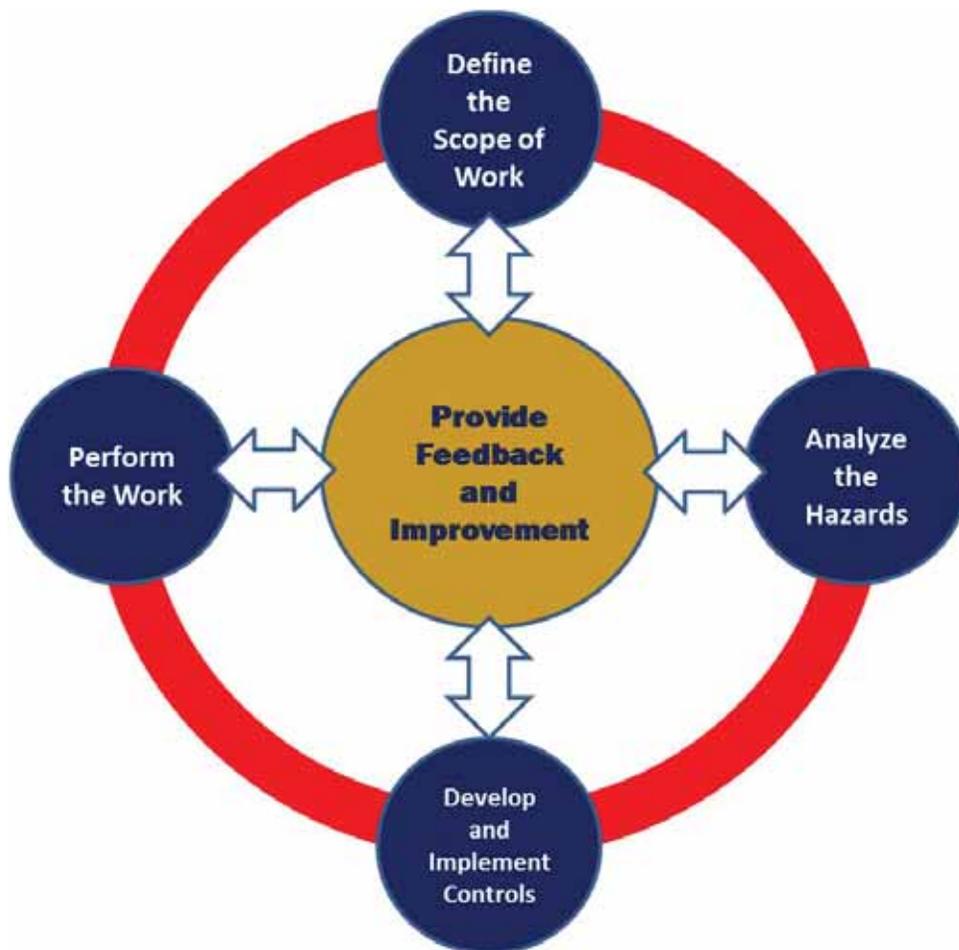


## Savannah River Remediation LLC

# INTEGRATED SAFETY MANAGEMENT SYSTEM DESCRIPTION DOCUMENT



SRR Integrated Safety Management System Description

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### Approvals

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30 November 2015

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Concurred by:



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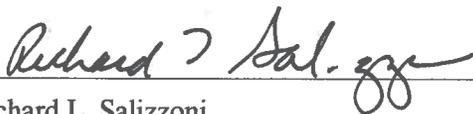


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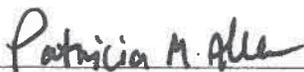


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Date

## SRR Integrated Safety Management System Description

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**Revision Log**

Revision Number	Pages Affected	Description of Revision
1	All	This revision has a limited scope (Editorial Changes Only). Changes to this document are limited to the following: <ul style="list-style-type: none"><li>• Editorial (non-intent) changes</li><li>• Added history of approval of SRR ISMS to Section 1.0</li></ul> Revision bar(s) are used to indicate the location of these changes.

## SRR Integrated Safety Management System Description

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**ACRONYMS**

AA	Authorization Agreement
APO&C	Assessment Performance Objectives and Criteria
AHA	Assisted Hazard Analysis
BBS	Behavior-Based Safety
CAIR	Compliance Assessment Implementation Report
CAP	Corrective Action Program
CARB	Corrective Action Review Board
CAS	Contractor Assurance System
CF	Core Function
CFR	Code of Federal Regulations
CHAP	Consolidated Hazards Analysis Process
CPB	Cost Performance Baseline
CRAD	Criteria Review and Approach Document
DCOP	Disciplined Conduct of Projects
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy
DPO	Differing Professional Opinion
EM	Environmental Management
EMS	Environmental Management System
ERT	Expert Review Team
ES&H	Environmental, Safety and Health
ESQB	Executive Safety and Quality Board
FA	Functional Area
FAPM	Functional Area Program Manager
FEB	Facility Evaluation Board
GP	Guiding Principle
HA	Hazards Analysis
HPI	Human Performance Improvement
IHA	Individual Hazard Analysis
IIE	Integrated Independent Evaluation
IPMS	Integrated Procedures Management System
ISME	Integrated Safety Management Evaluation
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
ISSM	Integrated Safeguards and Security Management
LSIT	Local Safety Improvement Team
LW	Liquid Waste
MCS	Management Control System
MOA	Memorandum of Agreement
MOSAIC	Management of Safety Analysis Integrating Concepts
MRT	Management Review Team
NSC	Nuclear Safety Culture

## SRR Integrated Safety Management System Description

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NTS	Non-Compliance Tracking System
OBS	Organizational Breakdown Structure
OIG	Office of Inspector General
ORPS	Occurrence Reporting and Processing System
ORR	Operational Readiness Review
OSHA	Occupational Safety and Health Administration
PA	Performance Analysis
PAAA	Price Anderson Amendments Act
PAAG	Performance Assurance Advisory Group
PEMP	Performance Evaluation Management Plan
PMP	Performance Management Plan
PO&C	Performance Objectives and Criteria
QA	Quality Assurance
QAMP	Quality Assurance Management Plan
SB	Safety Basis
SCWE	Safety Conscious Work Environment
SOW	Statement of Work
SPPC	Site Policy and Procedure Council
SRNS	Savannah River Nuclear Solutions
SRR	Savannah River Remediation
SRS	Savannah River Site
SR3S	Site Requirements for Services Subcontracted Scope
SS	Safety Significant
S&S	Safeguards and Security
SSC	Structure, System, or Component
SSP	Site Security Plan
SSSP	Site Safeguards and Security Plan
STAR	Site Tracking, Analysis, and Reporting
S/RID	Standards/Requirements Identification Document
USQ	Unreviewed Safety Question
VAR	Vulnerability Analysis Report
VPP	Voluntary Protection Program
WA/EP	Work Authorization/Execution Plan
WBS	Work Breakdown Structure
WP&C	Work Planning and Control
WSHP	Worker Safety and Health Program

## SRR Integrated Safety Management System Description

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### TABLE OF CONTENTS

ACRONYMS .....	4
1.0 BACKGROUND .....	7
2.0 ISM SYSTEM DESCRIPTION.....	8
2.1 Worker Safety and Health Program .....	9
2.2 Quality Assurance Program .....	9
2.3 Contractor Assurance System Description.....	10
2.4 Environmental Management System.....	13
2.5 Integrated Safeguards and Security Management .....	13
3.0 ROLES AND RESPONSIBILITIES .....	14
4.0 ISM SYSTEM IMPLEMENTATION METHODOLOGY .....	16
4.1 Seven Guiding Principles and Five Core Functions.....	19
4.2 Environmental Management System.....	20
5.0 OTHER SRR SAFETY-RELATED INITIATIVES.....	20
5.1 Voluntary Protection Program (VPP).....	20
5.2 Behavior-Based Safety (BBS).....	21
5.3 Human Performance Improvement (HPI) .....	21
5.4 Communications and Training .....	21
Appendices.....	24
APPENDIX A Site-Level Manuals Containing ISMS Implementing Mechanisms .....	25
APPENDIX B Implementation of the ISMS Guiding Principles and Core Functions .....	29
APPENDIX C Site Procedure – SRR Procedure Cross Reference Index .....	42
Attachments .....	63
Attachment 1 Worker Safety and Health Program .....	64
Attachment 2 SRR Quality Assurance Management Plan.....	66
Attachment 3 – SRR Contractor Assurance System Description .....	144

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## SRR Integrated Safety Management System Description

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### 1.0 BACKGROUND

Savannah River Remediation, LLC (SRR) has been recognized for its achievement in safety performance due to the implementation of an Integrated Safety Management System (ISMS) and its supporting safety systems and processes. Continuous improvement has been achieved by not accepting the *status quo*, analyzing goals and objectives, and setting the bar higher with improved processes. This is accomplished through strong management leadership, attention to operational details, and by learning from our and other's experiences through extensive internal and external assessment programs, analysis of the findings and lessons learned, and taking aggressive corrective actions when problems are identified.

This document describes the Integrated Safety Management System (ISMS) used to ensure that safety, quality, and contractor assurance are integrated into work performed under Contract DE-AC09-09SR22505 between Savannah River Remediation (SRR) LLC, and the Department of Energy (DOE). For purposes of this document, the term "safety" refers to environment, safety, health, performance assurance and quality management including pollution prevention, waste minimization, and safeguards and security.

SRR has maintained an ISMS Description document consistent with DOE G 450.4-1C since the company's assumption of the Savannah River Site (SRS) Liquid Waste Operations (LWO) contract on July 1, 2009. At that time, the contract for the LWO of the Savannah River Site (SRS) was transitioned from Washington Savannah River Company (WSRC) to Savannah River Remediation LLC (SRR), at which time SRR retained the approved WSRC ISM System Description until approval of the SRR ISM System Description.

As documented in SRR Transition Plan LWO-TRAN-2009-00001, a thorough "Due Diligence" review of all ongoing Environmental, Safety, Health, and Quality (ESH&Q) functions and activities was conducted for assumption of all ESH&Q responsibilities by SRR. An Executive Safety and Quality Board (ESQB) was formed and the groundwork laid for establishing the SRR ISMS program. A blue sheet review was conducted for existing manuals and procedures, and areas that required revision to reflect the new organizational structure and safety roles and responsibilities were identified. SRR assumed responsibility for Liquid Waste (LW) programs and projects, as discussed in the initial declaration, after confidently reaching the requisite level of understanding to ensure an orderly transfer with no loss of continuity. The Management and Operations (M&O) contractor, Savannah River Nuclear Solutions (SRNS), remained responsible for the ISMS program and the majority of the responsibilities for managing the day-to-day implementation of the ISMS via the procedure management system (also described in the description document); SRR management follows the existing ISMS program as contained in approved site and SRR specific implementing procedures.

The primary source of requirements for SRR's implementation of ISM is the ISM DEAR Clause, 48 CFR 970.5223-1. Section (e) of the DEAR Clause requires SRR "to annually review and

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## SRR Integrated Safety Management System Description

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update, for DOE approval, (our) safety performance objectives, performance measures, and commitments consistent with and in response to DOE's program and budget execution guidance and direction. Resources shall be identified and allocated to meet the safety objectives and performance commitments as well as maintain the integrity of the entire System. Accordingly, the System shall be integrated with the contractor's business processes for work planning, budgeting, authorization, execution, and change control." Keeping with the roll down of requirements from sources to company (site) level procedures, DOE P 450.4A, Integrated Safety Management Policy, rolls down DOE's ISM policy through the SRR Standards/Requirements Identification Document (S/RID) through Policy Manual 1-01, Policy 1.22, "Integrated Safety Management System." This policy, in turn, provides the blueprint for incorporation of safety from the various related sources of information into the site (and thence) to SRR programs and procedures.

SRR performed a baseline Phase I/II ISM assessment in October 2009 with a contractor-assisted verification in 2010 in preparation for a DOE readiness evaluation in June 2010. OSQA-10-0141, "DOE Verification of the Savannah River Remediation (SRR) Integrated Safety Management System (ISMS)," dated 15 July 2010, documents the results of the DOE evaluation and concluded that SRR management and staff demonstrated a strong commitment to safety, that the SRR ISMS was adequate and functioning as intended, and confirmed the effective implementation of the overall SRR ISM System.

Since the completion of this confirmation, the SRR ISMS has included the evaluation of implementation of the ISM as part of the independent assessment portion of the assessment program. Manual S12, Procedure ADM.08, *Integrated Safety Management Evaluation Implementation Procedure*, codifies the inclusion of the ISM evaluation as a part of the SRR Integrated Independent Evaluation (IIE) process. Part of the process of the development of each year's description is the verification that no significant changes are being made to the description that would make it inconsistent with DOE G 450.4-1C.

## 2.0 ISM SYSTEM DESCRIPTION

The objective of the SRR ISMS is to systematically integrate safety, quality, and contractor assurance into SRR management and work practices so that DOE liquid waste activities at all levels are accomplished while protecting the employees, the environment, and the public. Simply stated, the objective of the SRR ISMS is to "Do the right thing. Do safe work".

The essential methodology used to implement the SRR ISMS is by incorporating the concepts, principles and requirements of safe work into site level, company, and facility level procedures used for the performance of work. This is the Integrated Procedure Management System (IPMS). The basic structure of the ISMS is the overarching system SRR uses to manage the conduct of work under the Contract. To embrace continuous improvement, the ISMS structure is enhanced

## SRR Integrated Safety Management System Description

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and supported by the introduction of new and improved standards and processes such as the Voluntary Protection Program (VPP), Behavior Based Safety (BBS), and Human Performance Improvement (HPI).

The ISMS structure also serves as the framework in which the following Management Systems and programs are contained and implemented:

- Worker Safety and Health Program (WSHP)
- Quality Assurance Management Plan (QAMP)
- Contractor Assurance System Description
- Environmental Management System (EMS)
- Integrated Safeguards and Security Management (ISSM)

A brief discussion of each of these management systems follows in this description document. The individual description documents are attached to this description.

The SRR ISMS is tailored to the work with an organizational structure that provides:

- implementation of the ISMS Objective, Guiding Principles, and Core Functions,
- mechanisms for doing safe work,
- unambiguous assignment of responsibilities, and
- alignment with other management systems

### **2.1 Worker Safety and Health Program**

The process by which the SRR WSHP is implemented for work within the SRR scope remains unchanged from that submitted in Savannah River Remediation LLC, Annual Integrated Safety Management System (ISMS) Description And Evaluation – FY2012, SRR-CAA-2013-00008, dated January 15, 2013. The SRR WSHP remains implemented through the ISMS and the site Integrated Procedure Management System (IPMS). The Compliance Assessment Implementation Report (CAIR) for 10 CFR 851 has been updated constituting the submission of the revised WSHP Description.

Additional information on the SRR WSHP is contained in Attachment 1.

### **2.2 Quality Assurance Program**

The SRR Quality Assurance (QA) Program is a key element of the ISMS in ensuring adequate protection of workers, the public, and the environment from adverse consequences. It supports all of the five ISMS Core Functions with a goal of producing products and/or providing services that meet or exceed the expectations of DOE-SR. The degree and level of rigor applied to program elements, items, or activities is based on a graded approach that takes into account the work to be performed and the associated risks and hazards.

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## SRR Integrated Safety Management System Description

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The QA Program addresses three programmatic areas: Management, Performance, and Assessment. These three program areas incorporate the program criteria included in 10 CFR 830 Subpart A, Quality Assurance Requirements; DOE Order 414.1D; Quality Assurance; DOE/RW-0333P Revision 20, Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program; DOE Order 226.1B; Implementation of DOE Oversight Policy; DOE Order 243.1B Records Management Program; and, ASME NQA-1 2009, Quality Assurance Requirements for Nuclear Facility Applications.

The QA Program promotes the effective and efficient achievement of performance objectives by:

- planning and documenting requirements for items, processes, and services,
- controlling activities affecting the quality of items, processes, and services,
- verifying the required quality of items, processes, and services, and
- preventing errors and nonconforming conditions, and reducing variability by building quality into products and processes.

The programmatic QA requirements required by 10 CFR 830 Subpart A, DOE O 414.1D, DOE RW 0333P, Revision 20, DOE EM QAP-Revision 1, and DOE O 243.1B are contained in S/RID Functional Area 2 (Quality Assurance). The S/RID Functional Areas identify the source requirements, provide an index of requirements that are cross referenced to the source document, and links the requirements to the applicable implementing procedures.

Details of the implementation of the SRR Quality Assurance program are contained in a revision to G-QP-G-00001, SRR Quality Assurance Management Plan (QAMP), included as Attachment 2.

### **2.3 Contractor Assurance System Description**

The SRR Contractor Assurance System (CAS) provides a comprehensive and integrated oversight and assurance system essential to contract and customer mission success. The requirements of DOE Policy 226.1B, *Department of Energy Oversight Policy*, and DOE Order 226.1B, *Implementation of DOE Oversight Policy*, to maintain a CAS are incorporated throughout the SRR ISMS and support the full implementation of applicable Quality Assurance Management Program (QAMP) requirements. Implementation of the SRR CAS is performed through the Integrated Procedure Management System (IPMS) in the same way as other elements of the ISMS process are done.

The CAS is part of the framework to implement the corporate responsibility for the safety and health of workers at SRR. Implementation of the CAS is used to identify and address: program and performance deficiencies; opportunities for improvement; provide the means and requirements to report deficiencies to responsible managers and authorities; establish and effectively implement corrective and preventive actions; and share operating experience (lessons learned) across all aspects of operations. Functional Area Managers, who possess the

## SRR Integrated Safety Management System Description

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experience, knowledge, skill, and ability in their particular area of expertise (1Q and 4B Manuals), are charged with establishing effective programs and procedures, as well as, enforcing their implementation. The CAS also establishes the expectation for workers to implement procedures, comply with applicable requirements, deliver effective and efficient performance essential to mission success, and take a Time Out (8Q Manual) to reevaluate the activity before recommencing work.

There are four essential elements to the SRR CAS:

1. Regulatory Compliance – these are the processes necessary to ensure Environmental, Safety and Health (ESH) requirements are flowed down from upper-tier sources into policy / program implementing procedures and are then flowed down (as required) to both individual facility or organization implementing procedures and to subcontractors working in support of the SRR mission and operations. The process for performance of this function is contained in Manual 8B, Compliance Assurance. The identified source document requirements are verified to be included in the necessary SRR or site procedures in accordance with the IPMS.
2. Evaluations – SRR evaluation activities include, but are not limited to:
  - a. assessments (both management and independent safety management evaluations),
  - b. monitoring/observations (Management Field Observations, Behavior Based Safety Observations, Subcontractor Focused Observations)
  - c. evaluations (such as external / third party evaluations, Earned Value Management System Evaluations),
  - d. Quality Assurance activities (such as audits, surveillances, vendor assessments and the QA63 lines of inquiry reviews),
  - e. benchmarking,
  - f. effectiveness reviews,
  - g. extent of condition/extent of problem determinations,
  - h. peer reviews/verifications,
  - i. inspections,
  - j. investigations (such as accident / incident),
  - k. physical surveys (such as radiological protection surveys),
  - l. screenings (such as potential unreviewed safety question determinations), and
  - m. data analysis, tracking and data management.

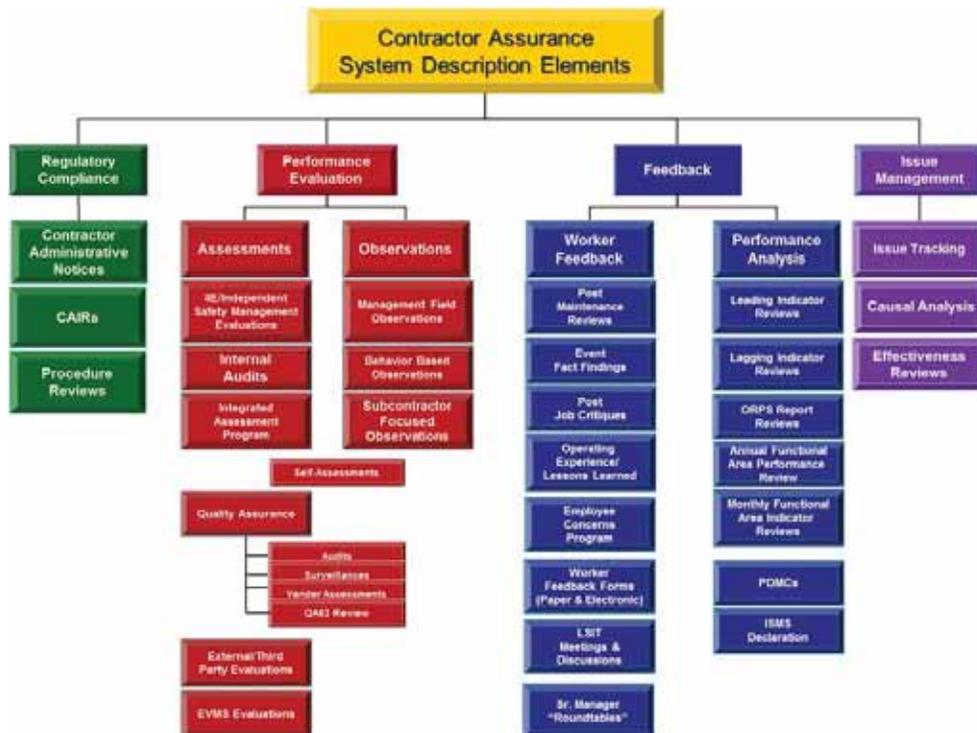
These assurance activities are integrated into the various SRS ISMS programs and procedures. Where applicable, these requirements are flowed down through the procurement system to subcontractors.

SRR Integrated Safety Management System Description

3. Issue Management – issues (either findings or improvement opportunities) raised during evaluations are analyzed and tracked to ensure effective resolution occurs, using a tiered approach based on issue significance.
4. Feedback – there are three general types of feedback making up this element of the CAS:
  - a. Worker Feedback, which includes such activities as post maintenance reviews, event / occurrence fact findings, post job critiques, Nuclear Safety Culture / Safety Conscious Work Environment (NSC / SCWE) surveys and evaluations, worker feedback forms and the Employee Concerns Program,
  - b. Management Evaluations, which include the evaluation of leading and lagging indicators, ORPS reports, quarterly and annual performance evaluations, Performance Objectives, Measures, and Commitments, and the annual ISMS effectiveness declaration, and
  - c. Oversight Reviews – these are second or third level reviews of data evaluated under the management evaluations processes, but these are performed by teams of managers (ranging from facility / organization for Management Review Teams (MRTs) and Corrective Action Review Boards (CARBs) to SRR Company executive level reviews by the Executive Safety and Quality Board (ESQB) for SRR corporate issue reviews).

The following displays this functional relationship pictorially:

Figure 1 – CAS Elements



## SRR Integrated Safety Management System Description

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SRR implementation of this CAS is used to identify and address the following:

- provide the means and requirements to report deficiencies and observations to responsible managers and authorities,
- correct program and performance deficiencies,
- follow up on opportunities for improvement, and
- share operating experience (lessons learned) across all aspects of operations.

SRR-IM-2014-00047, *CAS Description*, is included in this document as Attachment 3. Only minor / editorial changes have been made to the CAS Description since the previous version. Aside from the routine verification of the cross-reference of procedures between SRR and SRNS, changes were made to the CAS Description, at the request of the DOE-SR Office of Quality and Safety personnel, that a method be used to specifically show the locations where DOE O 226.1B Contractor Requirements Document (CRD) requirements are contained in the description. Additional phrasing and clarification of certain points also were made, but the essential CAS Description is unchanged.

### **2.4 Environmental Management System**

The Savannah River Site (SRS) Environmental Management System (EMS) complies with DOE O 450.1A, *Environmental Protection Program*, and DOE O 436.1 *Department Sustainability*, and is documented in the site level *Environmental Management System Description Manual*, G-TM-G-00001. The EMS is built from the framework provided by International Standards Organization (ISO) 14001.

The objective of the EMS is to implement sound stewardship practices which are protective of the air, water, land, and other natural, archaeological, and cultural resources potentially impacted by SRS construction activities and operations. This shall be accomplished through a consistent site-wide approach to environmental protection through the implementation of EMS as part of the overall ISMS. The EMS provides for the systematic planning, integrated execution, and evaluation of SRS activities for: (1) public health and environmental protection, (2) pollution prevention and waste minimization, (3) compliance with applicable environmental protection requirements, and (4) continuous improvement of the EMS. No changes were made to the EMS Manual since the previous submission of this description.

### **2.5 Integrated Safeguards and Security Management**

The SRS ISSM includes all topical areas of safeguards and security (e.g., personnel, physical, and information) and related cross-cutting areas (e.g., export control, classification, foreign visits and assignments, and foreign travel). ISSM assures the adequate protection of DOE assets (e.g., unclassified sensitive matter and government property). The ISSM System is used to

SRR Integrated Safety Management System Description

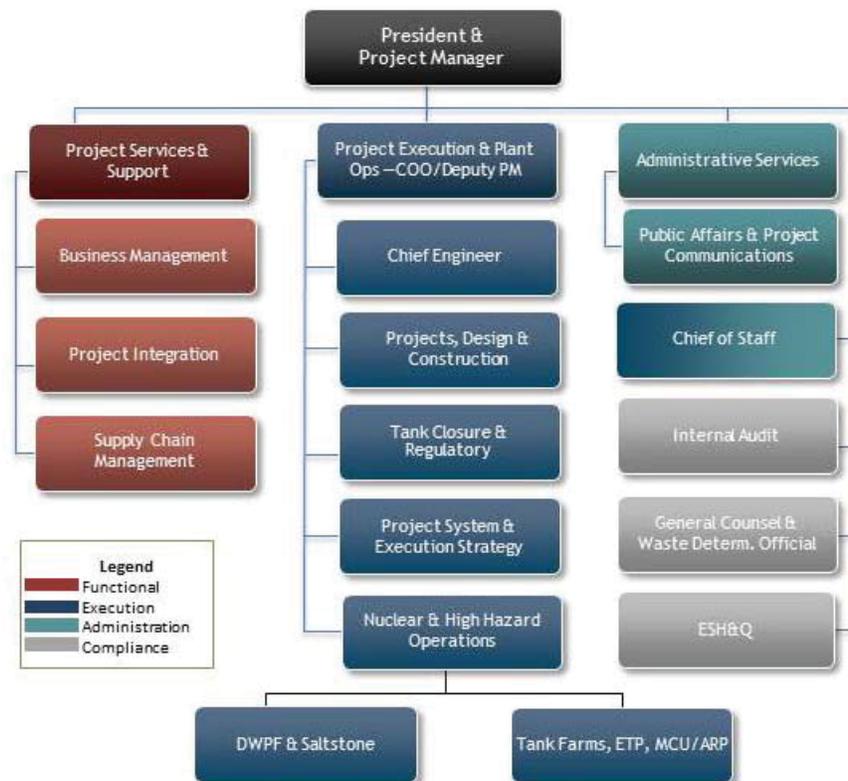
systematically integrate security into management and work practices at all levels so that missions are accomplished effectively. SRR contract obligations significantly limit the number of ISSM areas that are applicable to SRR operations.

SRR personnel utilize the programs, processes and procedures established by the Management and Operations (M&O) contractor for ISSM related functions within its contract scope. This process is contained in Policy Manual 1-01, Policy 4.9, *Integrated Safeguards and Security Management (ISSM)*, available on the Procedures Web Page, and is not included in this document.

### 3.0 ROLES AND RESPONSIBILITIES

SRR is organized in a way that line management is responsible for safety and quality. Unambiguous lines of responsibility within SRR are paramount to effective safety management. The SRR organizational structure has been enhanced to align to an Integrated Project Team model. Figure 2 shows the SRR organizational structure.

