

**U.S. Department of Energy**

**Office of Management, Budget and Evaluation**

**Integrated Quality**



Initiated by: Office of Engineering and Construction Management



# INTEGRATED QUALITY

## 1.0 OVERVIEW

Quality Assurance (QA) includes all the processes required to assure product and performance quality will meet project objectives and customer requirements. The Project Director is responsible for planning and implementing a Quality Assurance Program (QAP). Line Management is responsible to align processes and procedures to the QAP. Line Management must ensure compliance with the project policies and procedures, and should utilize management assessments to help improve processes. The Project Director should do periodic independent assessments to measure item and service quality, measure adequacy of work performed, and promote improvement.

## 2.0 INTEGRATED QUALITY MANAGEMENT

Integrated Quality Management is the integration of functional quality processes to deliver the project meeting customer requirements. This requires the management of deliverables within the project, as well as assuring the project meets technical requirements. Failure to meet quality requirements in either dimension can have negative consequences on the project. A critical part of quality management is turning implied needs into requirements. The Integrated Project Team must not confuse quality with the technical characteristics. Low quality is never acceptable, but tailored technical characteristics may change the requirements. These requirements drive the quality assurance and quality control programs. These differences should be reflected in the QAP.

The majority of existing Government contractors and Management and Integration contractors have an approved site QAP. A project specific QAP may use a site program or explain deviations. At a minimum, the project specific QAP should specify how and when management and independent quality assessments are to be performed.

The DOE Guide 414.1-2, "Quality Assurance Management System Guide" should be consulted to develop and implement integrated quality management systems that will meet 10 CFR 830.120 and DOE Order 414.1A, "Quality Assurance." This guide reflects lessons learned in the implementation of DOE quality expectations and requirements.

A stand-alone project must develop a QAP. The QAP would integrate all phases and functional areas into a common program to address alignment with multiple contracts and contractors.

### 3.0 QUALITY ASSURANCE PROGRAM

All quality programs are focused on providing a structured system that defines the control features that will demonstrate, through objective evidence, that the project requirements have been met. These features are documented in the design, are reviewed, and appropriate controls are developed. The QAP describes the extent that the project will control the key aspects of the organization, design, procurement, documents, records, inspection, testing, defects, maintenance, and test equipment and the process the project will use to review these aspects. The program will make sure the control features continue to function as planned. Nuclear and environmentally significant (regulatory driven) projects impose quality requirements to provide the evidence that regulatory requirements have been met.

In a general sense, the QAP documents the QA requirements based on the risk of a project while meeting DOE requirements. As an example, Attachment 1 provides an index of quality assurance procedures that would typically be prepared to meet the requirements of a nuclear project that must comply with 10 CFR 830.120 and has selected ASME National Quality Assurance Standard-1 (NQA-1) as the industry standard to follow. Supporting procedures from other organizations, such as engineering, procurement, records, testing etc., would all appear in the quality assurance matrix attached to the QAP for the project. An example of a project-specific matrix that utilizes a site QAP is shown in Attachment 2. This set of procedures provides the control system for the project to assure that the customer's requirements for the project will be met. It takes all of the project participants to make this happen.

A waste management example of a site QAP is shown in Attachment 3. A project specific QAP that is implemented under Attachment 3 is shown in Attachment 4. A project specific matrix referencing the site QAP is shown in Section II of Attachment 4. Attachments 3 and 4 are written to meet the applicable requirements of DOE/RW-0333P, 10 CFR 830.122, and NQA-1. These examples show diversity in QAP tailoring—dependent on project risks.

### 4.0 QUALITY PROGRAM TAILORING AND CATEGORIZATION

The determination of the impact on project mission, safety, and the environment of any activity is required early in order that appropriate controls can be instituted to minimize the potential for significant issues occurring. As the risk of injury or insult reduces, the controls can also be reduced. The potential impact to project cost or schedule is another aspect considered when categorizing systems or items.

**Significance Categorization.** The project should develop a list of items and activities as early as possible to determine the significance of the item or activity to the success of the project. Things that should be considered in assigning significance include:

- a) Radiological or Industrial Safety to the public and worker
- b) Potential to impact the environment

- c) Potential to impact the acceptability to the customer (Can you prove it is good?)
- d) Potential to impact project completion date
- e) Potential to impact project cost
- f) Regulatory significance
- g) Public perception
- h) Others

Once the significant discriminators for the project items or activities are determined, they can be used to apply the appropriate level of review and oversight. For example, in low-level radioactive waste shipments, the radiological hazard is low, the customer acceptance needs are high, and the public perception (if waste is spilled on the highway) is significant. Therefore one would expect to apply a significant effort to assure that the shipping containers and Department of Transportation shipping requirements are met. This typically would include independent inspection of the procurement and receipt integrity of the containers, independent verification of the radiological conditions, and an independent verification that the loaded containers meet the Department of Transportation shipping requirements for placards, manifest, and such.

Another example is the high-level vitrified waste being prepared for storage in a federal repository. The quality requirements for the chemicals that are used to manufacture waste are limited to the process controls necessary to assure that the chemicals can be mixed with waste. The glass waste mixture will produce a vitrified material that complies with the repository requirements. The high-level waste quality program requirements to be met in producing the chemicals are different than those for safely managing the vitrified waste.

**Quality Program Tailoring.** Quality program tailoring is accomplished by applying only those quality elements to an item or activity that are required to accomplish the goal of having an item or activity meet the mission needs and customer requirements.

The key is to having trained and qualified quality personnel with sound technical backgrounds who can understand both the quality requirements and the important technical aspects of the project activities.

Categorization usually is used to determine the need to apply quality program controls. Once the need to assign a level of assurance is determined, the description and extent of this assurance should be a mutual agreement between the quality and technical organizations. Typically, the responsible engineer and the quality engineer for the project will discuss the item or activity and reach a consensus on the appropriate level of oversight needed to assure the acceptability of the item or activity. Factors that enter into the determination include:

***Items***

- a) Will the item be contaminated in use?

- b) Can the item be removed or repaired?
- c) Will the item cost the project money or affect the schedule if it is procured incorrectly?
- d) Are the dimensions important to its function?
- e) Is the material important?
- f) Do the customer requirements dictate specific needs?
- g) Is the item significant to safety?
- h) Others

### ***Activities***

- a) Does the activity require independent oversight (e.g., for safety or project Requirements)?
- b) Is a record required that the activity was performed correctly?
- c) Other.

In some cases, project or customer requirements will include specific action to be taken, such as receipt inspection of all procured items or vendor qualification for all items that are fabricated to project design.

All of these decisions and activities associated with selecting the appropriate quality requirements for an item or activity are part of the specific tailoring of project quality requirements to the circumstances, and require knowledgeable and experienced people in the quality assurance organizations as well as the technical organizations. Tailoring is the tool that the project uses to minimize the cost of quality for the project by applying appropriate controls based on risk.

## **5.0 QUALITY ASSURANCE PLAN IMPLEMENTATION**

The QAP will be supported by specific quality-related procedures in each functional area and will be a part of the quality assurance matrix. These procedures ultimately will deliver a project that will demonstrate through objective evidence that all requirements have been met. Quality requirements, properly implemented, will be an integral part of a functional area demonstrating through objective evidence that their deliverables meet requirements.

These procedures must be in place to understand the resource requirements to develop cost estimates and schedules.

Significance categorization is required prior to developing the conceptual design and estimate. This information is generated during the development of the functional requirements and Preliminary Hazard Analyses. These categories, in addition to performance expectations, will invoke the appropriate consensus standards. Engineering will use these consensus standards as design input and will be drive quality control requirements. These controls should help deliver the objective evidence required for a Readiness

Assessment or an Operations Readiness Review. This evidence will not happen without extensive planning and integration of functional processes and procedures.

The expectations for a Readiness Assessment or an Operations Readiness Review must be understood prior to establishing the Performance Measurement Baseline. Often, the tailored approach to quality requirements is driven by these expectations. The qualification of operations personnel, the documents and records, the work processes, item identification, design verification, supplier performance monitoring, inspections, supplier documentation and inspections, and testing must be tailored to meet assessment and review expectations. The establishment of the requirements necessary for close out of a project must be developed during the Initiation Phase to meet expectations.

Maintenance of the quality assurance program matrix is an excellent tool to help ensure integration of the implementing procedures. This matrix should be established early in the project to maintain the integration of quality functions. Understanding the flow of quality requirements through design into procurement and onto construction culminating in inspection and testing is critical to project success.

The generation of quality records plays a major role in the development of objective evidence that requirements have been met throughout the project life cycle becoming the core documentation for declaring readiness as shown in the following diagram.

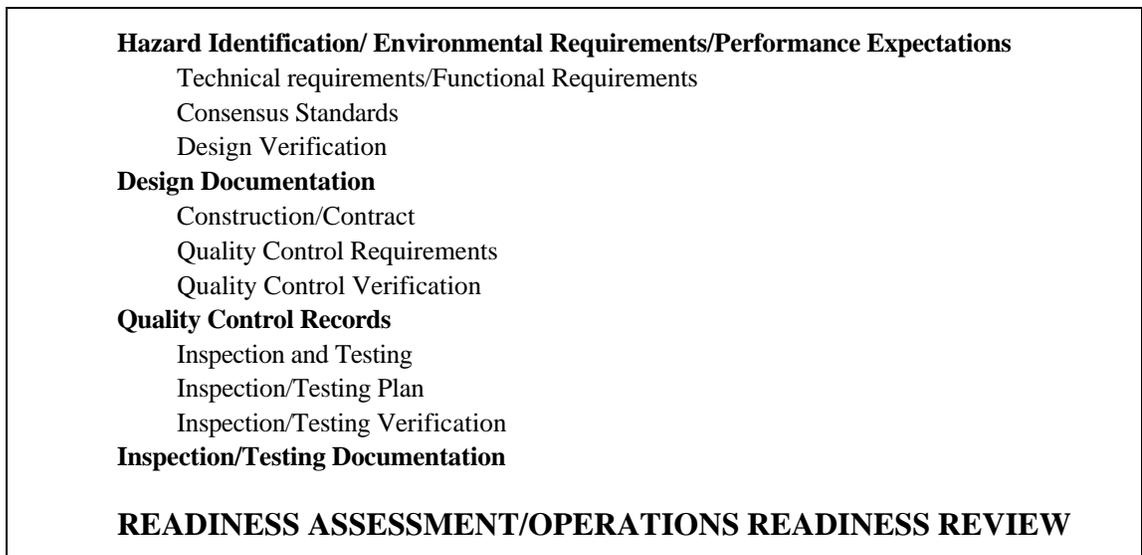


Figure 1. Typical Quality Record Development

**Attachment 1.** Index of quality assurance procedures that meet the requirements of a nuclear project that must comply with 10 CFR 830.120 and ASME NQA-1

**Attachment 2.** Quality Assurance Matrix showing compliance with 10 CFR 830.120 and ASME NQA-1

**Attachment 3.** Site Quality Assurance Plan written based on 10 CFR 830.120 and DOE Order 414.1A

**Attachment 4.** Project Quality Assurance Plan written under Attachment 3

**Attachment 5.** Quality Assurance Plan for a Disposition Project.

# ATTACHMENT 1

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## ATTACHMENT 2

### QUALITY ASSURANCE MATRIX

#### PQAP Requirements and Procedures Matrix

10 CFR 830.120 CRITERION	ASME NQA-1 CRITERION	PQAP SECTION	IMPLEMENTING DOCUMENT
Criterion 1 - Program	1 & 2	1 and 2	PDCF-PC-100; PDCF-PK-100; PDCF-PM-100, DN-PM-101, 102; PDCF-PE-010; PDCF-PQ-100; AB 6.10, 6.12
Criterion 2 – Personnel Training and Qualification	2	1	PDCF-PM-109; PDCF-PQ-111
Criterion 3 – Quality Improvement	15 & 16	15 & 16	PDCF-PQ-002, 003, 101, 102, 103
Criterion 4 – Documents and Records	6 & 17	6 & 17	PDCF-PG-101, 102, 103, 104; DN-PG-105
Criterion 5 – Work Processes	5 (8, 9, 12, 13 & 14 Not Applicable)	5	PDCF-PG-100
Criterion 6 – Design	3	3	PDCF-PE- 100, 102 103,105, 106, 107, 108, 109. 110. 111, 112, 113, 114, 115; 116, 117, 118, 119, 357; PDCF-PE-001, 002, 004, 006 thru 009, 011; 012 PDCF-PQ-106; CS-0306;
Criterion 7 – Procurement	4 & 7	4 & 7	PDCF-PP-101; PDCF-PQ-101, 107, 108; PDCF-PE-113, 114, 115; PDCF-PQ-001, 110, 112
Criterion 8 – Inspection and Acceptance Testing	11 (10 & 12 Are Not Applicable)	11	CS-0306; PDCF-PE-357
Criterion 9 – Management Assessment	2	1	PDCF-PM-001
Criterion 10 – Independent Assessment	18	18	PDCF-PQ-110, 111, 112

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## ATTACHMENT 3

VERIFY HARD COPY AGAINST WEB SITE IMMEDIATELY PRIOR TO EACH USE

# West Valley Demonstration Project

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WEST VALLEY NUCLEAR SERVICES COMPANY  
QUALITY ASSURANCE PROGRAM

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**WVNSCO QUALITY ASSURANCE PROGRAM  
STATEMENT OF POLICY AND AUTHORITY**

At West Valley Nuclear Services Company (WVNSCO) quality assurance has been and continues to be the focus of all individuals within the organization to ensure that risks are minimized, and that Environmental, Safety, Health (ESH) and Quality performance are maximized. To emphasize this site wide focus, WVNSCO integrates quality assurance and ESH at the West Valley Demonstration Project (WVDP) by this QAP and the Safety Management System (SMS) Description document (WVDP-310).

Staff Management at WVNSCO is responsible for implementing the WVNS Quality Assurance Program (**QAP**) as defined by this document. The Quality Assurance Program embodies the contemporary principles from 10 CFR Part 830.122, "Quality Assurance Criteria," and DOE O 414.1A, "Quality Assurance," and is applicable to the work performed by WVNSCO at the West Valley Demonstration Project (WVDP) nuclear and radiological facilities and activities. Many of the Applicable Standards and References identified in the April 15, 1994, DOE Implementation Guide (G-830.120-Rev 0) were initially used in developing this QAP. However, only the specific requirements of the QA Rule (10 CFR 830.122) and those selected from non-mandatory technical standards and identified as QAP requirements in the attached matrix (Appendix C) constitute enforceable compliance requirements under the Quality Assurance (QA) Rule. For reasons of management control and uniformity, the program as defined by this QAP is applied to nuclear and to non-nuclear WVDP facilities and activities alike. The enforcement provisions of 10 CFR 830.122 are applicable to those activities that have the potential to cause radiological harm (in the present or future) other than those already explicitly excluded by the Rule. This QAP establishes the policies and responsibilities for achieving the requisite quality in the management and operation of the West Valley Demonstration Project.

This QAP forms the foundation of the WVNSCO position of line management ownership of quality and provides for line management responsibility and involvement at all levels. This QAP focuses on recognizing and satisfying the customer's needs by applying a grading process to quality assurance controls commensurate with: (1) the relative importance to safety, safeguards, and security; (2) the magnitude of any hazard involved; (3) the life cycle stage of a facility; (4) the programmatic mission of a facility; (5) the particular characteristics of a facility; and (6) other relevant factors. It further recognizes the Staff Management mission of continuously assessing and improving internal processes.

Authority and responsibility for execution of this policy rests with the President of WVNSCO, and his staff. Each employee is responsible for performing work in compliance with the requirements of this Quality Assurance Program.

**Signature on File in Records & Information**

J. L. Little, President  
West Valley Nuclear Services Company

## WVNSCO QUALITY ASSURANCE PROGRAM

### INTRODUCTION

#### 1.0 BACKGROUND

This document defines the way WVNSCO conducts business. The West Valley Demonstration Act passed in 1980 directed the United States Department of Energy (DOE) to conduct a high level radioactive waste management demonstration project at the Western New York Nuclear Service Center (WVNSC). The WVNSCO Quality Assurance Program (QAP) was implemented at the WVDP in 1982. The program was originally developed to comply with ANSI/ASME NQA-1, 1979, which was the selected contemporary consensus standard. The WVNSCO program has since been updated to conform to ASME NQA-1-1989 as required by the current contract. It is periodically updated to comply with evolving DOE requirements and guidance.

Major tasks of the WVDP include the solidification of liquid High Level Waste, disposal of the low-level radioactive and transuranic wastes produced by project activities, cleanup of the residual fuel bearing materials in the Head End Cells, transfer of the remaining fuel assemblies to an off-site location, and decontamination and decommissioning of the tanks and facilities used in the solidification of the waste, and the materials and hardware used in connection with the project. An integral part of successfully pursuing these missions is to achieve the required level of quality in all site activities while protecting the health and safety of the public, site personnel, and safeguarding the environment. The mission strategy includes provisions to affirm that site activities are conducted in accordance with an effective management system for managing, performing, and assessing the adequacy of work. The success of the WVDP depends on the required level of quality being achieved in every functional area including process improvement, management and independent assessment, training, design and analysis, procurement, fabrication, installation, surveying, construction, testing, handling, storing, shipping, operating, maintenance, repair, modification, decontamination, decommissioning, sample selection and analysis, monitoring, measurement, data analysis, inspection, reviewing, and documentation.

WVNSCO has long established policies and practices that incorporate contemporary principles and techniques for managing, achieving, and assessing quality. Management systems established from ASME NQA-1 quality assurance requirements are considered consistent with, and responsive to, the Department of Energy (DOE) Secretary's quest for quality excellence. In pursuit of this level of excellence, Staff Management is committed to and is responsible for continuously striving to attain excellence in a safe, reliable, and effective **manner** to meet customers' requirements.

This Quality Assurance Program is a Safety Management Program as identified in WV-914, "Unreviewed Safety Question Process (USQP)," Attachment E, Safety Management Program Policy statements. WV-914, Attachment E also includes a policy statement for each of the several Safety Management Programs. In accordance with 10 CFR 830.201 and 10 CFR 830.207(b), any proposed change (i.e., modification, addition, or deletion) to WVDP-111 that would invalidate the policy statement requires prior DOE approval.

## 2.0 PROGRAM STANDARD

10 CFR Part 830.122 identifies the top level quality assurance criteria for establishing quality assurance programs for operating contractors and organizations performing work at or for DOE nuclear facilities. DOE/RW-0333P, "Quality Assurance Requirements and Description;" DOE O 414.1A, "Quality Assurance," DOE P 450.4 "Safety Management System Policy," and DOE O 440.1 "Worker Protection Management," specify **additional** quality assurance criteria for specific applications and activities. All of these standards documents (hereafter referred to as the DOE Quality Assurance Program Requirements) have some key elements such as planning and scheduling, performance improvement, cause identification, lessons learned, control of quality, evaluation of results, correction of deficiencies, etc. The WVNSCO Program uses ASME NQA-1 as a basis with program enhancements from other standards to assure that the requisite level of quality for all key activities is maintained. Figure 1 of WV-120 "Quality Assurance", depicts how these documents are integrated to form the basis for the QAP, and summarizes the hierarchy and flow of DOE requirements into implementing programs, policies, and procedures.

### 3.0 PURPOSE

The purpose of this Quality Assurance Program (QAP) is to describe the overall QA Program for implementation of the DOE Quality Assurance Program Requirements. The QAP describes responsibilities and authorities, policies, requirements, and provides for the management, performance and assessment of work.

### 4.0 SCOPE

This QAP identifies and describes the integral elements of the quality assurance activities that apply to the broad spectrum of work performed by WVNSCO and its contractors for all activities at the WVDP. This QAP also describes how it relates to the lower-tier quality assurance programs of the major project participants. This QAP provides the framework and criteria for implementing a quality assurance program to plan, perform, and assess the effectiveness of all project activities such as design, procurement, construction, and operation of engineered facilities in accordance with DOE Quality Assurance Program Requirements.

This QAP depends on the integration of various functions to follow a consistent path for conducting business. Good management practices will be implemented for planning, performing, and assessing activities.

QAP requirements and objectives are implemented as follows:

- 4.1 Staff Management provides planning, organization, direction, control, and support to achieve the organization's objectives;
- 4.2 The line organizations are responsible for the performance and achievement of quality; and
- 4.3 The overall quality performance is evaluated using a rigorous assessment process.

5.0 CURRENT PROGRAM

The QAP implements DOE Quality Assurance Program Requirements. The core policy documents which implement the QAP are the Quality Management Manual (QM), WVDP-002 and select policy/procedure documents, (ie;WVs). They establish and outline the policies, and requirements for the site Quality Assurance Program and establish the line organizations' responsibility for implementing the QAP. Each section of the QM is **approved** by the President of WVNS thus establishing its applicability to work performed at the WVDP by WVNSCO. This QAP is reviewed and approved by the DOE Ohio Field Office **Manager**. Performance against this QAP is periodically evaluated by the DOE-OH/WVDP.

6.0 OVERALL PROGRAM POLICY

WVNSCO has established and implemented a Quality Assurance Program that substantiates that adverse impacts are minimized and safety, reliability, and performance are maximized through the application of effective management systems commensurate with the ESH and quality considerations posed by the facility and its work. While the QAP encompasses many diverse activities such as high level radioactive waste management, effective performance will be verified to demonstrate:

- 6.1 Program control activities are of the appropriate type and quality for their intended use, and
- 6.2 Engineered items and systems are designed, constructed, and operated according to defined requirements and expectations.

## 7.0 PROGRAM CONTENT

This QAP is organized into three functional categories: Management, Performance, and Assessment. These categories capture the range of activities common to all work activities, from organizing and staffing to assessing results and providing feedback to improve the process. Within the three functional categories are the quality assurance criteria that provide the basic requirements of a quality assurance program. The application of these criteria extends from the planning and conducting of basic research and development, performing scientific investigation, and developing engineering design to the performance of operations, maintenance and repair activities, and finally to minimizing impact. As such, these quality assurance criteria reflect a comprehensive way of doing business throughout the life cycle of WVDP programs and activities.

The three programmatic areas and their ten (10) respective supplements (criteria) are:

### 7.1 Part A - Management

Criterion 1 - Program

Criterion 2 - Personnel Training and Qualification

Criterion 3 - Quality Improvement

Criterion 4 - Documents and Records

Management provides the common elements needed in effective quality assurance programs, regardless of the projects or programs to which they are applied. This QAP recognizes that it is management's responsibility to establish and cultivate principles that integrate quality requirements into the daily work routine. For this integration to be successful, the personnel performing the work must receive appropriate information, training, tools, empowerment, support, and encouragement. Management's role is to define

requirements and expectations clearly; properly train, motivate and empower personnel; provide appropriate resources; and demonstrate integrity, commitment, and leadership through active involvement in the implementation of an effective and continuously improving quality assurance program.

## 7.2 Part B - Performance

Criterion 5 - Work Processes

Criterion 6 - Design

Criterion 7 - Procurement

Criterion 8 - Inspection and Acceptance Testing

The above criterion contains the program elements that must be addressed for effective design, procurement, construction, installation, and operation of engineered items and systems and for decontamination and decommissioning. Line management is responsible for planning and achieving performance objectives; and for establishing and maintaining the technical requirements for project work. Performance objectives include the necessary implementation requirements for defining and performing work processes to assure that the right things are done right the first time, and to meet customer requirements.

### 7.3 Part C - Assessment

Criterion 9 - Management Assessment

Criterion 10 - Independent Assessment

This category provides for the periodic assessment of the QAP implementation to determine its effectiveness and to promote improvement, and describes the **senior and** line management assessment responsibilities. Management regularly assesses and documents the adequacy of the framework and infrastructure of the portions of the program for which they are responsible, to confirm the program's effective implementation. It also contains the independent assessment structure with the organizational freedom and authority for conducting inspections, surveillances, audits, and independent assessments. It provides for the auditing of operations, systematic handling of nonconforming conditions, issues resolution, and lessons learned through corrective actions, trending, and causal analyses.

## 8.0 PROGRAM IMPLEMENTATION

This QAP is approved by DOE. Implementing the Program requires the use of site procedures and departmental procedures which satisfy the provisions of this QAP. Separate supplemental quality assurance plans/programs may be used for special programs and projects when additional controls or special emphasis is needed. An example of such a supplemental QAP is WVDP-074, **"Quality Assurance Program for High Level Waste Form Production Through Acceptance"** which requires that the High Level Waste Form satisfies the appropriate requirements of the Office of Civilian Radioactive Waste Management document, "Quality Assurance Requirements and Description", DOE/RW-0333P. Supplementary quality assurance plans or programs are specific quality requirements which provide direction for special programs/projects above the baseline quality program requirements.

9.0 OVERALL PROGRAM RESPONSIBILITIES

- 9.1 WVNSCO President is responsible for the overall WVNSCO Quality Assurance Program and policy.
- 9.2 Staff Management is responsible for planning and implementing programs and projects and for assessing the performance of these activities against the requirements of this QAP. Staff Management is also responsible for establishing and cultivating principles that integrate quality requirements into daily work, and for providing individuals performing the work with the proper information, tools, training, support, empowerment, and encouragement to properly perform their assigned task.
- 9.3 Quality Assurance Manager is responsible for defining, coordinating, and establishing a quality assurance program appropriate to the work scopes and work activities being accomplished; and advising and assisting Staff Management concerning QAP implementation. The Quality Assurance Manager is also responsible for independently assessing WVNS performance to the requirements and commitments of this QAP.
- 9.4 Personnel are responsible for the achievement of the requisite level of quality in work they perform. Each employee is responsible for implementing the policies and procedures established to support this QAP, doing work safely and correctly the first time, and assuring that reliability, performance, and customer satisfaction are maximized. The employee's role is to meet established requirements and to recommend improvements in item and process quality, to inform management of suspected unsafe conditions, and to stop work when they know or suspect their work or others' could potentially result in an unsafe or unacceptable quality condition.

**PART A: MANAGEMENT**

Part A contains the program elements that define the framework for management processes supporting this QAP. It provides the common elements needed to manage an effective quality assurance program, regardless of the projects or programs to which they are applied. This portion of the QAP mandates that it is line management's responsibility to establish and cultivate principles that integrate quality requirements into the daily work routine. For this integration to be successful, the people performing the work must receive appropriate information, tools, support, and encouragement. Line Management must define requirements and expectations clearly; appropriately train; motivate, and empower personnel; provide appropriate resources; and demonstrate integrity, commitment, and leadership through active involvement in the implementation of an effective quality assurance program.

## 1.0 CRITERION 1 - PROGRAM

### 1.1 General

This section describes the requirements to develop, implement, and maintain a written QAP which describes the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing adequacy of work; and the management system, including planning, scheduling, resource considerations, and cost control.

Staff Management shall lead the development and implementation of a structured management system that provides the framework for implementing a quality assurance program directed toward achieving project missions and goals.

### 1.2 Approach

The existing Quality Management manual (WVDP-002), identified in Figure 1 of WV-120, and related procedures shall be retained and maintained in accordance with the original NQA-1 criteria format. The project or function specific quality assurance programs/plans will continue to support special programs or projects that are distinct from, but interact with, this overall QAP for implementing DOE Quality Assurance Program Requirements. For example, the high-level radioactive waste vitrification program is described by a specific quality assurance program (WVDP-074) responding to the OCRWM, DOE/RW-0333P, High-Level Waste "Quality Assurance Requirements and Description" (QARD). Appendix A provides matrices to cross reference related quality assurance requirement documents. The matrices relate the requirements of the DOE Quality Assurance Program Requirements to WVDP-002, "WVNS Quality Management;" and WVDP-074. Further, Figure 1, of WV-120 depicts the hierarchy of implementing programs, policies, and procedures sufficient to implement the various quality assurance requirements imposed or adopted by the WVDP.

- 1.2.1 WVNSCO has site-specific vision and mission statements, performance objectives, and measures which clearly communicate management's commitment to and ownership of quality excellence in all site activities, and for providing the leadership direction for developing and implementing the QAP.
- 1.2.2 WVNSCO implements total quality processes to achieve quality excellence. These Total Quality principles embody conditions of excellence for customer satisfaction, human resource excellence, product/process leadership, and management leadership. These Total Quality processes include benchmarking, saving through sharing, best management practices, employee empowerment, and employee ownership.
- 1.2.3 This QAP includes a description of Staff Management involvement with regard to satisfactory implementation of each of the ten criteria of the DOE Quality Assurance Program Requirements. It also includes a description of the individual management systems that substantiates that programmatic risks are appropriately considered in accordance with a method of graded quality assurance application.
- 1.2.4 This QAP identifies specific implementing policies and procedures to be used for QAP implementation.(see appendix C)

### 1.3 Implementation

- 1.3.1 The WVNSCO President has issued a quality assurance policy statement, WV-120, which commits WVNSCO personnel to implement a formal quality assurance program that promotes effective and efficient achievement of quality objectives.

- 1.3.2 Staff Management retains and exercises the responsibility for the scope and implementation of this QAP, with emphasis on confirming that personnel understand and implement this system. Line management is responsible for effective work process performance and for achievement of quality in the work performed. Each individual is responsible for the quality of their work.
- 1.3.3 Project and program planning documents contain descriptions of the scope of work to be performed, mitigation of associated hazards, the task assignments and responsibilities for achievement and assurance of quality, and the organizational structure including identification of lines of communication. They also identify or commit to providing the procedures and instructions necessary to perform planned work processes, and the necessary documentation to be provided as objective evidence of proper completion of planned work processes.
- 1.3.4 Processes and procedures require the application of management controls consistent with organizational structure, functional responsibilities, levels of authority, and interfaces, and the degree of confidence the performer and end product user must have in the quality of end products and services.
- 1.3.5 The quality of items and processes is commensurate with their importance. The use of a grading process to the application of management controls is implemented consistent with the degree of confidence necessary to be assured that requisite end product quality is attained.
- 1.3.6 Procedures and instructions are provided so that planned processes are performed in a consistent manner and that objective evidence of end product or service quality is documented.

- 1.3.7 The control of activities for collecting and analyzing data to monitor and measure the environment are commensurate with the importance of the decisions to be reached using the data. Environmentally related measurements are defined as those field and laboratory investigations that generate data to be used for acceptance of product or processes.

These activities include; the measurement of chemical, physical, or biological parameters in the environment; the determination of the presence or absence of pollutants in waste streams; assessment of health and ecological effect studies; performance of engineering and process acceptance; studies that bear on acceptance of laboratory simulation of environmental events; and study or measurement on pollutant transport and fate, including diffusion models.

