determine if inspection, test and operating status records are adequate and properly maintained or if corrective action is required.

#### 15. CONTROL OF NONCONFORMING ITEMS

- A. Parsons-Redpath Construction (Engineering and QC) and subcontractor personnel shall establish documented systems to control items that do not conform to specified requirements to prevent inadvertent installation or use. Controls shall provide for nonconformance identification, documentation, evaluation, segregation, disposition, and notification of affected organizations. Nonconforming items shall be reviewed and dispositioned, rejected, repaired, reworked or used "as is" in accordance with documented procedures in the Construction Procedures Manual. QC personnel will verify the dispositioning and control of nonconformances processes are properly done.
- B. Parsons-Redpath functional managers and the QA manager shall assure the nonconforming item control systems are adequately documented and implemented and that nonconformance reports are periodically analyzed for quality trends and appropriate corrective actions. QA audits shall be conducted to augment surveillance efforts and assure timely and adequate compliance with procedural requirements.
- C. The Parsons-Redpath QA Manager will notify DOE/NPO of potential quality-related unusual occurrences. Unusual occurrence reports (UORs) will be processed in accordance with procedures in the P-R Safety Manual.

#### 16. CORRECTIVE ACTION

- A. Parsons-Redpath Construction personnel shall develop a CM corrective action system and will also assure the subcontractors promptly identify conditions which may be adverse to quality and correct the conditions as soon as practicable. When a significant adverse quality condition exists, the cause of the condition shall immediately be determined and timely corrective action taken to prevent recurrence. Details of the condition and remedial actions shall be documented and appropriately reported to management. Follow-up actions shall be taken to verify corrective action implementation and effectiveness. Details of the CM corrective action process will be contained in the Construction Procedures Manual.
- B. The P-R QA Manager shall evaluate CM and subcontractor nonconformance data and associated analyses to determine any adverse trends which require systemic resolution. Where possible, nonconformance data (including costs) shall be used to determine priority of quality effort application and the return benefits of quality applications.

#### 17. QUALITY ASSURANCE RECORDS

- A. The P-R functional managers, the QA Manager, and subcontractor management personnel have the collective responsibility to specify requirements for documentary evidence of quality, from generic and project-

unique standpoints. These quality records shall be protected against damage, deterioration, or loss with special consideration being given to future usage and accessibility. Government, Parsons-Redpath and subcontractor requirements as well as responsibilities for record transmittal, distribution, retention, maintenance and disposition shall be established and documented. Details to assure compliance with NQA-1 requirements will be contained in the P-R Records Management Plan.

- B. The P-R QA Manager and other P-R managers shall conduct periodic audits of quality records and files to verify procedural compliance and adequacy of records management system operation.

## 18. AUDITS

The P-R QA Manager shall assure that a comprehensive system of planned and periodic P-R and subcontractor audits is developed and carried out to verify compliance with all aspects of the QA program and to determine the effectiveness of the program. Audits shall be performed in accordance with written procedures or checklists developed and used by trained personnel not having direct responsibilities in the areas being audited. Audit results and any remedial recommendations shall be documented and reviewed by cognizant management personnel. Follow-up actions, including reaudit of deficient areas, shall be taken as situations indicate such need. The P-R audit program will comply with NQA-1 requirements; details will be contained in the QA Manual.

## 19. MANAGEMENT ASSESSMENTS

A Management Assessment will be performed by personnel (e.g., home-office QA) identified by the Project Director on an annual basis (or when deemed necessary by the Project Director). Management Assessments combine data elements of the QA audit and verification programs with an overall evaluation of organizational interfaces, communications, procurement activities, construction and quality control accomplishments, and schedule and cost performance. Results of these assessments will provide a measure of the effectiveness of Project management controls.