Figure 2 – SRR Functional Organization Chart



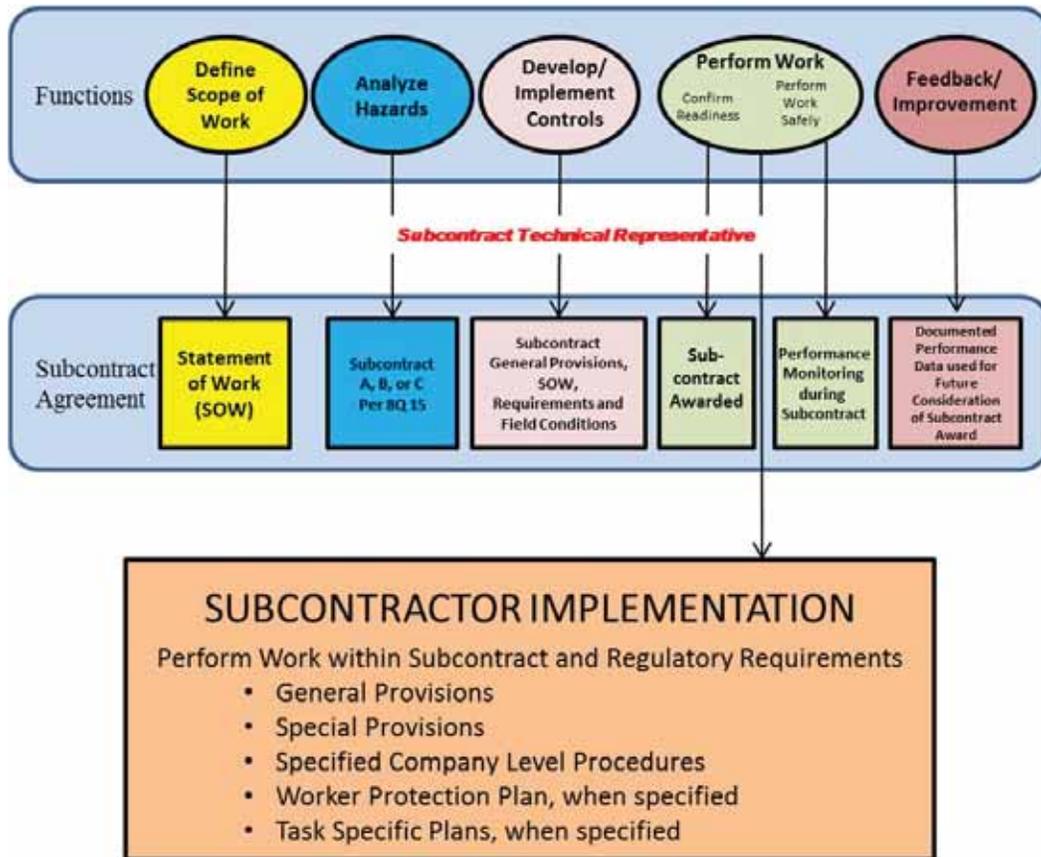
SRR Integrated Safety Management System Description

SRR roles and responsibilities are clearly defined through the Integrated Procedure Management System (IPMS) by the assignment, within each procedure, of responsibilities and approval authorities for each proceduralized activity. SRR’s organizations are staffed with personnel having competence commensurate with their responsibilities. Reporting to the SRR President and Project Manager are personnel having the appropriate line management authority for their areas of responsibility, and they ensure personnel are properly trained and qualified. For the names of the people assigned to each of the positions in Figure 2, consult the SRR Web Page on the site intranet.

Responsibilities of SRR subcontractors are contained in the individual subcontract language and within the individual subcontractor’s respective Worker Safety, Health and Quality Assurance Programs or Worker Protection Plans (for those not working under the SRR WSHP). If there is a conflict between worker protection programs, SRR personnel resolve the issue before allowing the subcontracted task or activity to be performed within Liquid Waste (LW) facilities.

The following pictorially depicts this relationship.

Figure 3 – Subcontractor Requirements Roll Down



## SRR Integrated Safety Management System Description

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Within the CAS, responsibility is assigned to Functional Area Program Managers (FAPMs) representing various areas of expertise. FAPMs are charged with oversight of the effective implementation of SRR programs and procedures. These activities are performed by knowledgeable, trained, and qualified personnel. The reporting relationships are dependent on the particular assurance activity being performed. The overall organizational structure and functional responsibilities are determined by the SRR President and Project Manager, who has the responsibility to ensure that DOE and SRR assurance personnel have unfettered access to the appropriate information and facilities required to implement an effective oversight program, consistent with applicable laws and requirements. Oversight of work for applicable requirements by SRR of subcontractor work is performed on a graded approach based on the tasks and hazard profile of the subcontracted site work.

The expectation for workers to implement procedures, comply with applicable requirements, and deliver safe, effective, quality, and efficient work performance essential to mission success has been clearly established by SRR management and is integral to the ISMS. The CAS provides ongoing verification that these expectations are being met.

The QA Program validates that clear roles and responsibilities are established for the work being performed by SRR and its subcontractors, and assurance that individuals have the competence necessary to discharge the responsibilities they are given. QA is also an integral part of the processes by which work is prioritized, facilities designed, hazards analyzed, standards and controls identified and applied, equipment procured, work performed, and performance evaluated and improved. The QA Program contains documented criteria for developing individual requirement documents. The SRR President and Project Manager identifies the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing work.

### **4.0 ISM SYSTEM IMPLEMENTATION METHODOLOGY**

SRR operations at the SRS are conducted in a manner that protects the employees, the environment and the public. To establish a consistent approach by all contractors, the following SRS policies, signed jointly by the top on-site officials of DOE and site primary contractors, state the objectives to be followed for all work performed on the SRS:

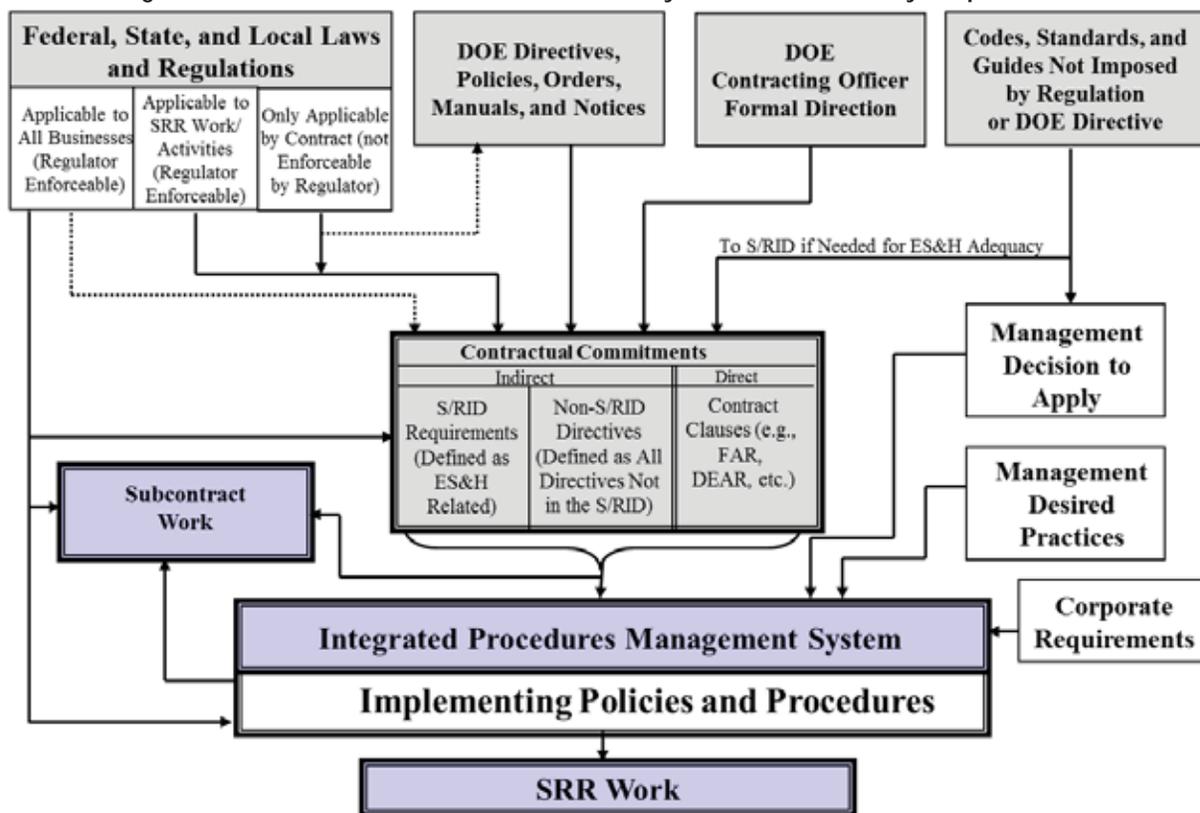
- SRS Environmental Assurance (Manual 1-01 Policy 4.1)
- Quality Assurance (Manual 1-01, Policy 4.2)
- Occupational Safety (Manual 1-01, Policy 4.7)
- Integrated Safeguards and Security Management (ISSM) Policy (Manual 1-01, Policy 4.9)

## SRR Integrated Safety Management System Description

- Industrial Hygiene Policy (Manual 1-01, Policy 4.15)
- Behavior Based Safety Policy (Manual 1-01, Policy 4.25)
- SRS Worker Safety and Health Program Policy (Manual 1-01 Policy 4.28)
- Human Performance Improvement (HPI) Policy (Manual 1-01, Policy 4.29)

These Policies and other Environment, Safety, Health, and Quality Requirements (Figure 4) in the form of laws, regulations, DOE Directives, consensus standards, and other sources flow down into the SRR Standards/Requirements Identification Document (S/RID) which contains those requirements that SRR and DOE agree are applicable to the work and conditions for operating LW facilities.

Figure 4 – Flowdown of Environmental, Safety, Health and Quality Requirements

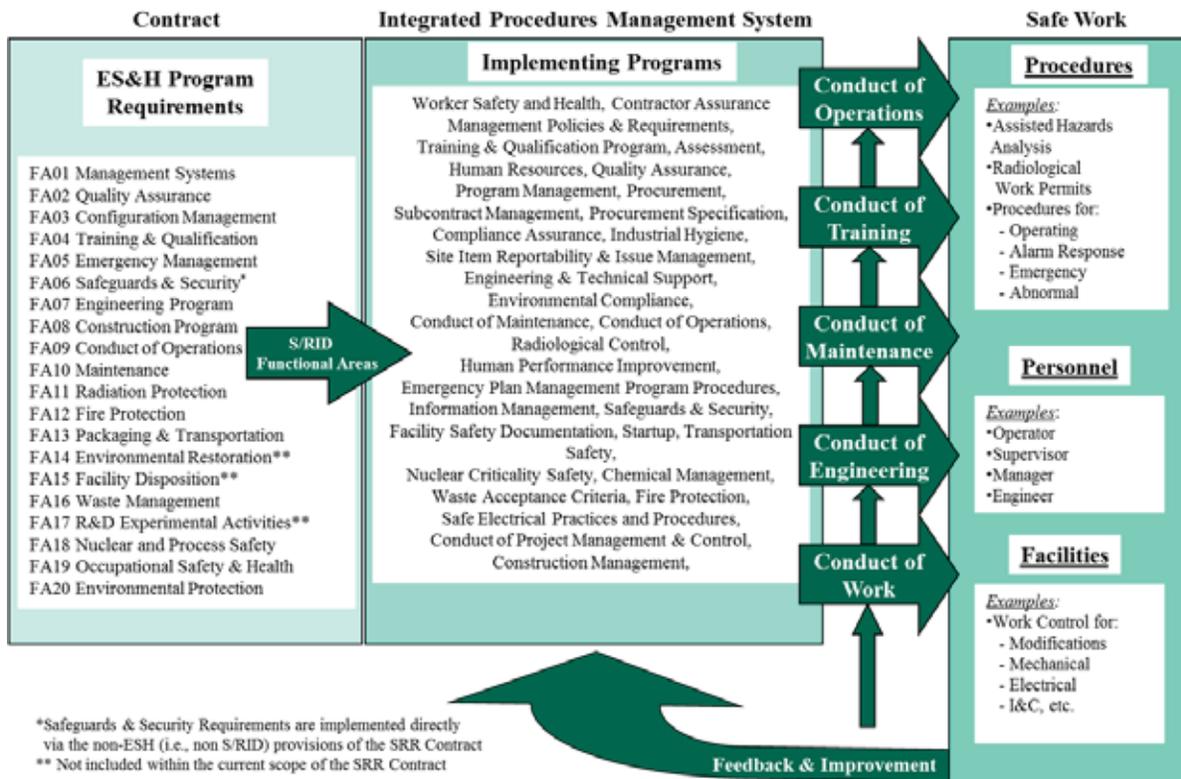


S/RIDs define the applicability of requirements on a facility basis according to the work and hazards conducted at that LW facility. The SRR contract directs that all work be conducted according to the applicable requirements. From the S/RID, the applicable requirements flow down to policies and procedures established and maintained by the IPMS.

SRR Integrated Safety Management System Description

The strategy for implementing the SRR ISMS continues to be the use of programs that meet the DOE’s and SRR’s shared objectives, principles, and functions for tailoring requirements to safely accomplish work at specific facilities. Environment, Safety, Health, and Quality program requirements, including Safeguards and Security requirements, are incorporated into the implementation of work, using the IPMS, through the process illustrated in Figure 5.

Figure 5 – Incorporation of Environmental, Safety, and Health Requirements into Work



Savannah River Nuclear Solutions, LLC (SRNS) serves as program owner and maintains site-wide policies, procedures, and manuals that comprise the mechanisms of the IPMS. SRR shares these mechanisms as described in Memorandum of Agreement (MOA) (G-MOA-G-00002), Functional Service Agreements and Service Level Agreements. The MOA requires that each Party be adequately represented on the Site Policy and Procedure Council (Manual 1B, MRP 3.26), which stipulates that each Party shall concur on any change in site-wide policies, procedures and manuals. Where SRR has deemed it necessary and its implementation of requirements differs from that of SRNS, SRR has developed its own implementing procedures in accordance with the IPMS.

Appendix A provides a crosswalk of site-level manuals within the IPMS that implement SRR’s WSHP, QAMP, and CASD into its ISMS. Appendix B provides a simplified list of the horizontal

SRR Integrated Safety Management System Description

linkages between the program manuals and the ISM guiding principles and core functions. Appendix C provides a cross-reference between site program manuals and procedures and instances where SRR has created company specific procedures where implementation differs.

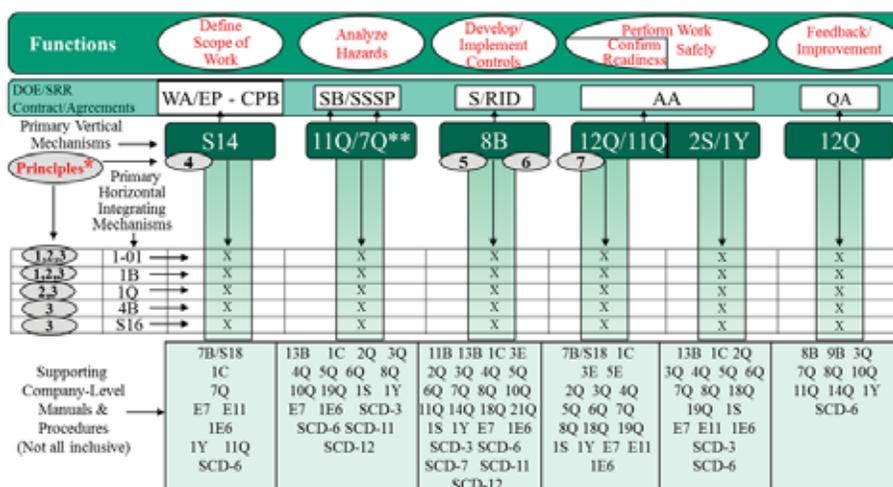
**4.1 Seven Guiding Principles and Five Core Functions**

The DOE Integrated Safety Management Policy, DOE P 450.4A, provides the expectation that an ISM System, based upon the seven Guiding Principles and the five Core Functions, be implemented. Through the implementation of the IPMS, and the SRR management team standards and expectations, these components are adopted as follows:

The Guiding Principles are the fundamental policies that SRR uses to direct actions from the development of safety directives to performance of work. SRR utilizes the Core Functions to provide the necessary structure for any work activity that could potentially affect the employees, the environment, and the public. The appropriate degree of rigor is applied as a continuous cycle in order to address the type of work activity and the hazards involved.

The SRR IPMS, depicted in Figure 6, illustrates the manuals and procedures that define the implementing mechanisms that direct the safe conduct of work, for all activities and organization levels, covered by the SRR Contract. Vertical integration is illustrated by the flowdown of ISMS requirements to the primary procedural mechanisms (manuals) and other supporting manuals and procedures. Horizontal integration is illustrated by the Manuals which cross-cut all of the Core Functions.

**Figure 6 – ISMS Implementing Mechanisms**



- \*ISM Guiding Principles:**
- 1 - Line Management Responsibility for Safety
  - 2 - Clear Roles and Responsibilities
  - 3 - Competence Commensurate With Responsibilities
  - 4 - Balanced Priorities
  - 5 - Identification of Safety Standards and Requirements
  - 6 - Hazard Controls Tailored to Work Being Performed
  - 7 - Operations Authorization

\*\*The mechanism for Safeguards & Security Vulnerability and Risk Analyses is the Security Manual (Procedure Manual 7Q)

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## SRR Integrated Safety Management System Description

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### 4.2 Environmental Management System

The *Environmental Compliance Manual* (Manual 3Q) contains the mechanisms for maintaining all SRR facilities and activities in compliance with applicable federal, state, DOE, and local environmental requirements, and contains the programs for Pollution Prevention and Waste Minimization. An example of SRR's commitment to Pollution Prevention and Waste Minimization is Manual E7, Procedure 1.41 *Sustainability and Pollution Prevention in Design* which provides the process, responsibilities and requirements for inclusion of Pollution Prevention into the design phases of new facilities and modifications to existing facilities. Properly applied, any additional cost incurred in design/construction to achieve Pollution Prevention and Waste Minimization objectives will be offset over the life of the facility by minimizing future waste management and environmental remediation cost. The site level *Environmental Management System Description Manual*, G-TM-G-00001, contains the site-wide implementing programs and procedures crosswalk for all environmental regulatory requirements contained in DOE O 450.1B and DOE O 436.1.

## 5.0 OTHER SRR SAFETY-RELATED INITIATIVES

### 5.1 Voluntary Protection Program (VPP)

By design, the VPP encourages individual responsibility, motivates employees to improve safety and health, and increases worker protection and morale.

The five Elements of VPP are:

- Management Leadership
- Employee Involvement
- Work-Site Analysis
- Hazard Prevention and Control
- Safety and Health Training

The Elements of VPP are embedded in the SRR IPMS, most notably in Manual 8Q, *Employee Safety Manual*. SRR has structured its Occupational Safety and Health Assessment Performance Objectives and Criteria in the Assessment Performance Objectives and Criteria (APO&C) database along the lines of the five VPP Elements. Therefore, conformance with the desired VPP Elements is evaluated when organizations conduct Self-Assessments and / or the company performs an independent oversight activity, such as an IIE. This feature enhances and continuously improves SRR's conformance to those VPP Elements on an ongoing basis and provides evidence for maintenance of VPP Certification.

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## SRR Integrated Safety Management System Description

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### 5.2 Behavior-Based Safety (BBS)

The concepts of BBS are valued and endorsed by SRR senior management and are at the core of employee involvement and engagement. Whereas traditional safety programs primarily focus on identifying and eliminating unsafe conditions and practices, the behavior-based safety process is focused on identifying and reinforcing safe work behaviors. Additionally, the process focuses on identifying and eliminating “at risk” behaviors of people. At risk behavior has been statistically proven to account for 96% of all workplace accidents. The foundation of this process involves individual workers directly in eliminating their own at-risk behaviors through the use of positive reinforcement techniques. The BBS Process is implemented as described in Manual 1-01, Policy 4.25. BBS Local Safety Improvement Teams (LSITs) work with their respective organizations to address BBS implementation issues and specific safety matters at the organization or facility levels. A BBS database, accessible from the site intranet system, is used by individual BBS Observers to log BBS Observations. The accumulated data is “mined” by the LSITs for analysis and trending to identify behaviors that need to be addressed locally and shared site-wide to improve safety performance. Although primarily targeted at improving employee safety, BBS techniques are also supportive of initiatives to continuously improve Conduct of Operations performance. Conduct of Operations performance impacts worker safety as well as protection of the public and the environment.

### 5.3 Human Performance Improvement (HPI)

SRR is an active participant and supporter of HPI. HPI is intended to promote behaviors that support safe and reliable execution of work by recognizing that people make errors (mistakes), but that these mistakes can be anticipated and mitigated by establishing defenses. Those defenses come in the form of error prevention methods and consequence mitigation methods. Excellent human performance requires a work environment in which individuals are motivated to exhibit desired behaviors. Such behaviors must be clearly described, communicated, and, most importantly, reinforced. SRR provides peer assistance, open communication, and positive reinforcement to establish and maintain a culture in which individuals, leaders, and organizational processes eliminate obstacles to excellent human performance.

### 5.4 Communications and Training

SRR produces and distributes the following communications as a means to drive continuous improvements in the safety culture:

- *Safety Culture Monitor* – provides timely dissemination of information on various topics associated with improving the SRR Nuclear Safety Culture and promotes Safety Conscious Work Environment principals.

## SRR Integrated Safety Management System Description

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- *Liquid Headlines* – contains injury statistics and descriptions, lessons learned, highlights of ISMS, NSC, VPP, BBS, and/or other safety related information
- *Safety Toolbox* – provides information to be used in shift turn-over meetings, safety toolbox meetings, or safety meetings to discuss ways to eliminate potential hazards associated with categories of activities (e.g., heat stress prevention)
- *Safety Focus* – provides employee awareness of injury trends
- *Safety Flash* – provides information on a specific safety incident or near miss to alert facilities for similar issues
- *Fact Sheets* – contains lessons learned focused on the human performance element associated with an event by identifying the activity performance mode, error precursors, flawed defenses, and the HPI tools to be used to prevent reoccurrence
- *Liquid Air* – utilizing television monitors located throughout SRR common areas, SRR provides information on various topics of interest on a rolling feed. Items vary from information on latest production accomplishments to reminders of safety and security good work practices

Training and qualification procedures establish standards used to conduct training and qualification programs. Training and qualification plans prepare individuals to perform a job and to maintain performance while in a job. Manuals 1Q, 4B, and S/RID Functional Areas FA 02 (Quality Assurance) and FA 04 (Training and Qualification) provide additional guidance and information.

As additional communications and training methods, SRR supports and provides the following safety culture activities that help focus employees on the elements of the ISMS:

- Safety Meetings
- Holiday Refocus
- Heat Stress Prevention Plan
- VPP Workshop
- Electrical Safety Awareness

## SRR Integrated Safety Management System Description

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### APPENDICES

APPENDIX A	Site-Level Manuals Containing ISMS Implementing Mechanisms
APPENDIX B	Implementation of the ISMS Guiding Principles and Core Functions
APPENDIX C	Site Procedure – SRR Procedure Cross Reference Index

### ATTACHMENTS

Attachment 1	Worker Safety and Health Program
Attachment 2	SRR Quality Assurance Management Plan (QAMP), G-QP-G-00001 Revision 1
Attachment 3	SRR Contractor Assurance System Description (CASD), SRR-IM-2014- 00047, Revision 1

SRR Integrated Safety Management System Description

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**Appendices**









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SRR Integrated Safety Management System Description

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## APPENDIX B

### Implementation of the ISMS Guiding Principles and Core Functions

#### ISMS Seven Guiding Principles (GP)

**GP 1 – Line Management Responsibility for Safety:** *Line management is directly responsible for the protection of the workers, the public, and the environment.*

Implementing Mechanism(s):

- Manual 1-01, *Management Policies*
- Manual 1B, *Management Requirements and Procedures*
- Manual 1-01, MP 1.22, *Integrated Safety Management System (Interim)*

In addition, various procedures define line management actions and approval authorities that represent, for the subject matter covered by the procedure, managerial responsibility for safety.

**GP 2 – Clear Roles and Responsibilities:** *Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within SRR and its subcontractors.*

Implementing Mechanism(s):

- Manual 1-01, *Management Policies*
- Manual 1B, *Management Requirements and Procedures*
- Manual 1Q, *Quality Assurance Manual*
- Manual 1-01, MP 1.22, *Integrated Safety Management System (Interim)*

Procedures within the IPMS contain a section that defines roles and responsibilities for the conduct of that procedure.

**GP 3 – Competence Commensurate with Responsibilities:** *Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.*

Implementing Mechanism(s):

- Manual 1-01, *Management Policies*
- Manual 1B, *Management Requirements and Procedures*
- Manual 4B, *Training and Qualification Program Manual*
- Manual S16, *LW Human Resource Manual*
- Manual 1Q, *Quality Assurance Manual*

## SRR Integrated Safety Management System Description

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**GP 4 – Balanced Priorities:** *Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the workers, the public, and the environment is a priority whenever activities are planned and performed.*

Implementing Mechanism(s):

- Manual S14, *SRR Business Management*

This Principle is implemented at the company level by risk-based budget prioritization and other requirements of Manual S14. Priorities are balanced during work execution guided by a philosophy that no job is so important that it must be performed unsafely.

**GP 5 – Identification of Safety Standards and Requirements:** *Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements is established which, if properly implemented, will provide adequate assurance that the workers, the public, and the environment are protected from adverse consequences.*

Implementing Mechanism(s):

- Manual 8B, *Compliance Assurance Manual*

This Principle is accomplished by selecting, based on the hazards analyses, the appropriate safety standards and requirements from the S/RID, developed according to Manual 8B.

**GP 6 – Hazard Controls Tailored to Work Being Performed:** *Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards.*

This Principle, supported by identification of safety standards (GP 5) and the results of the second Core Function, Hazards Analysis, is accomplished by selecting the appropriate hazard controls that are incorporated into the design and operation of facilities and activities.

**GP 7 – Operations Authorization:** *The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon.*

Implementing Mechanism(s):

- Manual 2S, *Conduct of Operations*
- Manual 11Q, *Facility Safety Document Manual*
- Manual 12Q, *Assessment Manual*

## SRR Integrated Safety Management System Description

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- Manual 8Q, *Employee Safety Manual*
- Manual 1Y, *Conduct of Maintenance*

Operations authorization is primarily implemented by Manual 2S, Procedure 4.4, *Shift Routines and Operating Practices* and Procedure 5.5, *Control of Equipment and System Status*. At the operating facility level, this Principle is ensured by compliance with the requirements in Manual 11Q, Procedure 1.08, *Generation, Review, Approval and Control of Authorization Agreements* and Manual 12Q, Section 2, *Verification of Readiness to Startup or Restart Nuclear Facilities*. Authorization for work in the field to commence is integrated into the Hazard Analysis Process specified in Manual 8Q, Procedure 122, *Task Level Hazards Analysis*. Before work (controlled by the process in Manual 1Y) may commence in an operating facility, the Shift Manager must authorize and release the facility/equipment. Additionally, pre-job briefings are required to be conducted with work participants before work may commence.

### ISMS Five Core Functions (CF)

**CF 1 – Define the Scope of Work:** *Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.*

Implementing Mechanism(s):

- Manual S14, *SRR Business Management*
- Manual E11, *Conduct of Project Management & Controls*
- Manual S23, *SRR Conduct of Project Management Manual*
- Manual 11Q, *Facility Safety Document Manual*
- Manual 7Q, *Security Manual*

Manual S14 contains the mechanisms by which SRR determines what work will be accomplished given the priority of the work and the available funding. Organizational responsibilities are defined in S14 procedures and include Baseline Change Control, Estimating, Planning and Budgeting, and Analysis and Reporting guidelines. Work Authorization is covered in the SRR Earned Value Management System Description, SRR-IM-2010-00009. Work is budgeted within the Integrated Budgeting System and documented in a Work Authorization/Execution Plan (WA/EP).

According to the SRR Contract, the general management goals and objectives for the Savannah River Site (SRS) are outlined in the SRS Strategic Plan and the Environmental Management (EM) Performance Management Plan (PMP). The SRS Strategic Plan establishes goals and

## SRR Integrated Safety Management System Description

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objectives for the site. In accordance with the Performance Evaluation Management Plan (PEMP), SRR performance of EM work is evaluated against EM objectives.

The SRR Management Control System (MCS) is the process used to manage and integrate the mission requirements by the SRR team and its sub-contractors. The MCS transforms mission and requirements into a baseline consisting of scope, schedule, cost, and performance metrics. It also provides a prioritization process to ensure a balanced approach to line and support tasks and resources. The MCS ensures that safety management is integrated into the budget process. The MCS provides the management structure for planning, integrating, and accomplishing goals by organizing and defining the scope of work into a Work Breakdown Structure (WBS) and an Organization Breakdown Structure (OBS).

The WBS is a task or product oriented hierarchical tree that includes all authorized contract work and defines the end products and deliverables in manageable units of work. The clearly defined units of work are then integrated with a responsibility assignment matrix with a cross reference of support organizations to align the proper technical disciplines with the appropriate elements of responsibilities. SRR is organized such that the functional departments are staffed with the unique core personnel required to perform the primary duties associated with the SRS program requirements. Authorized work is assigned to a department based upon the nature of the work. The OBS identifies the SRR organizations required to fulfill the WA/EP requirements. An OBS is used to assign responsibility to the various SRR organizations that plan and control the work.

Manual E11, Project Manual, establishes the site responsibilities and requirements to perform cost effective planning, control, and execution of projects using a risk-based approach. An SRR initiative, Disciplined Conduct of Projects (DCOP), is implemented in Manual E11 to address self-identified project management issues involving leadership, accountabilities and authorities, procedural compliance, and project scope control. Manual S23, SRR Conduct of Project Management Manual, provides additional SRR specific requirements for SRR related project management work.

Early in the project/modification or proposed activity planning, a Safety Basis Strategy is developed according to Manual 11Q, Procedure 1.10. The Safety Basis Strategy establishes the approach to be taken with regard to scope, strategy, materials, and methods that will become prime factors of the facility or activity Safety Basis.

For EM work, Operating Budget allocations and funding are prioritized as follows:

- 1) conduct of safe and secure operations including process facilities and stored radioactive material, and
- 2) projects that will yield the greatest risk reduction benefit.

## SRR Integrated Safety Management System Description

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The Site Safeguards and Security Plan (SSSP), as described in Manual 7Q, is used in addition to the WA/EP for defining the scope of Safeguards and Security (S&S) work and allocation of resources.