- 1.3.8 Delegation of work to parties outside the WVNSCO organization is identified. For delegated work, management control, direction, and guidance are established, responsibilities assigned, and lines of communication identified so that the programmatic elements of this QAP are met.
- 1.3.9 The detail and sophistication of planning and scheduling is commensurate with complexity, importance, duration, and safety. Initial estimates used to develop the organization's project plan, are based on sound data and assumptions relating to material/service costs, availabilities, and productivity.
- 1.3.10 Project status is monitored and reported using techniques that depict actual progress toward achieving identified goals. Plans and schedules are evaluated and revised to reflect past performance, current status, and forecasts.

1.3.11 Readiness reviews or assessments are performed prior to major scheduled or planned work, following an extended shutdown, or prior to resumption of activities following a shutdown for cause (significant disruption), or a substantial modification to an existing process or facility, and are performed based on the complexity, importance, and programmatic impact to verify at least the following characteristics:

- A. Work prerequisites have been satisfied.
- B. Hazards have been appropriately identified and controlled.
- C. Detailed technical and quality assurance procedures have been reviewed for adequacy and appropriateness.
- D. Personnel have been suitably trained and qualified.
- E. The proper equipment, material, and resources are available.

1.3.12 Responsibility and authority to stop unsatisfactory work and prevent further processing, delivery, installation, or use of nonconforming items is assigned such that planning and schedule considerations do not override ESH and quality considerations.

#### 1.4 Responsibilities

1.4.1 WVNSCO President retains and exercises the responsibility for defining and implementing an effective quality assurance program for WVNSCO, and maintaining its authority. This authority includes approval of this QAP.

1.4.2 Staff Management is responsible for implementing the quality assurance program, assessing it, and promoting effective and efficient achievement of performance objectives.

- 1.4.3 Quality Assurance Manager is responsible for developing the overall Quality Assurance Program including this QAP and the Quality Management Manual (which establishes the site-wide Quality Assurance Program policies), monitoring the program for implementation and effectiveness, and coordinating the organization's quality assurance functions. The Quality Assurance Manager evaluations are independent from cost and schedule considerations. Quality assurance programmatic effectiveness information is regularly reported to the President by the QA Manager, who has direct access to the President in matters affecting quality. The QA Manager is responsible for assuring there is routine monitoring and assessment of the implementation of this QAP.
- 1.4.4 Line Management is responsible for the achievement of quality and performance objectives for items and processes to an extent consistent with their importance, encouraging continuous improvement, and setting goals for exceeding customer expectations whenever possible.
- 1.4.5 Management, at all levels, is responsible for quality performance and encourages individual responsibility for quality achievement in the conduct of activities. Management encourages personnel at all levels to identify and correct problems and to offer solutions to those problems. Management provides leadership in the quality improvement process so that proper focus is given, adequate resources are provided, workers are involved, issues are resolved, and customer understanding of problem resolution is achieved.

2.0 CRITERION 2 - PERSONNEL TRAINING AND QUALIFICATION

2.1 General

This section describes the training and qualification and certification requirements for personnel to provide them the appropriate indoctrination, training and tools for performing their assigned work. Personnel are provided continuing training to maintain job proficiency.

WVNSCO policy requires that every employee be properly trained and qualified to perform his/her functions, and that each employee is evaluated for general and specific training needs for work performance and qualification.

2.2 Approach

WVNSCO has established and implemented training programs and procedures to provide the adequacy of personnel proficiency for work to be performed. Appropriate training is performed and documented, and when job requirements change, the need for retraining is evaluated.

2.2.1 Management provides resources for required training and retraining so that personnel performing work are qualified and/or certified to perform assigned work, including and according to any project-specific requirements.

2.2.2 Management is encouraged to stimulate and focus professional development through membership in appropriate professional societies and the utilization of appropriate professional and management courses that have been developed and are available.

2.2.3 WVNSCO uses educational programs to provide professional and management employees with the tools needed to perform their daily operations.

2.2.4 Management is encouraged to benchmark and maximize the use of training developed at other locations.

## 2.3 Implementation

2.3.1 Personnel performing work are capable of performing their assigned tasks. Training requirements are developed and implemented for all levels of personnel and for specific job categories. Qualification and/or certification requirements are established for specific job categories, such as operators, designers, instructors, managers, supervisors, inspectors, **testers**, welders, engineers, scientists, and independent assessment personnel.

2.3.2 Training provides the worker **with an** understanding of the processes and tools being used, the extent and sources of variability in those processes and tools, and defines the degree to which the worker has control over that variability.

2.3.3 Training emphasizes correct performance of work and provides an understanding of why ESH and quality requirements exist. The training provides an understanding of project and site related missions and goals as they relate to the fundamentals of the work and its context. Training instruction addresses potential consequences of improper work and **focuses** attention on "doing it right the first time." The training curricula addresses specific needs and is presented by qualified instructors.

2.3.4 Training plans address and stimulate professional development and provide for progressive improvement and are not limited to initial qualification for job proficiency. Training plans for management personnel may include professional, managerial, communication, and interpersonal skills.

- 2.3.5 Personnel performing work that requires special skills or abilities are qualified and/or certified prior to performing such work. The qualification program includes demonstration of the candidates proficiency. Qualified personnel are periodically reviewed to verify the continuing proficiency of their qualification status. A change to the qualified practice requires training of the changed requirement if the change affects their qualification status.
- 2.3.6 Training programs are subject to ongoing review to evaluate continued program and instruction effectiveness. Training and qualification materials are subject to ongoing review and evaluation and are upgraded whenever needed improvements or other enhancements are identified.

## 2.4 Responsibilities

- 2.4.1 Human Resources Department is responsible for developing and/or maintaining position descriptions and associated individual experience and educational records and for verifying relevant education and experience.
- 2.4.2 Staff Management is responsible for providing adequate resources to accomplish required training and retraining, and for assessing the adequacy and effectiveness of training.
- 2.4.3 Training and Development Department evaluates technical and ESH training programs that support the conduct of operations, quality assurance, and general employee training requirements. The Training and Development Department requires that organizations develop and implement technical training, educational, and employee development programs. These programs are implemented under the performance-based training procedures. Other responsibilities include the following:

- A. Evaluate the effectiveness of the training programs to determine the impact on improving the knowledge, skills, and abilities of WVNSCO personnel. The evaluations are performed through the use of surveys, interviews, observations, audits, self-assessments, and appropriate policies and procedures.
- B. Provide job-specific and program based training such as Computer-Based Training (CBT), and ISM training.
- C. Provide general employee training (GET) for all WVNSCO employees and subcontractors.
- D. Provide conduct of operations training for WVNSCO organizations.
- E. Provide on-the-job training (OJT) and workshops for instructors and classroom instructors.

2.4.4 Line Management is responsible for identifying relevant position descriptions and for providing training commensurate with the qualifications identified. Line management is responsible for identifying and documenting those work functions requiring special skills and for determining the training necessary to provide the adequacy of personnel proficiency for the work to be performed; identifying minimum education and experience requirements to perform the work; and identifying general training topics such as applicable codes, standards, and company directives and operating practices. Line management is responsible for the content of department level training materials, including preparation, obtaining appropriate review by subject matter experts, and approval. Line management is responsible for ensuring that the required indoctrination, training, and qualification for a specified task is provided to the appropriate personnel and that the training is completed prior to performing the task. Line

management is responsible to provide the performer of a task supervision by a person who is qualified if the training of the performer is not complete. Line management is responsible for documenting the indoctrination, training, and qualification.

2.4.5 All Personnel are responsible for maintaining and demonstrating proficiency in performing his/her assigned work.

2.4.6 Records and Information is responsible for maintaining personnel training records for inter-departmental (site) and departmental training.

### 3.0 CRITERION 3 - QUALITY IMPROVEMENT

#### 3.1 General

It is WVNSCO' policy to identify, control, and correct items and processes that do not meet established requirements. Correction includes identifying the causes of problems and preventing their recurrence. Item reliability and acceptability, process implementation, and other quality-related information are reviewed and the data analyzed to identify processes needing improvement.

#### 3.2 Approach

The management approach integrates a continuous improvement focus into existing processes and implementing procedures to promote continued achievement and improvement of quality. Management develops annual project plans that includes site goals, objectives and performance measures. The site goals and objectives are further supported by department goals, objectives, and performance measures, and further integrated on an individual basis.

- 3.2.1 WVNSCO has established and implemented procedures and processes to detect and prevent quality problems. The implementing processes concentrate on problem prevention and work performance.
- 3.2.2 Management encourages new ideas, worker ownership of work process methods, and encourages identification and reporting of unsatisfactory conditions. Management encourages the voicing of differences of opinion, and the early identification and resolution of such differences. WVNSCO has established and implemented an employee concerns program for reporting concerns such as potential environmental, safety, health, or quality problems. Management may periodically benchmark other outstanding quality initiatives and conduct periodic independent quality fitness reviews to verify that the quality process is producing continuous improvement in overall operations.

### 3.3 Implementation

- 3.3.1 A program is established and implemented to promptly identify, document, classify, analyze, correct, eliminate, and follow up on items, and processes that do not meet established requirements or goals, or do not result in the requisite quality.
- 3.3.2 Nonconformance/noncompliance data is analyzed to identify trends that adversely impact quality and to identify opportunities to improve items, services, and processes. These analyses consider information from external sources and are not limited to one type of work, one facility, or one contractor. The extent of causal analyses related to nonconformances is commensurate with the importance or significance of the problem.

- 3.3.3 All personnel are encouraged to identify opportunities for and to promote continuous improvement. This includes the identification and reporting of nonconforming items, and the encouraging of recommendations for process improvements.
- 3.3.4 All personnel are empowered to stop work until effective corrective action is taken.
- 3.3.5 Management, at all levels encourages individual responsibility for quality achievement in the conduct of their activities. Management is involved in the quality improvement process to oversee that proper focus is given, problems are identified, adequate resources are allocated, new ideas are encouraged, open communications exist across all organizations and organizational levels, and issues are resolved.
- 3.3.6 Process for resolving professional differences of views and opinions are established and implemented.
- 3.3.7 Nonconforming items (those that do not meet quality requirements) are properly controlled to prevent their inadvertent test, installation, or use. They are reviewed by the organization(s) that originally reviewed and approved the item or by a qualified designated organization. Each nonconforming item is provided with a disposition of accept (Use-As-Is), reject, repair, or rework. The justification for the selected disposition is appropriately documented.
- 3.3.6 Reworked and replacement items are inspected and tested in accordance with the original inspection and test requirements. Repaired items are inspected and tested to specified and approved alternative methods.

3.3.9 Personnel responsible for classifying, analyzing, and providing the disposition(s) to a nonconformance have an adequate understanding of the area in which they are working, and have access to pertinent background information concerning the nonconformance.

### 3.4 Responsibilities

3.4.1 Staff Management is responsible for establishing and leading the quality improvement process to oversee that proper focus is given and adequate resources are provided. Also they are responsible for establishing and implementing processes to promote and conduct continuous quality improvement in technical and management processes, including the identification of performance measures of success and standards of excellence.

3.4.2 Line Management is responsible for quality performance and encourages new ideas, worker ownership of work processes, and the identification of problems without fear of recrimination. Line management is responsible for implementing corrective action for problems, for identifying root causes of problems, for recommending processes/procedures to prevent their recurrence, and for evaluating deficiency and corrective action data for systemic impact and application.

3.4.3 Quality Assurance Manager is responsible for establishing processes/procedures to prevent and detect quality problems and to identify, control, document, report, and resolve nonconforming conditions.

3.4.4 All Personnel are responsible for identifying, controlling, and reporting items that do not meet established requirements (e.g., deficiencies, nonconformances). Each employee is empowered to identify improved methods of performing work.

4.0 CRITERION 4 - DOCUMENTS AND RECORDS

4.1 General

It is WVNSCO policy that uniform practices be used for establishing and implementing processes to require, prepare, review, approve, issue, use, and revise documents.

It is WVNSCO policy that documents be used to prescribe processes, specify requirements, and establish design. Records are specified, prepared, reviewed, approved, maintained, stored, protected, and capable of being retrieved in a timely manner.

4.2 Approach

WVNSCO integrates the requirements of documents and records processes into implementing procedures for the timely preparation, issuance, control, and revision of documents that specify requirements of prescribed processes or quality-affecting activities. Management encourages the use of electronic data systems and requires that workers use the correct documents to perform their assigned duties.

4.2.1 WVNSCO has established and maintains procedures to control documents. Such documents, including revisions, are reviewed for conformance with quality requirements and approved for release by authorized personnel.

4.2.2 Management oversees that documents are kept current, are available at the workplace as required, and are used by personnel performing work.

4.2.1 WVNSCO has established procedures to require that sufficient records are specified, prepared, reviewed, authenticated, maintained, stored, and protected.

### 4.3 Implementation

#### 4.3.1 Documents

- A. A program is established and implemented to control the preparation, review, approval, issuance, use, and revision of documents that prescribe activities, specify requirements, or establish design.
- B. The scope of the document control system is defined. Examples of documents to be controlled include drawings, data files (including various media), calculations, specifications, computer codes, purchase orders and related documents, vendor-supplied documents, procedures, work instructions, and data sheets.
- C. Revisions to controlled documents are reviewed and approved by the organization(s) that originally reviewed and approved the documents or by a designated organization that is qualified and knowledgeable.
- D. Controlled instructions and procedures are made available to and are required to be used by persons performing the activity.
- E. The distribution of new and revised controlled documents is in accordance with established timeliness guidelines. At the time of distribution of new or revised controlled documents, it is required that the recipient (usually the person on controlled distribution) destroy, or identify superseded documents.
- F. **Electronic access is also available to view controlled documents.**

#### 4.3.2 Records

- A. A program is established and implemented to require that sufficient records of items and processes (such as design, procurement, construction, data acquisition, inspection, testing, maintenance, modification, and decontamination and decommissioning) are specified, prepared, reviewed, approved, and maintained to reflect completed work. Records maintenance provisions include retention, protection, preservation, storage, traceability, accountability, and retrievability.
- B. For records that require special processing and control, such as computer codes or information on computer disks, the hardware and software required to maintain and access the records are controlled to provide records that are useable.
- C. The National Archives and Records Administration (NARA) exercises final authority for approving the disposition of Government records. The requirements for the records holding facilities were established using ASME NQA-1 criteria as guidance. Records retention and disposition are in accordance with NARA requirements. Quality assurance records are classified in accordance with ASME NQA-1.

#### 4.4 Responsibilities

- 4.4.1 Management is responsible for establishing and maintaining procedures for the timely preparation, issuance, control, and revision of documents that specify requirements of prescribed or quality-affecting activities, and to assure that documents are kept current and are used by personnel performing work. Management is responsible for establishing and maintaining procedures that require sufficient records to be specified,

prepared, reviewed, authenticated, and maintained to reflect completed work and/or to fulfill any statutory requirements. Retention times for records are determined based on the requirements of DOE Orders and guidance from ASME NQA-1. Implementing procedures assure that the NARA and their General Record Schedules (GRS) requirements are satisfied.

- 4.4.2 All Personnel are responsible for performing his/her work to the requirements of the most current documents and for documenting the results of work activities as specified.

**PART B: PERFORMANCE**

Part B contains the program elements essential for effective design, construction, and operation of engineered items and systems; for planning and achieving performance objectives; and for managing activities associated with establishing and maintaining the technical requirements for work. This section includes the necessary implementing processes for defining and achieving the performance objectives for work processes and operations, procurement of items and services, design, construction, and testing and operations of engineered items and systems. The responsibility for quality as work tasks are performed is assigned to the responsible line manager and ultimately to the worker who owns the task. This philosophy is expanded in the "Conduct of Operations" and "Conduct of Maintenance" manuals that were prepared as a guide for the conduct of business excellence and achievement of quality throughout the WVNSCO organization.

5.0 CRITERION 5 - WORK PROCESSES

5.1 General

It is WVNSCO policy to perform work under suitable conditions using approved instructions, procedures, or other appropriate means. Items are identified and controlled to ensure their proper use, and are maintained to prevent their damage, loss, or deterioration. Defective items are identified and controlled to prevent inadvertent use. Equipment used for process monitoring and data collection is calibrated and maintained.

5.2 Approach

WVNSCO integrates work processes which are consistent with DOE Orders, such as 5480.19, "Conduct of Operations," and DOE P 450.4 "Safety Management System Policy." WVNSCO fosters the attitude that personnel performing work are responsible for the quality of their work. Line management is directly involved in the achievement of quality, the assurance of quality, and the continuous improvement of work processes.

It is management policy that there is a proactive and continuing involvement by an independent Quality Assurance organization, which supports and assists line management in their implementation of the QAP. This independent involvement in no way preempts or replaces the quality responsibilities of the performing personnel or the associated line managers. The extent and degree of the independent quality assurance organizational involvement is established through graded application of the Quality Assurance Program. Significant cost-effective results are achieved through a well established grading process. This process recognizes and includes all grading criteria, considering, as appropriate, complexity, consequence of failure, worker and public safety, environmental impact, and programmatic effects.

5.2.1 WVNSCO has established and implemented procedures to manage work activities by planning, performing, and assessing according to approved requirements documents (e.g., plans, procedures, drawings, specifications). Planning requires involvement of the line management before initiation of significant project activities to identify and determine the overall project scope of work, identified associated hazards, cost, and schedule constraints within which project activities are required to be performed.

Procedures for special processes where conformance is difficult to measure, or where quality of the results cannot be readily determined by inspection or test of the product requires special attention for control of processes and/or worker skill.

5.2.2 WVNSCO has implemented a grading process, that requires the application of controls commensurate with the relative safety and programmatic importance or intended use of the resulting item or activity.

5.2.3 WVNSCO accomplishes assessments of work processes and operations through line organization self-assessments and independent assessments. Such assessments may include, but are not limited to; inspection, tests, quality control checks, surveillances, peer reviews, audits by qualified or certified personnel, and management walkdowns.

5.2.4 The independent assessment function is provided by designated, qualified persons (or organizations) who have no real or perceived conflict of interest and who have sufficient authority, access to technical programs, and organizational freedom to:

- A. Identify quality problems.
- B. Propose recommendations for resolving quality problems.

- C. Independently confirm implementation and effectiveness of solutions.
- D. Provide information to line management to ensure that further collection, analysis, or use of environmental data is controlled until the problem is suitably resolved.
- E. Provide information to line management to ensure that further design, fabrication, construction, or operation of engineered items and systems is controlled until nonconforming, deficient, or unsatisfactory conditions have been suitably resolved.

### 5.3 Implementation

#### 5.3.1 Work

- A. All personnel performing work activities are responsible for the **safety and** quality of their work. Because the individual worker is the first line for producing quality work, personnel are required to be knowledgeable of the requirements for work performed and the capabilities of the tools and processes used.
- B. Line management confirms that personnel are provided with the necessary training and are given sufficient resources to accomplish assigned tasks. Line management also confirms that the appropriate administrative controls are in place to establish the criteria for acceptable work performance and quality achievement.

- C. Line management reviews the quality of completed work and other quality-related information to determine that the desired quality is being achieved and to identify work processes and process implementation areas potentially in need of improvement.
- D. Work is planned, authorized, and accomplished under controlled conditions using approved instructions, procedures, or other appropriate means that are of a detail commensurate with the activity's complexity, risk, and importance. Those work processes that require the use of instructions, procedures, or other means are identified by line management.
- E. Instructions, procedures, and other forms of direction are developed, verified, validated, and approved by personnel knowledgeable, experienced, and authorized to provide direction in the area of work being addressed.

#### 5.3.2 Identification and Control of Items

- A. A program is established and implemented to control samples and to identify, control, and maintain items (including consumable materials and items with limited shelf life) to prevent the use of incorrect or defective items. Engineering and procurement provides instructions for the identification and control of suspect/counterfeit items, and directions to preclude them from the WVDP.
- B. Identification of items is maintained so that the item can be traced to its documentation. Traceability is maintained to the extent consistent with the item's importance.

### 5.3.3 Handling, Storage and Shipping

- A. A program is established and implemented to control the handling, storage, shipping, cleaning, and preservation of items to prevent their damage, loss, or deterioration.
- B. Items are marked and labeled during packaging, shipping, handling, and storage to identify, maintain, and preserve the items' integrity and indicate the need for special controls. Requirements for off-site transportation are established and implemented.
- C. Special protective measures (such as containers, shock absorbers, accelerometers, inert gas atmospheres, and specific temperature and moisture levels) are specified and provided when required to maintain acceptable quality.

### 5.3.2 Calibration and Maintenance of Process Monitoring Equipment

- A. A program is established and implemented to control the calibration, maintenance, and use of equipment used for data collection and process monitoring of work including environmental data collection activities.
- B. Process monitoring and data collection equipment is of the precision and type suitable for the intended use. The types of equipment used by the program are defined. Calibration certifications are traceable to nationally recognized performance standards, where possible. If no such nationally recognized standards exist, the basis for the calibration is documented and justified.

## 5.4 Responsibilities

5.4.1 Management is responsible for establishing policies and procedures for all aspects of work control and performance consistent with the items' importance and programmatic impact. Management is responsible for routine involvement in planning, designing, implementation, and continuous improvement of work processes in their area of responsibility.

5.4.2 All Personnel are responsible for contributing to continuous improvement of work processes, performing work to approved requirement documents (e.g., plans, procedures, drawings, specifications); performing work in a sequence consistent with the approved work instructions and performing work with the proper tools and equipment.

## 6.0 CRITERION 6 - DESIGN

### 6.1 General

It is WVNSCO policy to design items and systems using sound engineering/scientific principles and appropriate standards. Design work, including changes, are incorporated with applicable requirements and design basis. Design interfaces are identified and controlled. The adequacy of design products is verified or validated by individuals or groups other than those who performed the work. Verification and validation work is completed before approval and implementation of the design.

## 6.2 Approach

WVNSCO integrates a formal design control process which is consistent with the appropriate requirements of ASME NQA-1. Design controls are determined through a risk-based control process that considers ESH and Quality impact, and programmatic risk. The extent of design verification and validation is based on complexity, risk, and uniqueness of the design.

6.2.1 WVNSCO has established and implemented a formal design control program that requires engineered items and systems to be designed using sound engineering/scientific principles and appropriate standards. The formal design process defines the control of design inputs, processes, outputs, changes, lines of communication, interfaces, and records. This process provides for timely and correct translation of design inputs into design outputs, effective coordination and interfacing of organizations participating in the design process, and acceptable and verified design outputs. Designs shall provide for expected end use, including inspection, testing, acceptance criteria, hazard mitigation, and maintenance considerations.

6.2.2 WVNSCO has a formal design verification process which confirms design adequacy by persons other than those who designed the system or item where appropriate. Verification is completed and documented before implementation of the design. Complex designs are verified at critical stages of development to enable timely correction of deficient conditions. Computer software used for design and associated design calculations is validated through testing or simulation prior to use.

- 6.2.3 Design documents specify the technical and quality acceptance criteria and the information required to verify acceptable construction and operation. Design changes, including field changes, are governed by control measures commensurate with those applied to the original design.
- 6.2.4 WVNSCO policy establishes a grading process methodology (quality levels) which defines specific levels of Quality Assurance Program application. This policy takes into consideration the ESH and Quality, programmatic importance of the work, and intended use of items or systems.

### 6.3 Implementation

- 6.3.1 A program is established and implemented for the design of items and systems using sound engineering/scientific principles and appropriate standards. The program includes provisions to control design inputs, processes, outputs, changes, interfaces, records, and organizational interfaces.
- 6.3.2 Design inputs (such as the design bases) are correctly translated into design outputs (such as specifications, drawings, procedures, and instructions). Calculations and associated design decisions are monitored for correctness during the design process. Design outputs are verified to confirm that they are suitable for their intended use.
- 6.3.2 Changes to final designs (including field changes and modifications and nonconforming items that are dispositioned "use as is" or "repair") are subjected to design control measures commensurate with those applied to the original design. These design control measures may include review of the relevant design analyses to verify their continued validity.

- 6.3.4 Design interface controls (internal and external between participating design organizations and across technical disciplines) for the purpose of developing, reviewing, approving, releasing, distributing, and revising design inputs and outputs are defined. These controls include the assignment of responsibilities and the establishment of procedures among the various participating design organizations.
- 6.3.5 Design records, maintained to provide evidence that the design was properly accomplished, include not only the final design output and revisions to the final output, but also the important design steps (i.e., calculations, analyses, and computer programs) and the sources of input that support the final output.
- 6.3.6 The acceptability of design activities and documents, including design inputs, processes, outputs, and changes, are verified as appropriate. Computer programs are proven through previous use, or verified through testing or simulation prior to use.
- 6.3.7 Design verifications are conducted by qualified personnel (other than those who performed the original design), who may be from the same organization, and knowledgeable of the design, its hazards, and its intent. The extent of the design verification is based on the complexity, risk, and uniqueness of the design being verified.
- 6.3.8 Design verification methods include, but are not limited to, design reviews, alternate calculation, and qualification testing. Separate verification may not be needed for multiple uses of identical or previously proven designs, unless they are intended for different applications or the performance criteria are different.

- 6.3.9 When a test program is used to verify the acceptability of a specific design feature, the test program demonstrates acceptable performance under conditions that simulate the most adverse design conditions that are expected to be encountered. The operating modes and environmental conditions in which the item must satisfactorily perform its function is considered in establishing the most adverse conditions to be included in the test program.
- 6.3.10 Design verification is completed before design outputs are used by other organizations for design work and before they are used to support other activities such as procurement, fabrication, construction, or experimentation. When this timing cannot be achieved, the unverified portion of the design is identified and controlled. In all cases, design verifications are completed before relying on the item to perform its function and before its installation becomes irreversible (requiring extensive demolition or rework).

#### 6.4 Responsibilities

- 6.4.1 WVNSCO Engineering is responsible for implementing a formal design program for engineered items and systems that are designed using sound engineering/scientific principles and appropriate standards.

Engineering is responsible for planning, coordinating, and documenting design, construction, and operation of engineered items and systems used in protecting the environment, safety, and human health. Engineering activities shall be conducted such that the type and quality of inputs to design, construction, operation, and decontamination and decommissioning, are defined and documented to the extent necessary to confirm that participants in the engineering activities are informed of appropriate project requirements.

Engineering is responsible for the identification of the following elements as a minimum:

- A. Project/task scope and objectives, and a listing of primary activities involved.
- B. Associated hazards and their controls.
- C. Specific engineering systems components to be designed, fabricated, constructed, and operated.
- D. Technical, performance, quality standards, and design criteria or objectives.
- E. Correct translation of design inputs into design outputs.
- F. Coordination and interface organizations required to participate in the design process.
- G. Verifiable design outputs and acceptance criteria that are required.
- H. Special Skills, equipment, and other resources that are required.
- I. Program technical reviews, peer reviews, surveillances, technical or quality assurance audits, and other assessment processes.
- J. Provisions for precluding the introduction of Suspect/Counterfeit Items.
- K. Project and quality assurance records that are required.

7.0 CRITERION 7 - PROCUREMENT

7.1 General

It is WVNSCO policy to require that procured items and services meet established requirements and perform as specified. Prospective suppliers are evaluated and selected on the basis of specified criteria. WVNSCO requires that approved suppliers continue to provide acceptable items and services.

7.2 Approach

The WVNSCO procurement process is consistent with the requirements of applicable DOE Orders, Federal Acquisition Regulations (FARs), and Department of Energy Acquisition Regulations (DEARS). The procurement program includes performance monitoring and continuous improvement concepts as appropriate to establish, maintain, and improve supplier performance. Procurement activities are established that require adequate quality requirements to be included or referenced in procurement documents for items and services. Controls include the sharing and improvement of supplier performance through internal and external communication, and the performance of supplier evaluation and monitoring.

7.2.1 WVNSCO has established a program that requires the procurement process to be documented and controlled and that procured items and services conform to established specifications. Controls include procurement source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspections, supplier audits, and examination of deliverables. Changes to procurement documents receive appropriate review and approval.

- 7.2.2 The procurement process requires that procurement documents for items and services include requirement details commensurate with the established grading process (quality levels) and that suppliers have a quality assurance program consistent with the specified requirements. End-user requirements shall be clearly communicated to the supplier. The Quality Assurance Program requirements apply to those suppliers of items or services for which there are established quality program requirements.
- 7.2.3 The procurement of "commercial-grade" items takes into consideration the design application to enable substantiation that these items fully meet the required design and acceptance criteria. Additional testing, inspection, or other actions taken to verify and validate acceptability is based on risk and service considerations as determined through existing quality assurance program application.
- 7.2.4 The procurement program includes provisions for detection and identification of items or services of substandard quality. These provisions are consistent with the initiative for identification, control, and prohibiting delivery of suspect/counterfeit items in the DOE complex.

### 7.3 Implementation

- 7.3.1 The program is implemented to verify that purchased items and services meet established requirements and perform as expected.
- 7.3.2 Applicable technical and administrative requirements are used as appropriate for procurement of items and services. Requirements such as specifications, codes, standards, tests and inspections, nonconformance control, and acceptance criteria.

- 7.3.3 Appropriate controls for the selection, determination of suitability, evaluation, and receipt of commercial-grade items are imposed to require that commercial-grade items perform as expected.
- 7.3.4 Before selecting, prospective suppliers may be evaluated to specified criteria, past performance, and ability to meet schedule to verify that qualified suppliers are selected. When selected suppliers do not have a formal quality assurance program, performance monitoring, surveillances, or audits are performed to determine that acceptable products and services are provided.
- 7.3.5 Actions are taken, including performance monitoring or surveillance and audits, to confirm that qualified suppliers continue to provide acceptable products and services.
- 7.3.6 Procurement documents include acceptance criteria when applicable. When required, purchased items and services are accepted using methods such as: source verification, **supplier hold points**, receipt inspection, pre-installation and post-installation tests, and certificates of conformance, or a combination of these methods.
- 7.3.7 Before an item is used or placed in service, procurement, inspection, and test requirements are satisfied and nonconformances are properly dispositioned. The quality of purchased items and services is verified at intervals and to a depth consistent with the items' or services' complexity, importance, quantity, and frequency of procurement.
- 7.3.8 Verifications are executed in all phases of procurement. This may require verification of suppliers below the first tier. In cases where there are indications that suppliers knowingly supplied items and services of substandard quality, this information is reported to the DOE Office of Inspector General.

#### 7.4 Responsibilities

7.4.1 Management is responsible for establishing and implementing a management system to require the procurement process to be documented and controlled. This process shall provide for the following, as appropriate: procurement source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspections, supplier audits, and examination of deliverables.

7.4.2 Contractors and Suppliers are responsible for the quality of work performed or items and services provided by their subcontractors and suppliers.

7.4.3 Personnel are responsible for identifying, controlling, and implementing procurement actions that will provide adequate quality and to verify as appropriate that procured items and services conform to established specifications.