**CF 2 – Analyze the Hazards:** *Hazards associated with the work are identified, analyzed, and categorized.*

Implementing Mechanism(s):

- Manual 11Q, *Facility Safety Document Manual*
- SCD-11, *Consolidated Hazard Analysis Process (CHAP) Program and Methods Manual*
- SCD-12, *Safety Documentation Integrated Work Process*
- Manual 7Q, *Security Manual*
- SCD-3, *Nuclear Criticality Safety Manual*
- Manual 8Q, *Employee Safety Manual*
- Manual 1Y, *Conduct of Maintenance*
- Manual 2S, *Conduct of Operations Manual*

Manual 11Q is the primary document that specifies the process for determining facility hazard categories and specifies how to tailor the type and level of Safety Documentation to the type and level of hazards. That manual also specifies the documentation process to establish the safety envelope and approval authorities for Safety Basis documents, and the process for implementing Safety Basis requirements. Additional guidance on the analysis and documentation of hazards is given in SCD-11 and SCD-12.

In the area of S&S, vulnerabilities and threats are treated much the same as industrial safety hazards. Manual 7Q is the primary document that specifies the process for determining the levels of threats and specifies how to tailor S&S controls to the type and level of threat. The Vulnerability Analysis Report (VAR) and the SSSP serve as the S&S analog to Safety Basis documents. The SSSP must be approved by DOE. SRR must develop a facility specific Site Security Plan (SSP) for locations when a SSSP is not required because of the limited scope of interests. The SSP describes the facility's protection programs and is approved by the Facility Manager and DOE. A Modified Security Plan is developed for any activity that modifies the measures outlined in a VAR, SSSP or SSP.

After the scope of work is defined, the hazards of the specific work elements (facility modifications, new facilities, and new non-facility projects/activities, etc.) are identified and a Safety Basis Strategy is established per Manual 11Q, Procedure 1.10. Once identified, hazards are analyzed and categorized by type and quantity as a basis for determining the documentation standards applicable to the work. The term Safety Documentation is used to describe this

## SRR Integrated Safety Management System Description

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documentation. The 11Q Manual addresses process hazards to workers, the public, and the environment. The hazards analysis provides the foundation for identifying standards, requirements, and engineered controls needed to prevent/mitigate identified hazards. This foundation is a crucial element of the standards selection aspect of the SRR Standards/Requirements Identification Document (S/RID), in that applicability of requirements is tailored largely to facility hazard categories. Functional Area 00, *S/RID Purpose and Development of the S/RID*, explains this aspect in detail and includes the identification of SRR facilities within each hazard category. Linking Documents (per Manual 11Q, Procedure 1.06) are used for all Hazard Category 1, 2, and 3 Nuclear Facilities to identify the linkage between Safety Basis requirements and the documents that implement the requirements. In general, the level of safety analysis and documentation required is in proportion to the hazard level and complexity of the facility.

Line Management is responsible for the hazard analyses (a term used broadly here to include safety documentation and associated limits), change management of safety documentation, and assuring that the operation is within the safety envelope parameters (for nuclear facilities these are set forth in the Safety Basis). For nuclear facilities, the Unreviewed Safety Question (USQ) process (Manual 11Q, Procedure 1.05) is the mechanism that ensures proposed changes can be conducted within the bounds of the approved Safety Basis. The analysis of inadvertent nuclear criticality hazards is addressed by SCD-3.

SCD-11 combines several previous site process hazards analysis program into a single unified program, eliminating unnecessary duplication, and addressing the most current DOE hazard analysis requirements. Consolidated Hazard Analysis Process (CHAP) is applicable to both nuclear and non-nuclear facilities. Thus, CHAP supports the "Analyze Hazards" ISM program requirements as related to the evaluation of process hazards. CHAP also coordinates the integration of other specialized hazards analyses (e.g., Fire Hazards Analyses, Nuclear Criticality Safety Analyses, Emergency Preparedness Hazards Assessment) by the early identification of documented hazards analysis data and assumptions, such that all of these hazards analysis activities are using the same data. The functional classification of identified controls is also incorporated into CHAP as a logical extension of the process hazards analysis. An associated feature of CHAP is a tool called "Hazmap" that identifies, for project planners, the hazards analysis activities/reports potentially required at each stage of a project. CHAP incorporates a graded approach, making it applicable to both large and small process hazards analysis activities. Projects are required to complete a CHAP screening list of questions to determine if CHAP is required.

SCD-12 provides a consistent, efficient process for creating and maintaining Safety Basis documentation for SRR facilities/projects. The Integrated Work Process is one of several tools used to ensure that safety is fully integrated into the design process and the subsequent operation

## SRR Integrated Safety Management System Description

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of SRR nuclear and non-nuclear facilities. Additionally, this manual includes an overview of the Management of Safety Analysis Integrating Concepts (MOSAIC) process. MOSAIC is an electronic roadmap for the Safety Basis documentation process.

As SRR continues to improve the ISM Work Planning and Control (WP&C), each function that performs task/activity-level work (i.e., Maintenance, Operations, Construction, etc.) has completed an evaluation to identify any changes necessary for their procedures to align with the DOE WP&C Criteria Review and Approach Document (CRAD). At the activity/task level, the Hazards Analysis (HA) process is described in Manual 8Q, Procedure 122, *Task Level Hazards Analysis*. The HA process is a method for identification hazards such as industrial safety, industrial hygiene, environmental, and radiological hazards associated with specific tasks, and the specification of controls needed to safely perform those tasks. HA consists of Individual Hazard Analysis (IHA) and Assisted Hazard Analysis (AHA). IHA is applied to a variety of routine and repetitive tasks where the individual's safety knowledge and training are sufficient to perform work safely. The AHA is more a formalized process based on the complexity of the tasks, facility hazards/conditions, and the extent of the task hazards. When hazards are beyond the IHA controls, an AHA determination is required to ensure that the scope of the job is defined, the hazards are analyzed, and the controls are specified prior to performing work. The AHA process involves team planning including subject matter experts and workers in the identification of hazards. Manual 8Q, Procedure 122 integrates with the work planning and control processes such as Manual 1Y for maintenance/construction activities and Manual 2S for operational activities. When the AHA is completed and approved, commencement of the work may begin when authorized and released by the Shift Manager or designee. A pre-job briefing is required to be conducted before the work is executed to ensure the scope of work is well understood and the controls are in place to protect the worker. Upon completion of the activity, post-job feedback is solicited (verbal and/or written) from workers to identify potential improvements that may be applied the next time the job is performed.

**CF 3 – Develop and Implement Hazard Controls:** *Applicable standards and requirements are identified and agreed-upon, controls to prevent/mitigate hazards are identified, the safety envelope is established, and controls are implemented.*

Implementing Mechanism(s):

- Manual 8B, *Compliance Assurance Manual*

Manual 8B details how applicable standards and requirements are documented, their applicability is determined, and SRR compliance is assessed. The mechanism for cataloging ES&H requirement applicability for all facilities operated under the Contract is the S/RID. The

## SRR Integrated Safety Management System Description

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SRR S/RID, which lists applicable ES&H requirements, and another document entitled Applicable Non-ESH DOE Directives are both incorporated into the Contract by reference.

The majority of the DOE Directive requirements that drive safeguards and security (Manuals 7Q, 10Q, and 14Q) and Business Management (Manual S14) are on the Non-ESH List. The contractually-driven requirements in the Non-ESH List are mandatory unless exemptions are granted by the cognizant DOE-HQ office. Together, the S/RID and the Non-ESH List represent what is termed ‘List B’ in Department of Energy Acquisition Regulation (DEAR) clause 970.5204-2. This DEAR Clause also defines an optional ‘List A’, a list of “...Applicable Laws and regulations...” A formal ‘List A’ is not documented; however, the SRR S/RID includes those applicable laws and regulations that are ES&H requirements. SRR is obligated to follow all applicable laws and regulations regardless of their presence on any list. The S/RID and the Applicable Non-ESH DOE Directives list are both administered by Manual 8B which directs that both are accessible on the SRS intranet system. Any change to the S/RID requires SRR and DOE-SR formal approval through an S/RID Change Package. Refer to Functional Area 00 of the SRR S/RID for additional discussion of the development, maintenance, and compliance activities associated with the S/RID. S/RID Functional Area 00 also contains listings of SRR facilities grouped by hazard types and levels in a way that facilitates tailoring of the hazard control standards and requirements to the work and hazards at the listed facilities. The Facility Safety Document Manual contains the hazard categorization criteria mechanisms for deciding which facilities appear on the various lists. Similarly, the Security Manual contains the procedures that tailor levels of protection commensurate with the potential security risks and vulnerabilities.

Manual 8B describes the part of the S/RID process whereby a Table 2 is developed to list the SRR manual or procedure that implements each requirement contained in the S/RID.

**CF 4 – Perform Work within Controls:** *Readiness is confirmed and work is performed safely.*

Implementing Mechanism(s):

- Manual 12Q, *Assessment Manual*
- Manual 11Q, *Facility Safety Document Manual*
- Manual 1Y, *Conduct of Maintenance*
- Manual 2S, *Conduct of Operations Manual*
- Manual 8Q, *Employee Safety Manual*
- Manual 1E6, *Construction Management Department Manual*
- Manual 1Q, *Quality Assurance Manual*

Manual 12Q procedures define the mechanisms for confirming readiness to do work prior to facility startup or restart, establishes the basis for confirming readiness, identifies specific

## SRR Integrated Safety Management System Description

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confirmation processes, and designates approval authorities. Key criteria for startup/restart readiness determinations include adherence to the ISMS Guiding Principles. The specific confirmation processes are accomplished by conducting performance-based assessments at the facility/activity by observing qualified operators doing work using authorized procedures. The readiness confirmation process ensures that work may be conducted safely and in accordance with all S/RID and other contractual and regulatory requirements.

Operations at selected facilities (currently Nuclear Hazard Category 2 facilities of primary concern to the Defense Nuclear Facilities Safety Board (DNFSB)) are specifically authorized by Authorization Agreements (AAs) per Manual 11Q, Procedure 1.08. AAs state the basis for DOE's decision to authorize the specific scope of operations specified in the AA. The AA also contains the terms and conditions necessary to ensure the facility can be operated while protecting the environment and the health and safety of the workers and the public.

Manuals 1Y and 2S describe the mechanisms for performing work safely following startup authorization and confirming readiness on a day-to-day basis at the facility/activity level. This is accomplished by Plan of the Day, Plan of the Week, pre-job briefings, shift turnover meetings, and work planning and control processes.

The 2S Manual sets forth the SRR operational standards at the activity/task level for: content, format and procedure approval; communication and notification; training; and shift and facility operations. Manual 1Y, Procedure 8.20, *Work Control Procedure*, establishes a Work Control System that ensures safety is planned and integrated into maintenance/construction activities at the activity level. It implements the Computerized Maintenance Management System (Passport) that supports the work control processes. Manual 1Y, Procedures 8.20, *Work Control Procedure* and 20.01, *Project Specific Addenda*, and Manual 2S, Procedure 6.1, *Alternate Implementation Approval*, provide for documenting, reviewing and approving deviations, exceptions, and alternate implementation methods (from portions of the 1Y and 2S Manuals) for facility and non-facility activities and processes where: 1) the activity or process being performed is significantly different from that described in the 1Y and/or 2S Manuals; 2) the degree of risk associated with the exception/alternate implementation method is low and the financial impact of implementation is so high that meeting the requirements in the manner stated in these procedure manuals is not warranted. In either case, the alternate implementation method or deviation must meet established DOE Order and S/RID requirements or DOE authorization must be obtained to deviate from the established requirements.

The task level hazard analysis process, described in Manual 8Q, Procedure 122, *Task Level Hazards Analysis*, integrates the hazard analysis into the maintenance/construction work planning process and other stand-alone work not covered by Manual 1Y. Manual 1E6 specifies general safety practices that address worker protection for personnel performing construction

## SRR Integrated Safety Management System Description

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work and construction engineering practices that help ensure the safety of the end user of the project. The work control processes used are consistent with the Quality Assurance requirements contained in Manual 1Q, Procedure 9-4, *Work Planning and Control*, and the Hazard Analysis requirements located in Manual 8Q, Procedure 122. The HA procedure integrates with work authorization and work release requirements to ensure the scope of work is defined; the appropriate safety controls are in place; and workers have been properly briefed before the appropriate safety controls are in place and before the execution of work.

Workers are reminded in pre-job briefings to stop work if a hazard or condition is not adequately addressed or is questionable. The two methods of stop work are defined in Manual 1Q, Procedure 1-2, *Stop Work*, which is a formal process, or a “Time Out” (Manual 8Q, Procedure 1, *Safety Principles and Program Responsibilities*), which is informal. The resumption of work is only allowed after the issue has been resolved.

Line Management is responsible for tailoring safety programs to facility work using the 2S Manual and the 1Y Manual as basic operational doctrine. Each Line Manager clearly communicates performance expectations for Conduct of Operations and Maintenance to all workers. Facility personnel are responsible for following procedures that prescribe the controls necessary to perform work safely. Only qualified personnel are allowed to operate and maintain SRR facilities and equipment, except personnel-in-training in directly-supervised training situations. Qualified personnel have been trained to pay particular attention to safety during performance of work and to use appropriate procedures that assure work is performed safely and in accordance with all S/RID and other contractual and regulatory requirements.

**CF 5 – Provide Feedback and Continuous Improvement:** *Feedback information on the adequacy of controls is gathered; opportunities for improving the definition and planning of work are identified and implemented.*

Implementing Mechanism(s):

- Manual 12Q, *Assessment Manual*
- Manual 8B, *Compliance Assurance Manual*
- Manual 1-01, *Management Policies*
- Manual 1B, *Management Requirements and Procedures*

Manual 12Q describes a requirements-based two-tiered system consisting of Management Assessment, based on 10 CFR 830.120 Subpart A, (QA Rule) and DOE O 414.1D Criterion 9, comprised of self-assessments (Manual 12Q, SA-1, *Self-Assessment*) and performance analysis (Manual 12Q, PA-1A, *LW Site Level Quality Performance Analysis*) using strong Line Management involvement; and Independent Assessment (Manual 12Q, FEB-1, *Facility*

## SRR Integrated Safety Management System Description

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*Evaluation Board*) based on 10 CFR 830.120 Subpart A, and DOE O 414.1D Criterion 10, Independent Assessment: a consolidated, multi-disciplined, independent, company-level ISM Evaluation (ISME) activity, performed as part of the IIE process.

The expectation and basis for assessments in both tiers is documented in the APO&C database. These Performance Objectives and Criteria (PO&C) are a "smart sample" of requirements from the SRR S/RID as implemented by site-level procedure manuals. Assessments using PO&C selected from APO&C database have proven appropriate for the following purposes:

- effective identification of deficiencies and opportunities for performance improvement through self-assessment and independent oversight of operational activities
- providing a focus for management to evaluate performance data
- demonstration of field adherence to SRR policies and procedures when applied to operational activities
- demonstration of readiness for nuclear activity startup or restart

The IIE process described in Manual S12 Procedure ADM.08 is the way that SRR conducts independent assessments, called Integrated Safety Management Evaluations (ISMEs) of SRR facility operations/activities, and projects. The Independent Assessment Program provides SRR facility and senior management with performance-based information to support continuous improvement, to direct leadership resources, adjust personnel and financial resources, and identify areas of excellence. The program also satisfies contractual and regulatory obligations for company-level independent oversight.

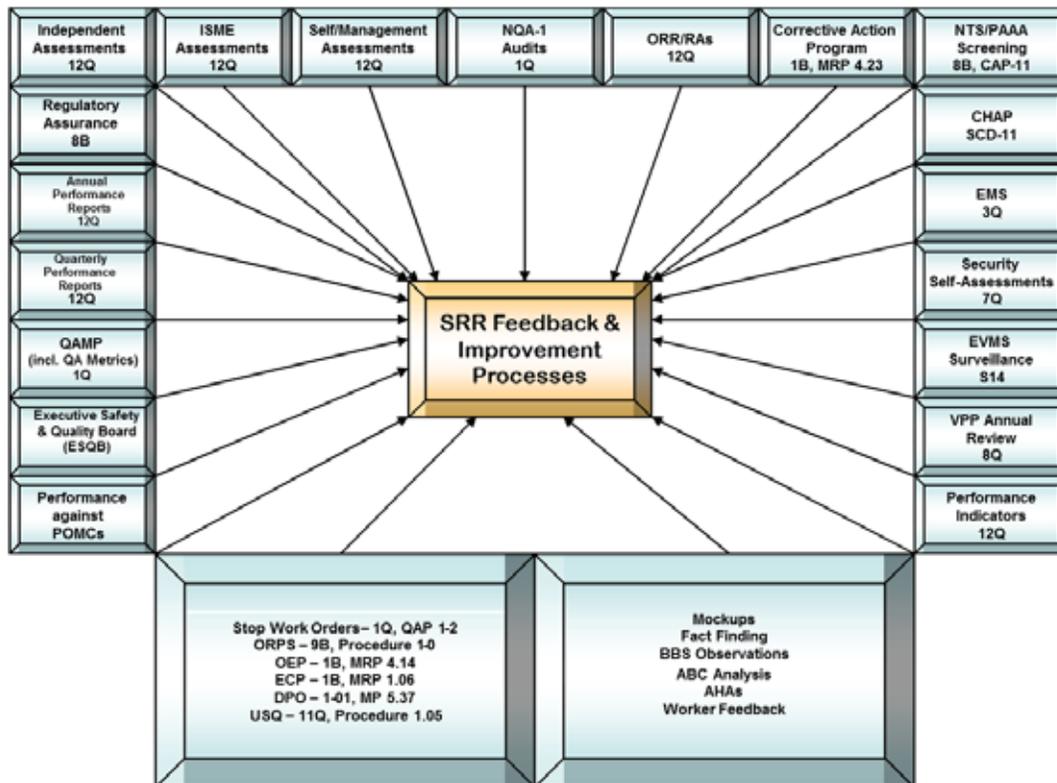
At times, SRR may also choose to utilize an Expert Review Team (ERT), an AECOM corporately sponsored process, which was developed as a means of corporate governance and oversight to enhance the compliance, efficiency and overall performance of the evaluated organization. The ERT members' presence during an ISME can bring corporate experience, lessons learned, and good practices from other DOE and nuclear sites where AECOM has a presence and responsibility. Specific focus areas are added to assessment criteria and evaluated based on recent performance and lessons learned from other facilities and projects. The ERT also provides AECOM performance-based information to support continuous improvement and direct corrective actions. The most significant conclusions and recommendations of the evaluation are aimed at providing a platform that allows current performance to be sustained and improved. In short, the evaluation functions as a leading indicator to drive future management decisions and actions.

Feedback information, as depicted in Figure 7, is screened for potential significant Price-Anderson Amendments Act (PAAA) and WSHP per 10 CFR 851 non-compliances in accordance with Manual 8B and combines with the performance analysis process (Manual 12Q, Procedure PA-1A) to ensure self-reporting and prevent recurrence of non-compliances.

## SRR Integrated Safety Management System Description

Additionally, DOE-HQ and DOE-SR conduct periodic general and focused external independent assessments of ESH and Safeguards & Security programs and activities.

Figure 7 – Feedback Mechanisms



Problems identified by feedback sources are processed through the Corrective Action Program (CAP), Manual 1B, Procedure 4.23, with corrective actions tracked using the Site Tracking, Analysis, and Reporting (STAR) electronic database.

This process is implemented in a tailored manner, with problems assigned to one of four levels of significance, and includes the following elements: problem identification (including Extent of Problem determination), problem significance determination and problem evaluation; lessons learned evaluation; corrective action development (including Extent of Condition determination); implementation and closure; and, effectiveness determinations of completed corrective actions. Post-closure Effectiveness Reviews of completed Significance Category (SC) 1 and 2 corrective actions (optional for SC 3; not required for SC 4) are conducted within 180 days to ensure that the potential for problem recurrence is minimized. Apollo Root Cause Analysis<sup>®</sup> was selected as the preferred root cause analysis method for SRS, but other techniques are allowed. STAR, per

## SRR Integrated Safety Management System Description

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Manual 1B, MRP 4.23, *Corrective Action Program*, defines the process for documenting and managing the resolution of problems to meet the requirements of the CAP.

Performance analysis per Manual 12Q Procedure PA-1A is the process used for periodically analyzing information to identify recurring problems and prioritize improvement opportunities from the analysis of feedback information. PA at the company level is performed quarterly. It evaluates both event-based and review-based data for the most recent 12-month period. The PAAG manages the SRR Quarterly Performance Analysis process and conducts a review of each quarterly report, which is then presented to the ESQB for approval and identification of further actions where appropriate. This process meets the requirements of the DOE Occurrence Reporting and Processing System (ORPS), PAAA/NTS reporting, and supports implementation of the DOE Quality Assurance Rule and Order.

Additionally, SRR is in the process of developing an additional information system to support receipt of worker feedback through kiosk stations and drop boxes. The plan is for worker originated information (issues or improvement opportunities) to be collected in a database and evaluated for action. Where required, issues will be transferred to the site corrective action program or other established systems for monitoring to closure. Feedback to individuals on the result of their submittal will be available in the collection database. Information from this effort will also be available for trending and analysis as described in the previous paragraph.

SRR Integrated Safety Management System Description

**APPENDIX C**  
**Site Procedure – SRR Procedure Cross Reference Index**

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
<b>1-01</b>			
1.1	Quality and Performance Leadership (M&O Scope)	N/A	N/A
1.29	Interface Management Policy (M&O Scope)	N/A	N/A
1.30	Functional/Facility Roles, Responsibilities, Accountability and Authority (R2A2) (M&O Scope)	N/A	N/A
1.31	Mobile Computing Device Acquisition and Usage (M&O Scope)	N/A	N/A
2.10	Equal Employment Opportunity	S21-1.5	Equal Employment Opportunity
2.11	Pay Policy - Company Plan Absences (M&O Scope)	N/A	N/A
2.14	Employment	2.14A	LW Employment
2.15	Compensation (M&O Scope)	N/A	N/A
5.14	Technology Transfer (M&O Scope)	N/A	N/A
5.37	Differing Professional Opinions (DPO)	S19, 1.2	Differing Professional Opinions
6.38	First Line Managers Advisory Committee (M&O Scope)	N/A	N/A

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
<b>1B</b>			
1.02	Approval Letter System	1.02A	LW Approval Letter System
1.03	Professional Society Memberships, Committee, and Organization Participation and Licenses	S13-3.2	Professional Society Memberships, Committee and Organization Participation and Licenses
1.05	Release of Information (M&O Scope)	N/A	N/A
1.06	Employee Concerns Program	S19, 1.1	Employee Concerns Program
1.07	Inventions, Invention Disclosures and Patents (Including Software Inventions)	S13-3.1	Intellectual Property, Invention Disclosures and Invention Evaluation
1.13	Work for Others	1.13A	LW Work for Others
1.14	Inter-Entity Work Orders/Memorandum Purchase Orders (M&O Scope)	N/A	N/A
1.23	Cooperative Research and Development Agreements	1.23A	Liquid Waste (LW) Cooperative Research and Development Agreements
1.25	Americans with Disabilities Act (ADA) and Medical Restrictions	S21-1.1	Americans with Disabilities Act (ADA) Accommodation
1.27	Discrimination / Harassment Complaints	S21-1.3	Discrimination / Harassment Complaints
1.28	Sexual Harassment Complaints	S21-1.4	Sexual Harassment Complaints

SRR Integrated Safety Management System Description

APPENDIX C  
Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
1.32	Memorandum of Understanding and Memorandum of Agreement Process for Non-SRS Tenants (M&O Scope)	N/A	N/A
3.03 3.03A	General Travel Procedure	S13-2.1	General Travel
3.10	Limits of Authority Procedure	S13-3.3	Liquid Waste (LW) Limits of Authority
3.17	Morale and Motivation Funds (M&O Scope)	N/A	N/A
3.23 3.23A	Taxability of Prizes/Awards LW Taxability of Prizes/Awards	S13-1.10	Taxability of Awards and Prizes
3.26	Management of Site-Level Policies and Procedures (M&O Scope)	N/A	N/A
3.27	Management of Program-Specific Administrative Procedures	1B, 3.27A	LW Management of Program-Specific Administrative Procedures
3.47	Collection of Debts from Employees, Former Employees, and Vendors	S13-1.5	Debt Collection Process
3.55	Management of Radios and RF Spectrum-Dependent Equipment  (M&O Scope)	N/A	N/A
3.64	Davis-Bacon Act Applicability	3.64A	LW Davis-Bacon Act Applicability
3.75	Nondisclosure Agreement Process (M&O Scope)	N/A	N/A

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
3.76	Non-seconded Reachback Assignment (M&O Scope)	N/A	N/A
4.24	Senior Management Review Board (M&O Scope)	N/A	N/A
5.29	Nuclear Materials Management (M&O Scope)	N/A	N/A
<b>8B</b>			
13	Statistical Trending	13A	LW Statistical Trending
<b>12B</b>			
1.05	Software Management (M&O Scope)	N/A	N/A
2.01	Acquisition and Management of Telecommunications Products and Services (M&O Scope)	N/A	N/A
<b>1D</b>			
3.02	Site Real Property Configuration Control (M&O Scope)	N/A	N/A
<b>1Q</b>			
2-1	Quality Assurance Program [NQA-1 2008/2009a]	2-1A	LW Quality Assurance Program [NQA-1 2008/2009a]
		2-1Q	Quality Assurance Program [NQA-1 2000]

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
3-1	Design Control [NQA-1 2008/2009a]	3-1	Design Control [NQA-1 2008/2009a]
		3-1Q	Design Control [NQA-1 2000]
7-2	Control of Purchased Items and Services [NQA-1 2008/2009a]	7-2	Control of Purchased Items and Services [NQA-1 2008/2009a]
		7-2Q	Control of Purchased Items and Services [NQA-1 2000]
7-3	QA Requests for Commercial Grade Item and Services [NQA-1 2008/2009a]	7-3	QA Requests for Commercial Grade Item and Services [NQA-1 2008/2009a]
		7-3Q	Commercial Grade Item Dedication [NQA-1 2000]
8-1	Identification and Control of Items [NQA-1 2008/2009a]	8-1	Identification and Control of Items [NQA-1 2008/2009a]
		8-1Q	Identification and Control of Items [NQA-1 2000]
13-1	Packaging, Handling, Shipping and Storage [NQA-1 2008/2009a]	13-1	Packaging, Handling, Shipping and Storage [NQA-1 2008/2009a]
		13-1Q	Packaging, Handling, Shipping, Storage and Receiving [NQA-1 2000]
17-1	Quality Assurance Records Management [NQA-1 2008/2009a]	17-1	Quality Assurance Records Management [NQA-1 2008/2009a]
		17-1Q	Quality Assurance Records Management [NQA-1 2000]
19-2	Quality Improvement (cancelled 10/02/12)	19-2A	LW Quality Improvement
<b>12Q</b>			

SRR Integrated Safety Management System Description

APPENDIX C  
Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
PA-1	Performance Indicators and Analysis	12Q-PA-1A	LW Performance Analysis
ORR-1 (Deactivated 6/11/2015)	Nuclear Startup/Restart Readiness Review Determination	12Q-ORR-1A	LW Nuclear Startup/Restart Readiness Review Determination
RA-1 (Deactivated 6/11/2015)	Readiness Assessment (RA) – Level Determination	12Q-RA-1A	LW Readiness Assessment (RA) – Level Determination
<b>E7</b>			
2.02	Baseline Technical Task Requests	2.02A	LW Baseline Technical Task Requests
2.05	Modification Traveler	2.05A	LW Modification Traveler
2.06	Temporary Modification Control	2.06A	LW Temporary Modification Control
2.25	Functional Classifications	2.25A	LW Functional Classifications
2.31	Engineering Calculations	2.31A	LW Engineering Calculations
3.04	SSC Performance Monitoring	3.04A	LW SSC Performance Monitoring
3.46	Replacement Item Evaluation/Commercial Grade	3.46	Replacement Item Evaluation/Commercial Grade Dedication [NQA-1

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
	Dedication [NQA-1 2008/2009a]		2008/2009a]
		3.46Q	Replacement Item Evaluation/Commercial Grade Dedication [NQA-1 2000]
5.01	Software Engineering and Control	5.01 (SRR utilized 5.01A, 5.03A, 5.04A, 5.07A, 5.10A, 5.20A, 5.40A prior to Rev 4 of E7, 5.0, approved by SPPC on 3/19/2015 and effective on 4/23/2015. At this time SRR's "A" procedures were deactivated.)	Software Engineering and Control
5.61	Engineering & Scientific Software Distribution and Control (Cancelled 3/27/2013, See E7, 5.01)	5.61A	LW Engineering & Scientific Software Distribution and Control
5.62	Computer Program Modification Tracker (Cancelled 3/27/2013, See E7, 5.01)	5.62A	LW Computer Program Modification Tracker
5.80	Data Management (Cancelled 3/27/2013, See E7, 5.01)	5.80A	LW Data Management
E7-1	Design Engineering Conduct of Engineering and Technical Support	E7-1A	SRR Design Services Conduct of Engineering And Technical Support
		DE-DP-109	Design Services Design Integration Desktop Instructions and Awareness Memorandum
		DE-DP-120	Design Trend Codes
		DE-DP-121	Design Drawing Amendments (at draft)

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		DE-DP-306	Design Services Deliverables
		DE-DP-360	SIL Verification Calculation (at review)
		DE-DP-383	Piping Data Sheet Package
		DE-DP-385	Component Location Identifier (CLI) Processing
		<b>Manual S13</b>	<b>Liquid Waste (LW) Company Level Administrative Procedures</b>
1B-1.18	Internal Audit Process and Audit Follow Up (cancelled 12/22/09)	S13-1.1	SRR Internal Audit Process and Audit Follow-Up
1B-3.23A	LW Taxability of Prizes/Awards	S13-1.10	Taxability of Awards and Prizes
		S13-1.11	Employee Participation in Community Commitment and Public Affairs Programs
		S13-1.12	Property Administration
1B-3.63	Receipt of Cash or Checks	S13-1.4	Receipt of Cash or Checks
1B-3.47	Collection of Debts from Employees, Former Employees, and Vendors	S13-1.5	Debt Collection Process
		S13-1.6	Corporate Support

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S13-1.7	Time Reporting
1-01-1.3	Internal Controls	S13-1.8	Internal Controls
		S13-1.9	Prime Contractor Request for Equitable Adjustment (REA)/Change Proposal Process
1B-3.03A	General Travel Procedure	S13-2.1	General Travel
		S13-2.2	SRR Event Attendance
		S13-3.1	Intellectual Property, Invention Disclosures, and Invention Evaluation
1B-1.03	Professional Social Memberships, Committee and Organization Participation and Licenses	S13-3.2	Professional Society Memberships, Committee and Organization Participation and Licenses
1B-3.10	Limits of Authority	S13-3.3	Liquid Waste (LW) Limits of Authority
		S13-5.1	Executive Safety And Quality Board (ESQB) Charter
		S13-5.2	Development of the SRR Integrated Assessment Plan
		S13-5.3	SRR Implementation of URS Global Management & Operations Services (GMOS) Significant Event Notification Standard
		S13-5.4	Liquid Waste (LW) Strategic Initiatives Development

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S13-5.5	Review Board Guidelines
		S13-5.6	Readiness Review Administration
		S13-5.7	Employee Feedback via “Feedback Forms”
1-01 – 1.4	Legal and Ethical Conduct	S13-6.1	Legal and Ethical Conduct
1-01 - 1.20	Reporting Fraud, Waste and Abuse	S13-6.2	Reporting and Protection of Reporting of Fraud, Waste and Abuse, Neglect, Conflict of Interest, Bribery, Violations Specified Under Section 1553 of ARRA, Gratuity Violations and Violations Under The False Claims Act
		S13-6.3	Legal Hold Policy Evidence Preservation, Retention and Retrieval Suspension of Document Destruction
		S13-7.1	Benchmarking Visit Process
<b>6B</b>	<b>Program Management Manual</b>	<b>Manual S14 (Replaced Entire 6B Manual)</b>	<b>SRR Business Management</b>
		S14-1.0	Glossary
		S14-1.1	Control Account Manager Responsibilities and Duties
		S14-1.10	Baseline Change Control
		S14-1.11	Earned Value Management System (EVMS) Surveillance

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S14-1.12	Risk Management
		S14-1.13	Subcontractor Planning And Control
		S14-1.14	Material Planning And Control
		S14-1.15	ARRA Scope Addendum
		S14-1.2	Work Breakdown Structure/Dictionary, EVMS OBS and RAM
		S14-1.3	Performance Measurement Baseline (PMB) Estimating, Planning and Budgeting
		S14-1.4	Work Authorization
		S14-1.5	Scheduling
		S14-1.6	Earned Value Status and Update
		S14-1.8	Estimates at Completion (EAC)
		S14-1.9	Analysis and Reporting
		S14-Appendix 1	Organization Process Flow
		S14-Appendix 10	Material Process Flow
		S14-Appendix 11	Monthly EAC Update Process Flow

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S14-Appendix 2	Planning and Budgeting Process Flow
		S14-Appendix 3	Earned Value Reporting Process Flow
		S14-Appendix 5	Comprehensive EAC Flow Process
		S14-Appendix 6	Analysis Process Flow
		S14-Appendix 7	Change Control Process Flow
		S14-Appendix 8	Work Authorization Process Flow
		S14-Appendix 9	Subcontract Process Flow
		<b>Manual S15</b>	<b>SRR Finance and Accounting</b>
		S15-1.1	Finance and Accounting Manual - Description of Policies and Practices
		S15-1.10	General Ledger Account Reconciliations
		S15-1.11	Journal Entries
		S15-1.12	Billings
		S15-1.13	Accounts Payable Process
		S15-1.14	Cash Management Process

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S15-1.15	Allocation of Direct and Indirect Costs
		S15-1.16	Accounting for Income, Rebates, Refunds, Allowances or Other Miscellaneous Credits
		S15-1.17	Project Accounting
		S15-1.19	Lease Versus Purchase Analysis And Lease Determination
		S15-1.2	Labor Distribution
		S15-1.20	Accounts Receivable
		S15-1.21	Accounting Records Management
		S15-1.22	Improper Payments and Government Refunds
		S15-1.3	Accruals Processing
		S15-1.6	Planning Rates
		S15-1.7	Accounting for Unallowable Costs
		S15-1.9	Payroll Process
<b>5BA (Replaced 5B)</b>	<b>LW Human Resource Manual</b>	<b>S16 Manual (Replaced 5BA Manual)</b>	<b>LW Human Resources Manual</b>
		S16-1.1	Employee Records

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S16-1.11	Employee Performance and Documentation
		S16-1.12	Disciplinary Process
		S16-1.15	Long Term Temporary Assignment
		S16-1.16	Time Bank Plan
		S16-1.17	Pay For Time Worked
5BA-3-7A and 1-01, 2.15		S16-1.18	LW Compensation
		S16-1.19	Tuition Reimbursement Program
		S16-1.20	Meals
		S16-1.22	Overtime - Nonexempt
		S16-1.23	Overtime - Exempt
		S16-1.24	Overtime and Premium Pay For Selected Overtime Positions
5BA-3-14A and 1-01, 2.11		S16-1.25	Company Paid Absences and Leaves Of Absence
		S16-1.26	Employee Plans and Benefits - General
		S16-1.29	Employee Assistance Program

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S16-1.3	Appointments and Organizational Changes
		S16-1.31	Grievance Procedure
		S16-1.32	Suitability For Employment
		S16-1.34	Work Hours And Schedules
		S16-1.35 (in review)	Routine Telework Procedure
		S16-1.4	General Human Resources Program
		S16-1.5	Resource Planning
		S16-1.6	Limited Service Employment
		S16-1.7	Exempt Relocation
		S16-1.8	Termination Practices
		S16-1.9	Fitness For Duty
<b>1-01</b>	<b>Management Policies</b>	<b>Manual S17</b>	<b>Liquid Waste (LW) Management Policies</b>
1-01-3.23	Site Cost Estimating	S17-1.1	Cost Estimating Policy
		S17-1.2	Cost Estimating

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
3B 7B (See Manual TOCs for applicability to SRR)	Property and Materials Management Manual Requisitioning Manual	Manual S18	SRR Procurement Services Manual
		S18-1.0	Glossary of Terms and Definitions
		S18-1.1	Liquid Waste (LW) Purchase Requisitioning
		S18-1.10	Receipt of Material
		S18-1.11	Guidance Related to Warehousing and Material Control
		S18-1.12	Compensatory Measures for Fire Safety Deficiencies in Building 241-102H
		S18-1.2	Strategic Agreements
		S18-1.3	Shelf Life Program
		S18-1.5	Purchase Requisitioning of Leased Equipment
		S18-1.6	Advance Procurement Planning
		S18-1.7	Purchasing Card Procedure
		S18-1.8	Material Access Center (MAC) Storage Facility Procedure
		S18-1.9	SRR Ordering Process from M&O Contractor Inventory

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S18-2.0	Procurement Practices
		S18-2.1	SRR General Provisions/Terms and Conditions for Subcontracts and Purchase Orders
		S18-2.10	Standard Solicitation Format
		S18-2.11	Strategic Sourcing Process
		S18-2.12	Signature Authority Thresholds
		S18-2.13	Notification of Award, Debriefing of Unsuccessful Offerors, and Protests
		S18-2.14	Procurement File Organization
		S18-2.15	Claims
		S18-2.16	Closeout of Orders
		S18-2.17	Subcontract Audit
		S18-2.18	Procurement Quality Assurance Requirements
		S18-2.19	Best Value Source Selection
		S18-2.2	Purchasing Action Under Review (PUR) Standard Format
		S18-2.20	Service Contract Act

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S18-2.21	Determination of Price Reasonableness
		S18-2.22	Performance-Based Milestone Payments
		S18-2.23	Task Order/Blanket Order Subcontract Releases
		S18-2.24	SRR Procurement Forms Listing
		S18-2.3	Purchasing Information (PI) Form
		S18-2.4	Foreign Ownership, Control or Influence (FOCI)
		S18-2.5	Organizational Conflicts of Interest
		S18-2.6	Socioeconomics
		S18-2.7	Davis-Bacon Act Wage Determinations
		S18-2.8	Government Property Process
		S18-2.9	Emergency Procurement Process
		<b>Manual S19</b>	<b>Employee Concerns Program (ECP) Administrative Procedures</b>
		S19-1.1	Employee Concerns Program
		S19-1.2	Differing Professional Opinions
		<b>Manual S20</b>	<b>Training Administration Guides (TAGs)</b>
		S20-1.1	Oral Board Training Administration Guide (TAG)

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S20-1.2	Performance Demonstration Training Administration Guide (TAG)
		S20-1.3	Multimedia Training Training Administration Guide (TAG)
		S20-1.4	Examination Materials Training Administration Guide (TAG)
		S20-1.5	“Exceptions to Training” Training Administration Guide (TAG)
		S20-1.6	Qualification Card Training Administration Guide (TAG)
		S20-1.7	Training Requests Training Administration Guide (TAG)
		S20-1.8	Remediation Training Administration Guide (TAG)
		S20-1.9 (in draft)	Simulator Drills Training Administration Guide (TAG)
<b>1B 1-01</b>	<b>Management Requirements and Procedures Management Policies</b>	<b>Manual S21</b>	<b>Equal Employment Opportunity (EEO) &amp; Employee Concerns Program (ECP) Administrative Procedures</b>
1B-1.25	Americans with Disabilities ACT (ADA) Accommodation	S21-1.1	Americans with Disabilities Act (ADA) Accommodation
		S21-1.2	Medical Restrictions Accommodation
1B-1.27	Discrimination / Harassment Complaints	S21-1.3	Discrimination / Harassment Complaints
1B-1.28	Sexual Harassment Complaints	S21-1.4	Sexual Harassment Complaints

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
1-01-2.10	Equal Employment Opportunity	S21-1.5	Equal Employment Opportunity
<b>E11</b>		<b>Manual S23</b>	<b>SRR Conduct of Project Management Manual</b>
GLOSSARY	Glossary	S23-1.0	Glossary of Terms
1.01	Project Management & Control Systems Description	S23-1.1	Project Management Manual System Description
		S23-1.10	Roles, Responsibilities, Accountabilities, and Authorities for Projects (R2A2)
		S23-1.11	Guidance for Achieving Readiness
2.20	Turnover Process	S23-1.7	Turnover Process
		<b>Manual S24</b>	<b>SRR Information Technology (IT) Manual</b>
		S24-1.1	Guidelines Regarding Mobile Computing Devices
		S24-1.2	SRR Application Vulnerability Management
		S24-1.3 (in review)	Retention and Maintenance of SRR Litigation Hold Information
		<b>Manual S25</b>	<b>LW Procedure Systems Administrative Procedures Manual</b>
		S25-PS.01	Liquid Waste Operations Procedure Writer's Guide

SRR Integrated Safety Management System Description

APPENDIX C

Site Procedure – SRR Procedure Cross Reference Index

Previous Manual/Procedure Number	Title	New SRR Manual /Procedure Number	New SRR Title
		S25-PS.02	Liquid Waste (Tank Farms) Transfer Procedure Boiler Plate
		S25-PS.03	Liquid Waste (Tank Farms) Maintenance Procedure Boiler Plate
		S25-PS.04	Liquid Waste Operations OSR Forms Guidance and Instructions
		S25-PS.05	Liquid Waste Operations Quality Checker Checklist and Guidance
<b>SCD-4</b>	DEACTIVATED 7/17/2014  (SCD-4 is maintained as APO&C: Assessment Performance Objectives & Criteria (New SCD-4 Database) in the Assessment Module of STAR.)	(SCD-4 is maintained as APO&C: Assessment Performance Objectives & Criteria (New SCD-4 Database) in the Assessment Module of STAR.)	FA-08A and FA-23A were also Deactivated

## **Attachments**

## **Attachment 1 Worker Safety and Health Program**

The SRR ISMS is the mechanism by which SRR fulfills its contractual responsibilities to provide a place of employment that is free from recognized hazards that may have the potential to be fatal or cause serious physical harm to workers. This ensures that work is performed in accordance with applicable requirements of 10 CFR 851, *Worker Safety and Health Program*.

The SRR WSHP applies to all work performed on the Savannah River Site by SRR, all work subcontracted by SRR, and provides coordination with other onsite contractors. Onsite contractors that perform work in and around SRR facilities are responsible for compliance with the ES&H requirements as specified in their worker safety and health plans and SRR policies as applicable. Interface agreements with the other onsite contractors define the roles and responsibilities for implementation of these requirements. For SRR subcontractors, the ES&H requirements are contractually flowed-down through the individual subcontractor's worker safety and health plans. SRR reviews these plans and provides oversight of the work to ensure compliance with the requirements.

The requirements of the WSHP Rule are implemented by a number of SRR policies, manuals, and procedures as described in the CAIR for 10 CFR 851 (link at the end of this section). Programmatic WSHP implementation is driven by the following implementing mechanisms:

- Policy Manual 1-01, MP 4.28, *Worker Safety and Health Program*
- Manual 9B, Procedure 2-0, *Identifying, Reporting and Tracking Noncompliances Under the DOE Nuclear Safety and Worker Safety and Health Regulations*

Requirements related to worker protection from process hazards are addressed in Manual 11Q, *Facility Safety Document Manual*. Additional worker safety elements specific to construction work are addressed in Manual 1E6, *Construction Management Department Manual*. Manuals 2S and 1Y contain provisions for alternate implementation methods for selected portions of these manuals where certain features of 2S and 1Y are not appropriate. Those special provisions are approved and inserted into the respective 2S or 1Y Manual. The special provisions meet S/RID requirements and are consistent with all company-level programs. At the activity level, implementation of the worker protection program is tailored to the activity/work according to Manual 8Q, Procedure 122, *Task Level Hazards Analysis*. That procedure invokes use of the Hazards Analysis (HA) process to ensure the work is planned and conducted in a manner that meets S/RID requirements and is integrated with other company-level programs. In addition to worker safety, many of the programs also have features designed to protect the public and the environment.

For work performed by subcontractors, SRR Manual S18, *SRR Procurement Services Manual*, Manual 11B, *Subcontract Management Manual*, Manual 3E, *Procurement*

*Specification Procedure Manual*, Manual 8Q Procedure 15, *Subcontractor and Visitor Workplace Safety and Health*, and Procedure Manual PM-TS-AP-4201, *Subcontract Technical Representative*, direct the specification and documentation of safety and health requirements in purchase requisitions and Subcontract Statements of Work (SOW).

The Site Requirements for Services Subcontracted Scope (SR3S) database is invoked by Manual 3E, *Procurement Specification Procedure Manual*, to assure the flow down of appropriate SRR S/RID requirements into subcontracts. That database, accessible on the SRS intranet system, assists preparers of procurement SOW by providing pre-prepared text that describes requirements for certain key SOW activities. The prepared texts contained in the SR3S database were developed by the responsible FAPMs and SMEs.

Manual 8Q Procedure 15 establishes responsibilities and requirements to ensure visitors, vendors, and subcontractors are provided a safe work environment while at SRS. That procedure and Manual 7Q, *Security Manual*, establish Point of Entry requirements that include presentation of General Site Safety, Security, and Radiological Point of Entry briefings for all non-photo (temporary) badged personnel prior to entry onto the SRS.

SRR implements a near miss program (Manual 9B, *Site Item Reportability and Issue Management*), in which near miss incidents and minor injuries are reported and analyzed for corrective actions that may prevent the recurrence of similar incidents having potentially more severe consequences. Reports of near misses judged to be potentially significant are transmitted appropriately to personnel via the Operating Experience Program.

The CAIR for 10 CFR 851 is available at the following SRS Intranet address for all CAIRs:

[http://lwnet.srs.gov/rss/index.asp?module=S/RID\\_cair&id=esh](http://lwnet.srs.gov/rss/index.asp?module=S/RID_cair&id=esh)

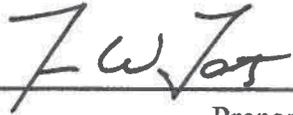
Finding 10 CFR 851 in the “Directives” column opens the latest version of the CAIR. Table 2 of the CAIR provides the current implementing documents for compliance with each 10 CFR 851 element applicable to SRR.

**Attachment 2 SRR Quality Assurance Management Plan**



# SRR Quality Assurance Management Plan (QAMP)

G-QP-G-00001

 Date 12/9/15

Prepared by Tim W. Tate  
SRR QA Programs

 Date 12/9/15

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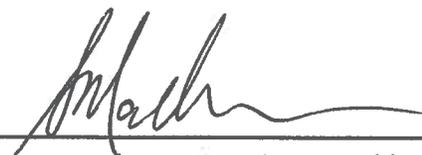
Approved by Stephen C. O'Connor  
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 Date 12/9/15

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Approved by Patricia M. Allen  
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 Date 12/21/15

Approved by Stuart A. MacVean  
President & Project Manager

## Contents

<b>SRR QUALITY ASSURANCE MANAGEMENT PLAN (QAMP)</b> .....	<b>1</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>4</b>
<b>INTRODUCTION</b> .....	<b>6</b>
<b>SRR INTEGRATED SAFETY MANAGEMENT</b> .....	<b>7</b>
<b>QUALITY ASSURANCE PROGRAM</b> .....	<b>8</b>
<b>ROLES AND RESPONSIBILITIES</b> .....	<b>9</b>
<b>REQUIREMENTS FLOW DOWN</b> .....	<b>11</b>
<b>QA PROGRAM REQUIREMENTS IMPLEMENTATION</b> .....	<b>13</b>
APPENDIX A Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP).....	57
APPENDIX B SSC Software Classification Graded Approach.....	72
APPENDIX C Non-SSC Software Classification Graded Approach .....	73
APPENDIX D Life Cycle Documentation Requirements Matrix / SQA Graded Approach.....	75

## EXECUTIVE SUMMARY

This Quality Assurance Management Plan (QAMP) provides an overall description of the Savannah River Remediation (SRR) quality assurance (QA) program. It documents the SRR approach to implementation of the contractually imposed DOE Orders (e.g. 414.1 D) and source documents (e.g. NQA-1 2008 and addenda 2009). The criteria and the commitment to implement the requirements are discussed and the path to the implementing manuals and procedures is provided.

The QAMP addresses three programmatic areas: Management, Performance, and Assessment. These three program areas incorporate the program criteria included in 10CFR830 Subpart A, *Quality Assurance Requirements*, DOE Order 414.1D, *Quality Assurance*, DOE/RW-0333P Revision 20, *Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program*, DOE Order 226.1B, *Implementation of DOE Oversight Policy*, Office of Environmental Management EM-QA-001 Revision 1, *EM Quality Assurance Program (QAP)*, 243.1B Change 1 *Records Management Program*, and ASME NQA-1 2008 with 2009 Addenda, *Quality Assurance Requirements for Nuclear Facility Applications* (NQA-1 2009). Other documents that are used in the development of the SRR QA program are identified below.

Contractually, the overall responsibility for site programs including the SRS QA program rests with the Management and Operations (M&O) contractor. SRR and Savannah River Nuclear Solutions (SRNS) work together in accordance with mutually developed Memorandums of Understanding to maintain and improve the site wide program. For the most part, SRR implements the requirements as defined in the site wide manuals and procedures. When conditions and program implementing requirements require SRR to proceed in a different direction SRR develops Liquid Waste Operations (LWO) specific procedures and manages these procedures through the SRS or SRR Procedure systems.

The QAMP is submitted annually as required to DOE-SR for review and approval. SRR may, at any time, make changes to the approved QAMP to address emerging issues or changes in requirements. Changes to the QAMP made during the year are provided to DOE-SR for review and do not affect the annual QAMP submittal schedule. Revisions to the QAMP that are submitted for approval provide identification of the changes, the pages affected, the reason for the changes, and the basis for concluding that the revised QAMP continues to satisfy the requirements of 10CFR830 Subpart A and DOE O 414.1D. Changes made to correct spelling, punctuation, or other editorial items do not require explanation. In accordance with 10CFR830 requirements, the QAMP shall be regarded as approved by DOE-SR 90 days after submittal, unless approved or rejected within the 90 days.

When conflicts occur between this QAMP and lower-tier documents, the requirements of the QAMP shall govern. Any conflicts involving interpretation of the requirements in this QAMP shall be resolved by the SRR QA Manager.

The changes made to the QAMP by this revision are additive, updating, clarifying or editorial, and satisfy the requirements of 10CFR830 Subpart A as implemented by DOE O 414.1D. The changes generally enhance the quality of the document, rather than providing substantive program changes.

Revisions (excluding such items as editorial changes and updated procedural/source document references) are noted with revision bars for convenience. Highlighted changes were primarily made to improve alignment of site program descriptions with the DOE-SR approved Savannah River Nuclear Solutions QAMP (SRNS-RP-2008-00020).

## INTRODUCTION

This QAMP documents how the requirements of 10CFR830 Subpart A, DOE O 414.1D, DOE O 226.1B, EM-QA-001 and other requirements are implemented by SRR for the work scope of the LWO contract. This QAMP is updated annually to reflect programmatic and organizational changes over the previous year. The updated QAMP is submitted to DOE-SR for review and approval. The submittal document for the QAMP provides assurance that the changes continue to satisfy QA requirements.

The QAMP and the QA Program are key elements of the Integrated Safety Management System (ISMS) and Contractor Assurance System (CAS). QA is a broad management program that supports all of the five ISMS core functions with a goal of producing products and/or providing services that meet or exceed the expectations of DOE-SR. QA also supports the guiding principles of Integrated Safety Management (ISM) by giving assurance that clear roles and responsibilities are established for the conduct of work and assurance that individuals have the competence commensurate with the work responsibilities they are given. Because these two principles speak to the effectiveness of the workforce, these “people” aspects are broadly and horizontally integrated into all work.

QA is an integral part of the processes by which work is prioritized, facilities designed, hazards analyzed, standards and controls identified and applied, equipment procured, work performed, and performance evaluated and improved.

Each section of this QAMP addresses specific areas of the QA Program’s role in the ISMS. The QAMP establishes QA requirements for conducting activities, including providing items or services that affect, or may affect, nuclear safety of facilities in a tailored manner to ensure that environmental, safety, and health risks and impacts are minimized and that safety, reliability, products, and performance are maximized by using effective management systems.

The QAMP also outlines contemporary principles for managing, performing, and assessing operations in an integrated and cost-effective manner. The CAS description is contained in SRR-IM-2014-00047, *Savannah River Remediation LLC Contractor Assurance Description Document*, and provides the road map for oversight and assurance activities for operations and business operations.

The programmatic QA requirements required by 10CFR830 Subpart A and DOE O 414.1D are contained in Standards/Requirements Identification Document (S/RID) Functional Area 2 (Quality Assurance). The programmatic oversight requirements required by DOE O 226.1B are contained in S/RID Functional Area 1 (Management Systems). The S/RID Functional Areas identify the source requirements, provide an index of requirements that are cross referenced to the source document, and links the requirements to the applicable implementing procedures. Functional Areas are listed in Figure 3 below.

The following requirement documents are incorporated where applicable during QA Program development and maintenance:

- ASME NQA-1-2008 with the NQA-1a-2009 Addenda, *Quality Assurance Requirements for Nuclear Facility Applications* (including the 18 requirements of Part I and application of Part II Subparts)
- DOE O 210.2A, *DOE Corporate Operating Experience Program*
- DOE O 221.1A, *Reporting Fraud, Waste, and Abuse To The Office of Inspector General*
- DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*
- DOE O 232.2, *Occurrence Reporting and Processing of Operations Information*
- DOE O 243.1B, *Records Management Program*
- DOE O 414.1D, *Quality Assurance*
- DOE O 450.1A, *Environmental Protection Program*
- DOE Policy 450.4, *Safety Management System Policy*
- DOE/RW-0333P Revision 20, *Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program*
- EM-QA-001, *Department of Energy Office of Environmental Management Quality Assurance Program, Rev. 1*
- Title 10 CFR Part 71, *Packaging and Transportation of Radioactive Material, Subpart H, Quality Assurance*
- Title 10 CFR Part 708, *DOE Contractor Employee Protection Program*
- Title 10 CFR Part 830, *Nuclear Safety Management, Subpart A, Quality Assurance Requirements*
- Title 10 CFR Part 830, *Subpart B, Safety Basis Requirements*
- Title 10 CFR Part 835, *Occupational Radiation Protection*
- Title 10 CFR Part 851, *Worker Safety and Health Program*

ASME NQA-1-2000 was previously the primary national consensus standard used to develop the QA Program. However, based on formal direction from DOE-SR to implement EM-QA-001, *Department of Energy Office of Environmental Management Quality Assurance Program*, the LWO contractor has adopted the SRS upgraded QA Program to use ASME NQA-1- 2009 as the primary national consensus standard for LWO. The SRR QA Implementation Plan for EM-QA-001 is included as Appendix A of this QAMP.

## SRR INTEGRATED SAFETY MANAGEMENT

The objective of SRR's ISMS is to systematically integrate safety, quality, and contractor assurance into SRR management and work practices so that DOE liquid waste activities at all levels are accomplished while protecting the employees, the environment, and the public. Simply stated, the objective of the SRR ISMS is to "Do the right thing; Do safe work".

ISMS is the system SRR uses to manage the conduct of work under the Contract. To embrace continuous improvement, the ISMS structure is enhanced and supported through the use of

effective safety standards and processes such as the Voluntary Protection Program (VPP), Behavior-Based Safety (BBS), and Human Performance Improvement (HPI) and implementation of the nuclear safety culture principles.

The ISMS structure also serves as the framework in which the following SRR Management Systems are contained and implemented:

- Worker Safety and Health Program (WSHP)
- Quality Assurance
- Contractor Assurance System
- Environmental Management System (EMS)
- Integrated Safeguards and Security Management (ISSM)

This document focuses on the description of the SRR QA Program and its implementation of the contractually required source documents for QA. The SRR ISMS and performance metrics are described in a separate submittal to DOE.

## QUALITY ASSURANCE PROGRAM

The SRR QA Program is a key element of ISMS in ensuring adequate protection of workers, the public, and the environment from adverse consequences. It supports all of the five ISMS Core Functions with a goal of producing products and/or providing services that meet or exceed the expectations of DOE-SR. The degree and level of rigor applied to program elements, items, or activities is based on a graded approach that takes into account the work to be performed and the associated risks and hazards.

The QA Program addresses three programmatic areas: Management, Performance and Assessment. These three areas incorporate the program criteria included primarily from 10CFR830 Subpart A, *Quality Assurance Requirements*; DOE Order 414.1D, *Quality Assurance*; DOE/RW-0333P Revision 20, *Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program*; DOE Order 226.1B, *Implementation of DOE Oversight Policy*; Office of Environmental Management EM-QA-001 Revision 1, *EM Quality Assurance Program (QAP)*; 243.1B *Records Management Program*; and ASME NQA-1 2008 with 2009 Addenda, *Quality Assurance Requirements for Nuclear Facility Applications* (NQA-1 2009).

The QA Program promotes the effective and efficient achievement of performance objectives by:

- Planning and documenting requirements for items, processes, and services,
- Controlling activities affecting the quality of items, processes, and services,
- Verifying the required quality of items, processes, and services, and
- Preventing errors and nonconforming conditions, and reducing variability by building quality into products and processes.