### 8.0 CRITERION 8 - INSPECTION AND ACCEPTANCE TESTING

#### 8.1 General

It is WVNSCO policy to perform inspection and acceptance testing of specified items and processes using established acceptance and performance criteria, and to require calibration and maintenance of equipment used for acceptance of inspections and tests.

#### 8.2 Approach

WVNSCO integrates the requirements for inspection and acceptance testing into existing NQA-1 based implementing procedures for engineered systems and components according to the intended use of the items as specified in approved design specifications or other planning documents. Required inspections and tests are established and conducted according to a grading process (quality levels). Acceptance

parameters and other requirements are specified in design documentation. The organization with final responsibility for the system, structure, or component is responsible for verification and documentation of final acceptance. The technical organizations with the cognizant engineering role have the primary responsibility for establishing the level, extent, and acceptability of inspection and testing, and for approval of test requirements and acceptance criteria. The degree of independence, including independent QA organizational oversight or verification, is determined and established through a grading process which incorporates environmental, safety, health, and quality programmatic considerations.

- 8.2.1 WVNSCO has established and implemented procedures to perform inspections and acceptance testing of engineered systems, components, or parts according to the intended use of the items as specified in approved design specifications or other planning documents.
- 8.2.2 WVNSCO has established and implemented procedures to demonstrate that items and processes will perform as intended. These procedures provide for an appropriate level of independence in the inspection or testing program, according to the design specifications and planning requirements. When acceptance criteria are not met, deficiencies are resolved and the resolution is approved by management, and retesting is performed as necessary.
- 8.2.3 WVNSCO has established and implemented procedures to require that measuring and test equipment are of the proper type, range, and accuracy, and are properly calibrated, maintained, and used according to design specifications and other planning documents. Included are measuring and test equipment used for operational process monitoring and acceptance.

## 8.3 Implementation

### 8.3.1 Inspection

- A. A program is established and implemented to specify when and what type of inspections (e.g., source, in-process, final receipt, maintenance, and in-service) are required. Administrative controls and status indicators are used to preclude inadvertent bypassing of required inspections and to prevent inadvertent operation or use.
- B. The inspection program may be implemented by or for the organization performing the work to be inspected. When an organization performs its own inspections, personnel within that organization do not inspect their own work for final acceptance. The level of inspection and the degree of independence of the inspector are commensurate with the importance and/or complexity of the item being inspected.
- C. Provisions requiring that inspection planning is properly accomplished are established. Planning activities identify item characteristics and processes to be inspected, the inspection techniques, the acceptance criteria, and the organization responsible for performing the inspection.
- D. Inspection hold points, beyond which work is not to proceed, are incorporated into work and procurement documents.
- E. Inspection personnel verify that items are identified and controlled to prevent the use of incorrect, defective, or suspect/counterfeit items.

- F. When acceptance criteria are not met, deficiencies are documented, resolved, causes are identified, and corrected areas are reinspected.

#### 8.3.2 Acceptance Testing

- A. A test control program is established and implemented to demonstrate that items and processes will perform as intended. The test control program includes, as appropriate, bench tests and proof tests before installation, pre-operational tests, post-maintenance tests, post-modification tests, and operational tests. The testing program is structured so that the proving of the design concept is maintained separate from the proofing of the adequacy of the work.
- B. The testing program may be implemented by or for the organization performing the work to be tested. When an organization performs its own testing, personnel within that organization do not test their own work for acceptance.
- C. Acceptance criteria are established when testing is required. The primary responsibility for defining the testing requirements and determining the acceptance criteria resides with the organization responsible for the design of the item being tested. Administrative controls and status indicators are used in an effort to preclude inadvertent bypassing of required tests and to prevent inadvertent operation of the item.

- D. Test procedures are developed and include as appropriate instructions and prerequisites to perform the test; test article configuration; use of test equipment; acceptance criteria; inspection hold points as required; and provisions for recording test data and the review of such data for completeness, accuracy, and acceptability of the results.
- E. When acceptance criteria are not met, the deficiencies are documented and corrected and the corrected areas are retested as required.

#### 8.3.3 Measuring and Test Equipment (Calibrated Equipment)

- A. A program is established and implemented to control the calibration, maintenance, accountability, installation, and use of equipment used for acceptance of items during inspection and testing.
- B. The types of equipment covered by the program (such as instruments, tools, gages, reference and transfer standards, and nondestructive examination equipment) are defined.
- C. Measuring and test equipment is calibrated at specified intervals (or immediately before or after use) on the basis of the item's required accuracy, intended use, frequency of use, stability characteristics, and other conditions affecting its performance.
- L. Measuring and test equipment is labeled, tagged, or otherwise controlled to indicate its calibration status and provide traceability to the calibration test data.

- E. Measuring and test equipment is calibrated against standards having an accuracy that will substantiate that the equipment being calibrated will be within required tolerances. If nationally recognized standards exist, calibration standards are traceable to them. Calibration standards have a greater accuracy than the standards being calibrated, except where calibration standards with the same accuracy as the instruments being calibrated are shown to be adequate for the requirements.
- F. Measuring and test equipment found out of calibration/tolerance is controlled until it is re-calibrated. The acceptability of items measured, inspected, or tested with an out of calibration/tolerance device is determined.

#### 8.4 Responsibilities

- 8.4.1 Management is responsible for establishing and implementing procedures for inspections and acceptance testing of engineered systems, components, or parts according to the design specifications and planning requirements. These procedures will provide for an appropriate level of independence of inspection personnel. Management is responsible for establishing and implementing procedures requiring that measuring and test equipment is of the proper type, range, and accuracy, and is properly calibrated, maintained, and used according to design specifications. These controls are also applied to measuring and test equipment used for operational process monitoring and acceptance.
- 8.4.2 All Personnel are responsible for compliance with implementing procedures for inspection, test and acceptance activities.

### **PART C: ASSESSMENT**

Part C provides for the periodic **and regular** assessment of the QAP and its implementation to determine its effectiveness and to promote improvement. It also describes the organizational and independent management system assessment requirements. Line management regularly assesses and documents the adequacy of the portions of the program for which they are responsible to verify the Program's effective implementation. This section also describes the independent assessment structure and establishes the organizational freedom and authority required for conducting inspections, surveillances, audits, and independent assessments. It provides for the auditing of operations, systematic handling of nonconforming conditions, and lessons learned through corrective actions, trending, and causal analyses. Organizational and independent assessments are planned, scheduled, and performed. Assessment results are documented and reported to and reviewed by line management. Conditions requiring corrective action are identified promptly and addressed as soon as practical. The cause of significant conditions are determined and appropriate response actions are taken by management to prevent their recurrence. Follow-up action(s) are taken to validate and verify implementation and effectiveness of the remedial action(s).

WVNSCO has developed a site wide self assessment program which evaluates project performance and compliance with applicable environmental, safety, health, quality assurance, and administrative/support requirements and best management practices. Key elements of the program are oversight of line organization self assessments, conduct of independent internal assessments, interface during external assessments, and performance of analysis and trending to include: (1) root cause analysis, (2) performance trending, and (3) lessons learned dissemination.

9.0 CRITERION 9 - MANAGEMENT ASSESSMENT

9.1 General

It is WVNSCO policy for management at all levels to periodically assess their organization in accordance with the appropriate criteria in this QAP, and to identify and correct problems that hinder them from achieving its quality objectives, and ultimately, total customer satisfaction.

9.2 Approach

Management assessment activities focus on an evaluation of independent, external, and line organization (or self) assessments. For the purpose of this section, both line and self-assessments are considered synonymous. These management assessments are structured to allow management to obtain an aggregate "picture" of WVNSCO' status in relation to its mission and programmatic considerations. Further, it measures WVNSCO' progress on such initiatives as integrated safety management core functions and guiding principals, benchmarking initiatives, and continuous improvement. WVNSCO will continue to provide a means for determining appropriate program effectiveness through Staff Management assuming the lead and responsibility for the overall management assessment activities, with the goal of substantiating that the QAP is functioning as Staff Management and the customer intends.

Management regularly evaluates management effectiveness to verify that the site mission is understood by the employees; that the mission and focus of site management is coordinated; that the programs for quality and cost improvement are effectively implemented; and that the programs for human resource excellence are meeting the Project's and the customer's needs.

- 9.2.1 Management assessments provide a means for identifying issues and triggering the necessary response actions to achieve and verify quality, and to substantiate adequacy of resources and personnel.
- 9.2.2 Management may not delegate its overall responsibility for substantiating that an effective quality assurance program has been established and implemented.
- 9.2.3 Management determines what response actions are appropriate as a result of management assessments and implements such actions. Barriers that hinder the organization from meeting quality objectives shall be identified and resolved.
- 9.2.4 Management assessments substantiate that the QAP and the implementing policies and procedures are reviewed, updated, and approved to reflect changes in the organization as well as changes in policy resulting from assessments.
- 9.2.5 The self assessment program includes line management assessment of all activities including ES&H programs.

### 9.3 Implementation

- 9.3.1 Implementation of the management assessment program focuses on how well the integrated QAP is working by identifying management barriers and other obstacles which hinder the organization from achieving its objectives. The focus of management assessments shall be on identification of systemic and cultural management issues or problems and providing corrective actions with the objective of promoting continuous improvement.

9.3.2 Implementation of the management assessment program may be delegated in part; however, Staff Management retains overall responsibility for the program and actively and directly participates in the assessment activities.

9.3.3 Assessment results are documented. Management takes prompt action and documents the resulting decisions in response to the recommendations which arise from the assessment process. Follow-up includes an evaluation of the effectiveness of management's actions.

1.4.6 Management assessments evaluate all key program elements.

#### 9.4 Responsibilities

9.4.1 Staff Management is responsible for assessing and documenting the adequacy and implementation of appropriate sections of the Quality Assurance Program and verifying its effective implementation. The assessment process includes a description of the assessment, planning, and scheduling processes. Staff Management is responsible for taking prompt action and documenting resulting decisions in response to recommendations which result from the management assessment process.

### 10.0 CRITERION 10 - INDEPENDENT ASSESSMENT

#### 10.1 General

It is WVNSCO policy to conduct planned and periodic independent assessments to measure item and service quality, to measure the adequacy of work performance, and to promote improvement. The assessment program evaluates the adequacy and effectiveness of items or activities to determine their compliance with applicable DOE requirements, federal, state, and local laws and regulations. The policy requires that lead responsibility for implementation of the quality program rests with the line organizations. Assessment

programs consist of internal and external independent assessments and are structured to provide an accurate picture of WVNSCO' actual performance as compared to the quality assurance programs in place.

## 10.2 Approach

The independent assessment process uses a performance-based approach directed toward satisfying customer expectations and achieving programmatic goals and objectives. The conduct of assessments considers the importance and significance of activities or processes being assessed. Major components of the assessment processes are: importance and complexity based assessment planning and scheduling; resource allocation; effective personnel selection for technical expertise and independence; equal importance given to compliance and improvement assessments; a "cradle to grave" reporting system which addresses tracking of deficiencies and improvement opportunities; and a comprehensive assessment program evaluation system which uses tools such as trending, lessons-learned, and causal analyses.

10.2.1 The organization performing an independent assessment has sufficient authority and freedom from the line organization to carry out its responsibilities.

10.2.2 Persons conducting independent assessments are technically qualified and knowledgeable in the areas being assessed.

10.2.3 The QA organization is assigned the independent assessment function. Some of the independent assessment activity may be performed by the QA organization; however, these activities may be complemented by involvement of other internal and external participants.

10.2.4 Assessments include inspections, tests, reviews, surveillances, audits, and other evaluations, and will be performed at a frequency appropriate to the circumstances as required by the planning documentation.

10.2.5 Independent assessments are planned, scheduled, and performed. Assessment results are documented, reported to, and reviewed by management. Conditions requiring corrective action are identified promptly and addressed as soon as practical. The cause of significant conditions are determined and appropriate response actions (including root cause analyses, as appropriate) are taken by management to prevent their recurrence. Follow-up action is taken to validate and verify the implementation and effectiveness of the response action.

### 10.3 Implementation

10.3.1 A program of planned and periodic independent assessments is established and implemented. Implementation of the assessment program focuses on improving the quality of items and processes by emphasizing the line organization's achievement of quality.

10.3.2 Personnel performing independent assessments act in a management advisory function. Organizations being assessed are provided feedback concerning observations of performance. Assessors monitor work performance, identify anomalous performance and precursors of potential problems, report findings to a level of management having the authority to affect corrective action, and confirm satisfactory resolution of problems.

10.3.3 Personnel performing independent assessments are technically qualified, with their primary focus on the quality of the end product, service, or work process, and identifying improvement opportunities.

- 10.3.4 Personnel performing independent assessments do not have direct supervisory or performance responsibilities in the area they are assessing.
- 10.3.5 Independent assessments are conducted using criteria which evaluate acceptable work performance and quality achievement. Additionally, independent assessments evaluate strengths and weaknesses identified during line and external assessments.
- 10.3.6 Scheduling of assessments and allocation of resources is based on the status of and importance associated with the item or process being assessed. Scheduling is flexible and additional attention is given to areas which indicate that quality performance may be suspect. Additionally, the scheduling of independent assessments is based on evaluations of the strengths and weaknesses identified during line and external assessments.
- 10.3.7 Assessment results are documented and reviewed by the assessor's management and by line management having responsibility in the area being assessed. Follow-up actions, including a reevaluation of deficient areas, are initiated as necessary.
- 10.3.8 Activities resulting from assessments include action to correct the deficiency, cause identification, extent of the deficiency, actions to prevent recurrence, lessons learned, and actions to be taken for improvement, as applicable.

#### 10.4 Responsibilities

- 10.4.1 Management is responsible for establishing and implementing independent assessments that include inspections, tests, reviews, and audits, and performing assessments at a frequency appropriate to the circumstances and as required by the planning documentation. Management is responsible for

establishing and implementing independent assessments that are planned, scheduled, and performed; documenting and reporting assessment results to line management and identifying promptly conditions needing corrective actions. Management is responsible for determining the cause and extent of adverse conditions, developing appropriate response actions to be taken by management to prevent their recurrence, and taking follow-up action to validate and verify implementation and effectiveness of the response action.

**APPENDIX A**  
**MATRICES BETWEEN DOE QUALITY ASSURANCE PROGRAM REQUIREMENTS**  
**AND RELATED WVNSCO**  
**QUALITY ASSURANCE REQUIREMENTS DOCUMENTS**

The comparison matrices provided in this appendix provide a frame of reference for relating various quality assurance requirement documents which the West Valley Nuclear Services Company (WVNSCO) uses to implement the missions for the West Valley Demonstration Project (WVDP). The matrices relate the requirements of DOE Quality Assurance Program Requirements, "Quality Assurance," to the quality assurance program plans or descriptions developed for the overall program (WVDP-002), and the HLW program (WVDP-074).

The QAP bases its implementation on the following programs:

! NQA-1 provides the basic format and primary content for the WVNS quality assurance program **policy** document WVDP-002; however, amplified and supplemental requirements established for the high-level waste program are incorporated in WVDP-002.

! DOE/RW-0333P, which is the Office of Civilian Radioactive Waste Management's preferred standard, amplifies the requirements of NQA-1 for the waste acceptance process work of high-level radioactive waste form production, and is the basis for establishing QAP requirements defined by WVDP-074 **and implemented by WVDP-002.**

As shown in the matrices, overall program elements are intentionally arranged to fit logically within the framework of the DOE Quality Assurance Program Requirements. The QAP requirement matrices are provided in the following sections:

- ! A1 - the DOE Quality Assurance Program Requirements vs. WVDP-002
- ! A2 - the DOE Quality Assurance Program Requirements vs. WVDP-074



QUALITY ASSURANCE PROGRAM REQUIREMENTS MATRIX  
 10 CFR 830.122 VERSUS WVDP-074

WVDP-074 SECTIONS	(1) MANAGEMENT				(2) PERFORMANCE				10 CFR 830.120 CRITERIA	
	1. PROGRAM	2. PERSONNEL TRAINING AND QUALIFICATION	3. QUALITY IMPROVEMENT	4. DOCUMENTS AND RECORDS	5. WORK PROCESSES	6. DESIGN	7. PROCUREMENT	8. INSPECTION AND ACCEPTANCE TESTING	9. MANAGEMENT ASSESSMENT	10. INDEPENDENT ASSESSMENT
SECTION 1 ORGANIZATION	•								•	•
SECTION 2 QUALITY ASSURANCE PROGRAM	•	•							•	•
SECTION 3 DESIGN CONTROL						•				
SECTION 4 PROCUREMENT DOCUMENT CONTROL				•			•			
SECTION 5 INSTRUCTIONS, PROCEDURES & DRAWINGS				•	•					
SECTION 6 DOCUMENT CONTROL				•						
SECTION 7 CONTROL OF PURCHASED ITEMS & SERVICES						•				
SECTION 8 IDENTIFICATION & CONTROL OF ITEMS					•					•
SECTION 9 CONTROL OF PROCESSES					•					
SECTION 10 INSPECTION							•			•
SECTION 11 TEST CONTROL							•			•
SECTION 12 CONTROL OF MATERIAL					•					•
SECTION 13 HANDLING, STORAGE & SHIPPING					•					
SECTION 14 INSPECT TEST & OPERATING STATUS					•		•			
SECTION 15 CONTROL OF NONCONFORMING ITEMS			•							•
SECTION 16 CORRECTIVE ACTION			•							•
SECTION 17 QUALITY ASSURANCE RECORDS				•						
SECTION 18 AUDITS										•
SECTION 19 COMPUTER SOFTWARE				•						•

**APPENDIX B**  
**TERMS AND DEFINITIONS**

Activities Affecting Quality - Activities which influence or affect the achievement or verification of quality objectives or requirements.

Assessment - An all-inclusive term used to denote any of the following: audit, performance evaluation, management systems review, peer review, inspection, or surveillance.

Audit - A planned and documented investigative evaluation of an item or process to determine the adequacy of and compliance with established procedures, instruction, drawings, quality assurance programs, and other applicable documents.

Commercial Grade Item - An item satisfying a), b), and c) below:

- a) not subject to design or specification requirements that are unique to nuclear facilities;
- b) used in applications other than nuclear facilities;
- c) is to be ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, catalog).

Data Quality - The totality of features and characteristics of data that bears on its ability to satisfy a given purpose. The characteristics of major importance are accuracy, precision, completeness, representativeness, and comparability.

Data Validation - A systematic effort to review data to identify any outliers or errors and thereby cause deletion or flagging of suspect values to ensure the validity of the data to the user. This "screening" process may be done by manual and/or computer methods, and it may utilize any consistent techniques such as sample limits to screen out impossible values or complicated acceptable relationships of the data with other data.

Design - The act of conceiving and planning the structure and parameter values of a system, device or process, including the act of conceiving and developing design documentation and system analysis.

Design Activities - The use and integration of design information for the purpose of design development and verification. Design activities are documented as design inputs and results of verification and may include data analysis, computer models or systems analysis such as performance assessments.

Design Review - A formally documented review of design documentation conducted at various points during the design process by individuals independent of those performing the design work, but who may be members of the organization within which the work was done. The design review compares design documentation against applicable codes, standards and other specifications to determine its adequacy and the extent to which the design conforms to stated requirements. Individuals performing a design review are completely knowledgeable in the codes, standards and other requirements forming the basis for the design.

Document - Recorded information that describes, defines, specifies, reports, certifies, requires, or provides data results. A document is not considered a record until it meets the definition of record.

Environmentally-Related Engineering and Process Evaluation Measurements - A term used to describe essentially all: field and laboratory investigations that generate data involving the measurement of chemical, physical, or biological parameters in the environment and determining the presence or absence of priority pollutants in waste streams; health and ecological effect studies; clinical and epidemiological investigations; engineering and process evaluations; studies involving laboratory simulation of environmental events; and studies or measurements on pollutant transport, including diffusion models.

Graded Approach (Grading Process) - The process by which the level of analysis, documentation, and actions necessary to comply with a requirement are commensurate with: (1) the relative importance to safety, safeguards, and security; (2) the magnitude of any hazard involved; (3) the life cycle stage of a facility; (4) the programmatic mission of a facility; (5) the particular characteristics of a facility; and, (6) any other relative factor. Graded Approach is the "Grading Process" at WVNCO.

Independent Assessment - An assessment performed by a qualified individual, group, or organization that is not a part of the organization directly performing the work being assessed.

Inspection - An examination or measurement to verify whether an item or process meets specified requirements.

Item - An all-inclusive term used in place of the following: appurtenance, facility, samples, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, documented concepts, or data.

Line-Organization Self-Assessment - A formal, documented internal self-evaluation performed or directed by line management to evaluate the way the organizations do business as it relates to compliance with applicable laws, regulations, and best management practices. Identifies problems and trends within specified areas of inquiry, assesses causes, develops corrective action plans and schedules, and identifies lessons learned. Self-assessments are conducted by line-organizations in accordance with this policy, the self-assessment program, and the individual department self-assessment schedules which implement this policy.

Management - (including staff and line) Those individuals directly responsible and accountable to provide technical (overall) guidance and direction for the performance of work. Management refers to those personnel who are responsible and accountable for mission accomplishment, QA program implementation, development of plans, procedures and self assessments to maintain compliance and achieve excellence. Management is responsible for the planning, scheduling and executing of programs. Managers are accountable for operating functions, items and services, in support of line operations.

Measuring and Test Equipment (M&TE) - As used at WVNSCO, includes calibrated equipment for accepting material or equipment, controlling processes, verifying correct facility operation, or obtaining data used to verify conformance to specified requirements.

Objective Evidence - Any substantiated statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests which can be verified.

Out of Calibration - A condition which exists when an item included in the Measuring and Test Equipment program (i.e.: calibrated equipment) has exceeded its due date for re-calibration.

Out of Tolerance - A condition which exists when an item included in the WVNS Measuring and Test Equipment program is found to be outside of its established accuracy parameters. This is usually discovered during the calibration process.

Peer Review - A documented assessment of an item, activity, or work performed that is conducted by one or more individuals independent of the originator who are regarded as technically expert in the subject area being assessed. Peer reviews provide an independent evaluation of a subject where quantitative methods of analysis or measures of success are unavailable or undefined, such as in research and development.

Planned and Systematic Activities - is an all encompassing phrase which includes the activities of all persons involved in a work process to produce a product or provide a service. Essentially this means that "the assurance of quality is the responsibility of all persons involved in the work process to produce a product or provide a service."

Procedure - A documented set of steps or actions that systematically specify or describe how an activity is to be performed.

Process - A system of actions that achieves an end result.

Quality - A term that characterizes the degree or grade of excellence of a product, service, or process. A product, service, or process that meets its prescribed "quality requirements" is described as a quality product, quality service, or quality process. The key words are "quality requirements." Communications between the "performer" and "client" must be constant to provide that quality requirements are understood and addressed in a timely manner. It is through effective communications that the performer and client agree upon the quality requirements in order that the right job is done right the first time.

Quality Assurance - All those planned and systematic activities necessary to provide adequate confidence that a product or service meets established (agreed-upon) requirements.

Quality Assurance Program - A structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for requiring quality in its work processes, products (items), and services. The Quality Assurance Program provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required quality assurance and quality control activities.

Quality Improvement - A management program for improving the quality of operations. Such management programs generally entail a formal mechanism for encouraging worker recommendations with timely management evaluation and feedback or implementation.

Quality Requirements - Those qualitative and quantitative measures that determine whether a product, service, or process is satisfactory to performer and client. As an example, data quality objectives as defined by the EPA provides quantitative requirements for the accuracy, precision, and completeness of data measurements. It is somewhat easier to define the quality requirements for a product such as a component, a report, or even raw data than it is to define requirements for a service. For that reason it is paramount to the successful completion of the service that client and performer communicate on the subject to the point that either can articulate the quality requirements and the other will agree.

Repair - The process of restoring a nonconforming characteristic to a condition such that the capability of an item to function reliably and safely is unimpaired, even though that item still does not conform to the original requirement.

Rework - The process by which an item is made to conform to original requirements by completion or correction.

Service - The category of economic activity that does not produce manufactured items. In environmental data operations or engineering projects, such activities include design, fabrication, inspection, laboratory analysis, repair, or installation.

Staff Management - The manager or managers responsible for mission accomplishment and overall operations. For WVNSCO, the President and his staff managers are responsible for mission accomplishment and overall performance.

Subcontractor/Supplier - This is an all-inclusive term used in place of any of the following: vendor, seller, contractor, fabricator, or consultant. Those personnel/organization/companies performing work or otherwise supplying services/items in accordance with contractual requirements or financial assistance agreements issued by WVNSCO. The requirements of WVDP-111, as appropriate to the items/work/services are imposed by technical specification and /or purchase order requirements, in accordance with the WVNS grading process.

Surveillance - The act of monitoring or observing a process or activity to verify conformance to specified requirements.

Testing - The determination of the capability of an item or process to meet specified requirements by subjecting it to a set of physical, chemical, environmental, or operating conditions.

Use-as-is - A disposition permitted for a nonconforming item when it can be established that the item is satisfactory for its intended use.

Validation - An activity that demonstrates that an item or process will perform under conditions of actual use and satisfy prescribed requirements of the end user.

Verification - The act of reviewing, inspecting, testing, checking, conducting surveillances, auditing, or otherwise determining and documenting whether items, processes, services, or documents meet specified requirements.

WVNSCO - West Valley Nuclear Services Company. When used herein it also includes WVNSCO' subcontractors and suppliers that perform activities for the WVDP with the potential to cause radiological harm.

Work - Process of performing a defined task or activity; for example, research and development, operations, administration, inspection, data collection, and analysis.

**APPENDIX C**  
**QA PROGRAM IMPLEMENTATION PLAN**

**Applicability**

This DOE approved WVNSCO QAP has been established, approved, and implemented to enable site missions to be accomplished while minimizing potential hazards to the public, site or facility workers, and the environment. The program is applied to all activities affecting quality in accordance with the grading process at the WVDP site. This QAP and its implementing procedures, identified in the attached matrix, provide identification of the appropriate and applicable requirements (provisions) of the QAP to be used in evaluating compliance to the DOE quality assurance program requirements. A core document providing policy and program implementation procedures for the QAP is the WVDP-002 Quality Management Manual. WVDP-002 is approved by the President of WVNS and **is being continuously** evaluated during reviews by DOE.

### **Organizational Structure**

The President of WVNSCO is the senior manager responsible for the adequacy, implementation, and continuing assessment of the Quality Assurance Program. The President's staff managers provide the top-level management responsibility for work processes and work performance in compliance with QAP requirements. The requirements of the QAP apply to all organizations performing activities affecting quality. As appropriate, QAP requirements are imposed upon subcontractors and others by contractual delegation. QM 1 of the WVDP-002 manual provides definition of the organizational structure and responsibilities as applied to individual QAP authorities and functions.

### **Requirements**

This QAP has been developed using the format and content of 830.122 Quality Assurance **Criteria** and DOE O 414.1A. The content of the QAP addresses the applicable requirements of ASME NQA-1. Acceptability for DOE Quality Assurance Program Requirements compliance has been confirmed by review of the WVNS QAP against DOE G 414.1-2 "Quality Assurance Guide for use with 10 CFR 830.120 and DOE O 414.1A." This review is summarized in the attached matrix. It is the conclusion of this review that the QAP provides full implementation with the requirements of the applicable supplemental information from the Guide. Many of the Applicable Standards and References identified in the Guide have been used in developing the QAP. However, only the specific requirements that are identified as QAP requirements by the implementation matrix in appendix C constitute enforceable compliance requirements. Requirements identified by WVDP-111 and the matrix of this Implementation Plan are implemented by QM level policies in the WVDP-002 "Quality Management Manual" and identified WV level procedures from the Policies and Procedures Manual, WVDP-117.

### QA Standards

The DOE Guide (G 414.1-2) provides a specific list of Technical Standards to be used to meet the criteria of the requirements document (10 CFR 830.122).

To implement the DOE quality assurance program requirements, the "Quality Assurance Program (QAP)" is based on the technical standards listed below:

- ! ASME NQA-1-1989, "Quality Assurance Program Requirements for Nuclear Facilities";
  
- ! DOE/RW-0333P, Rev. 0, "Quality Assurance Requirements and Description,"

As described by this QAP,(WVDP-111), it incorporates a grading process through use of quality levels established by risk-based evaluation of ESH and quality programmatic factors. An important feature of the approach to grading is that the level of rigor or degree of program application is determined by review of individual items or activities. The assigned Quality Level determines and provides a key basis for determining the degree of application of QAP requirements. The grading process is consistent with the 10 CFR, 830.3, "Definition of Graded Approach," and the 10 CFR, 830.7, "Description of Graded Approach." WVNSCO has applied the DOE Quality Assurance Program Requirements through WVDP-111 to the entire scope of work using a Grading Process.

**Exemptions**

WVNSCO takes no exceptions to the DOE Quality Assurance Program Requirements. All ten elements of the DOE quality assurance program requirements as defined in 10 CFR 830.122, "Quality Assurance Criteria," are applicable to the implementation of the QAP. Selected requirements from the DOE G 414.1-2 as identified in the matrix attached to this appendix, are considered as provisions subject to enforcement under 10 CFR 830.122.

**Standardized Format**

A standardized format identifying the requirements and implementation procedures for the QAP is provided by the attached matrix. Consistent with the July 18, 1994, EM-331 letter, "Specific Department of Energy Guidance on Preparation, Review, and Approval of Implementation Plans for Nuclear Safety Management Rule 10 CFR 830.120, Quality Assurance Requirements," signed by Stephen P. Cowan. Column 1 of the matrix lists each of the 10 CFR 830.122 requirements. Column 2 of the matrix provides added detail from the Quality Assurance Guide DOE G 414.1-2. Column 3 of the matrix identifies the appropriate sections from WVDP-111. Column 4 lists the applicable WVNS implementing documents. Column 5 (Implementation Status) indicates that implementation is complete for all sections.

Appendix C Attachment: Matrices of 10 CFR 830.12 Implementation Requirements

10 CFR 830.122 IMPLEMENTATION MATRIX				
1	2	3	4	5
Enforceable Under 10CFR830.122 Rule			Not Enforceable	
10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
<b>1. From: (1) Management (i) Program</b> A written QAP shall be developed, implemented, and maintained.	<b>From: I. Introduction</b> A comprehensive management system will result from the integrated quality and safety management expectations so that the DOE mission is accomplished safely and DOE/contractor performance can be objectively assessed.	<b>Introduction Paragraph 3.0 CRITERION 1, 1.1</b>	QM 2 WV-120	Complete
The QAP shall describe the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing the work.	<b>From: 4.1, PROGRAM 4.1.2, Responsibilities</b> Management is responsible for leadership and commitment to quality achievement and improvement within the framework of public, worker, and environmental safety. Management retains the primary responsibility and accountability for the scope and implementation of the management system. However, every individual in the organization is responsible for achieving quality in their activities. Senior management should require and cultivate the achievement and improvement of quality at all levels of the organization, and ensure that the QAP is understood and implemented.	<b>CRITERION 1, 1.1 1.3 1.4</b>	QM 1 WV-120	Complete
The QAP shall describe management processes including planning, scheduling, and resource considerations.		<b>CRITERION 1, 3, and 5 1.1 1.3 3.4 5.2</b>	QM 2 WV-101 WV-108 WV-109 WV-127	Complete
	<b>From: 4.1, PROGRAM 4.1.1, Introduction</b> The quality management system provides for managing, performing, and assessing adequacy of work including work assigned to parties outside the organization.	<b>CRITERION 1, and 10 1.0 1.1 1.3 10.1</b>	QM 2 QM 18 WV-121 WV-620	Complete
	A formal management system that has been established for a facility or activity should be compared to the criteria of the Rule and Order to ensure that the appropriate requirements have been addressed.	<b>CRITERION 1, 1.0 1.2</b>	QM 2 WV-120	Complete

10 CFR 830.122 IMPLEMENTATION MATRIX				
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Enforceable Under 10CFR830.122 Rule			Not Enforceable	
10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<p><b>From: 4.1, PROGRAM 4.1.2, Responsibilities</b>            Management promotes program effectiveness through establishing task assignments, identified lines of communication, determining and providing the necessary resources and environment to accomplish the required activities, ensuring employees are trained appropriately and are capable of performing task assignments, obtaining timely, objective feedback on the effectiveness of planning and work to meet performance measures, and involving all employees to ensure that improvements are identified and implemented to enhance performance.</p>	<p><b>CRITERION 1,</b>            1.1            1.3.2            1.3.3            1.3.8</p>	<p>QM 1            QM 2            QM 2-1            WV-110            WV-108            WV-109            WV-120            WV-127            WV-532            WV-538</p>	Complete
	<p><b>From: 4.1, Program 4.1.3, Graded Approach</b>            The purpose of grading is to select the controls and verifications to be applied to various items and activities consistent with their importance to safety, cost, schedule, and success of the program. The grading process provides the flexibility to design controls that best suit the facility or activity.</p>	<p><b>CRITERION 1, 5,6,7 and 8</b>            1.3.5            5.2            5.2.2            6.2            6.2.2            7.2.2            8.2</p>	<p>QM 2            QM 3</p>	Complete
<p><b>2. From: (1) Management (ii) Personnel Training and Qualification.</b>            Personnel shall be trained and qualified to ensure they are capable of performing their assigned work.</p>	<p><b>From: 4.2, Personnel Training and Qualification, 4.2.1, Introduction</b>            Training and qualification must ensure personnel capabilities for performing assigned work is achieved.</p>	<p><b>CRITERION 1, and 2</b>            1.3.11            2.1            2.2.1            2.3.5</p>	<p>QM 2-1            QM 2-2            QM 2-3            WV-538            WV-552</p>	Complete
<p>Personnel shall be provided continuing training to ensure that job proficiency is maintained.</p>	<p>Training and qualification must ensure personnel capability for performing assigned work is maintained.</p>	<p><b>CRITERION 2,</b>            2.2.1            2.3.5</p>	<p>QM 2-1            QM 2-2            QM 2-3            WV-552</p>	Complete

10 CFR 830.122 IMPLEMENTATION MATRIX				
1	2	3	4	5
Enforceable Under 10CFR830.122 Rule			Not Enforceable	
10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<p><b>From: 4.2, Personnel Training and Qualification, 4.2.2, Responsibilities</b>            Management should commit resources to facilitate the training and qualification processes for personnel in their organizations, and to ensure that personnel hired or transferred into positions meet the appropriate requirements.</p>	<p><b>CRITERION 2,</b>            2.1            2.2            2.2.1            2.4            2.4.1</p>	<p>QM 2-1            WV-110            WV-538            WV-552</p>	Complete
	<p>Each level of the organization should adequately describe its training and qualification needs. These descriptions should include requirements, interfaces, training methods, training responsibilities, and duties of line and training organizations.</p>	<p><b>CRITERION 2,</b>            2.4.4</p>	<p>QM 2-1</p>	Complete
	<p><b>From: 4.2, Personnel Training and Qualification, 4.2.3, Qualification of Personnel</b>            Position descriptions must define educational, experience, and physical condition requirements. Determination of qualification must be accomplished before allowing performance of work.</p>	<p><b>CRITERION 2,</b>            2.3.1            2.3.5            2.4.1            2.4.3            2.4.4            2.4.5</p>	<p>QM 2-1            WV-110</p>	Complete
	<p><b>From: 4.2, Personnel Training and Qualification, 4.2.4, Training</b>            Training should help personnel acquire knowledge of the correct current processes and methods to accomplish assigned tasks.</p>	<p><b>CRITERION 2,</b>            2.3.2            2.3.3</p>	<p>QM 2-1            WV-110            WV-538            WV-552</p>	Complete
	<p>Training effectiveness should be monitored. Worker performance should be evaluated to ensure that the training program conveys all required knowledge and skills. Feedback from personnel performance, former trainees and supervisors, accidents, and assessments should be used to determine effectiveness of training.</p>	<p><b>CRITERION 2,</b>            2.4.2            2.4.3</p>	<p>QM 2-1            WV-121</p>	Complete

10 CFR 830.122 IMPLEMENTATION MATRIX				
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Enforceable Under 10CFR830.122 Rule			Not Enforceable	
10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<p><b>From: 4.2, Personnel Training and Qualification, 4.2.5, Training Plans</b>            Training plans should consider changes in hazard conditions, technology, work methods, and job responsibilities. Training plans should also specify the type of training records to be maintained.</p>	<p><b>CRITERION 2, 2.4</b></p>	<p>QM 2-1            WV-538            WV-552</p>	<p>Complete</p>
<p><b>3. From: (1) Management (iii), Quality Improvement</b>            Processes to detect and prevent quality problems shall be established and implemented.</p>		<p><b>CRITERION 3, and 5</b>            3.1            3.2.1            3.2.3            3.4.3            5.2.1            5.2.4</p>	<p>QM 15            QM 16            WV-987</p>	<p>Complete</p>
<p>Items, services, and processes that do not meet established requirements shall be identified, controlled, and corrected according to the importance of the problem and the work affected. Correction shall include identifying the causes of problems and working to prevent recurrence.</p>	<p><b>From: 4.3, Quality Improvement, 4.3.1, Introduction</b>            An effectively planned and implemented quality management system is one that uses feedback information to improve items, services, and the processes that produce them; prevents or minimizes quality problems; and when necessary, corrects problems that occur.</p>	<p><b>CRITERION 1, 3, and 5</b>            1.4.5            3.1            3.3.1            3.3.2            3.3.3            3.3.4            3.3.7            5.2.4</p>	<p>QM 15            QM 16            WV-224            WV-990</p>	<p>Complete</p>
<p>Item characteristics, process implementation, and other quality-related information shall be reviewed and the data analyzed to identify items, services, and processes needing improvement.</p>	<p>Quality improvement is a management process that is carried out to improve an item, service, product, or process. All aspects of work activities and the management system is subject to continuous improvement through an assessment and feedback process.</p>	<p><b>CRITERION 3,</b>            3.1            3.3.1            3.3.2            3.3.3</p>	<p>QM 2            QM 18            WV-121</p>	<p>Complete</p>

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Enforceable Under 10CFR830.122 Rule			Not Enforceable	
10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<b>From: 4.3, Quality Improvement, 4.3.4 Quality Improvement</b> Management should encourage employees to develop and explore new ideas for improving products, processes, and services. Effective improvement processes require each employee to participate and cannot be delegated to a particular person or group.	<b>CRITERION 1, 3, and 5</b> 1.4.4 1.4.5 3.2 3.2.3 3.3.3 3.4.1 3.4.2 5.2 5.4.1 5.4.2	WV-120 WV-224 WV-990	Complete
<b>4. From: (1) Management (iv), Documents and Records</b> Documents shall be prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, or establish design.	<b>From: 4.4, Documents and Records, 4.4.1, Introduction</b> Documents and records are required to effectively manage, perform, and assess work.	<b>CRITERION 4,</b> 4.1 4.2 4.3 4.3.1	QM 3-1 QM 5 QM 6 WV-100 WV-108 WV-127 WV-911	Complete
	<b>From: 4.4, Documents and Records, 4.4.2, Documents</b> A document control system should be established to supply such documents necessary for personnel to safely and correctly perform their assigned responsibilities.	<b>CRITERION 4,</b> 4.4.1	QM 6 WV-100 WV-110	Complete
Records shall be specified, prepared, reviewed, approved, and maintained.	<b>From: 4.4, Documents and Records, 4.4.3, Records</b> Records are compiled into a records management system that ensures appropriate records are maintained. The system should include provisions for records retention, protection, preservation, change, traceability, accountability, and retrievability. While in storage, records should be protected from damage, loss, and deterioration.	<b>CRITERION 4,</b> 4.1 4.2.3 4.3.2	QM 17 WV-730	Complete

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<p><b>5. From: (2) Performance, (i) Work Processes</b>  Work shall be performed to established technical standards and administrative controls using approved instructions, procedures, or other appropriate means.</p>	<p><b>From: 4.5, WORK PROCESSES, 4.5.2, Worker Performance</b>  The scope and detail of documentation should be commensurate with the complexity and importance of the work, the skills required to perform the work, and the hazards and risk or consequences of quality problems in the product, process, or service.</p>	<p><b>CRITERION 5,</b>  5.1  5.2  5.2.2  5.3.1  5.4.1  5.4.2</p>	<p>QM 5  QM 6  WV-110  WV-108  WV-109</p>	Complete
<p>Items shall be identified and controlled to ensure their proper use. Items shall be maintained to prevent their damage, loss, or deterioration.</p>	<p><b>From: 4.5, WORK PROCESSES, 4.5.3, Item Identification and Use Control</b>  A process for the identification and control of items should be established and implemented to prevent the use of incorrect or defective items, identify and control suspect/counterfeit items, and provide for the control and maintenance of items.</p>	<p><b>CRITERION 5, 7, and 8</b>  5.1  5.3.2  7.2.4  8.3.1</p>	<p>QM 8  QM 14  WV-110  WV-108  WV-109</p>	Complete
<p>Equipment used for process monitoring or data collection shall be calibrated and maintained.</p>		<p><b>CRITERION 5, and 8</b>  5.1  5.3.4  8.2.3  8.4.1</p>	QM 12	Complete
<p><b>6. From: (2) Performance, Item (ii) Design</b>  Items and processes shall be designed using sound engineering scientific principles and appropriate standards. Design work, including changes, shall incorporate applicable requirements and design bases.</p>	<p><b>From: 4.6, Design, 4.6.1, Introduction</b>  Designs should provide for appropriate inspection, testing, and maintenance to ensure continuing reliability and safety of the items. The design should consider the expected use and life expectancy of the items in order to address appropriate disassembly and disposal requirements.</p>	<p><b>CRITERION 6,</b>  6.2  6.2.1  6.2.3  6.3.3  6.4.1</p>	QM 3	Complete

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Enforceable Under 10CFR830.122 Rule			Not Enforceable	
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	<b>From: 4.6, Design, 4.6.2, Design Input</b> Design input should be based upon contractual requirements and customer expectations, and should be technically correct and complete. Design input may include such information as design basis, health and safety considerations, expected life cycle, performance parameters, codes and standards requirements, and reliability requirements.	<b>CRITERION 6,</b> 6.2.1 6.3.1 6.3.2 6.3.3 6.4.1	QM 2 QM 3	Complete
	<b>From: 4.6, Design, 4.6.3, Design Process</b> The design process should translate design input into design output documents that are technically correct and compliant with the end-users requirements.	<b>CRITERION 6,</b> 6.3.2 6.4.1	QM 3	Complete
Design interfaces shall be identified and controlled.	<b>From: 4.6, Design, 4.6.4, Design Output</b> The administrative interface process should clearly indicate responsibilities for design output document activities including as-built mark-up and updating during project construction and operation phases, and the requirements for document control, and records management.	<b>CRITERION 6,</b> 6.2.1 6.3.1 6.3.4 6.4.1	QM 3	Complete
	The completed design should be recorded in design output documents, such as drawings, specifications, test/inspection plans, maintenance requirements, and reports.	<b>CRITERION 6,</b> 6.2.1 6.3.2 6.3.5 6.4.1	QM 3	Complete
The adequacy of design products shall be verified or validated by individuals or groups other than those who performed the work. Verification and validation work shall be completed before approval and implementation of design.	<b>From: 4.6, Design, 4.6.5, Design Verification</b> Design verifications is a formal, documented process for ensuring that the resulting items will comply with the requirements. Design verification methods include, but are not limited to, technical reviews, peer reviews, alternate calculations, and qualification testing.	<b>CRITERION 6,</b> 6.3.7 6.3.8 6.3.10	QM 3	Complete
	The extent and number of design verifications should be based on a graded approach and should depend on the designed product's complexity and importance to safety and project success.	<b>CRITERION 6,</b> 6.2 6.2.4 6.3.7 6.4.1	QM 2 QM 3	Complete

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Enforceable Under 10CFR830.122 Rule			Not Enforceable	
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	<b>From: 4.6, Design, 4.6.6, Design Changes</b> Design changes, including field changes and nonconforming items dispositioned for "use-as-is" or "repair," should be controlled by measures commensurate with those applied to the original design. Temporary modifications should receive the same levels of control as the designs of permanent modifications.	<b>CRITERION 6,</b> 6.2.3 6.3.3	QM 3	Complete
<b>7. From: (2) Performance, Item (iii) Procurement</b> Procured items and services shall meet established requirements and perform as specified.	<b>From: 4.7, Procurement, 4.7.1 Introduction</b> The procurement process should ensure that items and/or services provided by suppliers meet the requirements and expectations of the end-users. The procurement process should be planned and controlled to ensure that the end-user's requirements are accurately, completely, and clearly communicated to the supplier. The supplier, designer, and end-user requirements are met during the production phase, and the proper product is delivered on time and maintained until use.	<b>CRITERION 7,</b> 7.1 7.2.1 7.2.2 7.3.1 7.3.3 7.3.4 7.3.5 7.3.8	QM 4 WV-361 WV-602 WV-620	Complete
	<b>From: 4.7, Procurement, 4.7.2, Procurement Documents</b> Procurement documents should clearly state test/inspection requirements and acceptance criteria for purchased items and services.	<b>CRITERION 7,</b> 7.3.2	QM 4 WV-361 WV-602 WV-620	Complete
	Management controls exist for DOE procurement and subcontracts through applicable DOE Orders, the Department of Energy Acquisition Regulation (the DEAR) in 48 CFR Part 9, and Federal Acquisition Regulations (FAR) in 48 CFR Parts 1 to 99.	<b>CRITERION 7,</b> 7.2	WV-620	Complete
Prospective suppliers shall be evaluated and selected on the basis of specified criteria.	<b>From: 4.7, Procurement, 4.7.3, Supplier Qualification</b> Prospective suppliers should be evaluated to verify their capability to meet performance and schedule requirements.	<b>CRITERION 7,</b> 7.1 7.3.4 7.4.1	QM 4 QM 18 WV-620	Complete

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Enforceable Under 10CFR830.122 Rule			Not Enforceable	
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Processes to ensure that approved suppliers continue to provide acceptable items and services shall be established and implemented.	<b>From: 4.7, Procurement, 4.7.4, Supplier Performance Monitoring</b> The qualified supplier's performance should be evaluated periodically during the life of the contract to confirm its continuing capabilities. Suppliers should be monitored to ensure that acceptable items or services are produced and schedule requirements are being met.	<b>CRITERION 7,</b> 7.1 7.2 7.2.1 7.3 7.3.5	QM 4 QM 7 QM 8 QM 18 WV-620	Complete
	<b>From: 4.7, Procurement, 4.7.5, Inspection</b> The procurement process should provide for identifying the need for inspection and tests. Requirements for inspections and tests should be obtained from design documents. Inspections should be adequate to ensure conformance with purchase requirements, including verification that specified documentation has been provided by the supplier. The inspection should verify that items were not damaged during shipment.	<b>CRITERION 7,</b> 7.3.7	QM 7 QM 8 QM 10	Complete
	<b>From: 4.7, Procurement, 4.7.6, Supplier Documentation</b> Supplier-generated documents should be accepted through the procurement system and controlled and processed by the end-user organization according to the provisions of 4.4 (Documents and Records). These documents may include certificates of conformance, drawings, analyses, test reports, maintenance data, nonconformances, corrective actions, approved changes, waivers, and deviations.	<b>CRITERION 7,</b> 7.3.2 7.3.6 7.3.7 7.4.1	QM 7 QM 6 WV-602	Complete
<b>8. From: (2) Performance, Item (iv) Inspection and Acceptance Testing</b> Inspection and testing of specified items, services, and processes shall be conducted using established acceptance and performance criteria.	<b>From: 4.8, Inspection and Acceptance Testing, 4.8.1 Introduction</b> Inspection and test should be identified early in the design process and specified in the design output documents.	<b>CRITERION 8,</b> 8.1 8.2	QM 2 QM 3 QM 10 QM 11	Complete

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10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<p><b>From: 4.8, Inspection and Acceptance Testing, 4.8.2, Process</b>            Inspections/tests should be performed by technically qualified personnel who have the authority to access appropriate information and facilities in order to verify acceptance. Inspection/test results should be evaluated and verified by authorized personnel to document that all requirements have been satisfied. Final acceptance should be verified and documented by the organization having final responsibility for item or process.</p>	<p><b>CRITERION 8,</b>            8.1            8.2            8.3.1            8.3.2            8.4.1</p>	<p>QM 2-2            QM 10            QM 11            WV-100</p>	Complete
Equipment used for inspections and tests shall be calibrated and maintained.	<p><b>From: 4.8, Inspection and Acceptance Testing, 4.8.3, Control of Measuring and Test Equipment</b>            Measuring and Test Equipment (M&amp;TE) used for inspection, test, and monitoring or data collection should be calibrated and maintained using a documented process. M&amp;TE should also be checked prior to use to ensure that it is of the proper type, range, accuracy, and that it is uniquely identified and traceable to its calibration data.</p>	<p><b>CRITERION 5, and 8</b>            5.1            5.3.4            8.1            8.2.3            8.3.3            8.4.1</p>	QM 12	Complete
<p><b>9. From: (3) Assessment, Item (i) Management Assessment</b>            Managers shall assess their management processes. Problems that hinder the organization from achieving its objectives shall be identified and controlled.</p>	<p><b>From: 4.9, Management Assessment, 4.9.1, Introduction, 4.9.2, Responsibility</b>            Managers at every level should periodically assess the performance of their organizations and functions to determine how well it meets customer requirements and expectations, and mission objectives, so that improvements can be made. This assessment should address the use of human and material resources to achieve the organization's goals and objectives. Personal involvement by the manager will naturally yield the most meaningful information for that manager to use in taking actions to improve organizational performance.</p>	<p><b>CRITERION 9,</b>            9.1            9.2            9.2.2            9.2.3            9.3.2            9.4.1</p>	<p>QM 2            QM 2-4            QM 18            WV-121</p>	Complete

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10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<b>From: 4.9, Management Assessment, 4.9.4, Results</b> Management assessment results should be documented and used as input to the organization's improvement process. Periodic review of performance metrics at appropriate management levels and with customers is effective in validating organizational performance.	<b>CRITERION 9,</b> 9.1 9.3.1 9.3.3 9.4.1	QM 2 QM 2-4 WV-121	Complete
<b>10. From: (3) Assessment, Item (ii) Independent Assessment</b> Independent assessments shall be planned and conducted to measure item and service quality, to measure the adequacy of work performance, and to promote improvement.	<b>From: 4.10, Independent Assessment, 4.10.1, Introduction</b> The independent assessment process should use a performance-based approach to focus on results. Performance-based assessments are conducted on activities that relate directly to final objectives, emphasize safety and reliability, and measure item or service performance.	<b>CRITERION 5 and 10,</b> 5.2.3 5.2.4 10.1 10.2 10.4	QM 2 QM 18 WV-121	Complete
The group performing independent assessments shall have sufficient authority and freedom from the line to carry out its responsibilities. Persons conducting independent assessments shall be technically qualified and knowledgeable in the areas assessed.	<b>From: 4.10, Independent Assessment, 4.10.2, Performing Organization</b> The persons or organization conducting independent assessments should report to a sufficiently high level in the overall organization. This is to ensure organizational independence from the work and access to levels of management authority capable of directing subordinate levels to take actions in response to the assessment results.	<b>CRITERION 2, 5, and 10</b> 2.3.1 5.2.4 10.2 10.3	QM 2 QM 18 WV-121	Complete
	<b>From: 4.10, Independent Assessment, 4.10.3 Process</b> The type and frequency of independent assessments should be based on status, complexity, risk, and importance of the activities or processes being assessed. Independent assessments may include methods such as monitoring operations, inspections, peer and technical reviews, audits, surveillances, customer interviews, or combinations thereof. The assessment should focus on improving output quality and process effectiveness by emphasizing improvement methods.	<b>CRITERION 10,</b> 10.2 10.3 10.4	QM 2 QM 18 WV-121	Complete

10 CFR 830.122 IMPLEMENTATION MATRIX				
1	2	3	4	5
Enforceable Under 10CFR830.122 Rule			Not Enforceable	
10CFR830.122 QUALITY ASSURANCE REQUIREMENT	ADDED DETAIL FROM IMPLEMENTATION GUIDE FOR 10 CFR 830.122 and DOE O 414.1A	WVDP-111 QAP REFERENCE	IMPLEMENTING DOCUMENTS	IMPLEMENTATION STATUS
	<p><b>From: 4.10, Independent Assessment, 4.10.4, Results</b>            Management should evaluate the assessment results to identify improvement actions and determine whether similar quality problems may exist elsewhere in the organization. Lessons learned from assessment results should be communicated to other organizations with similar activities or concerns. Management should track improvement actions until a resolution has been implemented and verified as completed.</p>	<p><b>CRITERION 10,</b>            10.2            10.3            10.4</p>	<p>QM 2            QM 18            WV-121</p>	<p>Complete</p>

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**APPENDIX D**

**REFERENCES AND TECHNICAL GUIDANCE**

Department of Energy Orders or Memoranda

DOE O 414.1A Quality Assurance

DOE G 414.1-1 Implementation Guide for use with Independent and Management Assessment Requirements of 10 CFR 830.120 and DOE O 414.1A Quality Assurance (August 1996)

DOE G 414.1-2 Quality Assurance Management System Guide for use with 10 CFR 830.120 and DOE O 414.1A (06-17-99)

5400.1 General Environmental Protection Program

DOE/RW-0333P Quality Assurance Requirements and Description

DOE P 450.4 Safety Management Policy

DOE G 450.4-1 Integrated Safety Management System Guide (11-26-97)

DOE G 440.1-6 Implementation Guide for use with Suspect/Counterfeit Items Requirements of DOE O 440.1A (06-30-97)

5480.19 Conduct of Operations

Industry Consensus Standards

ASME NQA-1-1989 Quality Assurance Program Requirements for Nuclear Facilities

Federal Regulations

10 CFR 830.122 Quality Assurance Requirements

WVNS RECORD OF REVISION

<u>Rev. No.</u>	<u>Description of Changes</u>	<u>Revision On Page(s)</u>	<u>Dated</u>
7	Changed title page names/titles, changed WVNS to WVNSCO, changed 10 CFR 830.120 to 10 CFR 830.122, revised WV-914 USQP statement, added electronic viewing of controlled documents, updated the matrix to current implementing documents, and numerous minor editorial corrections. No departments are affected by this change.	All	02/22/02

## ATTACHMENT 4

### PROJECT ASSURANCE PLAN WRITTEN UNDER A SITE QUALITY ASSURANCE PLAN (ATTACHMENT 3)

VERIFY HARD COPY AGAINST WEB SITE IMMEDIATELY PRIOR TO EACH USE

# West Valley Demonstration Project

Doc. ID Number WVDP-074  
Revision Number 12  
Revision Date 12/20/2002

WEST VALLEY NUCLEAR SERVICES COMPANY

QUALITY ASSURANCE PROGRAM

FOR

HIGH LEVEL WASTE FORM PRODUCTION

THROUGH ACCEPTANCE

Approved By: L. B. McGetrick, High Level Waste Projects Manager

Approved By: R. A. Carter, Quality Assurance Manager

**WVNSCO**

West Valley Nuclear Services Company

10282 Rock Springs Road  
West Valley, New York USA 14171-9799

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WVNSCO

HIGH LEVEL WASTE

QUALITY ASSURANCE POLICY

At West Valley Nuclear Services, Co. (WVNSCO), quality assurance is applied commensurate with the complexity of the product/service and consequence of failure.

The WVNSCO High Level Waste (HLW) quality assurance program is periodically reviewed, maintained, and verified to ensure that WVNSCO' products and services for high-level waste form production through acceptance meet requirements, are fit for use, and satisfy the customer's contract requirements.

The HLW Quality Assurance Program, as documented in the WVNSCO Quality Management Manual (QM), WVDP-002 applies to those items and activities involved in production and acceptance of WVNSCO's canistered waste form. The Program provides for prevention of errors, as well as for detection and correction of deficient conditions. The program includes operating elements and procedures that comply with legal, regulatory, contractual, and corporate requirements related to quality. The QM, is the core document which implements all applicable WVNSCO QA Program documents.

The QM is responsive to 10 CFR 830.122, "Quality Assurance." The QM implements through selective and judicious application the requirements of DOE/RW-0333P, "Quality Assurance Requirements and Description."

Responsibilities and authorities for execution of this policy are detailed in this document and the referenced procedures. The overall responsibilities, policies, and procedures for more specific elements of the WVNSCO quality assurance program are delineated in the QM.

Compliance with the requirements of the quality assurance program is mandatory for all WVNSCO personnel.

WEST VALLEY NUCLEAR SERVICES COMPANY (WVNSCO)  
QUALITY ASSURANCE PROGRAM DESCRIPTION FOR  
HIGH-LEVEL CANISTERED WASTE FORM PRODUCTION  
THROUGH ACCEPTANCE

This document describes the West Valley Nuclear Services Company portion of the West Valley Demonstration Project Quality Assurance Program for High Level Waste Form Qualification and Production Through Acceptance.

1.0 INTRODUCTION

1.1 Scope

This section describes the WVNSCO HLW quality assurance program that applies to Waste Acceptance Process activities of high-level waste form production through acceptance at the WVDP. It includes how the WVNSCO quality assurance program relates to other quality assurance programs within the WVDP waste form producer organization and how it interacts with the quality assurance programs of the other participants. This document also describes the role of the WVNSCO quality assurance program in fulfilling the WVDP Project mission, and how it meets the specifications contained in the requirements documents.

2.1 Mission

The WVDP Project mission is to develop, qualify, and produce stabilized radioactive waste forms suitable for deposit in a licensed federal repository.

3.1 Strategy

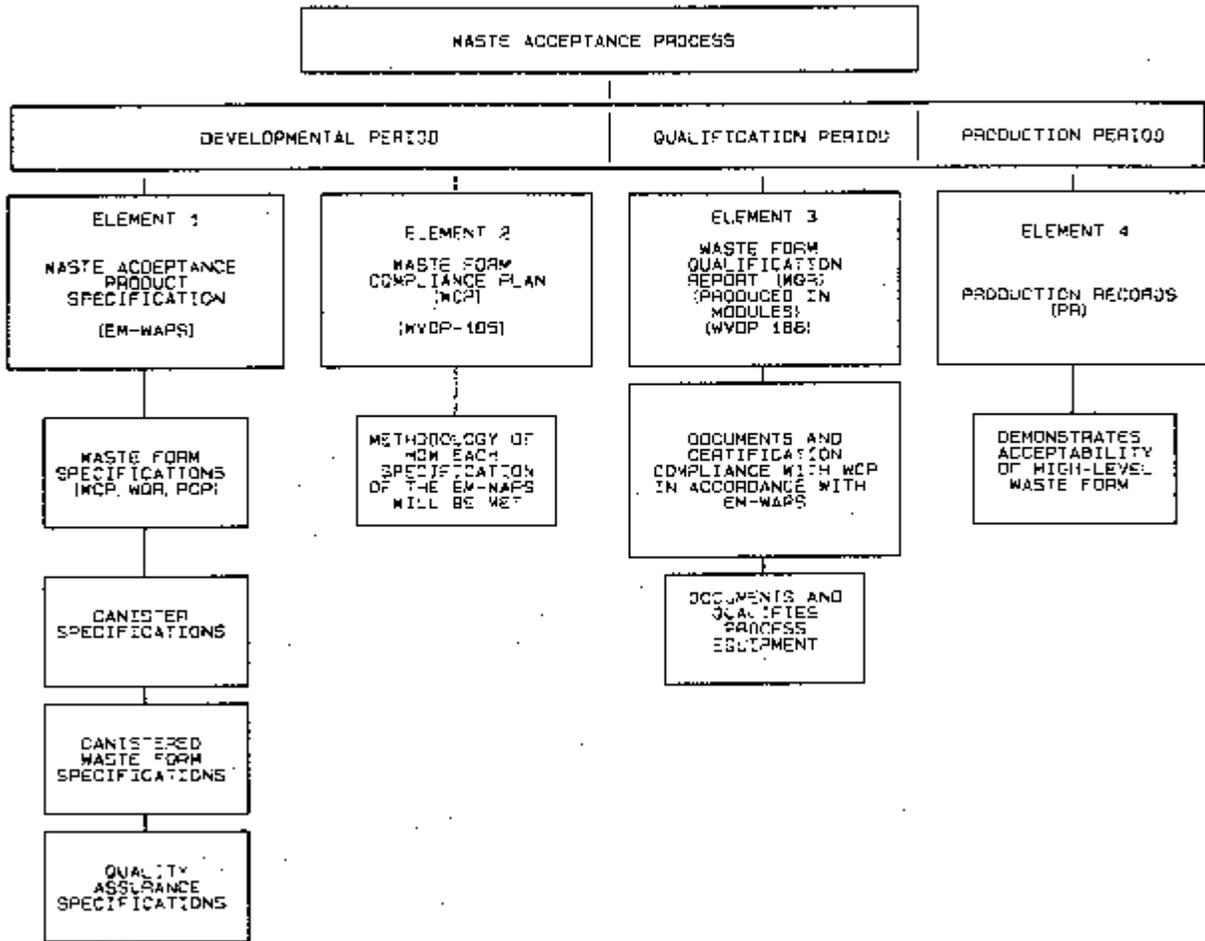
The strategy for realization of the WVDP Project mission divides the Project activities into three major activities and four elements known collectively as the Waste Acceptance Process. These are shown in Figure 1.3 and summarized below:

1. Developmental Activity - The developmental activity includes the essential research and development activities performed by accountable organizations to produce Element No. 1: viable waste acceptance technical and quality specifications. This activity also includes the preparation of Element No. 2: a Waste Form Compliance Plan (WCP), and Element No. 3: a Waste Form Qualification Report (WQR) by the waste form producer.
  