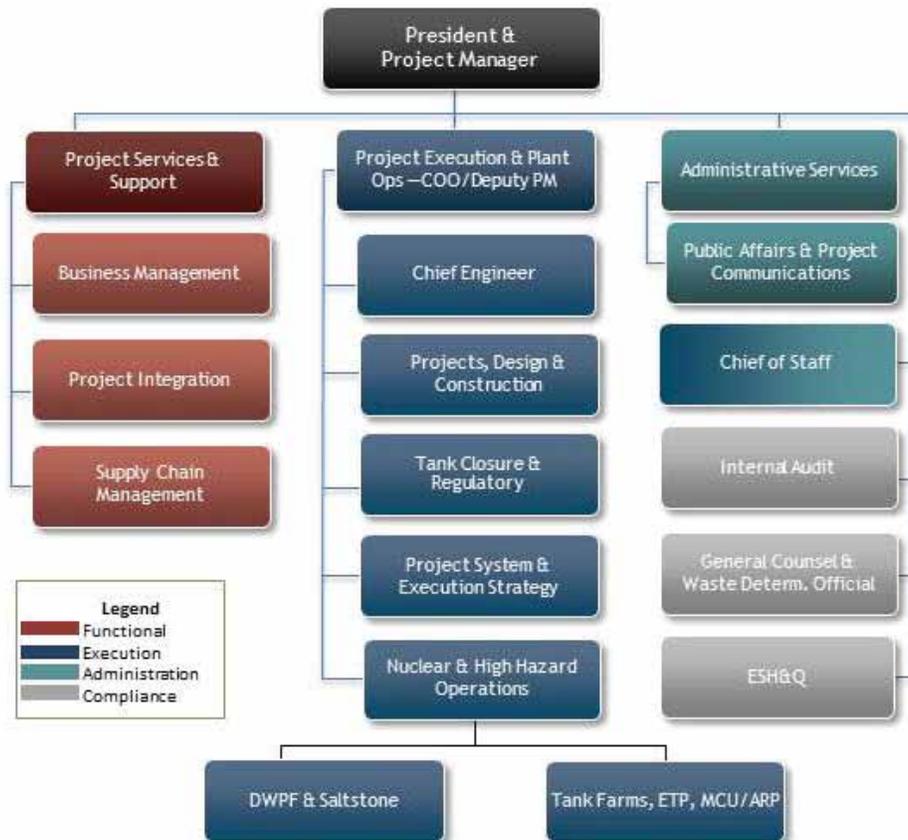
The programmatic QA requirements of 10CFR830, Subpart A; EM-QA-001 Revision 1; DOE O 414.1D; DOE/RW-0333P, Revision 20; and DOE O 243.1B are contained in S/RID Functional Area 2 (Quality Assurance). The S/RID Functional Areas identify the source requirements, provide an index of requirements that are cross referenced to the source document, and links the requirements to the applicable implementing procedures.

Office of Environmental Management EM-QA-001 Revision 1, EM Quality Assurance Program (QAP) provides EM headquarters direction for QA implementation. EM-QA-001 requires issuance of a Quality Implementation Plan. The SRR Quality Implementation Plan is contained in Appendix A of this QAMP. SRR has evaluated the requirements in the EM QAP document and has verified that the SRR QA Program satisfies these requirements.

## ROLES AND RESPONSIBILITIES

SRR is organized in a way that line management is responsible for safety and quality. Unambiguous lines of responsibility within SRR are paramount to effective safety management. Figure 1 shows the SRR organizational structure and the primary services provided by each functional organization.

Figure 1  
 SRR Functional Organizational Chart



SRR roles and responsibilities are clearly defined through the Integrated Procedure Management System (IPMS) through multiple means: (1) by the assignment, (2) within each procedure, and (3) through responsibilities and approval authorities for each proceduralized activity. SRR's organizations are staffed with personnel having competence commensurate with their responsibilities. Reporting to the SRR President and Project Manager are personnel having the appropriate line management authority for their areas of responsibility and for ensuring personnel are properly trained and qualified.

Responsibilities of SRR subcontractors are contained in the individual subcontract documents and within the individual subcontractor's respective Worker Safety, Health and QA Programs, or Worker Protection Plans, as applicable. If there is a conflict between worker protection programs, SRR personnel resolve the issue before allowing the subcontracted task or activity to be performed within Liquid Waste (LW) facilities.

Within the CAS, responsibility is defined through Functional Area Program Managers (FAPMs) representing various areas of expertise. FAPMs are charged with oversight of the effective implementation of SRR programs and procedures. These activities are performed by knowledgeable, trained, and suitably experienced personnel. The reporting relationships are dependent on the particular assurance activity being performed.

The overall organizational structure and functional responsibilities are determined by the SRR President and Project Manager, who has the responsibility to ensure that DOE and SRR assurance personnel have unfettered access to the appropriate information and facilities required to implement an effective oversight program, consistent with applicable laws and requirements. SRR oversight of subcontracted work to ensure applicable requirements are met is performed on a graded approach based on the tasks and hazard profile of the subcontracted work.

The expectation for workers to implement procedures, comply with applicable requirements, and deliver safe, effective, quality and efficient work performance essential to mission success has been clearly established by SRR management and is integral to the ISMS. The CAS provides ongoing verification that these expectations are being met.

The QA Program is used to ensure that clear roles and responsibilities are established for the work being performed by SRR and its subcontractors, and provide assurance that individuals have the competence necessary to discharge the responsibilities they are assigned. QA is also an integral part of the processes by which work is prioritized, facilities designed, hazards analyzed, standards and controls identified and applied, equipment procured, work performed, performance evaluated and improved. The QA Program contains documented criteria for developing individual requirement documents. The SRR President and Project Manager identifies the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing and assessing work.

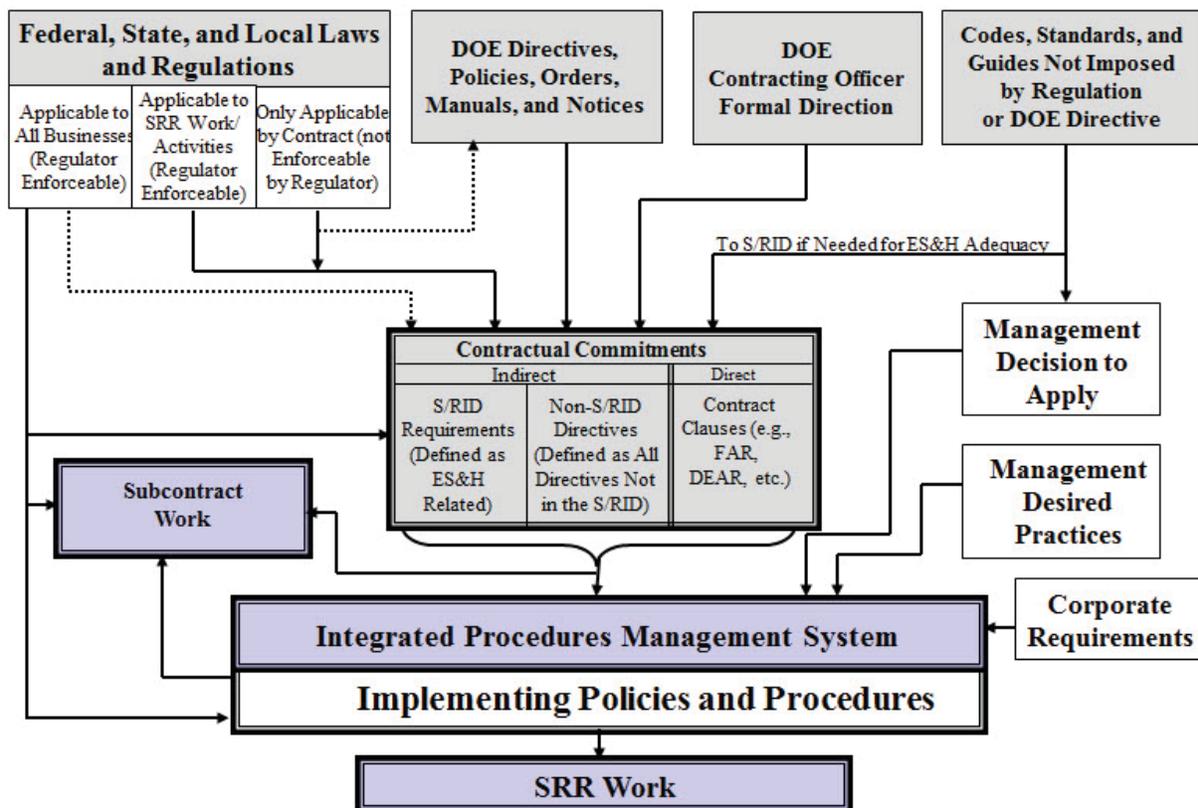
## REQUIREMENTS FLOW DOWN

SRR conducts operations at SRS in a manner that protects the employees, the environment and the public. To establish a consistent SRS approach by all site contractors, two site-wide policies were jointly signed by DOE senior management and senior management representing the performing entities. These SRS Policy documents state the objectives to be followed for all work performed on the site:

- SRS Workplace Safety, Health and Security Policy
- SRS Environmental Management System Policy

These Policies along with applicable Environment, Safety, Health, and Quality Requirements (i.e., laws, regulations, DOE Directives, consensus standards, and others) are flowed down into the SRR S/RID. The S/RID contains all the requirements that SRR and DOE have agreed are applicable to the work and conditions for operating LW facilities. Figure 2 shows how these requirements are flowed down for implementation into SRR work activities.

**Figure 2**  
**Flow Down of Environment, Safety, Health, and Quality Requirements**

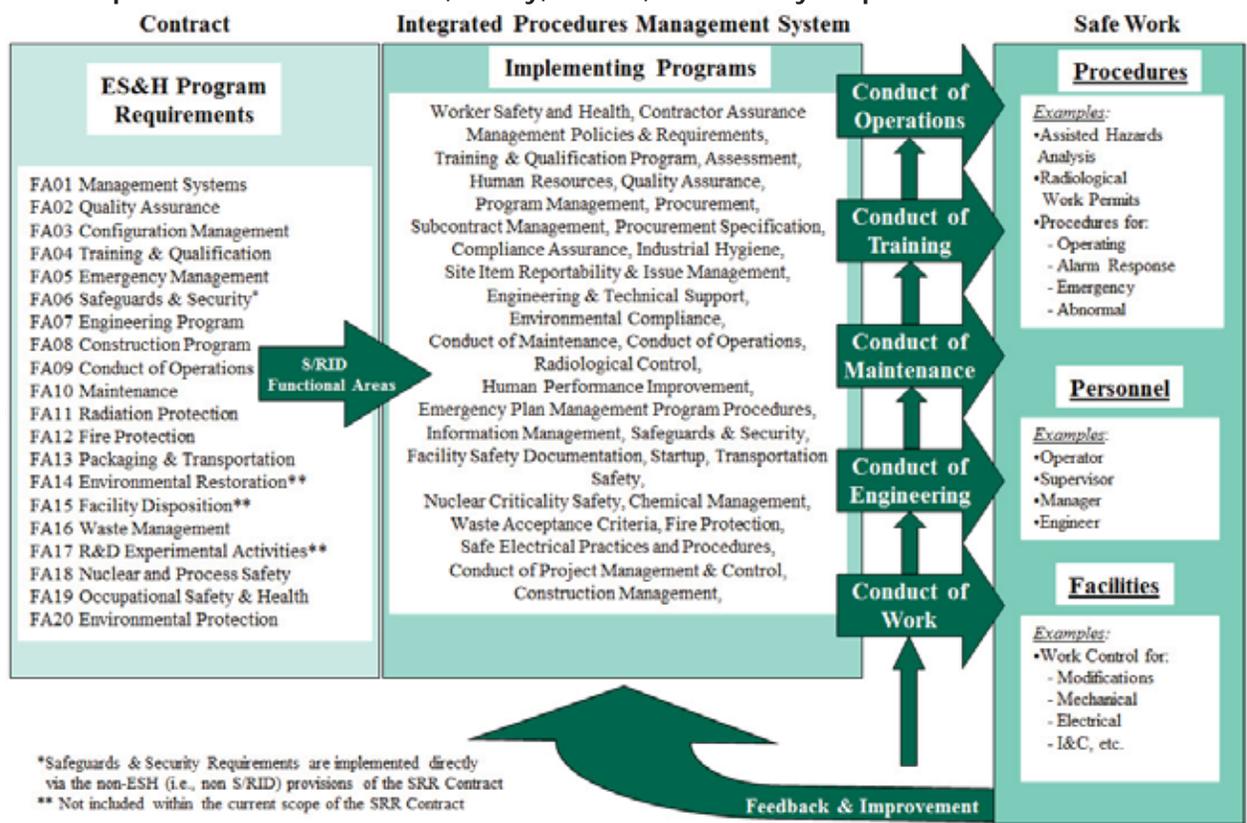


The S/RID defines the applicability of requirements on a facility basis according to the work and hazards conducted at each LW facility. The SRR contract directs that all work be conducted

according to the applicable requirements in the S/RID. From the S/RID, the applicable requirements flow down to policies and procedures established and maintained by the IPMS.

The strategy for implementing the SRR ISMS continues to be through the use of programs that meet the DOE's and SRR's shared objectives, principles and functions for tailoring requirements to safely accomplish specific work at specific facilities. Environment, Safety, Health, and Quality program requirements, including Safeguards and Security requirements, are incorporated into the implementation of the work, using the IPMS, through the process illustrated in Figure 3.

**Figure 3**  
**Incorporation of Environment, Safety, Health, and Quality Requirements into SRR Work**



SRNS serves as M&O primary contractor at SRS. As such, they are contractually the program owner (e.g., Safety and Health, Maintenance, Engineering) and maintain site-wide policies, procedures and manuals that comprise the mechanisms of the IPMS for program implementation. SRR shares these implementation mechanisms as described in Memorandum of Agreement, G-MOA-G-00002, Functional Service Agreements and Service Level Agreements. The Memorandum of Agreement requires that each Party be adequately represented on the Site Policy and Procedure Council (Manual 1B, MRP 3.26, Management of Site Level Procedures), which stipulates that each performing entity shall concur on any change in site-wide policies, procedures and manuals. Where SRR has deemed it necessary or its implementation of requirements differs from that of SRNS, SRR has developed its own implementing procedures in accordance with the IPMS. Table 2 provides an

example list of site-level/SRR manuals, including the primary QA Manual within the IPMS used to integrate SRR's WSHP, QAP and CAS into the ISMS. For additional information, Appendix A of the SRR ISMS Description, SRR-RP-2014-00926 Revision 1 (ISMS Document), provides a crosswalk of site-level manuals within the IPMS that implement SRR's WSHP, QAMP and Contractor Assurance System Description into its ISMS. Appendix B provides a simplified list of the horizontal linkages between the program manuals and the ISM guiding principles and core functions. Appendix C of the ISMS Document provides a cross-reference between site program manuals and procedures and instances where SRR has created company specific procedures where implementation differs.

## QA PROGRAM REQUIREMENTS IMPLEMENTATION

### Introduction

The following sections provide a narrative discussion of each of the ten QA criteria, the source requirements from DOE O 414.1D and 10CFR830.122 for each criterion, and a discussion of the processes used by SRR to meet the source requirements. The applicable NQA-1 2009 sections that are used to implement the source requirements are also identified.

Reference is made in each section to the leading manuals that provide the implementing procedures for each of the requirements. The detailed description of the procedures that implement each of the source requirements are provided in the SRR S/RID.

### Criterion 1 – Program

The following are the Criterion 1 requirements from DOE O 414.1D, Attachment 2 and 10 CFR 830.122:

- Establish an organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing and assessing work, and
- Establish management processes, including planning, scheduling and providing resources for work.

The following are the ASME NQA-1 requirements used to implement the above requirements:

- Requirement 1 - Organization, and
- Requirement 2 - Quality Assurance Program.

#### 1.1 Quality Policy

A written QA Program has been developed and implemented, and is being maintained. Senior management has established a policy to implement and maintain a formal QA Program. Senior management support for planning, organization, resources, direction, and control is an essential element for the effectiveness of the QA Program. The QA Policy and the subsequent QA Program are consistent with 10CFR830 Subpart A, DOE O 414.1D, EM-QA-001, NQA-1 2009, and Special program documents (DOE/RW-0333P).

The program is also consistent with DOE Orders on environment, safety, and health protection, Environmental Protection Agency and South Carolina Department of Health and Environmental

Control guidance documents applying to environmental protection and remediation (when that agency has primacy).

Policies and company-level manuals are part of the IPMS. The IPMS serves to integrate quality program requirements into all work performed under the contract, including items and services that are procured or subcontracted. These requirements are flowed down to subcontractors, using a graded approach, in the normal conduct of company business.

## 1.2 QA Program Description

SRR has transitioned to NQA-1 2009 and is using the SRS QA Manual 1Q. SRR is implementing NQA-1-2009 using a forward fit strategy by including the edition in newly generated products (e.g., new work packages, new procurement specifications) not under Code of Record considerations. Existing work implementing documents are treated as Code of Record and remain at NQA-1-2000 protocols. SRR may elect to use the new standard on Code of Record implementing documents. Work performed under NQA-1-2009 is acceptable for projects/activities working to NQA-1-2000. See Appendix A for further details on NQA-1 2009 implementation strategy (reference Appendix A paragraphs 4.0 through 4.5).

The QA Program is a management system that addresses three major elements: managing, performing, and assessing the adequacy of work. This document provides the strategy for implementing the QA Program in a tailored manner. Additional QA plans may be required and developed to provide guidance for specific programs, projects, functions, and environmental regulations, provided they meet the applicable requirements of this document. The QA Program implements the applicable NQA-1 2009 Part I basic (100) and supplemental (200-900) criteria and the Part II Subparts as outlined in the SRR S/RID. SRR treats NQA-1 Parts III and IV as information and optional guidance.

SRR also is committed to implementing requirements from DOE/RW-0333P, Rev. 20, *Quality Assurance Requirements and Description for the Civilian Radioactive Waste Management Program*, associated with its Defense Waste Processing Facility (DWPF) canister production as outlined in the DOE-SR approved S/RID. The S/RID includes implementation of the bulk of DOE/RW-0333P requirements but excludes those not applicable to canister production (e.g., requirements directly associated with the federal repository). In addition to DOE/RW-0333P, SRR also implements the DOE approved DWPF Waste Form Compliance Plan (WSRC-IM-91-116-0) that implements applicable expectations from DOE generated Waste Acceptance System Requirements Documents (WA-SRD) and the EM Waste Acceptance Product Specification (EM WAPS). SRR implementation of these requirements is part of the overall SRR QA program and is primarily implemented via the 1Q QA Manual and select DWPF specific implementing procedures (see SRR S/RID for more detail). SRR program implementation and compliance is subject to periodic surveillance and/or audit by DOE HQ. SRNS also implements portions of DOE/RW-0333P particularly for records repository management, Savannah River National Laboratory research and analysis activities associated with the canister waste form to meet the Waste Form Compliance Plan, and maintenance of DOE/RW-0333P requirements included in site manuals (such as 1Q).

Procedures to implement the requirements of the QA Program and other QA requirements mandated by law and contract are contained in SRS and SRR company-level manuals. These manuals are supplemented by other facility-level manuals (where applicable) to provide the detail necessary for proper implementation of QA requirements. As SRS site-level manuals and procedures are revised, the Site Policy and Procedure Council reviews and approves the changes. SRNS and SRR are represented on the Site Policy and Procedure Council for concurrence of procedure changes.

The QA Program applies to all personnel, including those responsible for planning, scheduling, providing resources for work, operating, and conducting business operation activities. QA Program requirements, programs and procedures are also applicable to subcontractors and are flowed down through the procurement system to the extent necessary to ensure compliance with the requirements for the safe performance of work.

QA Program implementation is verified through a two-tiered assessment program. The first tier consists of organizational-level Management Assessments, described in Criterion 9, comprised of self-assessments and performance analyses performed by appropriate facilities and organizations to determine compliance, promote continuous improvement and enhance performance. The second tier consists of independent assessments performed by oversight organizations such as QA in accordance with Criterion 10.

Third-party QA Program effectiveness activities include corporate audits, third-party certifications, and external reviews that are performed as requested or required and provide additional improvement information.

### **1.3 Organization and Responsibilities**

The QA Program describes the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing work. Procedures, charters, and/or organization charts are available on the SRS intranet, through InSite. Organizational descriptions include those functions within the QA Program scope. Although senior management is responsible for the scope, planning, implementation, and maintenance of an effective QA Program, each individual employee is held directly responsible for achieving and maintaining the quality of their work, with line management having final responsibility. Senior management establishes overall expectations for effective implementation of the QA Program, and is responsible for obtaining the desired end result. These expectations and responsibilities are described further in the QA Policy (Manual 1-01, MP 4.2).

All individuals have the responsibility to immediately stop their activities when work quality is unsatisfactory unless stopping would be detrimental to the safety or health of personnel or the environment, violate criticality rules or unnecessarily result in damage to equipment. In such cases, work shall be stopped as soon as practicable. Individuals also have the responsibility to verbally request responsible management to stop work external to their activities to prevent a nonconforming item from further use, installation or processing, or to prevent a nonconforming activity from proceeding. The authority to issue formal QA Stop Work Orders has been delegated to

the Cognizant Quality Functions (CQFs) to ensure planning or scheduling considerations do not override safety or quality considerations. Prior to restart after a formal QA Stop Work Order due to safety or quality concerns, appropriate reviews or assessments are planned, performed and documented to verify that conditions that warranted the Stop Work Order are resolved and corrective actions completed.

The QA Manager (QAM) has sufficient authority, direct access to senior management, organizational freedom and access to work to perform their function. The QAM is responsible for providing central leadership, direction, assessment, and implementation of the QA Program, and for ensuring that the QA Program is compatible and consistent with the DOE contract mandated Quality Program requirements. The QAM is the interpretive authority for the SRR QA Program requirements and as such is the final arbiter in defining requirements meaning and implementation.

The Performance of Independent Assessments (e.g., Integrated Independent Evaluations (IIE) and ISM Evaluations) is under the oversight of the ESH&Q Manager, who also has direct access to the SRR senior management including the President and Project Manager. SRR Independent Assessments evaluate implementation of the QA Program, Safety Management System, Contractor Assurance System and Worker Safety and Health Program. As program owner, SRNS evaluates site-wide programs as described in Criterion 10 "Independent Assessment." SRR implements the applicable site-wide programs and assists as requested for program assessments.

### **1.3.1 Relationship between QA and IIE Organizations**

The IIE, ISM Evaluation (ISME) and QA organizations report through the same administrative organization but have different missions. The IIE/ISME focuses on Startup, Operational Readiness, Operations, and Project activities. The IIE is independent of facility and project management and is tasked with providing them performance-based information to support continuous improvement, direct leadership resources, adjust personnel and financial resources, and identify areas of excellence. A role of the QA organization is to develop and maintain the quality program elements that are key components of an effective management system. The role of the organizational quality groups is to facilitate implementation of the quality programs in their specific organizations.

The key role of the QA organization is to provide support and oversight to the line organizations in the performance of their task to assure that operational and performance activities meet requirements. The IIE/ISME and QA organizations all considered to be independent organizations and perform independent oversight. For details, see Manuals 1Q and 12Q.

The IIE is the independent oversight function for SRR and is part of the two-tier assessment program established by Manual 12Q, "Assessment Manual" with the other tier being the management assessment process. IIEs and QA audits satisfy the contractual obligations for compliance with company level independent oversight requirements.

## **1.4 Management Processes**

The QA Program describes management processes including planning, scheduling, resource considerations and processes to detect and prevent quality problems and facilitate work. In the

planning process, the basis for initial identification of quality requirements and the controls necessary to ensure their performance are established. These processes directly support implementation of the first ISM Core Function, "Define Scope of Work."

For work assigned to external organizations, management controls are established, responsibilities are assigned, and lines of communication are identified in accordance with the controls for procured items and services. In addition, provisions are included in the subcontract or purchase order for subcontractors and suppliers to satisfy applicable quality criteria and independent oversight of these activities. Management maintains responsibility for flowing down the requirements to subcontractors and suppliers at any tier to the extent necessary, as described in Section 7.1, to ensure compliance with requirements and the safe performance of work. These quality aspects support the tailored flow down of programmatic requirements to subcontractors and satisfy the ISM requirements of the applicable contract. (For details, see Manuals 1Q, 11B, *Subcontract Management Manual*, and S/RID FA 01, *Management Systems*).

### 1.5 Graded Approach

10CFR830, Nuclear Safety Management allows and encourages the use of a graded approach in implementing its Subpart A QA and Subpart B Safety Basis requirements. 10CFR830.7 states in part: "Where appropriate, a contractor must use a graded approach to implement the requirements of this part, document the basis of the graded approach used, and submit that documentation to DOE."

SRR's graded approach to implementing the QA requirements of 10CFR830 Subpart A and DOE Order 414.1D does so without compromising the safety of the workers, public, facilities, or environment. The graded approach is in compliance with applicable DOE rules and regulations and is based on the level of risk (likelihood and consequence of occurrence) associated with the failure of an item, service, process, activity, program or facility.

Where appropriate, the degree and level of rigor applied to program elements, items, or activities is based on a graded approach that takes into account the work to be performed and the associated risks and hazards. The graded approach is not used in implementing the Unreviewed Safety Question (USQ) process or in implementing technical safety requirements.

Application of a graded approach process ensures that the level of analysis, documentation, and actions used to comply with a requirement is commensurate with:

- Relative importance to safety, safeguards, security, operations, and business operations
- Magnitude of any hazard involved
- Life cycle stage of a facility
- Programmatic mission of a facility
- Functional Classification or Procurement Level of an item, service, or activity
- Particular characteristics of a facility
- Relative importance of radiological and non-radiological hazards
- Any other relevant factors such as complexity, economic value, etc.

The graded approach process, as applied to safety, is synonymous with the concept of tailoring requirements to the work and hazards described in ISM. The term “safety” includes all aspects of environmental, safety, and health management including pollution control, waste management, radioactive waste minimization, transportation, and safeguards and security. A hazard analysis/categorization and safety analysis process is used to evaluate the magnitude and consequences of hazards, and impact on safety for existing facilities, modifications to existing facilities, and for new facilities. Early in the project/modification or proposed activity, a safety strategy is developed to guide the approach taken in establishing the safety basis for the process. This is a key mechanism for hazard control that supports the guiding principles and core functions of ISM.

The functional classification of Structures, Systems and Components (SSC), cost and complexity of the item, impact on mission success, and programmatic effects are used as the basis for applying QA Program requirements commensurate with risk for activities.

The established functional classification for a facility-based SSC serves as input for the level and rigor of design, analysis, technical reviews, QA Program requirements, verification actions, administrative controls, documentation requirements, and specific actions to be taken. Initially, the functional classification is assigned as early as practical in the design phase. However, it is periodically reviewed and evaluated and can be changed when the nature of the hazard, the mission of the facility, or specific characteristics of the SSC change. For a given functional classification, established methods and practices are applied to ensure that safe and proper operation or use of the SSC for the protection of the public, the workers, and the environment is achieved in a cost-effective manner.

The four functional classifications in order of decreasing significance are: Safety Class (SC), Safety Significant (SS), Production Support (PS), and General Services (GS). A qualitative evaluation of risk, considering all SC, SS, and Non-SC/SS Defense-In-Depth controls is performed to support selected accident scenarios. Defense-In-Depth is the process of selecting appropriate SSC and engineering/administrative controls to provide multiple layers of protection to prevent or to mitigate the release of hazardous material.

In addition to safety considerations, requirements are tailored according to cost and complexity of the item, impact on mission success, and programmatic effects. No facility or activity is exempt from meeting applicable safety requirements. The M&O Contractor logic, method of implementation, basis for grading and grading (quality) level determination processes are summarized in Table 1. Table 1 also provides a summary of areas where the graded approach is applied.

The graded approach is also specifically applicable to software based on the categorization of the specific software use relative to safety-related design and operation activities. Details of the application of the graded approach to software QA is presented in Section 5.6, *Control of Computer Software*, in Appendix B.

### **1.6 Special Program Requirements**

Some programs or projects require unique QA requirements for their activities. Such special QA Program requirements are added to, and integrated where possible with, the basic QA Program requirements for the affected facilities and activities. Some of these QA requirements are defined and controlled by the program or project, because they apply only to specific organizations and facilities. These special program requirements are reflected in the applicable S/RID. Table 3 below provides Functional Area Titles for the S/RID. For details, see Manual 1Q and S/RID FA 02.

Additional program requirements applicable to organizations disposing of high-level radioactive waste are identified in DOE/RW-0333P, QA Requirements and Description Document and are incorporated into the applicable S/RID.

### **1.7 Alternative Standards**

While the SRS QA program is based on NQA-1 2009 activities such as procurement can be performed using nationally recognized programs such as ASME Section VIII, ISO 17025 for Calibration/Testing, or ISO 9001 Quality Management Systems for non-safety applications or where equivalencies have been established, to be used as the prescribed quality standard in lieu of directly invoking NQA-1 2009. NQA-1 allows graded approach applications to be employed. These alternative standards, when specified, have been determined to be appropriate controls to ensure adequacy of an activity commensurate with the applicable requirements. In addition, even when NQA-1 is directly invoked in a procurement document, a supplier's QA program may be based on another quality standard but still must meet the intent of those requirements designated as applicable to the procurement or compensatory actions will be identified and implemented to address program deficiencies. When alternative standards are used, they must provide requirements to maintain adequate assurance and oversight activities commensurate with the scope of task being performed. When additional standards are used to address unique or specific work activities, they must be consistent with contractual and regulatory requirements.