2. Qualification Activity - The qualification activity encompasses the essential test and verification activities that will culminate in Element No. 3 which is the Waste Form Qualification Report (WQR). The WQR will provide documented evidence that the canistered waste form meets the U. S. Department of Energy, Office of Environmental Management Waste Acceptance Product Specification (EM-WAPS). The EM-WAPS ensures compliance with the Office of Civilian Radioactive Waste Management (RW) Waste Acceptance Systems Requirements Document (WA-SRD).
  
3. Production Activity - The production activity will begin with the production of the first canistered waste form and will finish when the last canistered waste form is accepted and placed in interim storage. The production records, Element No.4, will form most of the basis for acceptance of the canistered waste forms.

The strategy includes provisions to ensure that all Waste Acceptance Process activities are performed according to an effective quality assurance program. **WVNSCO** implementation of the requirements as defined in DOE/RW-0333P, Quality Assurance Requirements and Description from the Office of Civilian Radioactive Waste Management are in accordance with the direction and delegation from the OH-WVDP.

Figure 1.3

### WASTE ACCEPTANCE PROCESS CHART



N: \PROGRAMS  
\WVDP-074  
\FIG.003  
09/21/85

#### 4.1 Requirements

The requirement for the High-Level Waste (HLW) Quality Assurance Program is DOE/RW-0333P, Revision 0, which provides the basis for waste form producer quality assurance programs that can be used to support the licensing application for the federal repository.

The Quality Assurance Program has been implemented far enough in advance of production to ensure that Waste Acceptance Process activities, such as testing and analysis occurring during the developmental and qualification periods, meet required technical specifications.

#### 5.1 Application

The elements of the Project Quality Assurance Program being performed by **WVNSCO** are those identified by DOE/RW-0333P as Sections 1-18, Supplements I and III, and Appendix A:

1. Organization
2. Quality Assurance Program
3. Design Control
4. Procurement Document Control
5. Instructions, Procedures, and Drawings
6. Document Control
7. Control of Purchased Items and Services
8. Identification and Control of Items
9. Control of Processes
10. Inspection
11. Test Control
12. Control of Measuring and Test Equipment
13. Handling, Storage, and Shipping
14. Inspection, Test, and Operating Status
15. Control of Nonconforming Items
16. Corrective Action

17. Quality Assurance Records

18. Audits

Supplement I            Software

Supplement III        Scientific Investigation

Appendix A            High Level Waste Form Production

Further, these Quality Assurance Program elements shall be applied to all essential high level Waste Acceptance Process activities as identified in the WVNS Waste Acceptance Manual, WVDP-200, through which documentation and data are collected and prepared to support compliance with EM-WAPS derived specifications. Examples include testing and analysis activities associated with research and development that are essential to qualification of the waste form and includes control of materials, equipment, facilities, processes, and processing activities that are essential to the certification of the canistered waste form. Activities covered by the HLW quality assurance program include both the performing functions of achieving quality and the quality assurance functions. The quality assurance functions are: a) assuring that an appropriate HLW quality assurance program is established and effectively executed; and b) verifying, such as by checking, auditing, surveillance, assessment, and inspection, that activities affecting quality achievement (including safety functions) have been correctly performed.

## 2.0 ORGANIZATION

2.1 WVNSCO is organizationally structured to be both sensitive and responsive to its role as site managing and operating (M&O) contractor at the West Valley Demonstration Project. The intent of the organizational arrangement is to optimize conduct of the responsibilities and duties delegated to WVNSCO by DOE through the OH-WVDP. The authority delegated to WVNSCO is a charter to develop and implement an effective Quality Assurance Program that will assure the success of the West Valley Demonstration Project's mission, and execute Waste Acceptance Process activities in accordance with the HLW quality

assurance program. The authority and duties of persons and organizations performing activities affecting Waste Acceptance Process activities for high-level waste form production are established and delineated in program documents.

2.2 The WVNSCO organization discussed herein is described by Figure 1. With the exception of the Quality Assurance Manager, the organization depicted in Figure 1 represents WVNSCO staff management. The direct responsibility for the performance of activities affecting quality is delegated by the staff to line managers who are at the same or lower level than the Quality Assurance Manager. The project participants are also discussed here because of project responsibilities and activities that have been delegated to them. Major participants who have been required to have WVNSCO approved Quality Assurance Programs are identified in Figure 2. Other participants, including suppliers, consultants, subcontractors, and laboratories are a part of the overall WVNSCO program by virtue of WVNSCO delegated Quality Assurance Program elements. All such delegated Quality Assurance functions are identified by appropriate contractual requirements with accountability for acceptable implementation retained by WVNSCO. WVNSCO performs initial approval and scheduled periodic overview of the organizational structures and Quality Assurance Programs of all sub-tier program participants by audit, surveillance, or other appropriate methods.

2.3 A brief summary of the responsibilities and authority of persons and organizations performing safety functions and assuring that the Quality Assurance Program is established as follows:

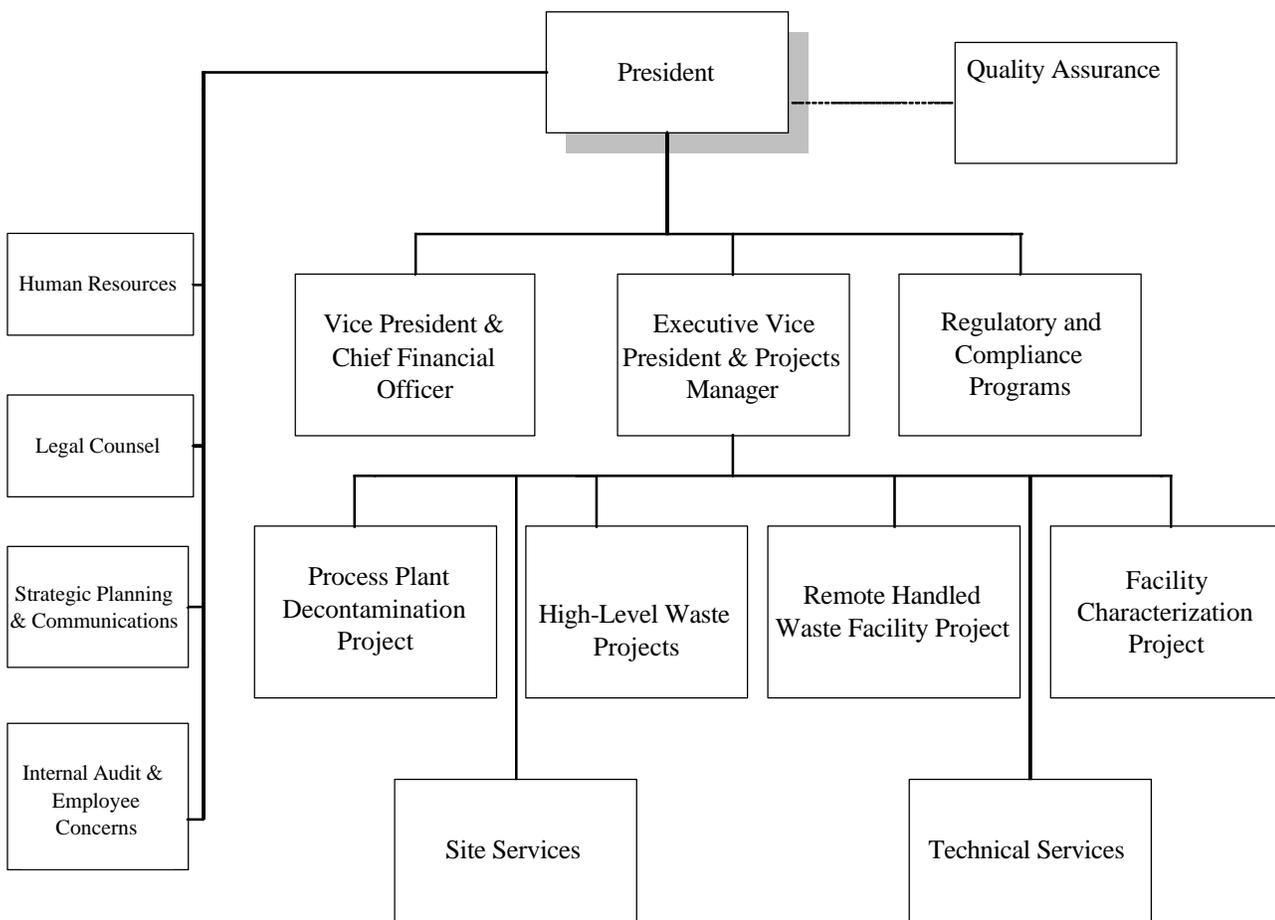
1. The President of WVNSCO is responsible for all functions of WVNSCO, including establishment and implementation of the Quality Assurance Program policies and procedures. The President may delegate authority to carry out these policies and procedures.

The President is also responsible for reviewing the Quality Assurance Program and for assuring corrective action is implemented, when necessary. Corrective actions will be undertaken by the responsible WVNSCO organization.

2. The High Level Waste Projects Manager is responsible for managing the safe operation of the Vitrification Facility including Vitrification Operations and Engineering, **vittrification maintenance and surveillance**, vittrification work control and shift engineering, Vitrification Process and Waste Qualification Report Compliance, Melter Shutdown, **and HLW canistered waste form storage**. In this position, the High Level Waste Project Manager is responsible for the major project performing functions necessary for achievement of project quality assurance requirements.

Figure 1.2

## West Valley Nuclear Services Company Organization Chart



1. The WVNSCO Quality Assurance Manager is responsible for the development, maintenance, and verification of effective implementation of the Quality Assurance Program. The Quality Assurance Manager is in charge of the Quality Assurance Department. The Quality Assurance Manager has both quality assurance and management experience and:

- A. Is at the same or higher organization level as the highest line manager directly responsible for performing activities affecting quality and is sufficiently independent from cost and schedule to assure impartiality. Also, has authority and responsibility to verify the adequacy and implementation of the WVNSCO organization and subtier quality program and to issue stop work.
- B. Has established effective communication channels with other senior management positions, and has direct access to the WVNSCO President in matters affecting quality assurance.
- C. Has the authority to approve WVNSCO and its subcontractor quality assurance manuals, changes thereto, and interpretations thereof.
- D. Has Stop Work Authority on matters affecting Quality which has been extended down the line organization by OH-WVDP to WVNSCO. WVNSCO line managers may orally Stop Work when, in their judgement, the quality of the product or operation is being compromised.

Should a quality affecting Stop Work action be

deemed necessary by an individual outside direct line management, the individual shall immediately notify the responsible line manager within the performing contractor or OH-WVDP, both orally and with follow up of the condition in writing. Based on this information, the responsible line manager will decide on the need to issue a Stop Work Order. Once issued and once corrective action has been completed, it is incumbent on the line manager to lift the Stop Work Action. Stop Work and lifting Stop Work is defined in implementing procedures.

- E. Has no other duties or responsibilities unrelated to quality assurance that would prevent full attention to quality assurance matters.
  - F. Has the authority to ensure resolution of quality disputes, elevating those to the President of **WVNSCO**, if necessary.
  - G. Develops QA programmatic effectiveness information which is regularly reported to the **WVNSCO** President.
4. Other Departments within **WVNSCO** are responsible for compliance with the Quality Assurance Program as documented in the QM, and for implementing the portions of the QM applicable to them. Referring again to figure 1, the **WVNSCO** departments are structured to effectively administer the Waste Acceptance Process qualification and production activities while assuring compliance with the HLW Quality Assurance Program. Their authority and duties are described in program documents.
5. All Individuals are given the right and duty to express quality allegations up through the line management chain, selected OH-WVDP and staff Managers, and if not resolved,

to the President of WVNSCO or the Director of OH-WVDP without fear of reprisal. A well publicized policy ensures that the provisions for reporting such allegations or concerns are known and understood, and are in compliance with RW directives regarding allegations.

### 3.0 WVNSCO QUALITY ASSURANCE PROGRAM

#### 3.1 Background

The West Valley Demonstration Project Act was passed in 1980 for the purpose of solidifying the liquid high-level waste for transport to a federal repository and decommissioning the shutdown West Valley Nuclear Fuel Reprocessing Plant. To control early decommissioning activities at the West Valley Demonstration Project (WVDP), the WVNSCO Quality Assurance Program was implemented at the WVDP in 1982. It was written to satisfy ANSI/ASME NQA-1-1979, which was the contemporary consensus standard. Since then it has been periodically reviewed and upgraded to meet amplified requirements. Milestones concurrent and subsequent to the WVNSCO Quality Assurance Program implementation at the WVDP are listed below.

1. The enactment in 1982 of the Nuclear Waste Policy Act (NWPA) which mandates that all high-level nuclear waste will be sent to a federal repository for disposal.
2. Following President Reagan's ratification in 1985 of the decision to send defense high-level waste to a civilian repository, the DOE devised its strategy, the Waste Acceptance Process, to ensure that high-level canistered waste products are acceptable to both a federal repository operator and regulatory authorities. This landmark decision led to the release of:
  - A) preliminary waste form requirements issued as the Waste Acceptance Preliminary Specifications (WAPS), PE-04, in April 1987, and
  - B) in response to the WAPS, the Waste Compliance Plan (WCP), WVNS-WCP-001, in April 1989.

3. In response to DOE/RW-0333P, the WVNSCO HLW quality assurance program has been updated to meet the amplified requirements that are applicable to Waste Acceptance Process Activities for production of high-level waste canisters at the WVDP.

#### 4.0 Current Program

The WVNSCO quality assurance program at the WVDP implements DOE/RW-0333P and is approved by OH-WVDP.

The core document for the WVNSCO program is the QM. Its purpose is to iterate the requirements for program quality assurance and to identify the internal organizations responsible for implementing them. Each section of the QM is approved by the President of WVNSCO. Subsequently, it is reviewed by the OH-WVDP.

The QM sections and the WVNSCO organizational procedures implement the present requirements for the Quality Assurance Programs for Waste Acceptance Process activities.

The WVNSCO HLW quality assurance program matrix, Section II, is based on the major sections and the applicable supplements and appendices DOE/RW-0333P and identifies the main requirement of DOE/RW-0333P, "Quality Assurance Requirements and Description," and the corresponding WVNSCO implementing procedures(s). The relationships and hierarchy of the documents listed in Section II is depicted in Figure II-1.

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING WVNSCO PROCEDURES
<p>1 Organization</p> <p>1S-1</p>	<p>1.2 Requirements</p> <p>1.2.1 Line Management</p> <p>1.2.2 Quality Assurance Management</p> <p>1.2.3 Responsibility for Quality</p> <p>1.2.4 Delegation of Work</p> <p>1.2.5 Resolution of Quality Disputes</p>	<p>WVDP-074, QM 1</p> <p>QM-1, WV-120</p> <p>QM 1</p> <p>QM 1, WV-120</p> <p>N/A (SEE NOTE 1)</p> <p>QM 1, WV-990</p>
<p>2 Quality Assurance Program</p> <p>2S-4</p>	<p>2.2.1 Quality Assurance Program Objective</p> <p>2.2.2 Quality Assurance Program Documents</p> <p>2.2.3 Classifying Items and Applying Quality Assurance Controls A through D</p> <p>2.2.3 Classifying Items and Applying Quality Assurance Controls, E&amp;F Only</p> <p>2.2.4 Planning Work</p> <p>2.2.5 Surveillances</p> <p>2.2.6 Management Assessments</p> <p>2.2.7 Readiness Reviews</p> <p>2.2.8 Peer Reviews</p> <p>2.2.9 Document Review</p> <p>2.2.10 Quality Assurance Program Information Management</p> <p>2.2.11 Personnel Selection, Indoctrination, Training, and Qualification</p> <p>2.2.12 Qualification of Personnel Performing Quality Assurance Functions</p>	<p>WVDP-074, WVDP-002</p> <p>WVDP-002, -114, -117, -130</p> <p>N/A(SEE NOTE 2)</p> <p>QM 2, 3, WVDP-074, SOPs</p> <p>QM 2,3,3-1, EP-5-002</p> <p>QM 2, QP 7-4, 10-3</p> <p>QM 2, 2-4, WV-121, WV-368, QM-2</p> <p>QM 3-3, EP-3-020</p> <p>WVDP-257, EP-3-003, -021, -026, QM 3-3</p> <p>QM 15, 16, 18, 2, 6,</p> <p>QM 2-1, WV-538, -552, T-60</p> <p>QP 2-1, 2-2, QM 2-2, 2-3, EP-11-004, WVDP-109</p>

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING WVNSCO PROCEDURES
3 Design Control  3S-1	3.2.1 Design Input Control 3.2.2 Design Process 3.2.3 Design Analysis 3.2.4 Design Verification 3.2.5 Design Reviews 3.2.6 Alternate Calculations 3.2.7 Qualification Testing 3.2.8 Design Change Control 3.2.9 Design Interface Control	QM 3, EP-3-002,-003,-004,-007 QM 3, EP-3-002,-003,-004 QM 3, EP-3-021, WV-730 QM 3, 3-3, EP-3-020,-021,-003,-11-003 QM 3, EP-3-003 QM 3, EP-3-021 QM 3, EP-11-003 QM 3, EP-3-007, QP 6-1 QM 3
4 Procurement Document Control  4S-1	4.2.1 Procurement Document Preparation 4.2.2 Procurement Document Review and Approval 4.2.3 Procurement Document Change	QM 4, WV-620, QM 4, QP 4-1, WV-620  QM 4, WV-620
5 Instructions, Procedures, and Drawings	5.2 Requirements 5.2.1 Types of Implementing Documents 5.2.2 Content of Implementing Documents 5.2.3 Review and Approval of Implementing Documents 5.2.4 Compliance with Implementing Documents	QM 5 QM 5 QM 5, WVDP-257, EP-5-002 QP 6-1, 6-2 WVDP-257 WV-120, Conduct of Ops Manual
6 Document Control  6S-1	6.2.1 Types of Documents 6.2.2 Preparing Documents 6.2.3 Reviewing Documents 6.2.4 Approving Documents 6.2.5 Controlling the Distribution and Use of Documents 6.2.6 Changes to Documents 6.2.7 Expedited Changes 6.2.8 Editorial Corrections	QM 6, WVDP-257 QM 6, WVDP-257 QM 6, WVDP-257, EP-3-003 WVDP-257, EP-3-003, -5-002 QM 6, WVDP-257  QM 6, WVDP-257 WVDP-257, EP-5-002 WVDP-257, EP-5-002

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING WVNSCO PROCEDURES
7 Control of Purchased Items and Services  7S-1	7.2.1 Procurement Planning 7.2.2 Source Evaluation and Selection 7.2.3 Proposal/Bid Evaluation 7.2.4 Supplier Performance Evaluation 7.2.5 Control of Supplier Generated Documents 7.2.6 Acceptance of Items or Services 7.2.7 Certificate of Conformance 7.2.8 Source Verification 7.2.9 Receiving Inspection 7.2.10 Post-Installation Testing 7.2.11 Control of Supplier Nonconformance 7.2.12 Commercial Grade Items	QM 7, 2, 3, WV-620 QM 7, 2, 3, WV-620 QM 7, WV-620 QM 7, QP 7-1 QM 7, WV-620, EP-5-003 QM 7, WV-620, QP 10-1, 10-2, 10-3 QM 7, QP 7-2 QM 7, QP 7-1, 7-2, 7-3, 7-4 QM 7, 10, QP 10-2 QM 7 QM 7, WV-620, EP-5-003, QP 7-2 QM 7,
8 Identification and Control of Items  8S-1	8.2.1 Identification 8.2.2 Physical Markings 8.2.3 Traceability 8.2.4 Conditional Requirements	QM 8, EP-8-001 QM 8, QM 8, WVDP-207, PROP 11 QM 8, WVDP-207, PROP 10
9 Control of Processes  9S-1  2S-2	9.2.1 Special Processes  9.2.2 Personnel, Implementing Documents, and Equipment Qualifications  9.2.3 Qualification of Nondestructive Examination Personnel	QM 9, 19; QP 9-1 WVDP-186 QM 9, EP-3-024  QM 9, 2-2, WV-538, QP 2-1 WVDP-109

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS		DOE/RW-0333P REQUIREMENTS		IMPLEMENTING WVNSCO PROCEDURES
10	Inspection	10.2.1	Inspection Planning	QM 10; QP 10-1, 10-2, 10-3 WVDP-109, EP-5-002
	10S-1	10.2.2	Selecting Inspection Personnel to Perform Inspections	QM 10
		10.2.2.B	Selecting Inspection Personnel to Perform Inspections	N/A (SEE NOTE 3)
		10.2.3	Inspection Hold Points	QM 10, QP 7-3
		10.2.4	Statistical Sampling	QM 10
		10.2.5	In-Process Inspections and Monitoring	QM 10; QP 10-1, 10-2, 10-3
		10.2.6	Final Inspection	QM 10,
		10.2.7	Accepting Items	QM 10, 14
	2S-1, 2A-1	10.2.8	Inspection Documentation	QM 10, QP 10-1, 10-2, 10-3
		10.2.9	Qualifications of Inspection and Test Personnel	QP 2-1, T-60, QM 2-1, 2-2, EP-11-004
11	Test Control	11.2.1	Test Planning	QM 11; EP-11-001, -11-003
		11.2.2	Performing Tests	QM 11; EP-11-001
	11S-1	11.2.3	Use of Other Testing Documents	QM 11;
		11.2.4	Test Results	QM 11; EP-11-001
		11.2.5	Test Documentation	QM 11; EP-11-001
	2S-1, 2A-1	11.2.6	Qualification of Test Personnel	QM 2-1, 2-2; EP-11-004
12	Control of Measuring and Test Equipment	12.2.1	Calibration	QM 12, WV-109, SOP 41-00
		12.2.2	Documenting the Use of Measuring and Test Equipment	QM 10
	12S-1	12.2.3	Out-of-Calibration Measuring and Test Equipment	QM 12, 15, SOP 41-00
		12.2.4	Handling and Storage	QM 12
		12.2.5	Commercial Devices	QM 12
		12.2.6	Measuring and Test Equipment Documentation	QM 12, SOP 41-00

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING WVNSCO PROCEDURES
13 Handling, and Shipping 13S-1	13.2.1 Controls 13.2.2 Special Equipment, Tools, and Environments 13.2.3 Marking and Labeling	QM 13, WVDP-207 QM 13, WVDP-207 QM 13, WVDP-207
1.4 Inspection, Test and Operating Status	14.2.1 Identifying Items 14.2.2 Indicating Status	QM 14 QM 14
15 Control of Nonconforming Items 15S-1	15.2.1 Documenting and Evaluating Nonconformances 15.2.2 Identifying Nonconforming Items 15.2.3 Segregating Nonconforming Items 15.2.4 Disposition of Nonconforming Items 15.2.5 Trending	QM 15, WVDP-357 QM 15; QP 15-2, WVDP-357 QM 15 QM 15, WVDP-257, WVDP-357 QM 15, 16
16 Corrective Action	16.2.1 Identifying Conditions Adverse to 16.2.2 Classification of Conditions Adverse to Quality 16.2.3 Conditions Adverse to Quality 16.2.4 Significant Conditions Adverse to Quality 16.2.5 Follow-up and Closure Action 16.2.6 Trending	QM 16, WVDP-357 QM 16, WVDP-357 QM 16, WVDP-357 QM 16, QP 15-2, WVDP-357 QM 16, WVDP-357, WV-101 QM 16

SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING WVNSCO PROCEDURES
17 Quality Assurance Records  17S-1	17.2.1.A Classifying Quality Assurance Records (5-7), .B	QM 17, WV-730, WVDP-257, QP 17-1
	17.2.1A Classifying Quality Assurance Records (1-4)	N/A (SEE NOTE 2)
	17.2.2 Creating Valid Quality Assurance Records	QM 17, WVDP-257, WV-730
	17.2.3 Receiving and Indexing Quality	
	17.2.4 Correcting Information in Quality Assurance Records	QM 17, WV-730, RM-2
	17.2.5 Storing and Preserving Quality	QM 17, WV-730, QP 17-1
	17.2.6 Retrieval of Quality Assurance Records	
	17.2.7 Retention of Quality Assurance Records	QM 17, WV-730
	17.2.8 Disposition of Quality Assurance Records	QM 17, WV-730
	17.2.9 Long-Term Storage Facility	QM 17, WV-730
	17.2.10 Temporary Storage Facility	N/A (SEE NOTE 2)
17.2.11 Replacement	QM 17	
		QM 17, 15, 18, WV-730
		QM 17

SECTION II  
MATRIX OF **WVNSCO** IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING <b>WVNSCO</b> PROCEDURES
18 Audits	18.2.1 Scheduling Internal Audits	QM 18, QP 18-1
	18.2.2 Scheduling External Audits	QM 18, 2, QP 18-1, WV-620
18S-1	18.2.3 Audit Schedule	QM 18
	18.2.4 Audit Planning	QM 18, QP 18-1
	18.2.5 Audit Team Independence	QM 18
	18.2.6 Audit Team Selection	QM 18, 2-3, QP 18-1
	18.2.7 Performing Audits	QM 18, QP 18-1
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2A-3	18.2.15 Lead Auditor Education and Experience	QM 2-3
	18.2.16 Lead Auditor Communication Skills	QM 2-3
	18.2.17 Lead Auditor Training	QM 2-3
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	18.2.20 Certification of Lead Auditor Qualifications	QM 2-3
	18.2.21 Maintaining Lead Auditor Proficiency	QM 2-3

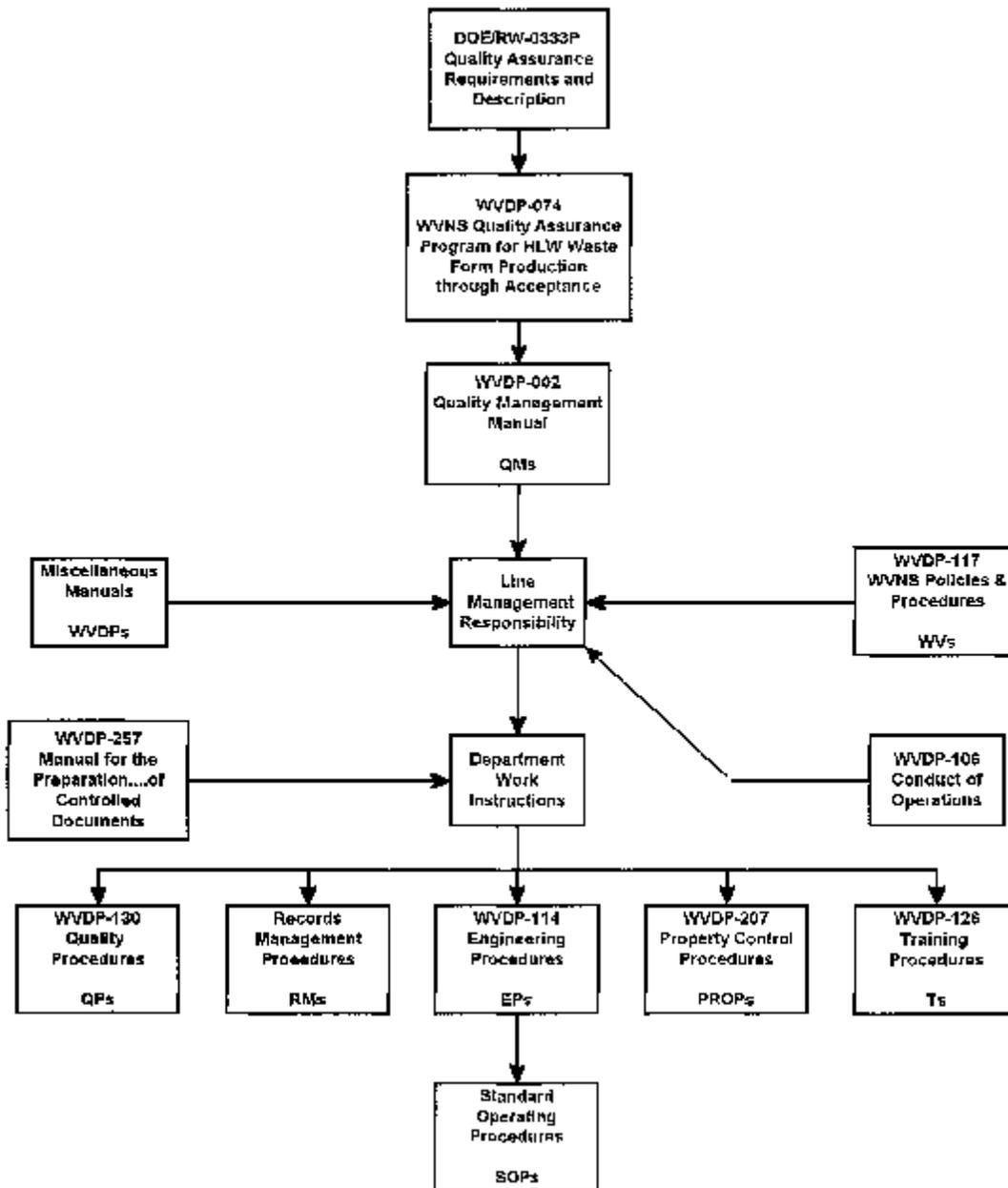


SECTION II  
MATRIX OF WVNSCO IMPLEMENTING PROCEDURES

NQA-1 REQUIREMENTS	DOE/RW-0333P REQUIREMENTS	IMPLEMENTING WVNSCO PROCEDURES
None	SUPPLEMENT III - Scientific Investigation III.1 General III.2.1 Planning Scientific Investigations III.2.2 Performing Scientific Investigations III.2.3 Data Identification III.2.4 Data Validation and Qualification III.2.4D Data Validation and Qualification III.2.5 Data Usage III.2.6 Model Validation	QM 3-4 EP-11-003 EP-11-003, EP-3-007 EP-11-003 EP-11-003 N/A (SEE NOTE 2) EP-11-003 EP-11-003
None	IV.1 General IV.2.1 Field Survey System IV.2.2 Field Survey Documentation	N/A (SEE NOTE 2) N/A (SEE NOTE 2) N/A (SEE NOTE 2)
None	APPENDIX A - High Level Radioactive Waste Form Production A.2.1 Amplification of QARD Section 2 Quality Assurance Program A.2.2 Amplification of QARD Section 3 Design Control	WV-368, QM-3, WVDP-342 QM-9, EP-3-007, WVDP-257, WVDP 185, 186
None	APPENDIX B - Transportation	N/A (SEE NOTE 2)
None	APPENDIX C - Mined Geologic Disposal System	N/A (SEE NOTE 2)

- NOTES:
1. WVNSCO does not delegate work.
  2. These sections are applicable to OCRWM and or the Geologic Repository and are not applicable to waste form producers.
  3. WVNSCO does not have these people report to QA inspectors.