**Table 1**  
**Graded Approach to QA Requirements**

QA Criterion	Graded Elements / Activities <sup>(1)(2)</sup>	Grading Levels / Basis / Application <sup>(2)(3)</sup>	Implementing Procedures <sup>(3)</sup>	QAMP Section
Criterion 1 Management/ Program	As described in the individual QA criteria listed below.	As described in the individual QA criteria listed below.	See individual QA criteria listed below.	1
Criterion 2 Management/ Personnel Training and Qualification	Level of analysis, documentation, actions, and controls for training and qualification: <ul style="list-style-type: none"> <li>• Training analysis</li> <li>• Training design</li> <li>• Training development</li> <li>• Training implementation</li> <li>• Training evaluation</li> </ul>	Grading Levels and Basis: Grading levels and their basis are established in DOE Order 426.2, <i>Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities</i> .  Application: The graded approach application process is implemented by the following Manual 4B procedures, which are designed to comply with DOE Order 426.2: Procedure 1, <i>Training and Qualification Program</i> ; Procedure 2, <i>Qualification/ Certification Program Requirements</i> ; Procedure 3, <i>Analysis, Design and Development of Training</i> ; Procedure 4, <i>Training Implementation and Evaluation</i> .	Manual 4B, Procedures 1, 2, 3, 4	2
Criterion 3 Management/ Quality Improvement	Level of analysis, documentation, actions, and controls for issue and corrective action management: <ul style="list-style-type: none"> <li>• Issue evaluation and causal analysis</li> <li>• Corrective action development</li> <li>• Corrective action closure and verification</li> <li>• Corrective action effectiveness review</li> </ul>	Five grading levels are used for identified issues. These levels are defined as issue significance categories: <ul style="list-style-type: none"> <li>• 1 (highest level of control)</li> <li>• 2</li> <li>• 3</li> <li>• 4</li> <li>• T (lowest level of control)</li> </ul> Basis: The significance category for a given issue is determined using the evaluation process and criteria given in Manual 1B, Procedure 4.23, <i>Corrective Action Program</i> .  Application: The graded approach application process for the above significance categories is also given in Manual 1B, Procedure 4.23.	Manual 1B, Procedure 4.23	3.2  App. A Sub- section 5.1
Criterion 4 Documents and Records	Level of analysis, documentation, actions, and controls for configuration management: <ul style="list-style-type: none"> <li>• Technical baseline information for configuration controlled SSCs</li> </ul>	Four grading levels are used for technical baseline information. These levels are defined as document categories: <ul style="list-style-type: none"> <li>• Essential (highest level of control)</li> <li>• Support</li> <li>• General</li> <li>• Non-technical baseline (lowest level of control)</li> </ul> Basis: The document category for a given set of technical baseline information is determined using the evaluation process and criteria given in Manual E7, Procedure 1.05, <i>Technical Baseline Identification</i> .  Application: The graded approach application process for the above document categories is also given in Manual E7, Procedure 1.05.	Manual E7, Procedure 1.05	4

**Table 1**  
**Graded Approach to QA Requirements (continued)**

QA Criterion	Graded Elements / Activities <sup>(1)(2)</sup>	Grading Levels / Basis / Application <sup>(2)(3)</sup>	Implementing Procedures <sup>(4)</sup>	QAMP Section
Criterion 5 Performance/ Work Processes	Level of analysis, documentation, actions, and controls for work planning and control: <ul style="list-style-type: none"> <li>Content of work packages</li> <li>Specifying test and inspection requirements in work packages</li> <li>Review and approval of work packages</li> </ul>	Three grading levels are used for work packages. These levels are: <ul style="list-style-type: none"> <li>Planned (highest level of control)</li> <li>Minor Maintenance (MM)</li> <li>Fix-It-Now (FIN) (lowest level of control)</li> </ul> Basis: The grading level for a given work package is determined using the evaluation process and criteria given in Manual 1Y, Procedure 8.20, <i>Work Control Procedure</i> . The use of MM and FIN work packages for work on safety-related (SC or SS) SSCs is restricted to cases where a pre-approved procedure or model work order already exists. Application: The graded approach application process for Planned, MM, and FIN work packages is given in Manual 1Y, Procedure 8.20, <i>Work Control Procedure</i> .	Manual 1Y, Procedure 8.20	5.1
Criterion 6 Performance/ Design	Level of analysis, documentation, actions, and controls for processing facility / SSC design modifications: <ul style="list-style-type: none"> <li>Design input content, level of detail, and review / approval</li> <li>Identification and control of design interfaces</li> <li>Design output content, level of detail, and review / approval</li> </ul>	Four grading levels are used for processing facility / SSC design modifications: <ul style="list-style-type: none"> <li>Modification traveler (MT) (highest level of control)</li> <li>Design change package (DCP)</li> <li>Design change form (DCF)</li> <li>Temporary modification (lowest level of control)</li> </ul> Basis: The grading level for a given design modification is determined using the evaluation process and criteria given in Manual E7, Procedure 1.02, <i>Engineering Overview and Graded Approach</i> . Application: The graded approach application process for: <ul style="list-style-type: none"> <li>MTs is given in Manual E7, Procedure 2.05A, <i>Modification Traveler</i></li> <li>DCPs is given in Manual E7, Procedure 2.38, <i>Design Change Package</i></li> <li>DCFs is given in Manual E7, Procedure 2.37, <i>Design Change Form</i></li> <li>Temporary modifications is given in Manual E7, Procedure 2.06A, <i>LW Temporary Modification</i></li> </ul>	Manual E7, Procedure 1.02  Manual E7, Procedure 2.05A  Manual E7, Procedure 2.06A  Manual E7, Procedure 2.37  Manual E7, Procedure 2.38	6
Criterion 7 Performance/ Procurement	Level of analysis, documentation, actions, and controls for: <ul style="list-style-type: none"> <li>Review and approval of procurement documents</li> <li>Supplier evaluation</li> <li>Supplier monitoring</li> <li>Item and service acceptance</li> </ul>	Three grading levels are used for procurement of items and services. These levels are defined as procurement levels: <ul style="list-style-type: none"> <li>1 (highest level of control)</li> <li>2</li> <li>3 (lowest level of control)</li> </ul> Basis: The procurement level for a given item or service is determined using the evaluation process and criteria given in Manual 1Q, Procedure 7-2, <i>Control of Purchased Items and Services</i> , and Manual E7, Procedure 3.10, <i>Determination of Quality Requirements for Procured Items</i> . Application: The graded approach application process for the above procurement levels is given in Manual 1Q, Procedure 4-1, <i>Procurement Document Control</i> , and Procedure 7-2, <i>Control of Purchased Items and Services</i> .	Manual 1Q, Procedure 4-1  Manual 1Q, Procedure 7-2  Manual E7, Procedure 3.10	7

**Table 1**  
**Graded Approach to QA Requirements (continued)**

QA Criterion	Graded Elements / Activities <sup>(1)(2)</sup>	Grading Levels / Basis / Application <sup>(2)(3)</sup>	Implementing Procedures <sup>(4)</sup>	QAMP Section
Criterion 8 Performance/ Inspection and Acceptance Testing	Level of analysis, documentation, actions, and controls for: <ul style="list-style-type: none"> <li>Specifying the required level of inspector independence for performing inspection activities</li> </ul>	Two grading levels are used to establish the required level of inspector independence for a given inspection task: <ul style="list-style-type: none"> <li>Independent inspection (highest level of control)</li> <li>Peer inspection (lowest level of control)</li> </ul> Basis: The required level of inspector independence is determined using the evaluation process and criteria given in Manual 1Q, Procedure 10-1, <i>Inspection</i> ; and Manual E7, Procedure 2.36, <i>Specifying Quality Inspection Requirements and Quality Inspection Plans</i> .  Application: The graded approach application process for the use of independent and peer inspection is given in the same procedures as above.	Manual 1Q, Procedure 10-1  Manual E7, Procedure 2.36	8.1 and 8.2
Criterion 9 Assessment/ Management Assessment	Level of analysis, documentation, actions, and controls for management assessments: <ul style="list-style-type: none"> <li>Training and qualification of assessors</li> <li>Scope and depth of assessment</li> <li>Extent and formality of documentation</li> <li>Review and approval</li> </ul>	Two grading levels are used for management assessments. These levels are established as the following management assessment types: <ul style="list-style-type: none"> <li>Self-Assessment (SA) (highest level of control)</li> <li>Performance Analysis (lowest level of control)</li> </ul> Basis: The type of management assessment to be used is determined using the evaluation process and criteria provided in Manual 12Q, Procedures SA-1, <i>Self-Assessment</i> , and PA-1A, <i>LW Performance Analysis</i>  Application: The graded approach application process for the use of the above management assessment types is given in the same procedures as above.	Manual 12Q, Procedure SA-1  Manual 12Q, Procedure PA-1A	9
Criterion 10 Assessment/ Independent Assessment	Level of analysis, documentation, actions, and controls for independent assessments: <ul style="list-style-type: none"> <li>Training and qualification of assessors</li> <li>Scope and depth of assessment</li> <li>Extent and formality of documentation</li> <li>Review and approval</li> </ul>	Four grading levels are used for independent assessments. These levels are established as the following independent assessment types: <ul style="list-style-type: none"> <li>Operational Readiness Review (ORR) (highest level of control)</li> <li>Readiness Assessment (RA)</li> <li>Independent Assessment (IIE) / QA Audit</li> <li>QA Surveillance (lowest level of control)</li> </ul> Basis: The type of independent assessment to be used is determined using the evaluation process and criteria given in Manual 12Q, Procedures ORR-1A, <i>LW Nuclear Startup/Restart Readiness Review Determination</i> , RA-1A, <i>LW Readiness Assessment (RA) - Level Determination</i> , and FEB-1, <i>Facility Evaluation Board</i> ; Manual 1Q, Procedures 18-6, <i>Quality Assurance Internal Audits</i> and 18-2, <i>Surveillance</i> .  Application: The graded approach application process for the use of the above independent assessment types is given in the same procedures as above.	Manual 12Q, Procedure ORR-1A  Manual 12Q, Procedure RA-1A  Manual 12Q, Procedure FEB-1  Manual 1Q, Procedure 18-2  Manual 1Q, Procedure 18-6	10
Suspect/ Counterfeit Items (S/CI) Prevention	Graded approach is not used for compliance with the S/CI requirements of DOE	Graded approach is not used for compliance with the S/CI requirements of DOE Order 414.1D.	Manual 1B, Procedure 5.19	5.7

**Table 1**  
**Graded Approach to QA Requirements (continued)**

QA Criterion	Graded Elements / Activities <sup>(1)(2)</sup>	Grading Levels / Basis / Application <sup>(2)(3)</sup>	Implementing Procedures <sup>(4)</sup>	QAMP Section
<p>Software Quality Requirements</p> <p>and</p> <p>Safety Software Quality Requirements for Nuclear Facilities</p>	<p>Level of analysis, documentation, actions, and controls for:</p> <ul style="list-style-type: none"> <li>• Software requirements determination</li> <li>• Software design</li> <li>• Software implementation</li> <li>• Software testing</li> <li>• Software installation and acceptance</li> <li>• Software operations and maintenance</li> <li>• Software configuration control</li> <li>• Software problem reporting</li> <li>• Software retirement</li> </ul>	<p>Four grading levels are used for software quality requirements. These levels are defined as software classification levels, and are different for SSC software (part of an SSC with an assigned functional classification) and non-SSC software. For SSC software, the classification levels are equal to the functional classification of the host SSC:</p> <ul style="list-style-type: none"> <li>• SC (highest level of control)</li> <li>• SS</li> <li>• PS</li> <li>• GS (lowest level of control)</li> </ul> <p>For non-SSC software, the classification levels are as follows:</p> <ul style="list-style-type: none"> <li>• A (highest level of control)</li> <li>• B</li> <li>• C</li> <li>• D (lowest level of control)</li> </ul> <p>The allowed grading levels for safety software for nuclear facilities are restricted to software classification levels <u>SC, SS, A or B only.</u></p> <p>Basis: For SSC software, the classification level is determined using the evaluation process and criteria given in Manual E7, Procedure 2.25A, <i>LW Functional Classifications</i>. For non-SSC software, the classification level is determined using the evaluation process and criteria given in Manual 1Q, Procedure 20-1, <i>Software Quality Assurance</i>.</p> <p>Application: For both SSC software and non-SSC software, the graded approach application process for the above software classification levels is given in Manual 1Q, Procedure 20-1, <i>Software Quality Assurance</i>; and Manual E7, Procedure 5.01, <i>Software Engineering and Control</i>.</p>	<p>Manual 1Q, Procedure 20-1</p> <p>Manual E7, Procedure 2.25A</p> <p>Manual E7, Procedure 5.01, 5.61A, 5.62A and 5.80A</p>	<p>5.6</p> <p>App. B, C, D</p>

**Notes:**

- (1) The graded approach addresses how applicable QA requirements are implemented, not which QA requirements are applicable. The graded approach allows for varying levels of management controls (level of analysis, extent of documentation, planned actions, and rigor of process control) to be applied to provide adequate assurance, commensurate with the level of risk, that the applicable QA requirements are being met. Ref. DOE EM QA Corporate Board deliverable *Graded Approach Model and Expectation*, 3/2010; and ASME NQA-1a-2009 Subpart 3.1, Nonmandatory Appendix 2A-2 (Paragraph 502) and Subpart 4.2 (Section 300).
- (2) The graded approach does not duplicate variable control levels inherent in QA requirement source documents such as ASME NQA-1. For example, the graded approach does not address the use and application of Packaging, Shipping and Storage Levels A, B, C and D since the requirements for the use and application of these control levels are already established in NQA-1 Requirement 13 and Subpart 2.2. Whether these variable control levels would apply in a given situation is determined by whether these specific NQA-1 requirements apply or do not apply to the specific items or activities under consideration.
- (3) Grading levels (i.e. quality levels) and the level and rigor of applied controls are based on the level of risk associated with the specific item or activity under consideration. When analyzing the level of risk, the primary risk factor is the relative importance of the item or activity to safety (i.e. the functional classification as defined in Manual E7, Procedure 2.25A, *LW Functional Classifications*), safeguards and security. However, other risk factors are also considered when appropriate, including but not limited to: magnitude of hazard, life-cycle stage of facility or item, programmatic mission of facility, particular characteristics of a facility or item, relative importance to radiological and non-radiological hazards, consequence of malfunction or failure, design and/or fabrication complexity or uniqueness, need for special controls and surveillance over processes and equipment, degree to which functional compliance can be demonstrated by inspection or test, quality history and degree of standardization, and difficulty of correction, repair, or replacement.
- (4) The "Implementing Procedures" column identifies the key implementing procedures that define the processes used to control application of the graded approach, including the grading level (i.e. quality level) determination processes and the quality program application processes used. Ref. EM-QA-001, Rev. 1, Attachment D, *Graded Approach*.

**Table 2**  
**Site-Level/SRR QA Implementing Manuals**

1-01, *Management Policies*  
1B, *Management Requirements and Procedures*  
3B, *Property and Materials Management Manual*  
4B, *Training and Qualification Program Manual*  
5B, *Human Resources Manual*  
6B, *Program Management Manual*  
S18, *SRR Procurement Services Manual*  
8B, *Compliance Assurance Manual*  
9B, *Site Item Reportability and Issue Management (SIRIM)*  
11B, *Subcontract Management Manual*  
12B, *Information Management Manual*  
13B, *Chemical Management Manual*  
1C, *Facility Disposition Manual*  
3E, *Procurement Specification Procedure Manual*  
5E, *Startup Test Manual*  
1Q, *Quality Assurance Manual*  
2Q, *Fire Protection Program Manual*  
3Q, *Environmental Compliance Manual*  
4Q, *Industrial Hygiene Manual*  
5Q, *Radiological Control Manual*  
6Q, *SRS Emergency Plan/Emergency Management Program Procedures Manual*  
7Q, *Security Manual*  
8Q, *Employee Safety Manual*  
10Q, *Computer Security Manual*  
11Q, *Facility Safety Document Manual*  
12Q, *Assessment Manual*  
14Q, *Material Control and Accountability Manual*  
18Q, *Safe Electrical Practices and Procedures Manual*  
19Q, *Transportation Safety Manual*  
1S, *SRS Waste Acceptance Criteria Manual*  
2S, *Conduct of Operations Manual*  
1Y, *Conduct of Maintenance Manual*  
2Y, *SRS HEPA Filter Program Manual*  
E7, *Conduct of Engineering and Technical Support Manual*  
1E6, *Construction Management Department Manual*  
L1, *SRNL Procedures Manual*  
SRNL-IM-2008-00025, *SRNL Conduct of Research & Development*

**Table 3**  
**Functional Area Titles for S/RID**  
**(Contractual Program Requirements)**

Foreword  
FA 00 S/RID Purpose and Development  
FA 01 Management Systems  
FA 02 Quality Assurance  
FA 03 Configuration Management  
FA 04 Training and Qualifications  
FA 05 Emergency Management  
FA 06 Safeguards and Security  
FA 07 Engineering Program  
FA 08 Construction Program  
FA 09 Conduct of Operations  
FA 10 Maintenance  
FA 11 Radiation Protection  
FA 12 Fire Protection  
FA 13 Packaging and Transportation  
FA 14 Environmental Restoration  
FA 15 Facility Disposition  
FA 16 Waste Management  
FA 17 R & D Experimental Activities  
FA 18 Nuclear and Process Safety  
FA 19 Occupational Safety and Health  
FA 20 Environmental Protection

## **Criterion 2 – Management/Personnel Training and Qualification**

The following are the Criterion 2 requirements from DOE O 414.1D, Attachment 2 and 10CFR830.122:

- Train and qualify personnel to be capable of performing assigned work, and
- Provide continuing training to personnel to maintain their job proficiency.

ASME NQA-1, Requirement 2, Quality Assurance Program is used to implement the above requirements.

### **2.1 Qualification of Personnel**

Management uses a formal, documented indoctrination and training program to ensure personnel understand the basic QA Program. Personnel are trained and qualified, commensurate with their responsibilities, to ensure they are capable of performing their assigned work. Management establishes initial and continuing training and qualification requirements with supporting processes for specific job categories. Management also verifies the training, qualification, and proficiency of personnel prior to assigning a task or activity. The qualification of personnel

supports the QA program, all of the ISM core functions, and satisfies the third ISM guiding principle to ensure personnel have the competence commensurate with their responsibilities.

The qualification of personnel is accomplished by consideration of experience, education, training, and by demonstration and testing to verify acquired skills. Training programs consist of a combination of classroom, on-the-job training, and simulator or laboratory training as it applies to the position. Classroom training includes lectures, seminars, computer-based training, and structured self-study activities. Personnel performing work that requires special skills such as Nondestructive Examination and Quality Control Inspections are required to be qualified and certified. NQA-1 based qualification and certification programs specify when this is required. If required, these personnel initially demonstrate proficiency and must periodically demonstrate maintenance of proficiency, which is documented and maintained as a QA record. Documentation of these demonstrations is collected and retained.

The qualifications for independent assessment personnel are established commensurate with the assessment purpose and scope. Persons conducting independent assessments are technically qualified and knowledgeable in the areas assessed. Cognizant technical/operational personnel may be included as team members to provide specialized expertise and knowledge. The assessment team leader is responsible for determining the need for specialized expertise to perform the assessment. Lead Auditors are certified and auditors are qualified.

All training and qualification programs for personnel are developed and implemented in a tailored manner consistent with the hazards and the risks associated with the operation of the facility or activity. Qualification and certification programs are reviewed by management and are maintained to reflect changes to the facility, operational procedures, QA requirements, and regulations as well as applicable industry operating experience. Programs are structured to be in compliance with DOE Order requirements for training and qualification of managers, operators, technicians, and maintenance personnel. All requirements are described in Manual 4B, "Training and Qualification Program Manual," applicable lower-tier implementing procedures and Training Program plans. For details, see Manuals 1Q, 4B, and S/RID FA 02 and 04.

## **2.2 Training**

Initial training programs are established for personnel performing activities affecting quality to develop or enhance their knowledge and skills to perform job assignments. These programs are structured for specific position needs. Examinations and/or operational evaluations on material included in the training programs are administered and documented as appropriate.

Continuing training programs maintain and enhance the knowledge and skills of all personnel including those who perform functions associated with safety-related structures, systems, and components. DOE guidance is used to develop continuing training programs that maintain job proficiency as well as improve the knowledge and skills of personnel. These programs are structured for specific position needs. Personnel are required to demonstrate proficiency prior to actual performance of task.

Continuing training includes items such as training in significant facility system and component changes, applicable procedure changes, applicable industry operating experience, selected fundamentals with emphasis on knowledge and skills necessary to assure safety, and other training as needed to correct identified performance problems. For details, see Manuals 1Q, 4B, and S/RID FA 02 and 04.

### **2.3 Training Plans**

Training and qualification procedures establish the standards used to conduct training and qualification programs. Training and qualification plans prepare individuals to perform a job and to maintain performance while in a job. For details, see Manuals 1Q, 4B, and S/RID FA 02 and 04.

### **2.4 Instructors**

Performance-based training instructors are appropriately qualified for the specific training tasks. Classroom instructors are trained in accordance with the SRS Instructional Staff Training and Qualification Program Description. The instructor training is based, in part, on the results of instructor evaluations and the need for training on new methods and equipment. Instructors possess the technical knowledge, experience, and developmental and instructional skills commensurate with the subject material and the level of instruction that is provided. For details, see Manuals 1Q, 4B, and S/RID FA 02 and 04.

## **Criterion 3 – Quality Improvement**

The following are the Criterion 3 requirements from DOE O 414.1D, Attachment 2 and 10 CFR 830.122:

- Establish and implement processes to detect and prevent quality problems,
- Identify, control, and correct items, services, and processes that do not meet established requirements,
- Identify the causes of problems, and work to prevent recurrence as part of correcting the problem and
- Review item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 2 - Quality Assurance Program,
- Requirement 15 - Control of Nonconforming Items, and
- Requirement 16 - Corrective Actions.

### **3.1 Improvement Program**

The QA Program integrates strategic plans, processes, and procedures to ensure compliance with legal, regulatory, contractual, and corporate requirements related to quality improvement. Methods used for problem prevention include peer reviews, design reviews, probabilistic risk assessments, and management assessments. Performance and quality improvement is the intended result of the feedback and improvement core function of ISM and the CAS.

Continuous improvement in the performance and quality of activities and the development of products and services is achieved by implementing the Management Assessment Program as described in Criterion 9 and the 1Q and 12Q Manuals. The Management Assessment Program includes self-assessment, with management leadership and participation, and on-going performance analysis of event-based and review-based deficiencies. The information is used to develop corrective actions to improve the program. In addition to the Management Assessment Program, continuous improvement is also the goal of the Performance Analysis, Operating Experience (Lessons Learned), and Corrective Action System, Section 3.2.

The Quality improvement process is used to identify, control, and correct items, services, and processes that do not meet established requirements. Problem prevention and continuous quality improvement are addressed in various implementing procedures. Item characteristics, process implementation, and other quality-related information are reviewed and the data analyzed to identify items, services, and processes needing improvement. This data is also used to identify adverse trends that impact the quality of items and processes.

Policies for managing and continuously improving how work is performed, in order to meet customer expectations for quality and to measure and produce results aligned with strategic objectives, involve all personnel in the respective organizations. Performance and quality improvements are obtained through rigorous assessment and corrective action programs. For details, see Manual 1-01 and Manuals 1B, 9B, 11B, 1Q, 1S, 2S, 11Q, 12Q, E7, and S/RID FA 02, 07, and 09.

### **3.2 Corrective Action System**

Corrective action procedures require personnel to report nonconforming items and processes. These procedures define the reporting system used to identify such items and processes, the graded approach used to correct deficiencies, and the process to ensure adequate closure and effectiveness of corrective actions. All personnel are granted the freedom and authority to identify those items and processes determined to be nonconforming and to stop work or to request that work be stopped until effective corrective action is completed. Procedures for bringing events, conditions, employee concerns, and issues to management's attention have been established by senior management. These procedures are in compliance with DOE Orders for occurrence reporting and the processing of operations information, and encourage and support identification and reporting of unsatisfactory conditions.

Processes to detect and prevent quality problems have been established and implemented. Items, services, and processes that do not meet established requirements are identified, controlled, and corrected according to the importance of the problem and the affected work. Correction includes identifying the causes of problems and taking action to prevent recurrence based on the significance of the problem. The system for identifying and controlling quality problems incorporates a single company-level problem identification and corrective action control system.

The Corrective Action Policy is described in Manual 1B, procedure 4.23, "Corrective Action Program." Although the inputs to the system come from multiple problem identification sources,

the tools used to resolve each type of problem have consistent process steps. The Corrective Action System forms a comprehensive process as defined in implementing procedures. Continuous improvement is achieved by integrating the Corrective Action System with feedback processes such as:

- Price Anderson Amendments Act (PAAA) noncompliance's;
- Occurrence Reporting;
- Management Assessments;
- Independent Assessments;
- Operating Experience (Lessons Learned) processes; and,
- Customer reviews.

The corrective action methodology yields quality improvements that are implemented in a tailored manner. The significance of identified problems is the basis for the tailored application of the requirements within the corrective action process. The extent of causal analysis (e.g., Apparent Cause, Root Cause) is commensurate with the importance or significance of the problem.

As part of the Corrective Action System, problems are evaluated and assigned to one of four Significance Categories based on the impact to safe/secure facility operations, worker or public safety and health, regulatory compliance, or public/business interests. Significance Category 1 is the most stringent, and includes problems that are recurring or have a significant impact, on safe/secure facility operations, worker or public safety and health, regulatory compliance, or public/business interests. Significance Category 2 problems have a moderate impact. Significance Category 3 problems have a minor impact, and Significance Category 4 is the least stringent with these problems only having inconsequential impact and are limited to errors that do not warrant further corrective action and are documented for trending purposes only. Significance Category T issues, that are not part of the corrective action program, are for *tracking* that is necessary and/or appropriate to address and manage items, but do not require a corrective action. Table 4 shows Corrective Action Program Elements by Significance Category from Manual 1B Procedure 4.23, *Corrective Action Program*, Revision 13.

Controls are used to prevent the inadvertent testing, installation, or use of nonconforming items. Controls include tagging of items, segregation when possible, and conditional release for post-installation testing. Nonconformances are reviewed and approved by the organizations that reviewed and approved the original items or processes unless another organization with qualified and knowledgeable personnel is designated. Justification for the disposition action is documented in accordance with procedures for those items not returned to their original, as-designed conditions. Nonconforming items that are subsequently reworked, repaired, or replaced are inspected and/or tested to either the original requirements or to design engineering specified alternative requirements. Such inspections or tests are conducted in accordance with documented procedures prior to the final acceptance of the items or processes.

The Cognizant Technical Function (CTF) is responsible for the analysis and disposition of non-conformances involving "Repair" or "Use-As-Is" dispositions.

QA activities associated with nonconforming items and processes include validation of the nonconformance, review of dispositions, verification of completion of disposition actions, and closure of the reporting document. Alternative reporting documents (for example, deficiency reports, work orders, and condition reports) may be used depending on the consequence of failure or operational status. Alternative controls are approved by the QAM in accordance with established procedures. For details see Manual 1-01, and Manuals 1B, 5BA, 9B, 1Q, and S/RID FA 02.

**Table 4**  
**Corrective Action Program Elements by Significance Category**

Minimum Corrective Action Program Elements	Issue Controls						Action Controls						5.8	
	5.1	5.2	5.3 Issue Evaluation			5.4 CA Development			5.5	5.6 Corrective Action Closure		5.7		
	Issue Identification	Significance Category Determination	Root Cause Analysis (Includes Extent of Condition)	Apparent Cause Analysis	Cause Coding	Functional Area Coding	Corrective Actions to Resolve the Issue Identified	Corrective Actions To Prevent Recurrence of Specific Issue Identified	Corrective Actions To Prevent Occurrence of Similar Issues Identified	Corrective Action Implementation & Closure	Independent Verification on Corrective Actions to Prevent Recurrence of Specific Issue	Independent Verification on Corrective Actions to Prevent Occurrence of Similar Issues		Corrective Action Effectiveness Review
1	●	●	●		●	●	●	●	●	●	●	●	●	●
2	●	●	*	●	●	●	●	●	●		**		**	●
3	●	●	*			●	●		●					●
4	●	●				●								●
T	●	●												●

\* Extent of Condition (EOC) determination should be considered. EOC determination required for SC 2 NTS reportables or SCAQ.

\*\* Refer to procedure sections 5.6 & 5.7. Required for issues that are NTS reportable items or SCAQ.

Note: Table 4 is extracted from Manual 1B Procedure 4.23, *Corrective Action Program*, Revision 13, and is included here for reference only. Refer to the SRS online ACCESS website for the latest version of Manual 1B Procedure 4.23.

## Criterion 4 – Documents and Records

The following are Criterion 4 requirements from DOE O 414.1D, Attachment 2 and 10CFR830.122:

- Prepare, review, approve, issue, use, and revise documents to prescribe processes, specify requirements or establish design, and
- Specify, prepare, review, approve and maintain records.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 5 - Instructions, Procedures and Drawings,
- Requirement 6 - Document Control, and
- Requirement 17 - Quality Assurance Records.

### 4.1 Documents

Documents are written, recorded, electronic media or pictorial information that describes, defines, specifies, reports, or certifies activities, requirements, procedures, results, data, or plant conditions. Documents are prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, or establish design.

Procedures require documents to be controlled, maintained, stored, protected, and capable of being retrieved in a timely manner. Record copies of documents are retained for their specified retention period. Documents are prepared and, when specified, reviewed by cognizant individuals or organizations. Individuals or groups responsible for developing, reviewing, approving, issuing, and revising documents are identified in procedures.