**Figure II-1  
High-Level Waste Quality Assurance Program Documentation Hierarchy**



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**ATTACHMENT 5**

**QUALITY ASSURANCE PLAN**

**FOR**

**PIT DISASSEMBLY AND CONVERSION FACILITY**

**FOR THE**

**DEPARTMENT OF ENERGY - OFFICE OF FISSILE MATERIALS DISPOSITION**

**CONTRACT No.**

**DE-AC02-99CH10903**

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**Approval Sheet/Receipt  
Acknowledgment**

**Project Quality Assurance Plan**

Effective: 11/19/02 Revision 6

Prepared By: Signed by D. C. Lambert 11/18/02  
 Project Quality Assurance Manager Date

Approved By: Signed by D. C. Lambert 11/18/02  
 Manager, Quality Management Date

Approved By: Signed by R. D. Raaz 11/18/02  
 Project Manager Date

Approved By: Signed by D. G. Wellen 11/19/02  
 Vice President – Denver Operations Center Date

One copy of this Approval Sheet/Receipt Acknowledgment Sheet shall be retained with this Manual. The other copy shall be signed, dated and returned to Mr. D. S. Saenz, Project Document Control Center, Washington Group International, Inc., P.O. Box 5888, Denver, CO 80217, to verify that:

- The Manual was received.
- The revision was received, new sheets inserted and obsolete sheets removed and destroyed or marked void.

This Manual is:  Controlled Copy No.  
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Assigned to: \_\_\_\_\_

Location: \_\_\_\_\_

Acknowledgment: \_\_\_\_\_ Date: \_\_\_\_\_

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**SECTION 8 - ..... INTENTIONALLY LEFT BLANK**

**SECTION 9 - ..... INTENTIONALLY LEFT BLANK**

**SECTION 10 - ..... INTENTIONALLY LEFT BLANK**

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**SECTION 12 – ..... INTENTIONALLY LEFT BLANK**

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**Project Policy Statement**

POLICY

The project policy of Washington Group International, Inc. is to provide our customers with products and services of appropriate quality and functional integrity. My commitment as Project Manager is to place quality considerations at the forefront of major business factors in project strategy, planning and priority.

OBJECTIVE

By making this commitment, the project will ensure total conformance of the project products and services in accordance with Washington Group International, Inc. project requirements. Meeting this objective requires the dedication of each person to the elements which concern quality.

IMPLEMENTATION

To provide consistency of quality, all applicable project personnel will adhere to this Project Quality Assurance Plan and Project Procedures which defines the scope of and quality approach to their work. Project supervision is responsible for directly carrying out this policy as it applies to their activities. The Manager, Quality Management is responsible for monitoring the implementation of this policy through the Project Quality Assurance Manager.

Signed by R. D. Raaz  
\_\_\_\_\_  
Project Manager  
Washington Group International, Inc.

11/18/02  
\_\_\_\_\_  
Date

Signed by D. G. Wellen  
\_\_\_\_\_  
Vice President – Denver Operations  
Center  
Washington Group International, Inc.

11/19/02  
\_\_\_\_\_  
Date

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### Revision Summary Sheet

- Revision 1
- Replaced the Effective Sheet List with the Revision Summary Sheet.
  - Sheet MC-1, last sentence, revised Effective Sheet List to Revision Summary Sheet.
  - Section 1 - Sheet 1-1, Par. 1.1.2, revised OFMD to FMDP; Sheet 1-3, Revised Par. 1.5.1; Sheet 1-4, deleted Par. 1.5.2.
  - Section 2 - Sheet 2-2, Par. 2.2.6, added (PQAM); Sheet 2-3, Par. 2.2.10, third sentence, changed "They" to "Facilities Design Group".
  - Section 3 - Sheet 3-3, Par. 3.3.4.A, deleted last sentence; Sheet 3-4, added new paragraph 3.3.6 to address configuration management; Sheet 3-6, Added new paragraph 3.3.10 to address procured hardware; revised paragraph numbering for 3.3.6, 3.3.7, 3.3.8, 3.3.9 and 3.3.10 accordingly.
  - Sheet 5-1, revised Par. 5.3.1.A.
  - Sheet 6-1, revised Par. 6.2.2 to clarify the PQAM responsibilities.
  - Sheet 7-1, revised Par. 7.2.2 to clarify that the PQAM does not maintain a list of suppliers.
  - Section 11 - Sheet 11-1, Par. 11.2.2., changed Denver Manager of Engineering to Project Engineering Managers; Para. 11.2.3, changed to reference Section 3.
  - Section 15 - Sheet 15-1, Par. 15.2.2, revised to indicate that all project personnel are responsible for identifying and documenting nonconformances; Sheet 15-2, Par. 15.3.9, added "Section 3".
  - Section 17 - Sheet 17-2, Para. 17.3.6, revised Raytheon Inc. to RE&C.
  - Section 18 - Sheet 18-2, Par. 18.3.2, revised "he" to "they"; Par. 18.3.4 and 18.3.5, included surveillance activities; Par. 18.3.5, 18.3.6 and 18.3.7, revised Project Manager to responsible Manager; Sheet 18-3, deleted Par. 18.3.10, requirement is addressed in Par. 18.3.4.
  - Appendix B, Sheet B-1 –
    - Criterion 1 – Changed DN-PG-100 to PDCF-PG-100;
    - Criterion 2 – Changed PDCF-PQ-006 to PDCF-PQ-111;
    - Criterion 3 – Changed PDCF-PQ-001, 002 and 003 to PDCF-PQ-101, 102 and 103 respectively;
    - Criterion 4 – Revised DN-PG-101 thru 105 to DN-PG-101, 103 thru 105 and changed DN-PG-102 to PDCF-PG-102;
    - Criterion 6 – Changed DN-PE-106 to PDCF-PE-106, DN-PE-108 to PDCF-PE-108, DN-PE-112 to PDCF-PE-112, DN-PE-116 to PDCF-PE-116, DN-PE-117 to PDCF-PE-117 and PDCF-PQ-004 to PDCF-PQ-106; added PDCF-PE-357
    - Criterion 7 – Added procedure PDCF-PQ-001; Changed PDCF-PQ-005 to PDCF-PQ-110; changed PDCF-PQ-007 to PDCF-PQ-112;
  - Appendix C, Sheets C-1 and C-2 –
    - Revised procedure numbering; added new procedures PDCF-PE-006, Radiological Design Review and PDCF-PE-007, Worker Safety and Health Design Review and PDCF-PQ-001, Evaluation of Nuclear Suppliers; deleted PDCF-PE-008 and 009.
- Revision 2
- Section 3, Sheet 3-3, Par. 3.3.4 – Fourth paragraph – Added graded approach;
  - Section 7, Sheet 7-2, Par. 7.3.7 – Added graded approach.
  - Appendix B – Revised Implementing Documents as a result of changes to Appendix C;
  - Appendix C – Revised Project Procedures Listing as a result of adding, deleting and redesignating procedures.
- Revision 3
- Changed all pages to Washington Group International, Inc. logo and revised all references to Raytheon and RE&C to Washington Group International, Inc. Revised titles.

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### Revision Summary Sheet

- Revision 3 - Section 1, Sheet 1-1, Par. 1.1.2 – Revised date of 10 CFR 830.120 to February 9, 2001; 4, Par. 1.6.1 – Added “stage” to 1.6.1.C; Revised item 1.6.1.F to G and 1.6.1.F. added new item
- Revision 4 - Section 2, Sheet 2-1, Par. 2.2.1 – Added Deputy Project Manager; Par. 2.2.2 – Added Systems Engineering Manager; Par. 2.2.11 – Deleted Executive Steering Committee; Figure 1 – Added PEM after System Engineering Manager; revised Company title for Operations Engineering Oversight.
- Section 4, Par. 4.3.2.D – Added requirements for graded approach.
- Section 15, Par. 15.2.3 – Added Price-Anderson Amendment Act.
- Appendix B and C – Revised as a result of adding, deleting and re-designating procedures.
- Revision 4 - Approval Sheet/Receipt Acknowledgment Sheet – Added Vice President – Denver Operations Center approval.
- Sheet TC-2 – Added Sections 8, 9,10, 12, 13, and 14 and noted that these sections have been intentionally left blank.
- Sheet RSS-2 – For Sheet 1-4, Par. 1.6.1, changed “cycle” to “stage”.
- Sheet PPS-1; Sheet 2-1, Par. 2.2.3; Sheet 2-3, Par. 2.3.2 – Changed title from President – Energy & Environmental Projects to Vice President – Denver Operations Center
- Sheet 7-1, Par. 7.1.2 – Revised to indicate the present team members of the Project.
- Revision 5 - Sheet 2-2, Par. 2.2.6, 3rd sentence, changed “as required” to “as specified in project procedures”; Sheet 3-3, Par. 3.3.4, Added sentence at end of fourth paragraph to address graded approach; Sheet 3-5, Added new Par. 3.3.7 to include Integrated Safety Management System; Renumbered Pars. 3.3.7, 3.3.8, 3.3.9, 3.3.10, and 3.3.11 to Pars. 3.3.8, 3.3.9, 3.3.10, 3.3.11, and 3.3.12; Deleted DN-PM-111 and PDCF-PE-005 from Appendix B and C; Added PDCF-PE-012, Graded Approach to Appendix B and C. Appendix B & C – Deleted DN-PE-109 which has been changed to PDCF-PE-109; Deleted CSD-0362 and changed it to PDCF-PE-119.
- Revision 6 - Sheet 1-1, Par. 1.1.2, added Subpart A to 10 CFR 830.120; Sheet 2-2, Par. 2.2.4, deleted reference to DOE Order 2250.1C; Sheet 3-3, Par. 3.3.4, 4th paragraph, added “...,or programmatic mission, ...” after safety in first sentence; Sheet 3-6, Par. 3.3.9.D , added Item 5, “the programmatic mission of the facility”; Sheet 16-1, Par. 16.1.1, deleted “...that require corrective action.”; Sheet 18-1, Par 18.2.1, added sentence to require that the PQAM coordinate scheduling of surveillance with management to ensure all activities that could affect project objectives are assessed; Sheet 18-2, Par. 18.3.7, deleted “for significant conditions adverse to quality” in second sentence; Appendix A, Sheet A-5, Surveillance definition, added sentence to address that surveillances include management processes.

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### Manual Control

The Project Quality Assurance Plan (PQAP) is for the use of Washington Group International, Inc., its clients and regulatory agencies. Controlled and uncontrolled copies remain the property of Washington Group International, Inc. The Project Document Control Center (PDCC) shall maintain a record of the recipients of the Plan. All recipients agree to return the PQAP to Washington Group International, Inc. upon request.

For the Pit Disassembly and Conversion Facility Project, the PQAP will be maintained on the project server for use by Project personnel. The PQAP will be "write protected" and any printed copies will indicate, "This printed copy is Uncontrolled".

When required controlled copies of the PQAP will be issued to Washington Group International, Inc. and appropriate sub-contractor personnel involved in the supervision of work performed to the requirements of this Plan. Distribution shall include two (2) copies of the Approval Sheet/Receipt Acknowledgment Sheet, one to be retained with the Plan and the other to be signed, dated and returned to Washington Group International, Inc. PDCC. The return of the Approval Sheet/Receipt Acknowledgment Sheet will acknowledge that the Plan was received or that revised sheets were inserted and all specified obsolete sheets were removed from the Plan and destroyed or marked "Void" or "Superseded". The PDCC shall maintain a file of plan revisions, distribution log and a file of properly executed Approval Sheet/Receipt Acknowledgments. When a copy of the Approval Sheet/ Receipt Acknowledgment Sheet is not returned as required, a recall notice shall be sent to recall that copy of the Plan or to place it on uncontrolled status.

In certain cases, Washington Group International, Inc. will issue uncontrolled copies of the PQAP to persons outside of the company for informational purposes only. These copies will be up-to-date at the time of issuance, but will not be updated thereafter. The Approval Sheet/Receipt Acknowledgment will be marked "Uncontrolled - For Information Only."

From time to time it may be necessary to prepare revisions to this Plan. When revisions are prepared, the revision shall be noted by a vertical line in the right hand margin. If later another revision is required to the same sheet, the line indicating the previous revision shall be removed. Revisions shall be distributed with a new Approval Sheet/Receipt Acknowledgment and an updated Revision Summary Sheet.

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## Section 1 The Quality Program

### SECTION 1 - THE QUALITY PROGRAM

#### 1.1 Scope

- 1.1.1 The outline of the Washington Group International, Inc. Quality Program (referred to hereinafter as The Program) is described in this Project Quality Assurance Plan. The scope of Washington Group International, Inc. activities, as covered by this Program, includes design and procurement of subcontracted services to support design.
- 1.1.2 The purposes of The Program are A) to provide requisite controls on all work falling within its scope such that all safety, quality, performance and reliability requirements are met for applicable components, structures and systems, and B) to meet the requirements of the client, regulatory agencies and industry standards (Department of Energy - FMDP Quality Assurance Requirements Document, Rev. 0, dated January 1999; 10 CFR 830.120, Subpart A, February 10, 2001; and ASME NQA-1-1997). In order to meet these objectives special skills or processes will be utilized as necessary.
- 1.1.3 The scope of items and services as covered by this program includes those "selected" quality items and services identified by the Project.

#### 1.2 Program Description and General Requirements

- 1.2.1 The Program is composed of this Project Quality Assurance Plan (PQAP) and various project policies, manuals, procedures and instructions which implement the requirements of The Program as stated in this PQAP. The various project policies, manuals, procedures and instructions shall be reviewed by the Project Manager and Project Quality Assurance Manager.
- 1.2.2 The preparation of the Cost Estimate for this project included the overall Washington Group International, Inc. Scope of Work, including the planning of the required activities and deliverables, the specified schedule for the work, and the required resources to meet the cost and schedule project objectives. Project performance reviews will be performed to assess and verify that these project objectives are achieved.
- 1.2.3 When this PQAP stipulates that provisions be made to meet a specific requirement of The Program, it is necessary that such provisions be documented in a project manual, procedure, instruction, specification or procurement document.
- 1.2.4 Provisions of the Program within the scope of their applicability shall be imposed on all Vendors at all appropriate subtiers of purchasing.

#### 1.3 Project Quality Assurance Plan

- 1.3.1 The Plan consists of twelve sections and appendices. Seven of the twelve sections contained herein deal directly with the prevention of defects and errors. The other five sections deal with the correction of defects, administration and determination of program effectiveness. The appendices deal with project specific requirements. The twelve sections of this PQAP are grouped as follows:

##### A. Administration

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## Section 1 The Quality Program

Section 1 - Overall program description, references and general requirements.

Section 2 – Washington Group International, Inc. Project Organization for quality, and quality program responsibilities.

### B. Provisions for Defect Prevention

#### 1. Program - Wide Controls

Section 5 - General Program criteria for documented procedures, instructions, specifications and drawings.

Section 6 - Controls relating to the issuance and status of Program related documents.

Section 17 - Administration of records.

#### 2. Design Phase Controls

Section 3 - The development of design inputs, the design process, and the preparation of design outputs and design validation and verification.

Section 4 - The technical and quality content of procurement documents.

Section 11 - The verification and validation of computer software

#### 3. Controls Applicable to Procurement Services

Section 7 – The procurement process, including Supplier evaluation and selection, and verification of conformance of purchased items with procurement specifications.

### C. Determination of Program Effectiveness

Section 18 - Requirements for, and applicable to, Quality Surveillance and audits.

### D. Correction of Defects

Section 15 - Control and administration of nonconformances.

Section 16 - Initiation and follow-up corrective action.

1.3.2 Except for Sections 1 and 2, the basic format of each section is as follows:

XX.1 Scope - A brief introduction to the scope of the activities covered by the section with definitions if required, and where appropriate, the relationship of the section to others, where applicable.

XX.2 Responsibilities - Identification of the organizational positions responsible for implementation of the requirements given in the section.

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## Section 1 The Quality Program

XX.3 Program Requirements - Specific requirements which are to be implemented on the Project and are applicable to all items on the project.

1.3.3 The PQAP is prepared by the Project Quality Assurance Manager and reviewed and approved by the Project Manager and the Manager, Quality Management. The PQAP shall be presented to the Client for approval.

1.3.4 When required, Washington Group International, Inc. will prepare a revision to the PQAP which modifies The Program to meet any changes in Client requirements. The revisions shall be prepared by the Project Quality Assurance Manager, reviewed and approved by the Project Manager and the Manager, Quality Management. Revisions shall be presented to the Client for approval.

1.3.5 The PQAP and its revisions are distributed and controlled by the Project Quality Assurance Manager.

### 1.4 Indoctrination and Training

1.4.1 Personnel performing activities within the scope of this Program shall receive indoctrination and training in The Program, to the extent necessary, to perform their assigned tasks.

1.4.2 The Project Manager, the Project Engineering Manager, and supervisors are responsible for assuring that personnel under their direction are qualified and, as applicable, certified to perform their assigned tasks. Where certification of personnel is required by this PQAP, the certification process shall be accomplished in accordance with written procedures. Records of personnel qualification and certification shall contain all required information to establish the basis for certification. Personnel Indoctrination and Training records shall be maintained as part of the Project Document Control Records System.

1.4.3 The Project Manager, the Project Engineering Manager and supervisors will annually assess project personnel performance and continuing personnel development needs to ensure on-going personnel proficiency. Identified personnel development needs will be addressed thru project specific indoctrination and training and/or the Washington Group International, Inc. Educational Assistance Program.

### 1.5 Management Review of the Program Implementation

1.5.1 The Project Manager shall periodically assess the performance of the organization and its function to determine how well it meets customer requirements and expectations, and mission objectives, so that improvements can be made. This assessment should address the use of human and material resources to achieve the organization's goals and objectives. The management assessment should also include an introspective evaluation to determine if an integrated management program exists and if it focuses on meeting both customer requirements and strategic goals.

### 1.6 Graded Approach

1.6.1 The Quality Assurance Program for the project shall provide control over activities affecting quality to an extent consistent with their importance. The project shall utilize a graded approach in the application of the Quality Program. The Graded Approach is a process by which the level of analysis, documentation, and actions necessary to comply with a requirement is commensurate with:

A. The relative importance to safety, safeguards, and security;

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## Section 1 The Quality Program

- B. The magnitude of any hazard involved;
- C. The life cycle stage of a facility;
- D. The programmatic mission of a facility;
- E. The particular characteristics of a facility;
- F. The relative importance of radiological and nonradiological hazards; and
- G. Any other relevant factor.

The basis of the graded approach used shall be documented and submitted to DOE. The graded approach shall not be used in implementing the unreviewed safety question (USQ) process or in implementing technical safety requirements.

### 1.7 Quality Improvement

- 1.7.1 The project shall establish and implement processes to detect and prevent quality problems and to ensure quality improvement.
- 1.7.2 Early detection and prevention of quality problems is addressed in Sections 15, 16, and 18 of this plan. Procedures are in place to identify and resolve nonconformances, achieve corrective action, and help prevent recurrence.
- 1.7.3 Quality performance, process and procedure implementation, technical performance, cost and schedule performance, and other information shall be reviewed and the data analyzed to identify areas and processes needing improvement.
- 1.7.4 Quality improvement shall be an ongoing endeavor of the project. Continuous improvement is achieved by the following activities, which are addressed in project procedures:
  - A. Prompt incorporation of changes to the project Quality program and procedures.
  - B. Implementation of the QA Training Program for project individuals who perform quality affecting activities, including indoctrination in program changes.
  - C. Open lines of communication for all project employees, including access to project Management to make suggestions.
  - D. Periodic comprehensive review of the project quality program and procedures.
  - E. Management review of the quality program implementation.
  - F. Independent assessments of the project through the conduct of comprehensive audit and surveillance programs. The audit and surveillances cover the principal aspects of the QA program, and serve to identify quality issues before they become quality problems.

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## Section 1 The Quality Program

- G. Assignment of specific responsibilities for the implementation of the project quality program to each individual at project, and empowering the individuals to perform their assigned work.
- H. Implementation of the checks and balances system in design control (interdiscipline review, design verification, software quality assurance) which assure the technical accuracy of project work products.
- I. Analysis of quality trends to identify and correct adverse quality trends, and promote positive trends.
- J. Application of strict cost and schedule controls and performance measures at the Task Order level.

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## Section 2 Organization

### SECTION 2 - ORGANIZATION

#### 2.1 Scope

This section describes the Washington Group International, Inc. project organization and establishes general responsibilities as they relate to the Program.

- 2.1.1 Specific responsibilities for various elements of the Program are indicated in the applicable sections of this PQAP and in implementing procedures.
- 2.1.2 Figure 1 in this section depicts organizational relationships.
- 2.1.3 The responsibilities indicated herein pertain to the individual in the stated position. Unless specifically indicated to the contrary, the authority associated with each position may be delegated; such delegation shall be via written notices. Delegation of authority does not relieve the individual of the responsibility for actions taken by the delegate.

#### 2.2 Responsibility and Authority

##### 2.2.1 Project Manager/Deputy Project Manager

The Project Manager/Deputy Project Manager reports to the Vice President – Denver Operations Center, and is responsible for initiating the staffing of key personnel on the project and directs the planning and work execution for administration, engineering and procurement. He is the primary contact with the Client’s project management. He is responsible for the establishment and implementation of the Project Quality Assurance Plan.

##### 2.2.2 Project Engineering Manager (Facility Design Manager/Systems Engineering Manager/Fissile Materials Engineering Manager)

The Project Engineering Manager reports to the Project Manager and is responsible for ensuring that all engineering work is conducted in a manner that will meet the requirements and schedule of the project. For the PDCF project the Facility Design Manager, the Fissile Materials Engineering Manager and the Systems Engineering Manager are designated to be the Project Engineering Managers as defined herein.

##### 2.2.3 Lead Discipline Engineers

The Lead Discipline Engineers report to the Facility Design Manager/Fissile Materials Manger and are responsible for managing the work and establishing manpower requirements for their disciplines on the project. They will review the scope of work, develop schedule logic, establish work priorities, identify scope changes and review work products for compliance to established project formats and procedures. They are also responsible for reviewing work products for compliance to the facility design bases and engineering codes and standards, and ensuring that technical review and checking of drawings and calculations are performed as required for their areas.

##### 2.2.4 Project Controls Manager

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The Project Controls Manager (PCM) reports to the Project Manager and is responsible for managing and directing all of the financial, cost, schedule, and estimating activities on the project, as well as administration and clerical activities and staff. The project controls team will prepare and maintain an integrated cost and schedule reporting system (IPCS). The PCM will prepare and maintain budgets and schedules for the engineering and design work and will establish and maintain a cost and schedule trend identification reporting system. The PCM will provide cost and schedule status reports for the Project Manager, including reports on expenditures and deviations from project expenditures. The PCM will establish and maintain a project records system and will supervise the administrative and clerical support staff on the project. The PCM will also prepare a project automation plan and will be responsible for providing all electronic systems required by the project team.

### 2.2.5 Subcontracts Manager

The Subcontracts Manager reports to the Project Manager and has overall responsibility for project procurement activities.

### 2.2.6 Project Quality Assurance Manager

The Project Quality Assurance Manager (PQAM) reports administratively to the Project Manager and functionally to the Manager, Quality Management is responsible for reviewing engineering and procurement documents to ensure project procedures are followed and technical information concerning welding, nondestructive examination, inspection and testing is complete and accurate. He will assist engineering, as specified in project procedures, in developing specifications and will review project documents to ensure all drawing, project specification and data requirements have been met. He is responsible for scheduling and the performance of all surveillance and audits associated with the project.

### 2.2.7 Contracts Manager

The Contract Manager reports to the Project Manager and has responsibility for review and approval of all contractual matters pertaining to the Washington Group International, Inc. prime contract with the U. S. Department of Energy.

### 2.2.8 Fissile Materials Engineering Manager

The Fissile Materials Engineering Manager reports to the Project Manager and is responsible for the proper execution of the Security & Safeguards, ES&H, and plutonium process and handling aspects of the project. The Fissile Materials Engineering Manager will fully develop the preliminary design of the pit disassembly and conversion process (in conjunction with LANL and LLNL), coordinate the determination of robotic/automated equipment applications, design the Material Control & Accountability and Security & Safeguards systems (classified portion) and provide requirements and interface information to the facility design and systems engineering groups (for the non-classified portion), conduct the Environmental, Safety & Health program and prepare licensing documentation.

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### 2.2.9 Systems Engineering Manager

The Systems Engineering Manager reports to the Project Manager and is responsible for managing the Systems Engineering Process which is responsible for preparation and maintenance of the project requirements and interface documents, preparation and implementation of the Risk Management Plan and Configuration/Change Management Plan, coordination of the studies and evaluations performed early in the Title 1 Design, performance of the Reliability, Availability, Maintainability, and Human Factors analyses and conduct of independent peer reviews for Criticality, Vulnerability, DOE and Regulatory/Code Compliance.

### 2.2.10 Facility Design Manager

The Facility Design Manager reports to the Project Manager and is responsible for the engineering and design of all systems, structures, and components for the PDCF and its supporting infrastructure. The Facilities Design Group produces all non-classified drawings, specifications, and analyses required to procure and construct the PDCF. The Facilities Design Group is also responsible for the complete engineering and design of the overall facility and structure, support and utility systems, ventilation systems, bulk material handling systems, waste management systems, control systems and support infrastructure systems, all in accordance with project requirements and interface documents. The Facilities Design Group produces all non-classified CADD design services and maintains the master plant arrangement and interface drawings current for use in the classified design activities.

## 2.3 Responsibilities and Authorities

- 2.3.1 The Project Quality Assurance Manager has the organizational freedom and authority to identify problems; initiate, recommend or provide solutions to quality problems; verify implementation of solutions; assure that further processing, delivery, installation or use is controlled until proper disposition of nonconformance or unsatisfactory condition has occurred.
- 2.3.2 Differences arising between the Quality Management Group and other functional groups are normally resolved at the working level. However, when a resolution cannot be found, differences may be taken to the next higher level of management (up to the Vice President – Denver Operations Center).
- 2.3.3 The responsibilities indicated herein pertain to the individual in the stated position. Unless specifically indicated to the contrary, the authority associated with each position may be delegated; such delegation shall be via approved implementing procedures or written notices. Delegation of authority does not relieve the individual of the responsibility for actions taken by the delegate.

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## Section 2 Organization

### 2.4 Interface Control

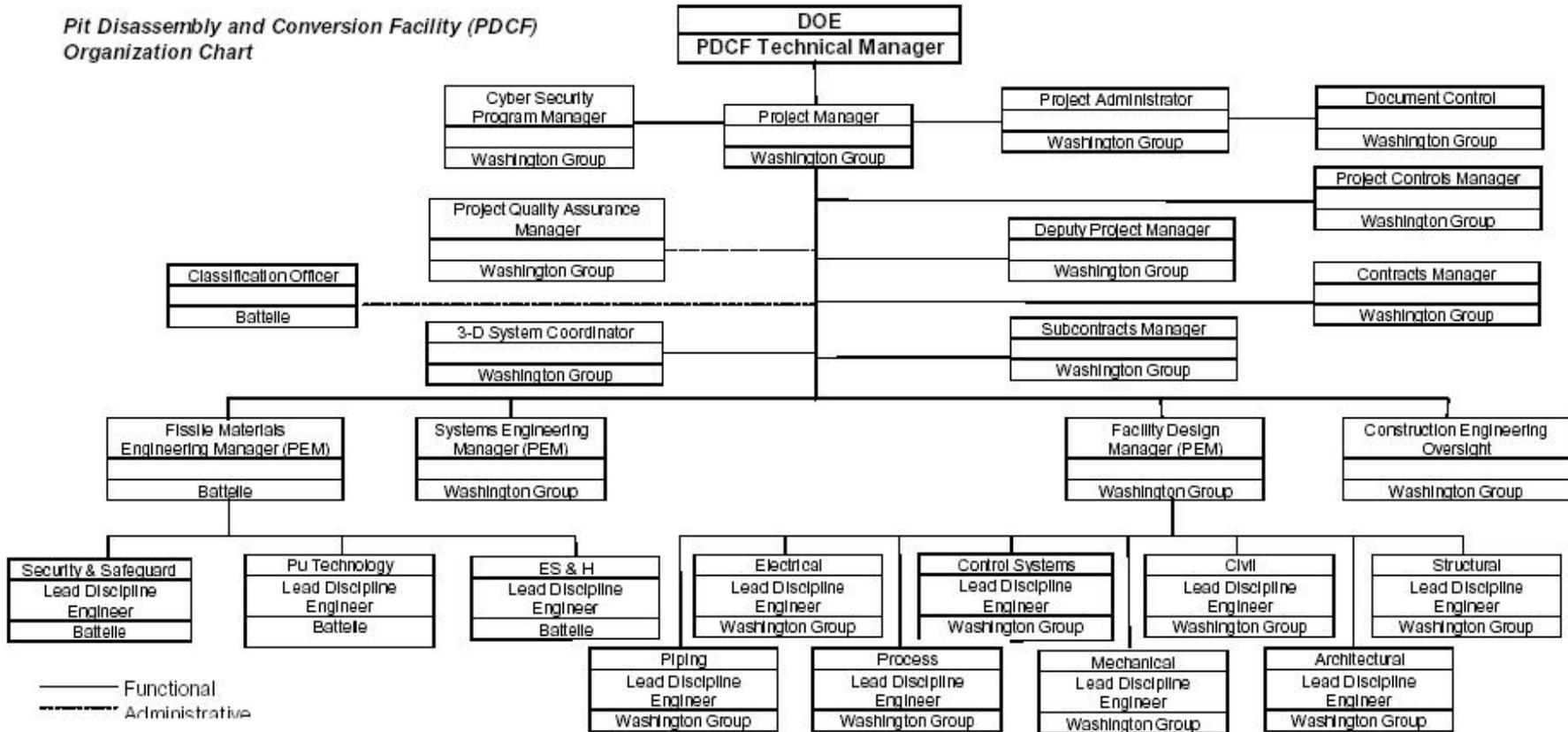
- 2.4.1 The project will establish internal interfaces for conducting work. The interfaces and lines of responsibility/authority and accountability shall be as shown in the project organization charts. Project Procedures outline the details of internal interfaces.
- 2.4.2 The project shall establish external interfaces with the Client, suppliers, and others. The interfaces will be described and conducted in accordance with Project Procedures which shall outline the details of interfaces with external organization.
- 2.4.3 Formal and informal lines of communications between the project and the Client, and between the project and other organizations shall be established. The lines of communication shall be described in appropriate procedures.