Revisions are reviewed and approved by the same organizations that reviewed and approved the original document. Alternative organizations may be designated to review and approve documents based on their technical competence and capability in the required functional areas. The revision process provides for minor editorial changes and urgent changes to be processed expeditiously. Urgent changes are approved by organizations affected by the change as defined in implementing procedures. Measures are provided to assure that approved changes are included in documents prior to implementation.

Controlled copies of approved documents are distributed or made available through the M&O contractor system, Document Control. Data and Document Images are also available for validation and performing assigned tasks. Document control activities include provisions for a master index and/or table of contents to identify the current revisions of controlled documents. Superseded or cancelled documents are controlled to preclude their use and to ensure the use of correct revisions.

Company-level and program-specific procedure manuals are also available electronically on InSite. Controls ensure that the current revisions of approved procedures are identified and are available electronically. For details, see Manuals 1B, S18, 1Q, E7, 2S and S/RID FA 02 and 07.

## 4.2 Records

A record is a completed and accurate document or any other form of media that provides objective evidence about an item, service, or process. The Records Management and QA Records Programs are detailed in Manuals 1B and 1Q and managed by the M&O Contractor. These manuals identify the specific procedures, requirements, and responsibilities to ensure records management. These records management procedures along with the Records Disaster Preparedness Recovery Plan (WSRC-RP-99-00850) meet the requirements for a records management program identified in DOE O 243.1B, "Records Management Program" and DOE O 414.1D "Quality Assurance".

Records providing objective evidence of the quality of an item or activity are identified and retained for in-process and/or completed work activities. Records are specified in documents affecting quality, and are prepared, reviewed, approved, and maintained. Record maintenance includes provisions for record retention, protection, preservation, traceability, accountability, and retrievability. The requirements for the maintenance and control of QA records are specified in various procedures governing the particular activity.

A QA record is a completed and authenticated document that provides evidence of the quality of an item and/or activity; conformance to significant requirements; the quality of site characterization data and samples; and effective operation of a quality program.

M&O Contractor record storage facilities are used for long-term retention of QA records. Staging areas are also used for records. In these staging areas, records are indexed and prepared for transfer to the primary records storage facility. Staging facilities, as well as temporary satellite records storage buildings, are equipped with fire detection and/or suppression devices, or other protective devices, and include provisions for controlling access to the records. All of these facilities provide retention, protection, preservation, traceability, accountability, and retrievability of records.

The Retention Schedule Matrix conforms to the National Archives and Records Administration (NARA) guidelines, General Records Schedule (GRS), and applicable DOE schedules. For those records not identified in the GRS or DOE Order on records disposition, appropriate retention and disposition schedules are written by originating organizations and submitted for NARA approval. When requirements differ from NARA, a request is submitted to NARA requesting authorization to retain the affected records in accordance with other requirements.

Required documentation and records are specified in manuals and procedures. Manuals and procedures that are created and maintained through the Integrated Procedure Management System serve as the primary mechanisms for implementing ISM. For details, see Manuals 1B, S18, 1Q, E7, and S/RID FA 02 and 07.

## Criterion 5 – Work Processes

The following are the Criterion 5 requirements from DOE O 414.1D, Attachment 2 and 10 CFR 830.122:

- Perform work consistent with technical standards, administrative controls, and other hazard controls adopted to meet regulatory or contract, requirements using approved instructions, procedures, or other appropriate means,
- Identify and control items to ensure their proper use,
- Maintain items to prevent their damage, loss, or deterioration, and
- Calibrate and maintain equipment used for process monitoring or data collection.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 5 - Instructions, Procedures and Drawings
- Requirement 8 - Identification and Control of Items
- Requirement 9 - Control of Special Processes
- Requirement 12 - Control of Measuring and Test Equipment
- Requirement 13 - Handling, Storage and Shipping
- Requirement 14 - Inspection, Test and Operating Status
- NQA-1 Part I - Introduction
- Part II, Subpart 2.1 – Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components for Nuclear Power Plants
- Part II, Subpart 2.2 - Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants,
- Part II, Subpart 2.3 – Quality Assurance Requirements for Housekeeping for Nuclear Power Plants
- Part II, Subpart 2.4 – Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities
- Part II, Subpart 2.5 – Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and Foundations for Nuclear Power Plants
- Part II, Subpart 2.7 - Quality Assurance Requirements for Computer Software for Nuclear Facility Applications
- Part II, Subpart 2.8 – Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for Nuclear Power Plants
- Part II, Subpart 2.15 – Quality Assurance Requirements for Hoisting, Rigging, and Transporting of Items for Nuclear Power Plants
- Part II, Subpart 2.18 – Quality Assurance Requirements for Maintenance of Nuclear Facilities
- Part II, Subpart 2.20 - Quality Assurance Requirements for Subsurface Investigations for Nuclear Power Plants.

For Process System Cleanliness, SRR has developed company specific engineering direction to define system cleanliness requirements for each applicable system cleanliness level (E7 2.05A, *LW Modification Traveler*) and has defined the cleanliness levels for all systems and processes under SRR purview in engineering technical documents. Implementation of the requirements is in new work packages/procedures or when making planned, routine technical revisions of work packages/procedures (i.e., not field generated changes, Radiological Control Operation hold point changes, or Assisted Hazard Analysis changes, etc.). The application of requirements may also be used when it is considered beneficial to the project/activity. Routine maintenance/simple tasks (e.g., instrument tube breaks) that do not have the potential to affect system cleanliness conditions do not require specific cleanliness checks.

Housekeeping implementation will credit existing work planning and control guidance. Each facility, project, as well as Construction have developed and issued housekeeping ownership programs that define a process for required management walk downs of facility and project areas for housekeeping conditions. The programs and procedures define facility and project zones and expected housekeeping conditions to assure that facility conditions are not adversely impacting operations, maintenance and modification. This approach will be utilized by SRR in lieu of project and facility placarding.

Alignment to the housekeeping zone requirements in NQA-1 is provided as follows: Housekeeping zones are not being defined or noted in the facilities. In lieu of identifying housekeeping requirements in descending levels of control and placarding the boundaries of each area (as discussed in NQA-1 Part II subpart 2.3) SRR facilities have identified areas by function (office space, operations areas, maintenance areas, etc.) and specified the housekeeping conditions to be checked in each of the areas with an emphasis on assuring that safety related operating systems and equipment are not being impacted by housekeeping conditions.

Facilities and projects translate these requirements into facility and functionally specific procedures that require periodic management team walk downs to assure that areas are being maintained in a condition that assures that safety related systems and equipment are not affected or threatened by housekeeping practices.

### **5.1 Performance of Work**

Line management ensures that trained and qualified people are assigned to perform work and that necessary resources to accomplish the work are provided. The Conduct of Operations, Conduct of Engineering, and Conduct of Maintenance programs require employees to have the necessary training and skill development to perform their assignments.

Work Control Programs require personnel with work approval authority to review the scope of work and provide approval prior to work commencement. Necessary engineering and/or administrative controls, including hazard assessment, tagging and lockout, radiological work permits, and quality inspections are specified. Work control programs provide for work and job planning functions which require preparation, review, and approval of work documents prior to

initiation of work. Work documents consist of steps needed to safely work. Work documents also specify post-modification or functional acceptance tests (if applicable) and associated acceptance criteria.

Work planning at the task/activity level is enhanced by conducting, when applicable, a multi-disciplinary team-style, parallel review of work documents and associated hazards that workers and support personnel helped develop. This work planning process is one tool used to implement ISM at the task and activity level. Personnel responsible for work performance help prepare and review the work document for its correctness and adequacy, and become familiar with its contents. Work documents and associated hazard controls are reviewed and approved by applicable line supervision, quality, engineering and/or operations personnel prior to commencement of work.

Pre-work reviews facilitate compliance to technical standards, verification plans, and inspection acceptance criteria. Pre-work reviews also ensure adherence to worker safety criteria, correctness of quality hold points, planned inspections, and work document completeness. After completion, post-work reviews verify that desired results have been attained and that the required documentation is available.

Procedures and instructions accompanying work documents must comply with the requirements of applicable technical standards, vendor manuals, safety analysis codes, specifications, and other technical requirement documents. Procedures used to accomplish work are developed using technical, safety, and quality requirements as specified in various applicable documents. These procedures define the requirements for reviews by CTF, CQF, operations, maintenance, radiological control, safety, engineering, and other affected organizations prior to approval. Personnel reviewing these procedures are selected by their organization based on qualification, knowledge, experience, and competency in their area of responsibility.

Similar work control functions exist to control work conditions in the development and issuance of safety documents, design documents and procurement documents. Control of these processes includes procedures for preparation, review, approval, issuance, and change of the documents that define the safety basis, design, and procurement of items and activities important to quality, safety, and performance of systems and equipment.

QA and safety requirements are applied to work based on risk, hazard analysis, functional classification, cost and complexity of the item, impact on mission success, and programmatic effects (see paragraph 1.5 for Graded Approach). Hazard analysis is part of the work planning process, and includes, task complexity, environmental and safety consequences, and programmatic effects (for example, mission and cost). This approach is also used to determine the extent of involvement of the CQF, CTF, and Safety/Environment functions in the review, approval and monitoring of work control programs. For details, see Manuals 2S, 5Q, 1C, 1Q, 8Q, 1Y, E7, Conduct of R&D, and S/RID FA 02, 07, 10, and 19.

## **5.2 Identification and Control of Items**

Items are identified and controlled to ensure their proper use. Material identification and traceability requirements are based on the specificity of the material identification, its end use, and the consequences of its failure. Identification of items is maintained either on the item or in documentation traceable to the item. Items important to safety, waste isolation or potentially impacted by environmental conditions may require identification from initial receipt or fabrication up to and including installation or use. Procedures are established to ensure that, when items having identification or traceability requirements are subdivided or sampled, identification will be transferred to each part, container of parts, or sample at the time of subdividing or sampling.

Items are maintained to prevent their damage, loss, or deterioration. Items include materials, equipment, components, appurtenances, assemblies, modules, parts, structures, subsystem units, subassemblies, and systems. Controls are established and implemented to ensure that only correct and accepted items are used and installed. Where specified, items having limited shelf life, operating life or operating life cycle are controlled to preclude use when such limits have been exceeded. (For details, see Manuals 1B, 3B, 1Q, and S/RID FA 02.)

## **5.3 Handling, Storing, and Shipping**

Procedures are established and implemented to control the handling, storing, shipping, cleaning, and preservation of items to prevent damage, loss, or deterioration. The control levels established for storing and shipping are derived from national consensus standards, SRS standards, or technical documents if no standards exist.

Instructions for marking and labeling for packaging, shipment, handling, and storage of items are established, as necessary, to adequately identify, maintain, and preserve the items' integrity, including indication of the need for special environments or special controls. Procedures for offsite transportation are established and implemented.

The need for special protective measures is evaluated and documented. Measures include containers, shock absorbers, accelerometers, inert gas atmospheres, and specific temperature and moisture levels. Measures are also specified and provided to maintain acceptable quality during storage. For details, see Manuals 3B, 1Q, 19Q, and S/RID FA 02, 11, and 13.

Items are maintained to prevent their damage, loss, or deterioration. Items include materials, equipment, components, appurtenances, assemblies, modules, parts, structures, subsystem units, subassemblies, and systems. Controls are established and implemented to ensure that only correct and accepted items are used and installed. Where specified, items having limited shelf life, operating life or operating life cycle are controlled to preclude use when such limits have been exceeded. For details, see Manuals 1B, 3B, 1Q and S/RID FA 02.

## **5.4 Calibration and Maintenance of Monitoring and Data Collection Equipment**

Monitoring and data collection equipment is identified as Measuring and Test Equipment (M&TE), Installed Process Instrumentation (IPI) or Radiological Monitoring Equipment (RME). M&TE is portable or fixed equipment used for acceptance, calibration, measurement, gauging, testing,

and/or inspection of equipment in order to control or acquire data to verify conformance to specified requirements or for reference only. M&TE is not used for process controls.

IPI is the installed equipment, devices, instrument loops, or systems used for monitoring, collecting data, or controlling a facility process, system, or component that is an integral part of the process, system, or component. A program describing IPI calibration and maintenance requirements and controls is established and implemented. The responsible CTF defines what equipment is considered IPI. IPI calibration requirements are specified and documented in implementing procedures. Each piece of IPI is uniquely identified with the identification either on or near the individual piece of instrumentation. The identification is used for traceability and accountability of the equipment.

IPI calibration is performed at specified intervals, commensurate with the application of the equipment. The calibration frequencies and accuracy requirements are based on the system monitoring requirements, stability characteristics, service conditions, and other factors determined by the CTF. M&TE is used to calibrate IPI. Out of tolerance IPI is documented and reported to responsible facility management. An evaluation is required to determine the effect on the validity of previous data collected by that IPI and the impact on previously accepted data. Conclusions for these evaluations which indicate conditions adverse to quality are documented and processed through the Corrective Action System.

RME is radiation monitoring equipment used to measure radioactive emissions from ionizing radiation fields, radioactive effluents, or radioactive surface contamination for radiological control purposes. A program describing RME calibration and maintenance requirements and controls is established and implemented. The responsible CTF establishes the minimum technical requirements for repair, calibration, and source checking of RME. RME calibration and source check requirements are specified and documented in implementing procedures that comply with applicable National Standards and Procedures such as American National Standards Institute (ANSI) Standards, National Institute of Standards and Technology (NIST), International Organization for Standardization (ISO), and others as applicable.

All RME receives an initial calibration and a source check performed by qualified personnel using approved procedures prior to being placed into service. RME calibration frequencies are established by the CTF and documented. Out of tolerance RME is documented, tagged and/or segregated and not used until it has been recalibrated. An evaluation is required to determine if the use of the RME could have resulted in an adverse impact on the health and safety of personnel. Conclusions for these evaluations which indicate conditions adverse to quality are documented and processed through the Corrective Action System.

The site RME Technical Authority maintains a list of controlled RME instrument types. RME is uniquely identified with the identification either on or near the individual piece of equipment. For details, see Manuals 1Q, 5Q, 1S, and S/RID FA 02.

## 5.5 Status Indicators

Managers of organizations that perform operating, support, or experimental functions are required to maintain physical status indicators and supporting documentation for those work processes under their control. Procedures specify the content, application, updating, or removal of physical status indicators. For details, see Manuals 1B, 5E, 1Q, 2S, E7, and S/RID FA 02, 07, and 09.

## 5.6 Control of Computer Software

Software QA procedures define measures to ensure that computer programs used to develop, verify designs, or establish safety envelopes (design analyses, models, or algorithms) are adequate for the software's intended use, including previous use, validation, or simulation.

Computer software used for the control or support of work processes is controlled using a graded approach commensurate with the software classification based on intended use of the software, risk, safety, hazard analysis, facility life cycle, complexity, and project quality requirements. Access to the computer software is limited to authorized individuals. (For details, see Manuals 1B, S18, 3E, 1Q, 7Q, 10Q, E7, and S/RID FA 02 and 07.)

Software (computer programs and associated documentation and data pertaining to the operation of a computer system) used for the control or support of work processes, including (a) design analysis, (b) operations or process control or (c) data base or document control registers when used as the controlled source of quality information for a and b above, is controlled using a graded approach commensurate with the software classification based on intended use of the software, risk, safety, hazard analysis, facility life cycle, complexity, and project quality requirements. Access to the computer software is limited to authorized individuals. (For details, see Manuals 1B, S18, 12B, 3E, 1Q, 7Q, 10Q, E7, and S/RID FA 02 and 07.)

Computer programs are a combination of computer instructions and data definitions that enables computer hardware to perform computational or control functions. To the extent that computer programs are a physical part of plant systems (e.g., digital reactor protection systems, digital instrumentation) they are included in the term item.

### 5.6.1 Graded Approach to Software Quality Assurance

The software quality assurance program identifies two different software types, SSC Software or Non SSC Software. SSC Software is software that is designated as part of an SSC with an assigned functional classification. Non SSC Software is software that is not part of a SSC. Software QA requirements apply not just to safety applications, but also to non-safety applications. Exceptions are limited to low risk personal productivity software and alternate verification method applications (e.g. calibration or other programmatic checking processes).

A graded approach to software QA is applied to computer software using controls commensurate with the software classification based on intended use of the software, risk, safety, hazard analysis, facility life cycle, complexity, and project quality requirements.

The graded approach to software QA is based on DOE Orders, ASME NQA-1, and other consensus standards as documented in the S/RID, which provides detailed mapping to implementing procedures. The use of these standards is approved by DOE through the S/RID approval process. The graded approach to software QA ensures that the level of analysis, documentation, and controls are commensurate with the following:

- Relative importance of the software to safety, safeguards, and security,
- Magnitude of any hazard involved with or controlled by the software application,
- Life cycle stage of the facility or item relative to the software's use,
- Programmatic mission of a facility relative to the software's use,
- Particular characteristics of a facility or item relative to the software's use,
- Impact of the software relative to radiological and non-radiological hazards, and
- Impact the software may have on any other relevant factors.

The software QA graded approach is defined in the software classification process. The software classification process applies to software that is part of a structure, system, or component as well as software that is not part of a structure, system, or component.

While the implementing procedures for classification differ, the appropriate controls are applied based on the resulting software classification. SSC-related software is classified and controlled in accordance with the requirements identified in the E7 Manual, Procedure 2.25A.

Software that is not part of an SSC (non-SSC) is classified and controlled in accordance with Manual 1Q, Procedure 20-1.

An overview of the software classifications life cycle documentation requirements and QA graded approach are provided in Appendix B, Software Life Cycle Documentation Requirements Matrix/Software Quality Assurance Graded Approach.

### **5.6.2 Safety Software Quality Requirements**

Requirements are established to ensure that safety software in SRS facilities performs its intended specific functions in relation to SSCs and that the classification, design, and analysis associated with nuclear facility operations are correct. These requirements are detailed in site manuals (For details, see Manuals 1-01, 1B, Management Requirements and Procedures, 1Q, E7, and 12B, Information Management). These Manuals contain the specific procedures that provide the details to perform work associated with safety software that is conducted in accordance with 10CFR830 and DOE O 414.1D.

Safety Software Grading Levels:

A total of eight grading levels are established for all software: four levels for SSC-based software (SC, SS, PS, and GS) and four levels for non-SSC based software (A, B, C, D). Four of these grading levels are established specifically for safety software and are defined as follows:

Safety Class (SC) - Software for a nuclear facility that performs a safety function as part of a Safety-Class SSC cited in either a DOE approved Documented Safety Analysis (DSA) or an approved hazard analysis.

Level A – Software that is not part of an SSC but has an effect on nuclear safety protection systems that keep exposure to the general public below the off-site regulatory or evaluation guidelines. This includes software running on hardware that has no output connections to an SSC, but whose output is used without further review or evaluation as an input to the functioning of an SSC.

Safety Significant (SS) - Software for a nuclear facility that performs a safety function as part of a Safety-Significant SSC cited in either a DOE approved DSA or an approved hazard analysis.

Level B – Software whose failure to properly function may have an effect on nuclear safety protection systems or toxic materials hazard systems that are used to keep nuclear or toxic material hazard exposure to the general public and workers below regulatory or evaluation guidelines. This includes software whose results are used to make decisions that could result in death or serious injury or are part of the evaluation in accident analyses.

Work processes involving safety software are developed based on national or international consensus standards. ASME NQA-1 and other applicable consensus standards are used to provide the level of QA requirements to implement these work activities. (For details, see Manuals 1Q, 7Q, 10Q, E7, and S/RID FA 02.)

A Software QA Plan (SQAP) is required for all safety software per defined procedures. These procedures/plans may be prepared individually for each software project or may be a generic document applied to software prepared, procured, or used by an organization. Software QA procedures/plans are reviewed and approved by the responsible manager, CTF, and CQF. Based on the nature, complexity, hazard, risk, and intended uses of the software, software QA procedures/plans are prepared using a graded approach.

As part of the software classification process, all software classified as SC, SS, A, or B is designated as safety software and is included on the Safety Software Inventory List (SSIL). The SSIL is managed by SRNS. The software Design Agency can recommend the software classification level and ensures the software classification documentation is complete. The software Design Authority approves the software classification level and for safety software assigns one of the three safety software categories below. The safety software categories are based on those identified in DOE O 414.1D. SSIL determination and assignment of safety software category is included in the OSR 19-337, *Software Classification Document*, process.

Safety software categories:

- Safety System Software - Software for a nuclear facility that performs a safety function as part of an SSC cited in either a DOE approved DSA or an approved hazard analysis (see DOE P 450.4A, *Integrated Safety Management Policy*).
- Safety and Hazard Analysis Software and Design Software - Software that is used to classify, design, or analyze nuclear facilities. This software is not part of an SSC but helps to ensure the proper accident or hazards analysis of nuclear facilities or an SSC that performs a safety function.
- Safety Management and Administrative Controls Software - Software that performs a hazard control function in support of nuclear facility or radiological safety management programs or technical safety requirements or other software that performs a control function necessary to provide adequate protection from nuclear facility or radiological hazards. This software supports eliminating, limiting, or mitigating nuclear hazards to workers, the public, or the environment (see 10CFR830, 10CFR835, and the DEAR ISMS clause).

The software QA program includes the following elements:

- Management ensures the program is established, documented, and implemented
- Facility design authority is involved in software: specification, acquisition, design, development, verification and validation (including inspection and test), configuration management, maintenance, and retirement
- Software is identified, documented, and maintained using a graded approach
- A safety software inventory list is identified, developed, documented, and maintained
- Software is controlled throughout the life cycle, using a graded approach, based on classification
- Using the graded approach identified above and detailed in approved procedures, the following work activities are used to ensure safety software performs its intended functions:
  - A. Software project management and quality planning
  - B. Software risk management
  - C. Software configuration management
  - D. Procurement and supplier management
  - E. Software requirements identification and management
  - F. Software design and implementation
  - G. Software safety
  - H. Verification and Validation (Design Verification, Testing, Implementation, Installation and Acceptance)
  - I. Problem reporting and corrective action
  - J. Training in the design, development, use and evaluation of safety software.

### **5.7. Work Process Controls to Prevent/Detect Suspect Counterfeit Items (S/CIs)**

An item is suspect when inspection or testing indicates that it may not conform to established Government or industry-accepted specifications or national consensus standards or whose documentation, appearance, performance, material, or other characteristics may have been misrepresented by the supplier or manufacturer. A counterfeit item is one that has been copied or substituted without legal right or authority or whose material, performance, or characteristics have been misrepresented by the supplier or manufacturer. Items that do not conform to established requirements are not normally considered S/CIs if nonconformity results from one or more of the following conditions (which are controlled by site procedures as nonconforming items):

- Defects resulting from inadequate design or production quality control,
- Damage during shipping, handling, or storage,
- Improper installation,
- Deterioration during service,
- Degradation during removal,
- Failure resulting from aging or misapplication, or
- Other controllable causes.

The SRS work process controls used by SRR to prevent or detect S/CIs and include a combination of engineering, procurement specification development, design, and administrative controls involving the engineering CTFs commensurate with the facility/activity hazards and mission impact. The S/CI Program relies on procurement, engineering, design, modifications, testing, inspection, maintenance, evaluation, disposition, reporting, trend analysis, operating experience (lessons learned), and work process controls to prevent receiving or using S/CIs when replacing, maintaining, or modifying equipment. SRR Engineering is the point of contact between SRR and the SRNS S/CI program manager. Engineering is involved in these activities commensurate with the facility/activity hazards and mission impact. Training and informing managers, supervisors, and workers promotes S/CI awareness, inspection, and nonconformance reporting. These efforts help ensure potential S/CIs are identified, segregated, and sent to the S/CI program manager for evaluation and disposition.

The S/CI process is used to identify, analyze, remove, and/or prevent S/CIs from being used or supplied in goods or services to DOE, the LW contractor or its customers. This comprehensive process, which prevents the introduction and use of S/CIs, involves multiple organizations including engineering, design, testing, inspection, procurement, maintenance, operations, construction, and quality. This is accomplished through various detailed procedures, programs, and process controls. These same prevention methods are flowed down into Subcontracts through procurement clauses.

Processes used to inspect for and identify potential S/CIs include receipt inspection of procured items, commercial grade dedication of items prior to installation, inspection of inventory and storage areas, screening of external and internal notifications through the operating experience (lessons learned) program, and final acceptance inspections of new, altered, or dispositioned facilities or equipment.

The nonconformance report (NCR) control process is used for the evaluation, control and disposition of identified S/CIs, including those that have been installed in safety applications and other applications that create potential hazards. Disposition of all potential S/CIs are at the direction of the owner organization's cognizant engineer with support by the site S/CI manager. All installed S/CIs dispositioned as acceptable for use are supported by an engineering evaluation, and are identified, tagged or marked with any necessary restrictions (if conditionally approved for use) and to prevent future reuse. Exception: Grade 5 and Grade 8 fasteners that are removed during a maintenance activity can be replaced with appropriate pedigreed fasteners without generation of an NCR. This is considered pre-authorized rework. These fasteners have been previously evaluated and dispositioned by engineering evaluation WSRC-TR-2005-00368.

For disposition of S/CIs installed in safety applications and other applications that create potential hazards, the engineering evaluation must consider potential risks to the environment, the public and workers along with a cost/benefit impact, and a schedule for replacement (if required).

For S/CIs installed in non-safety applications, the engineering evaluation must determine whether the S/CIs pose potential safety hazards or may remain in place. S/CIs identified during routine maintenance and/or inspections are dispositioned to prevent future reuse in these applications.

The M&O S/CI Program Manager is responsible for implementation of the S/CI Program at SRS (via intercompany agreements between SRNS and SRR) and interfacing with the DOE Office of Health, Safety and Security on issues related to collecting, analyzing, maintaining, disseminating, and using the most accurate, up-to-date information on S/CIs and associated suppliers. Supporting the S/CI Program Manager, the M&O Operating Experience program screens key external sources for SC/I information to include: Government-Industry Data Exchange Program (GIDEP), Institute of Nuclear Power Operations (INPO), DOE ORPS, and the DOE S/CI Website.

The S/CI Program Manager determines specific actions required to investigate suspect items and determines S/CI reportability. The S/CI owner organization identifies safety issues and tracks/reports the status of corrective actions. The S/CI Program Manager works with General Counsel to notify the appropriate Office of Inspector General regarding the potential Fraud, Waste, and Abuse (DOE Order 221.1A or latest contract edition) and dispositioning of counterfeit items For details, see Manuals 1-01, 1B, 1Q, E7, 3B, 3E, 5E, 8Q, 14Q, 18Q, 2S, 1Y, 1E6, and L1, see Table 1 for titles.

## Criterion 6 – Design

The following are the Criterion 6 requirements from DOE O 414.1D, Attachment 2 and 10CFR830.122:

- Design items and processes using sound engineering/scientific principles and appropriate standards,
- Incorporate applicable requirements and design bases in design work and design changes,
- Identify and control design interfaces,
- Verify or validate the adequacy of design products using individuals or groups other than those who performed the work, and
- Verify or validate work before approval and implementation of the design.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 3 - Design Control,
- Part II, Subpart 2.7 - QA Requirements for Computer Software for Nuclear Facility Applications,
- Part II, Subpart 2.14 – Quality Assurance Requirements for Commercial Grade Items and Services, and
- Part II, Subpart 2.20 - QA Requirements for Subsurface Investigations for Nuclear Power Plants.

### 6.1 Design Requirements

Items and processes are designed using sound engineering/scientific principles, and appropriate standards. The design of items and processes to accommodate a defined scope of work has features tailored to address the hazards associated with the work. Design considerations interface with nearly all ISM functions and principles, but focus on the first three ISM core functions. Facilities and equipment are designed to help translate missions into work. Design bases are developed to address the identified and analyzed hazards, culminating in tailored hazard controls. Engineering practices and procedures have been established and implemented to perform and control design, including design requirements, inputs, processes, outputs, changes, records, and organizational interfaces. If software or experiments are part of the design process, and safety or mission risks are identified, then design controls apply. SSCs are designed using a graded approach that assigns functional classifications according to the level of hazards present. Various elements of the QA Program and administrative controls are applied in accordance with these functional classifications, cost and complexity of the SSC, impact on mission success, and programmatic effects. Design control measures correctly translate appropriate codes, standards, and quality requirements to ensure SSCs meet their specified design requirements.

Design work, including design changes, incorporates applicable requirements and design bases. The design control program specifies a number of design basis elements that must be considered during development of design input documents. Requirements for determining design bases include basic

function and performance requirements; computer systems and applicable software programs; design and environmental conditions; material requirements; interface requirements; operational, maintenance, constructability, and redundancy requirements; and fire protection, safety, quality and reliability requirements. Requirements are typically contained in task requirements or system/facility design description documents.

Design control processes ensure that design input requirements are correctly translated into design output documents, such as drawings and design and procurement specifications. Design input and output alignment, including drawings, calculations and analyses, and supporting documentation, is an integral part of the design verification process performed during various phases of design development to ensure that the applicable requirements are properly incorporated throughout the design activities. For details, see Manuals 1Q, E7, 11Q, and S/RID FA 02 and 07.