Section 2  
Organization

Figure 1

Pit Disassembly and Conversion Facility (PDCF)  
Organization Chart



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### Section 3 Design Control

#### SECTION 3 - DESIGN CONTROL

##### 3.1 Scope

3.1.1 This section establishes control measures necessary to assure that applicable design requirements including design bases, statutory or regulatory requirements, and applicable industry codes and standards and changes thereto are correctly translated into design documents and that the design is defined, controlled and verified.

3.1.2 Requirements of Section 6 concerning control of documentation are applicable to design documents.

##### 3.2 Responsibilities

3.2.1 The Project Engineering Manager is responsible for the implementation of design controls on a project.

3.2.2 Project engineering personnel are responsible for adhering to the requirements of this section and the implementing procedures which amplify the requirements of this section.

3.2.3 The Project Quality Assurance Manager is responsible for reviewing design documents prepared for selected quality items and services, for inclusion of appropriate quality standards and requirements.

##### 3.3 Program Requirements

3.3.1 Design inputs may be generated by Washington Group International, Inc. or obtained from the Client. Design inputs shall be identified and documented by the applicable Lead Discipline Engineer. The selection of design inputs shall be reviewed and approved by the Systems Engineering Manager or the Project Engineering Manager on a timely basis. Changes from approved design inputs, including the reason for the changes, shall be documented, approved and controlled in the same manner as the original design input. The translation of design inputs and design basis and assumptions into the design shall be clearly established by the design documentation. The design input shall be specified to the level of detail necessary to permit the design activities to be carried out in a correct manner and to provide a consistent basis for making design decisions, accomplishing design verification measures, and evaluating design changes.

3.3.2 The design process shall:

A. Prescribe and document the design activities to the level of detail necessary to permit the design process to be carried out in a correct manner, and to permit verification that the design meets requirements. Design documents shall support facility design, construction and operation.

B. Assure that the design methods, materials, parts, equipment, and processes that are essential to the function of the items are selected and reviewed for suitability of application.

Applicable information derived from experience, as set forth in reports or other documents, shall be made available to cognizant design personnel.

C. Assure that the final design:

1. be traceable to the design input by documentation in sufficient detail to permit design verification;

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2. specify required inspections and test and include or reference appropriate acceptance criteria; and
3. identify assemblies and/or components that are part of the item being designed. When such an assembly or component part is a commercial grade item, the characteristics of the item to be verified for acceptance and the acceptance criteria for those characteristics shall be documented.

Characteristics to be verified are those which provide reasonable assurance that the item will perform its intended function. If a commercial grade item, prior to its installation, is modified or selected by special inspection and/or testing to requirements that are more restrictive than the Supplier's published product description, the component part shall be represented as different from the commercial grade item in a manner traceable to a documented definition of the difference.

- 3.3.3 Design analyses shall be sufficiently detailed such that a person technically qualified in the subject can review and understand the analyses and verify the adequacy of the results without recourse to the originator.

Documentation of design analyses shall include A thru E below:

- A. the objective of the analyses;
- B. design inputs and their sources;
- C. results of literature searches or other applicable background data;
- D. assumptions and indication of those assumptions that must be verified as the design proceeds;
- E. Identification of any computer calculation, including identification of the computer type, computer program name, and revision, inputs, outputs, evidence of or reference to computer program verification, and the bases (or reference thereto) supporting application of the computer program to the specific physical problem.

Computer program acceptability shall be preverified or the results verified with the design analysis for each application. Preverified computer programs shall be controlled.

- A. The computer program shall be verified to show that it produces correct solutions for the encoded mathematical model within defined limits for each parameter employed.
- B. The encoded mathematical model shall be shown to produce a valid solution to the physical problem associated with the particular application.

- 3.3.4 The particular design verification method(s) used shall be identified and documented. The results of design verification shall be documented with the identification of the verifier clearly indicated. Design verification shall be performed by any competent individual(s) or group(s) other than those who performed and/or directly supervised the original design but who may be from the same organization.

Design verification shall be performed prior to releasing the design for procurement, manufacture, construction, or use by another design organization except where this timing cannot be met, such as when

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insufficient data exist. In those cases, the unverified portion of the design shall be identified and controlled. In all cases the design verification shall be completed prior to relying upon the component, system, structure, or computer program to perform its function.

If the design is modified to resolve verification findings, the modified design shall be verified prior to release for use.

The extent of the design verification shall be a function of importance to safety or programmatic mission, the complexity of the design, the degree of standardization, the state of the art, and the similarity with previously proved designs. The project shall use a graded approach. The graded approach is a process by which the level of analysis, documentation, and actions necessary to comply with a requirement is commensurate with the relative importance to safety, safeguards, and security; the magnitude of any hazard involved; the life cycle of a facility; the programmatic mission of a facility; the particular characteristics of a facility; and any other relevant factor. The basis of the graded approach used shall be documented and submitted to DOE. The graded approach shall not be used in implementing the unreviewed safety question (USQ) process or in implementing technical safety requirements. Procedures shall be established for implementing the graded approach on the project.

Where the design has been subjected to a verification process, the verification process need not be duplicated for identical designs. However, the applicability of standardized or previously proven designs, with respect to meeting pertinent design inputs, shall be verified for each application. Known problems affecting the standard or previously proved designs and their effects on other features shall be considered. The original design and associated verification documentation shall be referenced in records of subsequent application of the design.

Acceptable verification methods include, but are not limited to, any one or a combination of the following: design reviews, alternate calculations and qualification testing.

- A. Design Reviews. Design reviews shall provide assurance that the final design is correct and satisfactory by addressing, where applicable, 1) through 7) below.
  - 1. Were the design inputs correctly selected?
  - 2. Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?
  - 3. Were appropriate design methods and computer programs used?
  - 4. Were the design inputs correctly incorporated into the design?
  - 5. Is the design output reasonable compared to design inputs?
  - 6. Are the necessary design inputs for interfacing organizations specified in the design documents or in supporting procedures or instructions?
  - 7. Have suitable materials, parts, processes, and inspection and testing criteria been specified.

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- B. Alternate Calculations. Alternate calculations shall use alternate methods to verify correctness of the original calculations or analyses. The appropriateness of assumptions; input data used; and the computer program, its associated computer hardware and system software, or other calculation method used shall also be verified.
- C. Qualification Tests. Testing shall demonstrate adequacy of performance under conditions that simulate the most adverse design conditions. Where the test is intended to verify only specific design features, the other features of the design shall be verified by other means. When tests are being performed on models or mockups, scaling laws shall be established and verified. The results of model test work shall be subject to error analysis, where applicable, prior to use in the final design.

3.3.5 Changes to design inputs, final designs, field changes, and temporary and permanent modifications to operating facilities shall be justified and subject to design control measures commensurate with those applied to the original design. These measures shall include evaluation of effects of those changes on the overall design and on any analyses upon which the design is based. The evaluation shall include facility configurations that occur during operation, maintenance, test, surveillance, and inspection activities. The design organization approving the change shall have demonstrated competence in the specific design area of interest and have an adequate understanding of the requirements and intent of the original design.

When a design change is approved other than by revision to the affected design documents, measures shall be established to incorporate the change into these documents, where such incorporation is appropriate.

Where a significant design change is necessary because of an incorrect design, the design Process and verification procedure shall be reviewed and modified as necessary.

3.3.6 Procedures implementing configuration management requirements shall be established and documented. These procedures shall include the responsibilities and authority of the organizations whose functions affect the configuration of the facility during design and procurement.

- A. Configuration management requirements shall include measures to ensure changes that may affect the approved configuration are recognized and processed.
- B. The configuration shall be established and approved as part of the final Title II design.
- C. The configuration shall include, as applicable, characteristics derived from regulatory requirements and commitments, calculations and analyses, design inputs, installation and test requirements, supplier manuals and instructions, operating and maintenance requirements, and other applicable sources.
- D. Interface controls shall include the integration of activities of organizations that can affect the approved configuration.
- E. Documentation shall identify the design bases and the approved configuration for the approved modes of operation.
- F. Measures shall be established and implemented to assure that proposed changes to the configuration are evaluated for their conformance to the design bases.
- G. The implementation sequence for approved configuration changes shall be reviewed to determine that the configuration conforms to the design bases.

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- H. Approval by the design authority shall be required prior to implementation of a change to the design bases.
  - I. The configuration of the facility shall be documented in drawings, specifications, procedures, and other documents which reflect the operational status of the facility. The process utilized to control the current revision and issuance of these documents shall take into account the use of the document and the need for revision in support of operation.
- 3.3.7 Procedures shall be established for an Integrated Safety Management System (ISMS). The system will ensure that the project systems and engineering function effectively integrate Environmental, Safety & Health (ES&H) and nuclear safety requirements into the design.
- 3.3.8 Design information transmitted across interfaces shall identify the status of the design information or document provided and identify incomplete items which require further evaluation, review, or approval. Where it is necessary to initially transmit design information orally or by other informal means, the transmittal shall be confirmed promptly by a controlled document.
- 3.3.9 The software designed by the project shall be documented, approved by the Project Engineering Manager, and controlled. This process shall include the activities described in the following subparagraphs.
- A. **Identification of Software Design Requirements.** Software design requirements shall be identified and documented and their selection reviewed and approved. The software requirements shall identify the operating system, function, interfaces, performance requirements, installation considerations, design inputs, and any design constraints of the computer program.
  - B. **Software Design.** The software design shall be documented and shall define the computational sequence necessary to meet the software requirements. The documentation shall include, as applicable, numerical methods, mathematical models, physical models, control flow, control logic data flow, process flow, data structures, process structures, and the applicable relationships between data structures and process structures.. The documentation may be combined with the documentation of the software design requirements, or the computer program listings resulting from implementation of the software design.
  - C. **Implementation of the Software Design.** The software design shall be translated into computer program(s) using programming standards and conventions.
  - D. **Software Design Verification.** Software design verification shall be performed by competent individual(s) or group(s) other than those who developed and documented the original design, but who may be from the same organization. The results of verification shall be documented with the identification of the verifier indicated. Software verification methods shall include any one or a combination of design reviews, alternate calculations, and tests performed during computer program development. The extent of verification and the methods chosen are a function of:
    - 1. the complexity of the software;
    - 2. the degree of standardization;

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### Section 3 Design Control

3. the similarity with previously proved software; and
4. the importance to safety;
5. the programmatic mission of the facility.

E. **Computer Program Testing.** Computer program testing shall be performed and shall be in accordance with Section 11.

3.3.10 Software configuration management includes, but is not limited to, configuration identification, change control, and status control. Configuration items shall be maintained under configuration management until the software is retired.

A. **Configuration Identification.** A software baseline shall be established at the completion of each activity of the software design process. Approved changes created subsequent to a baseline shall be added to the baseline. A baseline shall define the most recently approved software configuration.

A labeling system for configuration items shall be implemented that:

1. uniquely identifies each configuration item;
2. identifies changes to configuration items by revision; and
3. provides the ability to uniquely identify each configuration of the revised software available for use.

B. **Configuration Change Control.** Changes to software shall be formally documented. The documentation shall include:

1. a description of the change;
2. the rationale for the change; and
3. the identification of affected software baselines

The change shall be formally evaluated and approved by the organization responsible for the original design, unless an alternate organization has been given the authority to approve the changes. Only authorized changes shall be made to software baselines. Appropriate verification activities shall be performed for the change. The change shall be appropriately reflected in documentation and traceability of the change to software design requirement shall be maintained. Appropriate acceptance testing shall be performed for the change.

C. **Configuration Status Control.** The status of configuration items resulting from software design shall be maintained current. Configuration item changes shall be controlled until they are incorporated into the approved product baseline. The control shall include a process for maintaining the status of changes which are proposed and approved, but not implemented. The controls shall also provide for notification of this information to affected organizations.

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3.3.11 Existing software and procured or otherwise acquired software that has not been previously approved under a program consistent with NQA-1 for use in its intended application shall be evaluated in accordance with the requirements of this Section. This software shall be uniquely identified and controlled prior to evaluation; and placed under configuration control prior to use as software approved in accordance with this Section. The user organization shall perform and document the above evaluation of the software to:

- A. Determine the adequacy to support operation and maintenance, and
- B. Identify the activities to be performed and the documentation that is needed. This determination shall be documented and shall identify as a minimum:
  - 1. Capabilities and limitations for intended use;
  - 2. Test plans and test cases required to validate the capabilities within the limitations; and
  - 3. Instructions for use within the limits of the capabilities.

Exceptions from the documentation requirements and the justification for acceptance shall be documented.

The results of the above evaluation and the performance of the activities identified by this evaluation shall be reviewed and approved. The resulting documentation and associated computer program(s) shall establish the current baseline.

Revisions to previously baselined software received from organizations not required to follow this Section shall be evaluated according to criteria of this Section.

3.3.12 Design documentation and records shall include not only final design documents, such as drawings and specifications, and revisions to those documents but also documentation which identifies the important steps in the design process, including sources of design inputs that support the final design.

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**Section 4  
Procurement Document Control**

SECTION 4 - PROCUREMENT DOCUMENT CONTROL

4.1 Scope

- 4.1.1 This section establishes requirements for the preparation, review, approval and issue of procurement documents.
- 4.1.2 Requirements of Section 6 concerning control of documentation in general are applicable to procurement documentation.
- 4.1.3 Section 7 of this manual provides further requirements which assure that purchased material and services conform to procurement documents.

4.2 Responsibilities

- 4.2.1 The Project Manager has overall responsibility for assuring compliance with the requirements of this section.
- 4.2.2 The Project Engineering Manager has specific responsibility for the activities involved in the translation of design bases and applicable regulatory requirements, codes and standards into procurement specifications.
- 4.2.3 The Subcontracts Manager is responsible for assuring that initiation, handling and execution of procurement documents are in compliance with the requirements of this section.
- 4.2.4 The Project Quality Assurance Manager is responsible for reviewing of procurement documents for selected quality items and services for inclusion of applicable quality standards and requirements.

4.3 Program Requirements

- 4.3.1 Applicable design bases and other requirements necessary to assure adequate quality shall be included or referenced in documents for procurement of items and services. To the extent necessary, procurement documents shall require Suppliers to have a quality assurance program consistent with the applicable requirements of this Section.
- 4.3.2 Procurement documents issued at all tiers of procurement shall include provisions for the following:
  - A. Scope of Work

Procurement documents shall include a statement of the scope of work to be performed by the Supplier.
  - B. Commercial Terms

Procurement documents will specify the commercial terms applicable to the order and will include:

    1. General provisions (F.O.B. points, consignment, routing, payment terms, account codes, tax provisions, pricing and Total Value of Order – TVO).
    2. Terms and Conditions and applicable modifications.

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**Section 4  
Procurement Document Control**

3. Special Terms and Conditions and/or Successful Bidder Requirements.
4. Lien Waiver and Insurance Forms, if applicable.
5. Tax Identification Form, if applicable.
6. Project Controls Requirements (invoicing, schedules, reporting, change procedure, backcharges, etc.).
7. Material/Work Descriptions (items, unit of measure, quantities, price deviation, delivery/work schedule, tag numbers, etc.).

C. Technical Requirements

Technical requirements shall be specified in the procurement documents. These requirements shall be specified, as appropriate, by reference to specific drawings, specifications, codes, standards, regulations, procedures, or instructions, including revisions thereto, that describe the items or services to be furnished. The procurement documents shall identify appropriate test, inspection, and acceptance criteria for determining acceptability of the item or service.

D. Quality Assurance Program Requirements

Quality Assurance program requirements shall be specified in the procurement documents. These requirements shall be consistent with importance and/or complexity of the item or service being procured. The procurement documents shall require the Supplier to incorporate appropriate quality assurance program requirements in subtier procurement documents. The requirements for graded approach shall be included in procurement documents, when applicable.

E. Right of Access

The procurement documents shall provide for access to the Supplier's and subtier Supplier's facilities and records for surveillance, inspection, or audit by the purchaser, its designated representative, and others authorized by the Project.

F. Documentation Requirements

The procurement documents shall identify the documentation required to be submitted for information, review, or approval by the Project. The time of submittal shall also be established. The Project requires the Supplier to maintain specific records, the retention times and disposition requirements shall be prescribed.

G. Nonconformances

The procurement documents shall specify the Project's requirements for the Supplier's reporting of nonconformances.

H. Spare and Replacement Parts

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## Section 4 Procurement Document Control

The procurement documents shall specify the Supplier's requirements to identify spare and replacement parts or assemblies and the related data required for ordering those parts and assemblies.

- 4.3.3 A review of the procurement documents, and changes thereto, shall be made and documented prior to award to assure that documents transmitted to prospective Supplier(s) include appropriate provisions to assure that items or services will meet the specified requirements.

Technical or quality assurance program changes made as a result of bid evaluations or negotiations shall be incorporated into the procurement documents prior to their issuance to the Supplier.

Procurement document review shall be performed by personnel who have access to pertinent information and who have an adequate understanding of the requirements and intent of the procurement documents.

- 4.3.4 Procurement document changes affecting the technical or quality assurance program requirements shall be subject to the same degree of control as utilized in the preparation of the original documents.

- 4.3.5 Technical and quality requirements of procurement documents shall be prepared by each applicable Discipline Engineer and reviewed and approved by the Project Quality Assurance Manager and the Project Engineering Manager. The Subcontracts Manager shall add the commercial terms and conditions to the procurement documents and solicit bids for the items and services.

- 4.3.6 The need to perform Supplier Quality Surveillance (SQS) shall be determined by the Project Quality Assurance Manager and the applicable Lead Discipline Engineer. When SQS is required, surveillance plans shall be developed. The Surveillance plan shall include the characteristic(s) to be verified or process(es) to be witnessed and the accept/reject criteria to be used during the inspection. Mandatory hold and witness points established in the surveillance plan shall be included in the procurement documents sent to the Supplier. Surveillance plans shall be prepared by the Project Quality Assurance Manager.

- 4.3.7 A documented review of Supplier proposals shall be performed prior to the award of a purchase order/contract. Upon approval of the Project Manager, a purchase order or contract will be provided by the Subcontracts Manager and forwarded to the Supplier.

- 4.3.8 When the Client performs part of the procurement function, the interface between Washington Group International, Inc. and the Client shall be clearly defined in documented procedures.

- 4.3.9 The extent of the Supplier's quality program shall depend upon the type of service supplied. The requirement for a quality program and specific quality requirements shall be transmitted to the Supplier via procurement documents. Where applicable, procurement documents shall require the Supplier to invoke quality program requirements on his subtier Suppliers.

- 4.3.10 A method of source evaluation and selection of Suppliers shall be established by one or more of the following methods:

- A. Performance of similar procurements.
- B. Evaluation of Quality Program.
- C. Survey of facility.

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**Section 4**  
**Procurement Document Control**

D. Previous knowledge of capability.

4.3.11 Supplier Quality Surveillance (SQS) shall be performed on selected project engineering services, when required, by Project engineering and the Project Quality Assurance Manager. Exemption from Supplier Quality Surveillance (SQS) may be permitted when:

- A. The service is relatively simple and standard in design, manufacture and test, and
- B. The item is adaptable to standard or automated inspections or tests of the end product to verify quality characteristics after delivery, and
- C. The service does not require operations that could adversely affect the integrity, function, or cleanliness of the item.

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## Section 5 Instructions & Procedures

### SECTION 5 - INSTRUCTIONS & PROCEDURES

#### 5.1 Scope

5.1.1 This section directs the use of instructions and procedures for activities affecting quality.

5.1.2 Section 6 provides requirements for the control of instructions and procedures.

#### 5.2 Responsibilities

5.2.1 The Project Manager and Project Quality Assurance Manager are responsible for the development of instructions and procedures for ensuring compliance with the requirements of this PQAP for activities within the scope of this project.

#### 5.3 Program Requirements

5.3.1 Documented instructions and procedures are required:

- A. For activities affecting quality and services that could lead to quality failures (i.e., a failure to meet customer requirements and mission objectives)
- B. When the specified outcome of an operation, process or series of operations/processes requires an accuracy not normally achievable without procedural control.
- C. For all activities used to qualify personnel, production equipment, special processes and test apparatus.
- D. Whenever the result of an operational activity is considered to be important and where interpretation of that result is dependent upon knowledge of the specific process which produced it.

5.3.2 Procedures and instructions shall include or reference quantitative and qualitative acceptance criteria to be met during the performance of activities.

5.3.3 Procedures and instructions shall establish what is to be accomplished, by whom, when, under what conditions and where it is to be accomplished. When procedures and instructions direct activities involving interfaces between organizations, they shall have those interfaces identified.

The activity shall be described to a level of detail commensurate with the complexity of the activity and the need to assure consistent and acceptable results. The need for, and level of detail in, written procedures or instructions shall be determined based upon complexity of the task, the significance of the item or activity, work environment, and worker proficiency and capability (education, training, experience).

5.3.4 The authority approving an instruction or procedure shall ensure that an adequate review has been provided and documented. The review shall be accomplished to assure compliance with applicable codes, standards, contract and quality requirements.

5.3.5 Instructions and procedures, when approved, require compliance by those whose activities are affected. In no event shall a documented requirement be bypassed or voided except by approval of the Project Manager and Project Quality Assurance Manager.

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**Section 5  
Instructions & Procedures**

- 5.3.6 Instructions and procedures shall identify the documentation to be retained as objective evidence that quality acceptance criteria has been met.

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**Section 6  
Document Control**

SECTION 6 - DOCUMENT CONTROL

6.1 Scope

6.1.1 This section establishes requirements applicable to the preparation, review, approval, issuance, and control of documents (e.g., Procedures, Instructions, Drawings, Specifications, etc.) which describe activities or conditions affecting quality. These requirements are also applicable to changes and revisions of approved documents.

6.2 Responsibilities

6.2.1 The Project Manager has overall responsibility for compliance with the requirements of this section.

6.2.2 The Project Quality Assurance Manager shall review project procedures and instructions governing activities affecting quality and shall assure that they include requirements for an independent review of specifications and drawings that are prepared for items that require NQA-1 design verification.

6.3 Program Requirements

6.3.1 Provisions shall be made and procedures and/or instructions established for the preparation, review, approval and issuance of documents which prescribe activities or conditions affecting quality to assure that correct documents are being employed.

The following controls shall be applied to documents and changes thereto:

- A. the identification of controlled documents;
- B. the specified distribution of controlled documents for use at the appropriate location;
- C. the identification of individuals responsible for the preparation, review, approval, and distribution of controlled documents;
- D. the review of controlled documents for completeness, and approval prior to distribution;
- E. a method to ensure the correct documents are being used.

6.3.2 The Project Manager shall provide for the documented identification of those responsible for preparation, review, approval and issuance of these documents and revisions thereto.

6.3.3 Major changes and revisions to documents shall receive the same level of review and approval as the original document. Personnel reviewing documents shall have access to pertinent background data and information upon which to base their approval. Minor changes to documents, such as editorial corrections, do not require the same level of review and approval as the original document. What constitutes a minor change and who shall review and approve such changes shall be established in procedures.

6.3.4 Provisions shall be made in project procedures for determining the proper status of all documents relating to an activity and for assuring that only the applicable revision is available in work areas.

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**Section 6  
Document Control**

- 6.3.5 Applicable documents are required to be available at the work locations prior to start of the work, when such work is governed by instructions and procedures

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**Section 7  
Control of Purchased Material, Equipment and Supplies**

SECTION 7 - CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

7.1 Scope

- 7.1.1 This section establishes requirements for the selection of vendors and controls necessary to assure that items and services conform to the procurement documents. Project subcontractors, functioning as team members, will be subject to the project QA program and are exempt from the qualification/requirements of this section.
- 7.1.2 Battelle, Chew & Associates and PM Tech are organizational team members working under the Project QA Program and are considered subcontractors under the requirements of this section.
- 7.1.3 Section 4.0 contains the requirements for the preparation of procurement documents.

7.2 Responsibilities

- 7.2.1 The Subcontracts Manager shall act as an interface between the Vendor and various departments within Washington Group International, Inc. and shall prepare Bidders Lists, evaluate Supplier proposals and maintain a Project Approved Supplier List (ASL).
- 7.2.2 The Project Quality Assurance Manager shall also assure that QA evaluations and audits of suppliers are performed, when required.
- 7.2.3 The Lead Discipline Engineer(s) and Project Quality Assurance Manager shall prepare technical procurement documents, evaluate Supplier proposals, review Supplier documents, perform Supplier quality surveillance and resolve nonconformances.
- 7.2.4 When required, the Project Quality Assurance Manager shall perform surveillance of suppliers and report the conditions found.

7.3 Program Requirements

- 7.3.1 The Subcontracts Manager shall maintain a list of Suppliers who can supply or have supplied items or services in accordance with the requirements of NQA-1 to Washington Group International, Inc. For this project, the Client may add or delete suppliers from the approved Supplier list.
- 7.3.2 Lead Discipline Engineers shall prepare technical and quality requirements of procurement documents in accordance with the requirements of Section 4.
- 7.3.3 The Subcontracts Manager shall forward inquiries to Suppliers who are capable of supplying items to the technical and quality requirements identified in the procurement documents.
- 7.3.4 Supplier proposals shall be evaluated by the assigned Subcontracts Manager, Project Quality Assurance Manager, and Lead Discipline Engineers to determine the Supplier's capability to provide items in conformance with the requirements defined in the procurement documents. This evaluation should include the following:

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**Section 7**  
**Control of Purchased Material, Equipment and Supplies**

- A. Technical Requirements.
- B. Quality requirements.
- C. Supplier's personnel.
- D. Supplier's production capability.
- E. Supplier's past performance.
- F. Alternates proposed.
- G. Exceptions taken to stated requirements.

Prior to the award of the contract, the Project shall resolve or obtain commitments to resolve unacceptable technical and quality assurance conditions resulting from the proposal evaluation.

- 7.3.5 Lead Discipline Engineers shall initiate the Material Requisition for Quote (MRQ). The Project Engineering Manager, the Project Quality Assurance Manager and the applicable Lead Discipline Engineer shall approve all material requisitions. The Subcontracts Manager shall translate the MRQ into a Request for Quotation (RFQ). After the Bid Analysis Summary (BAS) review to select the correct supplier, the Lead Discipline Engineer shall initiate the Materials Requisition for Purchase (MRP). The Subcontracts Manager will then translate the MRP into a purchase order.
- 7.3.6 The Lead Discipline Engineers and the Project Quality Assurance Manager shall review Supplier documents for compliance with the purchase order/contract. Supplier requested changes to the technical and/or quality requirements of the purchase order shall have documented approval by the Lead Discipline Engineers and the Project Quality Assurance Manager.
- 7.3.7 When applicable, the Supplier's performance shall be verified through surveillance of Supplier operations and inspection of the items produced. Qualified personnel shall be used in the performance of these verification activities. The extent to which verification activities are performed is dependent on the relative importance, complexity, and quantity of the items procured. The project shall use a graded approach. The graded approach is a process by which the level of analysis, documentation, and actions necessary to comply with a requirement is commensurate with the relative importance to safety, safeguards, and security; the magnitude of any hazard involved; the life cycle of a facility; the programmatic mission of the facility; the particular characteristics of a facility; and any other relevant factor. Verification activities shall be started as early as practicable and shall continue at a frequency which is sufficient to assess the effectiveness of the Supplier's quality program. Verification activities shall be documented. Verification shall not absolve the supplier of the responsibility to provide acceptable products nor shall it preclude subsequent rejection.
- 7.3.8 Procedures shall be developed for:
  - A. Control and issue of the Approved Suppliers List (ASL).
  - B. The receipt, distribution and evaluation of Supplier proposals.
  - C. The receipt, review, approval and distribution of Supplier prepared documents.

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**Section 7**  
**Control of Purchased Material, Equipment and Supplies**

- D. Change in design requirement.
- E. Interfacing with the receiving organization including controlling the transfer of Supplier documentation, the performance of receipt inspection and the resolution of any nonconformances identified at the receiving location.
- F. Acceptance of the item(s) furnished by a Supplier.

7.3.9 The Subcontracts Manager shall establish an Approved Suppliers List (ASL) which identifies those suppliers whose quality program has been evaluated and accepted as meeting the requirements of NQA-1 by audit by Washington Group International, Inc.. The ASL shall be maintained and issued as a controlled document. A Client-approved Supplier may be added to the ASL provided sufficient data is supplied to Washington Group International, Inc. to support the inclusion of the supplier in the Washington Group International, Inc. ASL. If a Supplier is not reevaluated or if their program is not found to be acceptable, their name shall be removed from the ASL.

7.3.10 Project Quality Assurance Manager or his designee shall evaluate prospective Suppliers for selected quality items and services. Such evaluation shall include the following quality considerations insofar as they are applicable to the type of procurement:

- A. Supplier's history of providing identical or similar product which performs satisfactorily in actual use. The Supplier's history shall reflect current capability.
- B. Supplier's current quality records supported by documented qualitative and quantitative information which can be objectively evaluated.
- C. Supplier's technical and quality capability as determined by a direct evaluation of the facilities, personnel, and the implementation of the Supplier's quality assurance program.
- D. For Supplier's noted on the ASL as meeting NQA-1 quality assurance requirements, documented evidence of audit of the Suppliers QA program within the last three years shall be maintained. In addition, evidence that the Suppliers QA program has been evaluated (not audited) at the end of the first and second year, after the last audit, shall be maintained.

7.3.11 Suppliers need not be evaluated at the inquiry stage; however, purchase orders/contracts should only be awarded to Suppliers who have been evaluated and found acceptable. The Project shall accept the service of any or all of the following methods:

- A. technical verification of data produces;
- B. surveillance and/or audit of the activity;
- C. review of objective evidence for conformance to the procurement document requirements.

7.3.12 Controls shall be implemented to assure that the submittal and evaluation of Supplier-generated documents are accomplished in accordance with the procurement document requirements. The controls shall provide for the acquisitions, processing, and recorded evaluation of the quality assurance, technical, inspection, and test documentation data against acceptance criteria.

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**Section 7**  
**Control of Purchased Material, Equipment and Supplies**

7.3.13 The control and disposition of Supplier nonconformances for items and services that do not meet procurement documentation requirements shall include:

- A. evaluation for nonconforming items;
- B. submittal of nonconformance notice to the Project by the Supplier. These submittals shall include the Supplier-recommended disposition (e.g., use-as-is, or repair) and technical justification. Nonconformances to the procurement requirements of Project-approved documents, which consist of one or more of the following shall be submitted to the Project for approval of the recommended disposition:
  - 1. technical or material requirements violated;
  - 2. requirement in Supplier documents, which has been approved by the Project, is violated;
  - 3. nonconformance cannot be corrected by continuation of the original manufacturing process or by rework;
  - 4. the item does not conform to the original requirements even though the item can be restored to a condition such that the capability of the item to function is unimpaired.
- C. project disposition of Supplier recommendation;
- D. verification of the implementation of the disposition;
- E. maintenance of records of Supplier-submitted nonconformances.

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## Section 11 Test Control

### SECTION 11 - TEST CONTROL

#### 11.1 SCOPE

11.1.1 This section provides requirements for the validation and control of technical software used in engineering applications.

#### 11.2 RESPONSIBILITIES

11.2.1 The Project Manager has overall responsibility for assuring compliance with the requirements of this section.

11.2.2 The Project Engineering Managers and Chief Discipline Engineers are responsible for adhering to the requirements of this section and implementing procedures which amplify the requirements of this section.

11.2.3 Project Engineering personnel are responsible for assuring that proper design control of software is implemented per Section 3 of this plan.

#### 11.3 Program Requirements

11.3.1 Tests required to verify conformance of computer programs used in design shall be planned and executed.

11.3.2 Computer program test procedures shall provide for assuring that the computer program produces correct results. For those computer programs used for operation control, computer program test procedures shall provide for demonstrating required performance over the range of operation of the controlled function or process. The procedures shall also provide for evaluating technical adequacy through comparison of test results from alternative methods such as hand calculations, calculations using comparable proven programs, or empirical data and information from technical literature.

11.3.3 In-use test procedures shall be developed and documented to permit confirmation of acceptable performance of the computer program in the operating system. In-use test procedures shall be performed after the computer program is installed on a different computer, or when there are significant changes in the operating system. Periodic in-use manual or automatic self-check in-use tests shall be prescribed and performed for those computer programs where computer program errors, data errors, computer hardware failures, instrument drift can affect required performance.

11.3.4 Test results for design qualification tests and software design verifications shall be evaluated by Project Engineering.

11.3.5 Test records shall be established and maintained to indicate the ability of the computer program to satisfactorily perform its intended function or to meet its documented requirements

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**Section 15**  
**Nonconformance Material, Components, Equipment and Services**

SECTION 15 - NONCONFORMANCE MATERIAL, COMPONENTS, EQUIPMENT AND SERVICES

15.1 Scope

15.1.1 This section establishes requirements for control of nonconforming items to preclude their inadvertent use or installation.

15.2 Responsibilities

15.2.1 Lead Discipline Engineers are responsible for including, as appropriate, the requirements of this section in procurement, design, and/or construction documents. They shall review and approve nonconformance use-as-is or repair dispositions and reflect these conditions in the appropriate documents.

15.2.2 All project personnel are responsible for identifying and documenting nonconforming items and procedural noncompliance's.

15.2.3 The Project Quality Assurance Manager is responsible for evaluating and accepting the proposed corrective action, and assuring implementation of the corrective action. He is also responsible for assuring noncompliances/nonconformances are evaluated for reporting under the Price-Anderson Amendment Act PAAA)

15.2.4 Lead Discipline Engineers are responsible for responding to procedural noncompliance reports and taking appropriate action to maintain quality.

15.3 Program Requirements

15.3.1 Items that do not conform to specified requirements shall be controlled to prevent inadvertent installation or use. Controls shall provide for identification, documentation, evaluation, segregation, when practical, and disposition of nonconforming items, and for notification of affected organizations.

15.3.2 The Project Quality Assurance Manager shall document nonconformances/noncompliances identified as a result of surveillance activities (see Section 18). The report shall be submitted to the Project Manager for review, response and action. The responsible Lead Discipline Engineer shall determine what action will be taken to assure the quality of the drawings, specifications, items, etc., affected by the nonconformance/noncompliance. The reply shall be reviewed to determine the adequacy of the action to be taken. After action has been taken, the results shall be verified and documented.

15.3.3 Nonconforming items shall be identified (by tagging or marking and, where practicable, shall be segregated from acceptable items) to preclude their inadvertent use. Pending resolution and acceptance of items or activities identified as nonconforming or noncomplying, reports of nonconformance/noncompliance shall be considered to be open and shall be followed up at a frequency and with an intensity appropriate to the severity and potential impact of the nonconformance/noncompliance.

15.3.4 The disposition of Washington Group, Inc. initiated nonconformances shall include the following:

- A. Nonconforming items shall be evaluated and recommended dispositions proposed. Further processing, delivery, installation, or use of a nonconforming item shall be controlled pending the evaluation of an approved disposition by authorized personnel.

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**Section 15**  
**Nonconformance Material, Components, Equipment and Services**

- B. The responsibility and authority for the evaluation and disposition of nonconforming items shall be defined. Responsibility for the control of further processing, delivery, installation, or use of nonconforming items shall be designated in writing.
  - C. Personnel performing evaluations to determine a disposition shall have demonstrated competence in the specific area they are evaluating, have an adequate understanding of the requirements, and have access to pertinent background information.
  - D. A disposition, such as use-as-is, reject, repair, or rework of nonconforming items shall be made and documented. Technical justification for the acceptability of a nonconforming item dispositioned repair or use-as-is shall be documented. Nonconformances to design requirements dispositioned use-as-is or repair shall be subject to design control measures commensurate with those applied to the original design. Required as-built records shall reflect the use-as-is or repair conditions.
  - E. Repaired items shall be re-examined in accordance with applicable procedures and with the original acceptance criteria, unless the disposition has established alternate acceptance criteria.
- 15.3.5 Nonconformances found during vendor surveillance shall be dispositioned via the Supplier's program when possible. Supplier nonconformances shall be processed in accordance with the requirements of this section and Section 7.
- 15.3.6 Lead Discipline Engineers shall include, as appropriate, the requirements of this section in procurement and/or construction documents. They shall review and approve nonconformance dispositions which do not rework the item to the specified requirements (i.e. repaired or accept-as-is) and reflect these conditions in the appropriate documents.
- 15.3.7 "Use-as-is" and "Repair" dispositions to Supplier initiated nonconformance reports shall be transmitted to Washington Group International, Inc. for review and approval. "Scrap", "Rework" and "Return-To-Supplier" dispositions to Supplier-initiated nonconformance reports do not require Washington Group International, Inc. review or approval, however copies shall be submitted to Washington Group International, Inc. for information.
- 15.3.8 All dispositions of Washington Group International, Inc. initiated nonconformance and noncompliance reports shall be reviewed by the Project Quality Assurance Manager. Nonconformance logs shall be maintained by the Project Quality Assurance Manager.
- 15.3.9 Revisions or changes to design, procurement and/or construction documents resulting from disposition of nonconformances shall be handled consistent with the requirements of Sections 3 and 6 of this Plan.
- 15.3.10 Rework, repair or replacement accomplished pursuant to the resolution of the nonconformance shall be performed in accordance with approved work instructions and procedures which shall also provide for appropriate inspection.

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## Section 16 Corrective Action

### SECTION 16 - CORRECTIVE ACTION

#### 16.1 Scope

16.1.1 This section provides methods for the prompt identification, reporting, and disposition of conditions adverse to quality.

#### 16.2 Responsibilities

16.2.1 The Project Quality Assurance Manager is responsible for:

- A. Identifying conditions and circumstances necessitating corrective action.
- B. Issuing requests for corrective action.
- C. Providing systematic follow-up and close-out of such action.
- D. Advising appropriate levels of management of such matters.
- E. Maintaining corrective action logs.

16.2.2 Lead Discipline Engineers are responsible for including the requirements of this section in procurement documents.

16.2.3 The Project Manager has overall responsibility for initiating action to correct conditions noted on requests for corrective action.

#### 16.3 Program Requirements

16.3.1 Request for corrective action shall be initiated when any of the following conditions are identified:

- A. Trends of nonconformances indicate inadequacies in either process or inspection procedures.
- B. Existence of program conditions which, if uncorrected, may possibly compromise the quality program or degrade the quality of an item.
- C. Whenever discrepancies noted in quality program or implementation thereof are not resolved in a timely fashion by other means.
- D. When quality related work is performed without approved instructions.

16.3.2 Requests for corrective action shall be documented by the Project Quality Assurance Manager and submitted to the Project Manager for review, response and action. The Project Manager shall reply to the request for corrective action stating how and when the discrepant condition will be corrected and what action(s) is to be taken to prevent recurrence. The response shall be reviewed by the Project Quality Assurance Manager. The review shall determine the adequacy of the action to be taken. After corrective measures have been taken, the results shall be verified and documented by the Project Quality Assurance Manager.

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**Section 16  
Corrective Action**

- 16.3.3 A stop work order shall be initiated when continued processing, development, installation, etc. adversely affects the quality or safety of the product.; is in violation of codes, standards, or requirements; or is contrary to Client direction and/or goals. Such conditions include but are not limited to the following:
- A. Performance of work by unqualified personnel or organizations;
  - B. Performance of activities without appropriate or approved instructions, procedures or drawings;
  - C. Continued processing of items which do not conform to specifications;
  - D. Breakdown of the quality program;
  - E. Significant design errors or omissions;
  - F. Fraudulent or negligent activities.
- 16.3.4 Stop work orders shall be documented by the Project QA Manager and submitted to the Project Manager for review, response and action. The Project Manager shall reply to the stop work order by identifying the cause of the condition, proposed action to correct the condition, and action to prevent recurrence. The response shall be review by the Project QA Manager to determine the adequacy of the action to be taken. After corrective measures have been taken and the results verified and documented by the Project QA Manger, the stopped work may resume.
- 16.3.5 The requirements of this section, including the methods for promptly notifying Washington Group International, Inc. of conditions adverse to quality, shall be included, as appropriate, in procurement and/or construction documents.
- 16.3.6 A system for detecting trends adverse to quality shall be developed. When a trend is detected the appropriate corrective action shall be taken.

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**Section 17  
Records**

SECTION 17 - RECORDS

17.1 Scope

17.1.1 This section establishes the requirements applicable to administration of a Records system, i.e., a system for collection, storage and maintenance of Records associated with design, procurement and quality assurance activities included in the scope of The PQAP.

17.1.2 Requirements relating to the preparation, approval, distribution and other actions on documents are established in other sections of this PQAP.

17.2 Responsibilities

17.2.1 The Project Manager is responsible for implementing the requirements of this section.

17.2.2 Lead Discipline Engineers shall include, as appropriate, the requirements of this section in procurement documents.

17.3 Program Requirements

17.3.1 A Records System shall be established at the earliest practicable time consistent with the schedule for accomplishing quality related activities. The records system shall be prescribed by documented procedures which shall include requirements and assign responsibilities for:

- A. Generation and correction of Records
- B. Validation of Records
- C. Indexing Records
- D. Distributing Records
- E. Identification of Records
- F. Classification of Records retention time
- G. Receipt control and determination of Record status
- H. Storage, maintenance and retrieval of Records
- I. Protection against damage, deterioration, or loss of Records
- J. Final disposition of Records
- K. Control of access to stored Records
- L. Control and security for classified records and documents.

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**Section 17  
Records**

- 17.3.2 Documents shall be legible, completely filled out and adequately identifiable to the items or activities to which they apply. Documents shall be considered valid quality records only if stamped, initialed or signed by authorized personnel or otherwise clearly identified as a statement by the reporting individual or organization. Records may be originals or reproduced copies. Records include, but are not necessarily limited to:
- A. Manuals, Procedures, and Instructions which govern quality activities.
  - B. Design inputs, design outputs and procurement and/or construction documents.
  - C. Results of reviews, surveillances, audits and material analyses.
  - D. Qualification of personnel, procedures and equipment.
  - E. Reports of nonconformances and corrective action.
- 17.3.3 Design, procurement and construction documents shall define what records are to be provided by the supplier and at what time (e.g., prior to or with shipment).
- 17.3.4 In the event of loss or damage to records, action shall be initiated to replace or restore the affected records. If replacement or restoration is not practicable, necessary action shall be taken to assure the quality of items or activities affecting quality such as re-examination or investigation by alternative means.
- 17.3.5 Quality records shall be classified and maintained by retention time. A lifetime record as used herein is a quality record which meets one or more of the following criteria:
- A. One which would be of significant value in demonstrating capability for safe operation.
  - B. One which would be of significant value in maintaining, reworking, repairing, replacing or modifying the item.
  - C. One which would be of significant value in determining the cause of an accident or malfunction of an item.
  - D. One which would provide required baseline data for in-service inspection. All other quality records are considered nonpermanent quality records.
- 17.3.6 Lifetime records shall be transferred to the Client for their use. Nonpermanent records accumulated by Washington Group International, Inc. shall be disposed of by methods mutually established and agreed to between Washington Group International, Inc. and the Client. Upon turnover of records (lifetime and/or nonpermanent) to the Client, Washington Group International, Inc. responsibility for records retention ceases.
- 17.3.7 Quality records maintained by a supplier at his facility shall be accessible to Washington Group International, Inc. or to the Client as provided for in procurement documents. Upon completion of work by the supplier, quality records shall be stored or sent to the Client as indicated in procurement and/or construction documents.

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## Section 17 Records

17.3.8 Records shall be stored in facilities, containers, or a combination thereof, constructed and maintained in a manner which minimizes the risk of damage or destruction from the following;

- A. Natural disasters such as winds, floods, or fires;
- B. Environmental conditions such as high and low temperatures and humidity;
- C. Infestation of insects, molds, or rodents.

Dual facilities, containers, or combination thereof shall be provided for records storage if a single facility, container, or combination thereof is not capable of providing adequate protection.

Provisions shall be made for specially processed records (such as radiographs, photographs, negatives, microform, and magnetic and optical media) to prevent damage from excessive light, stacking, electromagnetic fields, temperature, and humidity.

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## Section 18 Surveillance and Audits

### SECTION 18 - SURVEILLANCE AND AUDITS

#### 18.1 Scope

- 18.1.1 This section provides requirements for the establishment and implementation of a quality surveillance and audit program which is applicable to all activities included within the scope of this Program.
- 18.1.2 A quality surveillance or audit as used herein comprises an activity performed in accordance with documented procedures or checklists to verify by examination and evaluation of objective evidence that applicable elements of The Program have been developed, documented and effectively implemented in accordance with specified requirements.

#### 18.2 Responsibilities

- 18.2.1 The Project Quality Assurance Manager is responsible for the establishment and implementation of a quality surveillance system. The Project Quality Assurance Manager shall review the surveillance schedule with Project Management to determine if there are activities that have been identified as possible areas/activities likely to adversely affect project objectives to assure they are assessed in a timely manner.
- 18.2.2 The Manager, Quality Management is responsible for the establishment of a quality audit system, for the certification of qualified auditors, for appointing the Audit Team Leader and for implementing the audit requirements of this section.
- 18.2.3 The Audit Team Leader is responsible for notifying the group to be audited, directing the preparation of audit procedures or checklists, directing the audit, reporting the audit findings, evaluating the responses to audit findings and assuring follow-up of corrective action. He is assisted by audit team members.
- 18.2.4 The Project Manager is responsible for providing free access to information required to perform the surveillance and audit, and for taking corrective action when deficiencies are identified.

#### 18.3 Program Requirements

- 18.3.1 Surveillances and audits of Washington Group International, Inc. project activities within the scope of this program shall be performed by the Quality Management Department. A schedule for performing these surveillances and audits shall be developed based on the following requirements:
- A. Project quality activities shall be audited at least annually. Surveillances of specific project quality activities shall, to the extent possible, coincide with the schedule for accomplishing identified quality activities.
  - B. Surveillances and audits shall be performed as early in the life of the activity as practical.
  - C. When significant changes are made in the organization or the quality assurance program.
  - D. When it is suspected that the quality of an item is in jeopardy due to deficiencies in the quality program.
  - E. When a systematic, independent assessment of program effectiveness is considered desirable.
  - F. When it is necessary to verify implementation of required corrective action.

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**Section 18  
Surveillance and Audits**

- 18.3.2 Audits shall be performed by an audit team which includes a qualified Audit Team Leader and, as required, other auditor(s) and/or technical specialist(s) who have expertise in the areas to be audited. No member of the audit team shall have direct responsibility for the activities they are auditing.
- 18.3.3 Audits shall be performed in accordance with a documented plan which shall include functional areas to be audited, names of those who will perform the audit, schedule date of the audit, and a list of the requirements or procedures which govern the functional areas being audited. The depth and scope of each audit shall be commensurate with the status and importance of the activities being audited.
- 18.3.4 Surveillance and audits shall be performed using written procedures or checklists. The purpose of such procedures or checklists is to serve as a guide to all the significant characteristics of the functional area being surveilled/audited.
- 18.3.5 The surveillance and audit team shall examine objective evidence to the depth necessary to determine if the elements of the quality program are being implemented effectively. Characteristics in addition to those on the procedure or checklist should be investigated when, in the opinion of the auditor, such items are pertinent to the scope of the surveillance and audit. Conditions requiring prompt corrective action shall be reported immediately to the responsible Manager and the Project Quality Assurance Manager.
- 18.3.6 Surveillance and audit reports shall be distributed to the responsible manager and supervisor(s). The surveillance and audit report(s) shall include a description of each activity reviewed and any adverse quality finding(s), and any significant observations which may enhance the quality of the reviewed activity.
- The audit report shall be signed or otherwise endorsed by the Lead Auditor and issued to the audited organization. The contents of the report shall:
- A. describe the scope;
  - B. identify Auditors and persons contacted;
  - C. summarize the audit results, including a statement on the effectiveness of the elements audited; and
  - D. describe each reported adverse audit finding.
- 18.3.7 The responsible Manager shall submit a written response to surveillance and audit findings. The response shall indicate on the action planned or taken to correct and preclude recurrence of the deficiencies revealed by the audit. Surveillance and audit responses shall be submitted and evaluated by the Surveillance and Audit Team Leader to determine if the actions to be taken will correct and/or preclude recurrence of the finding and if the schedule for completion of these actions is reasonable.
- 18.3.8 Corrective action taken in response to a surveillance or audit shall be verified to assure that it has been completed satisfactorily and within the scheduled time frame.
- 18.3.9 Records of surveillances and audits shall be maintained as nonpermanent records in accordance with Section 17.0 and shall include the surveillance and audit plan, surveillance and audit procedures or checklists, reports, responses, and recorded verification of corrective action completion.

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## Appendix A Terms & Definitions

This Appendix contains certain terms and their definitions used in this Manual that are important to the uniform understanding of the Manual and its application.

### ACCEPTANCE CRITERIA

Specified limits placed on the performance, results, or other characteristics of an item, process, or service defined in codes, standards, or other requirement documents.

### APPROVED SUPPLIER LIST

The Approved Suppliers List is a document used to control the purchase of material and services. This list is comprised of Suppliers that have been surveyed and approved in accordance with applicable quality documents.

### AUDIT

A planned and documented activity performed to determine by investigation, examination, or evaluation of objective evidence the adequacy of and compliance with established procedure, instructions, drawings, and other applicable documents, and the effectiveness of implementation. An Audit should not be confused with surveillance or inspection activities performed for the sole purpose of process control or product acceptance.

### CERTIFICATION

The act of determining, verifying, and attesting in writing to the qualifications of personnel, processes, procedures, or items in accordance with specified requirements.

### CHARACTERISTIC

Any property or attribute of an item, process, or service that is distinct, desirable, and measurable.

### COMMERCIAL GRADE ITEM

An item satisfying the following:

- A. not subject to design or specification requirements that are unique to nuclear facilities;
- B. used in applications other than nuclear facilities;
- C. to be ordered from the manufacturer/supplier on the basis of specifications set forth in the manufacturer's published product description (for example, a catalog).

### COMPUTER PROGRAM

A combination of computer instructions and data definitions that enables computer hardware to perform computational or control functions.

### CONDITION ADVERSE TO QUALITY

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## Appendix A Terms & Definitions

An all-inclusive term used in reference to any of the following; failures, malfunctions, deficiencies, defective items, and nonconformances. A significant condition adverse to quality is one which, if uncorrected, could have a serious effect on safety or operability.

### CONFIGURATION

The physical, functional, and operational characteristics of the structures, systems, components, or parts of the existing facility.

### CONFIGURATION ITEM (SOFTWARE)

A collection of hardware or software elements treated as a unit for the purpose of configuration control.

### CONFIGURATION MANAGEMENT

The process that controls the activities, and interfaces, among design, construction, procurement, training, licensing, operations, and maintenance to ensure that the configuration of the facility is established, approved, and maintained.

### CORRECTIVE ACTION

Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

### DESIGNEE

An individual who is acting on behalf of the person responsible for the activity and is from the same organization/department. The person responsible for the activity retains the responsibility for the activity as performed by the designee. By definition, a named individual has the authority to appoint a designee.

### DESIGN, FINAL

Approved design output documents and approved changes thereto.

### DESIGN AUTHORITY

The organization having the responsibility and authority for approving the design bases, the configuration and changes thereto.

### DESIGN BASES

That information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state-of -the art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculations and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals.

### DESIGN CHANGE

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## Appendix A Terms & Definitions

Any revision or alteration of the technical requirements defined by approved and issued design output documents and approved and issued changes thereto

### DESIGN INPUTS

Those criteria, parameters, bases, regulatory requirements or other design requirements upon which detailed final design is based.

### DESIGN OUTPUTS

Drawings, specifications, and other documents used to define technical requirements of structures, systems, components, and computer programs.

### DESIGN PROCESS

Technical and management process that commence with identification of design input and that lead to and include the issuance of design output documents.

### DESIGN REVIEW

A critical review to provide assurance that the final design is correct and satisfactory.

### DEVIATION

A departure from specified requirements.

### DOCUMENT

Any written or pictorial information describing, defining specifying, reporting, or certifying activities, requirements, procedures, or results. A document is not considered to be a quality assurance record until it satisfies the definition of a quality assurance records as defined in this section.

### DOCUMENT CONTROL

The act of assuring that documents are reviewed for adequacy, approved for release by authorized personnel, and distributed to and used at the location where the prescribed activity is performed.

### INSTRUCTIONS

Written descriptions of activities to be performed, including job specifications, drawings, operating or procedure manuals, test procedures or other written forms, to assure that the activity is adequately described.

### ITEM

An all-inclusive term used in place of any of the following: appurtenance, assembly, component, equipment, material, module, part, structure, sub-assembly, subsystem, system, or unit.

### NONCONFORMANCE

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## Appendix A Terms & Definitions

A deficiency in characteristic, documentation, or procedure which renders the quality of an item or activity unacceptable or indeterminate. Examples of nonconformances include: physical defects, test failures, incorrect or inadequate documentation, or deviations from prescribed procedures, design drawings and specifications.

### OBJECTIVE EVIDENCE

Any documented statement of fact, other information, or record, either quantitative or qualitative, pertaining to the quality of an item or activity, based on observations, measurements, or tests which can be verified

### PROCUREMENT DOCUMENTS

Purchase requisitions, purchase orders, subcontracts, drawings, contracts, specifications or instructions that identify and define the requirements for purchase.

### QUALIFICATION, PERSONNEL

The characteristics or abilities gained through education, training, or experience, as measured against established requirements, such as standards or tests, that qualify an individual to perform a required action.

### QUALITY ASSURANCE (QA)

All those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

### QUALITY ASSURANCE RECORDS

A completed document that furnishes evidence of the quality of items and/or activities affecting quality. Records may include specially process records such as radiographs, photographs, negatives, microforms, and magnetic and electronic media.

### REPAIR

The process of restoring a nonconforming characteristic to a condition such that the capability of an item to function reliably and safely is unimpaired, even though that item still may not conform to the original requirement.

### REWORK

The process by which an item is made to conform to original requirements by completion or correction.

### SERVICE

The performance of activities such as design, fabrication, inspection, nondestructive examination, repair, or installation.

### SOFTWARE

Computer programs and associated documentation and data pertaining to the operation of a computer system.

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## Appendix A Terms & Definitions

### SPECIAL PROCESS

A process, the results of which are highly dependent on the control of the process or the skill of the operators, or both, and in which the specified quality cannot be readily determined by inspection or test of the product.

### SUPPLIER

Any individual or organization who furnishes items or services in accordance with a procurement document. An all-inclusive term used in place of any of the following: vendor, seller, contractor, subcontractor, fabricator, consultant, and their subtier levels.

### SURVEILLANCE

Review, observation, and/or examination for the purpose of verifying that project activities and purchased items and services are performed/supplied in accordance with project requirements. Surveillances may be used by Project Management as part of the routine assessment activities to provide data on performance and to identify quality issues before they have a significant impact on safety and reliability.

### USE-AS-IS

A disposition permitted for a nonconforming item when it has been established that the item is satisfactory for its intended use.

### WAIVER

Documented authorization to depart from specified requirements.

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**Appendix A  
Terms & Definitions**

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**Appendix B**  
**PQAP Requirements and Procedures Matrix**

<b>10 CFR 830.120 CRITERION</b>	<b>ASME NQA-1 CRITERION</b>	<b>PQAP SECTION</b>	<b>IMPLEMENTING DOCUMENT</b>
Criterion 1 - Program	1 & 2	1 and 2	PDCF-PC-100; PDCF-PK-100; PDCF-PM-100, DN-PM-101, 102; PDCF-PE-010; PDCF-PQ-100; AB 6.10, 6.12
Criterion 2 – Personnel Training and Qualification	2	1	PDCF-PM-109; PDCF-PQ-111
Criterion 3 – Quality Improvement	15 & 16	15 & 16	PDCF-PQ-002, 003, 101, 102, 103
Criterion 4 – Documents and Records	6 & 17	6 & 17	PDCF-PG-101, 102, 103, 104; DN-PG-105
Criterion 5 – Work Processes	5 (8, 9, 12, 13 & 14 Not Applicable)	5	PDCF-PG-100
Criterion 6 – Design	3	3	PDCF-PE- 100, 102 103,105, 106, 107, 108, 109. 110. 111, 112, 113, 114, 115; 116, 117, 118, 119, 357; PDCF-PE-001, 002, 004, 006 thru 009, 011; 012 PDCF-PQ-106; CS-0306;
Criterion 7 – Procurement	4 & 7	4 & 7	PDCF-PP-101; PDCF-PQ-101, 107, 108; PDCF-PE-113, 114, 115; PDCF-PQ-001, 110, 112
Criterion 8 – Inspection and Acceptance Testing	11 (10 & 12 Are Not Applicable)	11	CS-0306; PDCF-PE-357
Criterion 9 – Management Assessment	2	1	PDCF-PM-001
Criterion 10 – Independent Assessment	18	18	PDCF-PQ-110, 111, 112

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**Appendix C  
Project Procedure Listing**

PROCEDURE NO.	TITLE
<b>PROJECT MANAGEMENT (PM)</b>	
PDCF-PM-100	Quality Policy
DN-PM-101	Introduction to the Quality Systems Procedure Manual
DN-PM-102	Management Responsibility
DN-PM-103	Project Resource Management
DN-PM-105	Project Code of Accounts
PDCF-PM-106	Project Specific Client Feedback
PDCF-PM-109	Indoctrination and Training
PDCF-PM-001	Management Assessment
<b>GENERAL /ADMINISTRATION (PG)</b>	
PDCF-PG-100	Preparation and Administration of Procedures
PDCF-PG-101	File Coding and Maintenance
PDCF-PG-102	Project Communications Control
PDCF-PG-103	Project Document Control
PDCF-PG-104	Final Disposition of Project Documents and Files
DN-PG-105	Procedure for Computer Systems Backup
<b>PROJECT CONTROLS (PC)</b>	
PDCF-PC-100	Project Performance Measurement System
<b>CONTRACTS (PK)</b>	
PDCF-PK-100	Project Letter of Instructions and Contract Briefing
<b>OTHER STANDARDS AND PROCEDURES</b>	
AB 6.10	Executive Review Committee
AB 6.12	Schedule for Signature Authority
<b>ENGINEERING/DESIGN (PE)</b>	
PDCF-PE-100	Preparation of Engineering Execution Plan
PDCF-PE-102	Design Document Identification Codes & Lists
PDCF-PE-103	Preparation of advanced Requisition List & Subcontract Scope of Work
PDCF-PE-105	Document Status/Revision Control
PDCF-PE-106	Design Document Verification

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<b>PROCEDURE NO.</b>	<b>TITLE</b>
PDCF-PE-107	Project Scope of Work and Design Basis
PDCF-PE-108	Preparation of Drawings
PDCF-PE-109	Preparation of Calculations
PDCF-PE-110	Preparation of Study Report
PDCF-PE-111	Preparation of Data Sheets
PDCF-PE-112	Preparation of Technical Specifications
PDCF-PE-113	Preparation of Bid Evaluations
PDCF-PE-114	Vendor Drawing & Data Review
PDCF-PE-115	Constructability Review
PDCF-PE-116	Chief Engineers Design Review
PDCF-PE-117	Design Change Control
PDCF-PE-118	Hazardous Operations Review
PDCF-PE-119	Software Error Notification
PDCF-PE-357	Computer Software Control
PDCF-PE-001	Nuclear Criticality Operational Review for PDCF Title I/Title II Design Related Activities
PDCF-PE-002	Conduct of Environmental Safety and Health Design-Related Activities
PDCF-PE-004	Functional Classification
PDCF-PE-006	Radiological Design Review
PDCF-PE-007	Worker Safety and Health Design Review
PDCF-PE-008	Alara Optimization Procedures
PDCF-PE-009	ES&H Preliminary Hazard Analysis
PDCF-PE-010	ADC/RO Document Review Procedure
PDCF-PE-011	Emergency Preparedness Hazards Survey and Assessment Procedure
PDCF-PE-012	Graded Approach
<b>OTHER STANDARDS/PROCEDURES</b>	
CS-0306	Computer Program Validation for Engineering Application
<b>PROCUREMENT (PP)</b>	
PDCF-PP-101	Preparation of Procurement Documents

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<b>QUALITY ASSURANCE (PQ)</b>	
PDCF-PQ-001	Evaluation of Nuclear Suppliers
PDCF-PQ-002	Price Anderson Amendment Act Compliance Reporting
PDCF-PQ-003	Trend Analysis
PDCF-PQ-100	Preparation and Control of Project QA Plan
PDCF-PQ-101	Procedural Noncompliance
PDCF-PQ-102	Corrective Action Request
PDCF-PQ-103	Stop Work Orders
PDCF-PQ-106	Review of Design Documents
PDCF-PQ-107	Quality Management Review of Procurement Documents
PDCF-PQ-108	Quality Management Review of Vendor Documents Submittals
PDCF-PQ-110	Surveillance of Quality Related Activities
PDCF-PQ-111	Qualification and Certification of Audit Personnel
PDCF-PQ-112	Audit Program

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