## **6.2 Design Change Control**

Written procedures establish controls for changes to final design, field changes, modifications, and changes resulting from nonconforming items dispositioned as “Use-As-Is” or “Repair.” Design change information is typically included on approved, controlled change documents. Procedures require technical justifications for design changes, including the use of acceptance criteria if different from that specified in original design. Design changes are subject to the same controls as the original design. These controls ensure that the design analyses for the system, structure or components are still valid or are re-performed, as applicable. Procedures provide for changes to be approved by an in-house design organization, or other technically qualified designee, assigned the responsibility for developing, reviewing and approving the design. Formal change control processes are used depending upon the impact of a change. For details, see Manuals 1Q, E7, and S/RID FA 02 and 07.

## **6.3 Temporary Modifications**

Temporary modifications are controlled in a similar manner to the controls for permanent design modifications. They are initiated by a request to the appropriate technical organization responsible for the SSC. A technical evaluation is performed for acceptability and the request logged into a temporary modification log. A formal technical review is conducted by individuals qualified to evaluate the temporary modification and the necessary approvals are obtained. The modification is installed and tags are applied to identify the modification. While in place, the temporary modification is subject to periodic reviews by the organization responsible for the SSC. When the temporary modification is complete, the SSC is returned to its original configuration and the modification log entry is closed. In some cases, a temporary modification may become permanent through an approved, controlled design change process. For details, see Manuals 1Q, E7, and S/RID FA 02 and 07.

## **6.4 Design Interfaces**

Design interfaces are identified and controlled using procedures, instructions and/or formal agreements to provide effective coordination of design effort between participating organizations. These controls describe the responsibilities of the affected organizations for initiation,

development, review, approval, release, distribution, revision of design documents, and management of the tasks. For details, see Manuals 1Q, E7, and S/RID FA 02 and 07.

### **6.5 Design Records**

Design control procedures provide for the collection, storage and maintenance of design documentation and records. Design records include final design output and revisions, such as drawings, specifications, and quality inspection plans. Also included are documents prepared during important design steps: calculations/design analyses, quality assessments, design verifications, formal design reviews, computer programs, and design change documents. Design input documents are maintained as records.

These design records provide evidence that the design and design verification processes were adequately performed. For details, see Manuals 1Q, E7, and S/RID FA 02 and 07.

### **6.6 Design Verification**

Design output adequacy is verified prior to its release for use by other organizations or to support processes such as procurement, manufacturing, construction, operation, or experimentation. If any portion of the design cannot be verified prior to release, the unverified portion of the design is identified, tracked, and controlled. Verification and validation work is completed before approval and implementation of the design.

Design output adequacy is verified or validated by qualified individuals other than those who performed the work. Design organizations assign design verification responsibility to individuals knowledgeable in the application of the design and capable of performing similar design activities.

Design verification is accomplished using one or more of the following methods: design review; independent verification; alternate calculations; and/or qualification testing. Separate verification is not required for multiple uses of identical or previously proven/verified designs unless they are intended for different applications or performance criteria.

Formal design review processes have been established and implemented that independently verifies compliance of the design with applicable requirements specified in design input documents. These review processes include review of design inputs, processes, outputs, and changes. The extent of verification is commensurate with the hazard, complexity of design, degree of standardization, and uniqueness of the design.

Representatives from project-sponsoring organizations and other applicable organizations are included on design review teams. Design review processes consist of peer reviews, interdisciplinary reviews, and reviews within design agencies.

Qualification tests may be used to verify design adequacy or portions of it in conjunction with other verification methods. Programs have been implemented to control such tests. These tests are conducted using approved procedures and include acceptance criteria which verify or validate acceptability of specific design features. Qualification tests are conducted on a timely basis under

conditions that simulate the most adverse design conditions. Determination of the most adverse conditions takes into consideration operating modes and environmental conditions in which the item being tested is required to perform satisfactorily. Test results are documented, evaluated, approved, and retained. Structures, systems or components are put into operation only after successful completion of qualification tests. When only certain feature characteristics can be verified by qualification testing, the remaining features are verified by other appropriate methods (for example, run-ins or monitored operations). The portions of the design to be verified are identified and the extent of the verification is defined and documented.

Alternate calculations may be used to verify correctness of the original design calculations. The appropriateness of assumptions, input data used, and the computer program or other calculation method used are also reviewed for correctness. For details, see Manuals 1Q, E7, and S/RID FA 02 and 07.

### **6.7 Commercial Grade Dedication (CGD) Process**

For items to be used within nuclear facilities, commercially-available items may be used in SC or SS functional applications provided that applicable specifications and acceptance processes provide verification that the items are suitable for their intended use. SRS has specific implementing procedures that define the processes for identification of methods of item specification and dedication. When CGD is utilized, the following requirements apply:

- The CGD and its critical characteristics are identified by Engineering from the DSA identified safety functions, and
- The acceptance criteria and method used for CGD are specified by the CTF, and they provide assurance that the item meets specified critical performance requirements.

The CGD process provides for the continued use of an existing Receipt Inspection Criteria Package (RICP) and CGD document for stores/field bought materials. NQA-1-2009 is followed as defined in the E7 Engineering Manual and in the 1Q QA Manual for materials/services where no pre-existing RICP or CGD package is applicable to the material/service being procured.

### **6.8 Design Analysis Using Software**

Software QA procedures define measures to ensure that computer programs used to develop, verify designs, or establish safety envelopes (design analyses, models, or algorithms) are adequate for the software's intended use, including previous use, validation, or simulation. For details, see Manuals 1Q, E7, and S/RID FA 02 and 07.

## Criterion 7 – Procurement

The following are the Criterion 7 requirements from DOE O 414.1D, Attachment 2 and 10 CFR 830.122:

- Procure items and services that meet established requirements and perform as specified,
- Evaluate and select prospective suppliers on the basis of specified criteria, and
- Establish and implement processes to ensure that approved suppliers continue to provide acceptable items and services.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 4 - Procurement Document Control,
- Requirement 7 - Control of Purchased Items and Services,
- Part II Subpart 2.7 – Software Quality Assurance, and
- Part II, Subpart 2.14 - Quality Assurance Requirements for Commercial Grade Items and Services.

### 7.1 Procurement Program Description

Procurement program procedures provide a detailed methodology for preparing, reviewing and approving purchase requisitions, amendments to requisitions, procurement specifications, bid packages, and other procurement documents. These procedures ensure procured items and services meet established requirements and perform as specified.

Technical, administrative, and quality requirements applicable to items or services being procured are identified and specified in procurement documents. These requirements include applicable codes, regulations and industry standards, tests and inspections, traceability and special procedures or instructions. This process is in direct support of the contractual requirement to flow-down to the point of use, in a tailored manner, applicable QA and other contractual requirements to subcontractors including voluntary consensus standards consistent with contractual and regulatory requirements. Procurement documentation includes expectations for technical and quality requirements to be flowed down, as applicable to sub-tier suppliers at all levels. The SRS procurement activities involve the Engineering CTFs and CQF's in procurement specification/requisition development and approval commensurate with the facility/activity hazards and mission impact. Procurement processes require procurement specifications/requisitions to include appropriate technical and quality requirement flow down (and other applicable expectations such as worker safety). This technical and quality flow down is defined/decided by the Engineering CTF and CQF for safety related and non-safety related commensurate with the hazard/mission impact. The CTF and CQF also procedurally determine the appropriate oversight strategies (e.g., deliverables, in process surveillances, receipt inspection, etc.) to ensure suppliers meet procurement expectations. These processes are primarily addressed in the QA Manual 1Q, Procedures 4 and 7, E7 Engineering Manual, and the 3E Procurement Specification Procedure Manual.

In the case of on-site subcontracted services, a graded approach is used to determine the extent to which worker safety-related procedural requirements must be imposed on the subcontractor and their visitors and vendors. That graded approach is based on the intended use of the service, complexity of the work, the level of hazards associated with the work, the subcontractor's safety performance history, and the proximity of the work to other workers. Subcontract Technical Representatives (STRs) provide appropriate oversight of subcontractor activities to assure compliance with safety, security, technical, quality and any other requirements specified in the subcontract.

Procurement documents identify acceptance methods and criteria for acceptance or rejection of items or services. Procurement documents for items or services critical to safety or having significant operational risks are reviewed by CQFs and CTFs.

Procedures provide specific requirements to initiate purchase requisitions, procurement specifications, and other procurement documents. These procedures define appropriate controls for the selection, suitability determination, evaluation, and receipt of items or services being procured. The procurement program includes a CGD process for procuring off-the-shelf commercial grade items and dedicating these items for safety-related applications. As part of the CGD process, the CTF defines the critical characteristics of the item and associated verification requirements. These items are subjected to specific inspections, tests, and/or evaluations to ensure that these items will perform properly in the safety-related application. Additional discussion of commercial grade item use is presented in Section 6.7, *Commercial Grade Dedication (CGD) Process*. The procurement and procurement QA processes support the ISMS core function "develop and implement controls." For details, see Manuals 1-01, 1Q, E7, S18, 3E, 8Q, and S/RID, FA 02 and 07.

The SRS QA program that SRR implements is based on NQA-1 2009 Parts I and II and is applied using a graded approach. Alternative, nationally recognized standards may be used for site or procurement activities when appropriate. For example, ASME section VIII may be used for applicable code work and ISO 17025 may be used for calibration and testing. ISO 9001 may be used for non-safety applications. For safety related applications, ISO 9001 may be used when equivalency to NQA-1 can be established or CGD is used. When programs are found to be deficient, compensatory actions may be used.

## **7.2 Supplier Selection and Evaluation**

Supplier selection and evaluation applies to the procurement of items and services that are important to safety or mission success. Prospective suppliers are evaluated and selected through specified criteria, using a graded approach. Items or services are procured from suppliers whose qualification results satisfy the requirements of the procurement specifications. Review of the suppliers' documentation and if deemed appropriate, in-plant assessment of the suppliers' capabilities, are used for supplier selection based on the nature and application of items or services being procured. In addition, requalification and supplemental audits, surveillances and source inspections are performed on selected suppliers to verify compliance with the procurement requirements. Supplier performance monitoring is an implemented example of the ISMS "feedback and improvement" function. For details, see Manuals 1Q, S18, 11B, and S/RID FA 02.

### 7.3 Product Acceptance

The quality of purchased items and services is verified at intervals during various phases of the procurement process. The frequency of verification is determined by requirements of the procurement documents, applicable specification, code and standard, uniqueness, complexity, application of the item, quantity and frequency of the procurement, and previous quality-related performance of the supplier. Programs have been established to monitor suppliers of on-site environmental services. Suppliers of off-site analytical services are evaluated to ensure compliance with QA and technical requirements.

Purchased items or services are accepted by the method(s) specified by the requisitioning organization. Items important to safety or having significant operational risks are accepted by one or more of the following methods: source verification, receiving inspection or post-delivery testing. In addition, a Certificate of Conformance (C of C) from a qualified supplier with the appropriate receipt inspection can be used for acceptance of certain procurements. The C of C is traceable to the item and satisfies the requirements of the procurement documents. Procured services may be accepted by the review and technical verification of data/reports produced, supplier performance, or by surveillance/audit of the activity. Source verification and receiving inspection activities are performed using procurement documents reviewed by the CQF of the requisitioning organization. Receipt inspected items are routinely examined for potential suspect/counterfeit characteristics. If identified as a potential suspect/counterfeit item, they are evaluated by engineering and may be dispositioned as nonconforming items.

Processes to ensure that approved suppliers continue to provide acceptable items and services have been established and implemented. When required by procurement documents, surveillances are conducted at supplier facilities by qualified personnel to verify compliance to requirements. These surveillances consist of inspections and tests, including witness and hold points, and document verification as specified in procurement documents. Surveillance of sub-tier suppliers may also be performed.

Procured items are put into service only when the acceptance requirements of the procurement documents are met. If an item does not meet a specified requirement or there is a documentation deficiency, a nonconformance or alternative reporting document is initiated to document such deficiency. Identified deficiencies are dispositioned and corrective action is taken and verified prior to the item's use. Information from these nonconformance/deficiency documents is placed in a program which identifies and analyzes supplier trends and problems.

Post-maintenance, functional, or pre-operational testing is performed after installation of procured items when specified. These tests verify actual performance against established criteria for the item and the system. Tests, in-service inspections, and preventive maintenance programs monitor the performance of the procured item against established criteria. For details, see Manuals S18, 11B, 5E, 1Q, 2S, 1Y, and S/RID FA 02, 07, 09 and 10.

## Criterion 8 – Inspection and Acceptance Testing

The following are the Criterion 8 requirements from DOE O 414.1D, Attachment 2 and 10 CFR 830.122:

- Inspect and test specified items, services, and processes using established acceptance and performance criteria, and
- Calibrate and maintain equipment used for inspection and tests.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 3 - Design Control,
- Requirement 8 - Identification and Control of Items,
- Requirement 10 - Inspection,
- Requirement 11 - Test Control,
- Requirement 12 - Control of Measuring and Test Equipment,
- Requirement 14 - Inspection, Test and Operating Status,
- Part II, Subpart 2.7 - QA Requirements for Computer Software for Nuclear Facility Applications,
- Part II, Subpart 2.8 – Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for Nuclear Power Plants,
- Part II Subpart 2.18 – Quality Assurance Requirements for Maintenance of Nuclear Facilities, and
- Part II Subpart 2.20 – Quality Assurance Requirements for Subsurface Investigation for Nuclear Power Plants.

### 8.1 Inspection

Inspection and testing of specified items, services, and processes are conducted using established acceptance and performance criteria. Examples of inspections include in-process, in-service, final, source, receiving, and, independent. Independent inspections are performed by qualified and certified inspectors who are not responsible for performing or directly supervising the item or activity inspected.

Inspections are performed in accordance with requirements established by the CTF. The CTF is responsible for establishing the level, extent, and acceptance criteria for inspections based on critical characteristics, functional classification, or procurement level. Functional classification and procurement level are also a basis for establishing who will perform designated inspections. Inspections are identified in work documents by hold or witness points.

Measuring and Test Equipment (M&TE) is used to perform inspections, when appropriate. A program describing controls applicable to M&TE has been established and implemented. Equipment used for inspections and tests is calibrated and maintained at specified intervals. Traceability and accountability of this equipment is also required.

M&TE is labeled, tagged, or otherwise controlled to indicate calibration status. M&TE identification provides traceability to calibration and test data.

Accuracy of M&TE calibration standards is established to ensure equipment being calibrated will be within required tolerances. Calibration standards are traceable to national standards. If no national standards exist, the program requires the CTF to identify alternative standards.

M&TE found to be out of calibration or out of tolerance is tagged or segregated. Such M&TE is not used until it has been either successfully recalibrated or replaced. The M&TE control program requires formal documented review of the use of such equipment dating back to its last known in-calibration date (reverse traceability). This review determines if such use resulted in the acceptability of items or processes being either invalid or indeterminate. The CTF performs these activities in accordance with the requirements of the applicable procedures. These activities are quality impacting and are the responsibility of the CTF as defined in the procedures. The basis for acceptance of these nonconforming or indeterminate items and processes is formally evaluated and documented. For details, see Manuals 1Q, 1Y, E7, and S/RID FA 02 and 10.

IPI is the installed equipment, devices, instrument loops, or systems used for monitoring, collecting data, or controlling a facility process, system, or component that is an integral part of the process, system, or component. A program describing IPI calibration and maintenance requirements and controls is established and implemented. The responsible CTF defines what equipment is considered IPI. IPI calibration requirements are specified and documented in implementing procedures. Each piece of IPI is uniquely identified with the identification either on or near the individual piece of instrumentation. The identification is used for traceability and accountability of the equipment.

The inspection planning process is used to ensure that the characteristics to be inspected, method of inspection, and acceptance criteria are provided, properly identified, and incorporated into inspection documents before an inspection is performed. The inspection planning process includes, as a minimum, item and process characteristics to be inspected; inspection techniques to be used; acceptance criteria (including tolerances); hold and witness points; and identification of the organization performing these inspections.

When acceptance criteria are not met, nonconforming items and processes being inspected are controlled in accordance with the applicable Nonconformance Control System. After verification of corrective action implementation, the item or process is re-inspected to the original or approved alternative acceptance criteria prior to being used or returned to service.

Administrative controls, including the use of status indicators, are used to preclude inadvertent bypassing of required inspections and inadvertent operation of nonconforming or indeterminate items or processes. For details, see Manuals 1Q, E7, and S/RID FA 02.

## 8.2 Acceptance Testing

Acceptance testing of specified items, services, and processes are planned and conducted using established acceptance and performance criteria. Establishment and implementation of the test program includes the use of testing methods to demonstrate that items and processes perform, as intended. Test programs include bench tests and proof tests before installation, pre-operational tests, post-maintenance tests, post-modification tests, and operational tests. These programs are structured to clearly distinguish between tests that verify design requirements and tests that verify operation within safety limits and requirements. Test programs are implemented by or for the organization performing the work to be tested, using a graded approach to determine independent organizational involvement.

Item and process test requirements, including specified acceptance criteria, are provided or approved by the organization responsible for design. The CTF has the primary responsibility for establishing and approving test requirements and associated acceptance criteria. Designated operations personnel review the test packages for impact on/interface with operating systems and confirm that proposed testing will provide adequate verification that the equipment being tested will perform its design functions. Administrative controls and status indicators are used to preclude inadvertent bypassing, incomplete required tests, or operation of untested items or processes.

Test program controls include the development, approval, and use of test procedures. These procedures include instructions and prerequisites to perform the test, requirements to ensure completeness and accuracy of data, use of test equipment, acceptance criteria, inspection hold points as required, and test article configuration.

When items and processes do not meet documented test acceptance criteria, these deficiencies are documented on non-conformance reporting documents and dispositioned.

Corrective action control documents are included as a part of test documentation. When deficiencies have been corrected, retesting is performed to verify that acceptance criteria are met. Inspection and acceptance testing processes are mechanisms to confirm readiness to perform work safely and ensure that items will perform their assigned function. For details, see Manuals S18, 5E, 1Q, 2S, 1Y, E7, and S/RID FA 02, 09, and 10.

## **Criterion 9 – Management Assessment**

The following is the Criterion 9 requirement from DOE O 414.1D, Attachment 2 and 10CFR830.122:

- Ensure that managers assess their management processes and identify and correct problems that hinder the organization from achieving its objectives.

The following ASME NQA-1 requirements are used to implement the above requirement:

- Requirement 2 - Quality Assurance Program,
- Requirement 16 – Corrective Action, and
- Requirement 18 - Audits.

Management and Independent assessment have different objectives. The goal of Management Assessment is to ensure that assessments are planned and conducted by managers to measure the quality of items and services, adequacy of work performance, and to promote improvement. Independent Assessments outlined in Criterion 10 provide validation of the effectiveness of the Management Assessment process and evaluate the extent to which the objectives of the organization are met. The approach to management assessment incorporates two major program activities: self-assessment and performance analysis. These activities are jointly implemented to ensure the adequacy and effectiveness of the management control system and contractor assurance system are appropriately assessed. Senior management requires managers to assess performance of activities assigned to them and identify and correct problems. The Management Assessment Program is a major contributor to ISM and oversight activities that comprise contractor assurance activities.

Self-assessments are planned and performed to verify conformance to applicable requirements and identify opportunities to improve performance and cost effectiveness (i.e. to support organizational objectives). Results and conclusions from these assessments are documented and evaluated. Problems identified are documented using the site-wide database system, Site Tracking, Analysis, and Reporting (STAR), for management of problem resolution as required by the company-level Corrective Action Program. Provisions are included to track and follow-up on planned corrective actions from self-assessments.

Performance analysis of event-based and review-based data from various sources (i.e., the Corrective Action Program, Management and Independent Assessment Programs, DOE Occurrence Reporting and Processing System (ORPS), and contractor assurance activities) is performed periodically to identify recurring problems and potential areas of concern. Analysis is accomplished at two different levels. Performance analysis is performed quarterly under the leadership of the Performance Analysis Advisory Group, composed of key senior management personnel, and is used to identify recurring site-wide problems. Performance analysis is performed annually by the Functional Area Managers, as directed by procedure and identifies recurring organizational problems within their areas of responsibility. Functional Area Managers also monitor performance quarterly to identify trends which are fed into quarterly performance analysis process. All problems identified as recurring are processed and reportability determinations are made in accordance with the Corrective Action System and as applicable in the DOE ORPS and DOE Price Anderson Amendment Act (PAAA) Non-Compliance Tracking System (NTS). Results from performance analysis activities are documented, and issues managed through the corrective action database, STAR. For details, see Manuals 1Q, 8B, 9B, and 12Q, and S/RID FA01 and 02.

## Criterion 10 – Independent Assessment

The following are the Criterion 10 requirements from DOE O 414.1D, Attachment 2 and 10 CFR 830.122:

- Plan and conduct independent assessments to measure item and service quality, to measure the adequacy of work performance, and to promote improvement,
- Establish sufficient authority, and freedom from line management, for the group performing independent assessments, and
- Ensure that persons conducting independent assessments are technically qualified and knowledgeable in the areas to be assessed.

The following ASME NQA-1 requirements are used to implement the above requirements:

- Requirement 1 - Organization,
- Requirement 2 - Quality Assurance Program,
- Requirement 10 - Inspection,
- Requirement 11 - Test Control,
- Requirement 15 - Control of Nonconforming Items,
- Requirement 16 - Corrective Action, and
- Requirement 18 – Audits.

Independent assessments, performance-based Integrated Safety Management Evaluations (ISMEs), and compliance-based assessments are planned and conducted by the Independent Assessment Organization. This function includes the Facility Evaluation Board, which is the primary mechanism for performing ISMEs, and also participating in other independent assessment activities. The ISME is part of the ISM feedback and improvement function. They are separate from, and in addition to the management assessments identified in Criterion 9. These documented assessments are routinely planned, scheduled, and conducted to provide a factually accurate comparative evaluation of performance; evaluate facility and programmatic self-assessment programs; and verify conformance to established requirements and contractual obligations. The schedules and allocation of resources are based on the status, hazard, complexity, and prior performance of the activity or process being assessed.

Independent Audits verifying implementation of the QA Program are conducted by SRR QA. These audits are performed to verify compliance to QA program requirements, verify performance criteria are met, and determine the effectiveness of the QA program. The qualification of independent assessment personnel is specified in Section 2.1. The group performing independent assessments has sufficient authority and freedom from the line organization to carry out its responsibilities. Personnel performing independent assessments do not have direct responsibilities in the areas they are assessing, but are technically qualified and knowledgeable in these areas. Table 5 below shows assessment performance Functional Areas.

Assessment results are tracked and management responsibilities for their resolution are clearly assigned. Follow-up review of areas found deficient during an assessment is determined by cognizant management.

Continuous improvement is fostered by applying formal corrective action methodology to the assessment results as described in Section 3.2. That methodology includes problem identification, significance determination and analysis, Operating Experience (Lessons Learned), corrective action development, implementation, and closure; and effectiveness determination of completed corrective actions.

Readiness requirements for the startup/restart of nuclear activities are determined in accordance with Manual 12Q. A graded approach is utilized to determine the scope and depth of readiness determinations, the appropriate level of approval authority and the rigor and formality of process documentation. The methodologies range from use of routine restart procedures, to graded approach Readiness Assessments (RA), up to a complete Operational Readiness Review (ORR).

Independent audits, assessments, and surveillances are also performed by units within designated organizations to address special program requirements identified in Criterion 1. These requirements apply only to the specific organizations. For details, see Manuals 1Q, 12Q, SCD-4, and S/RID FA 02.

**Table 5**  
**Assessment Performance Functional Areas**

FA01 Design	FA15 Nuclear Criticality Safety
FA02 Construction	FA16 Testing
FA03 management Systems	FA18 Safety and Security
FA04 Training and Qualification	FA19 Packaging and Transportation
FA06 Safety Documentation	FA20 Occupational Safety and Health
FA07 Environmental Protection	FA21 Procurement
FA08 Quality Assurance	FA22 Conduct of Operations
FA09 Configuration Management	FA23A Liquid Waste Project Management
FA10 Maintenance	FA24 Waste Management
FA11 Radiation Protection	FA25 Chemical safety and Life Cycle Management
FA12 Fire Protection	FA27 Work Planning and Control
FA13 Emergency Preparedness	

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

#### 1.0 PURPOSE

The purpose of this Quality Assurance (QA) Implementation Plan (QIP) is to describe how the Liquid Waste Operations (LWO) contractor implements the requirements of EM-QA-001, *Department of Energy Office of Environmental Management Quality Assurance Program* (EM-QAP rev.1), using applicable requirements of national consensus standard ASME NQA-1-2009, *Quality Assurance Requirements for Nuclear Facility Applications*, as addressed in the EM-QAP and as modified by LWO contract directives from the DOE Savannah River Operations Office (DOE-SR).

#### 2.0 SCOPE

The objective of the EM-QAP is to provide a basis for consistent QA implementation across the DOE complex for all EM mission-related work, while allowing both for grading based on importance to the EM mission and safety, and for site-specific requirements to be addressed. The EM-QAP implements the requirements of 10CFR830 Subpart A, *Quality Assurance Requirements*, and DOE O 414.1D, *Quality Assurance*, and adopts ASME NQA-1 2009 as the national consensus standard for implementing the EM-QAP requirements. The EM-QAP directs use of ASME NQA-1 Parts I and II requirements, but allows exceptions to these requirements based on their applicability to the work scope being performed if justified and documented in the QIP and approved by DOE-SR. The EM-QAP recommends that ASME NQA-1 Parts III and IV guidance should be considered where applicable to the work scope, and that those portions applied should be documented in the QIP. Subsequent DOE-SR LWO contract directives and letters directed LWO to use ASME NQA-1 2009 as the national consensus standard for implementing the EM-QAP requirements.

This QIP describes how LWO will implement the following requirements of the EM-QAP for EM scope using NQA-1 2009:

##### Management Criteria

- Criterion 1 - Management/Program
- Criterion 2 - Management/Personnel Training and Qualification
- Criterion 3 - Management/Quality Improvement
- Criterion 4 - Management/Documents and Records

##### Performance Criteria

- Criterion 5 - Performance / Work Processes
- Criterion 6 - Performance / Design
- Criterion 7 - Performance / Procurement
- Criterion 8 - Performance / Inspection and Acceptance Testing

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

#### Assessment Criteria

Criterion 9 - Assessment / Management Assessment

Criterion 10 - Assessment / Independent Assessment

Suspect/Counterfeit Items (S/CI) Prevention

Safety Software Quality Requirements

Corrective Action Management Program

SRR applies QA Program requirements to items, services, processes, and associated activities, which implement the requirements in a graded manner as defined in 10CFR830 Subpart A and DOE O 414.1D. Additional detail is provided in Appendix D, paragraph 1.5.

### 3.0 APPLICABILITY

The requirements of this QIP apply to the LWO contractor and to subcontractors performing work for LWO when required by subcontract or applicable law. It is the members of the LWO line organization who shall be responsible for implementing the QIP requirements within their areas of responsibility.

### 4.0 GENERAL IMPLEMENTATION APPROACH AND TRANSITION TIMELINE

Since the LWO QA Program already meets the requirements of 10CFR830 Subpart A and DOE O 414.1D as described in the body of the QAMP, this QIP will focus on the implementation of the requirements of NQA-1 2009 (Part I, Requirements 1-18 and Part II, Subparts . NQA-1 2009 Parts III and IV have been considered and it has been determined that no portions of these Parts will be considered mandatory for application at SRS. Therefore, SRR will treat NQA-1 Parts III and IV of NQA-1 as information and optional guidance only. Engineering / Cognizant Technical Function (CTF) staff may invoke these Parts at their discretion when judged beneficial or when sufficient technical and quality requirements are not provided via other consensus codes and standards, specifications/scope of work requirements, Part I requirements etc.; however, no additional action is required to consider Parts III and IV for SRS application or supplier flow down considerations.

The QA Program requirements are incorporated into the contract by inclusion in the Standards/Requirements Identification Document (S/RID). The S/RID identifies the source documents, provides an index of requirements that are cross-referenced to the source document, and links them to the applicable implementing procedures. The S/RID has been revised in accordance with Manual 8B, *Compliance Assurance Manual* to incorporate the applicable requirements of NQA-1 2009, EM-QA-001, Rev.1, DOE O 243.1B, and DOE/RW-0333P. The requirements of NQA-1 2009 apply to affected activities for new and existing facilities on a forward-fit basis as agreed to in letter OSQA-13-0010 dated November 1,

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

2012, *Savannah River Remediation LLC (SRR) Contract DE-AC09-09SR22505; Department of Energy Savannah River Operations Office (DOE-SR) Approval of SRR Implementation Strategy for NQA-1-2008 with 2009 Addendum*, and summarized below.

NQA-1 2009 is applied on a “forward fit” basis to newly generated work implementing documents, design packages, procurements, etc. issued after implementation (unless under code of record allowances noted below). Existing work implementing documents may be treated as code of record and remain at NQA-1-2000 protocols. SRR may elect to use the new standard on code of record implementing documents. Work performed under NQA-1-2009 is acceptable for projects/activities working to NQA-1-2000.

A code of record approach is utilized for work implementing documents in place before the NQA-1 2009 implementation date of July 22, 2014. Minor revisions to these documents may continue to be under NQA-1 2000. Major revisions require upgrading to NQA-1 2009. Revisions are considered to be major when technical baseline or an Engineering defined critical characteristic is revised. Examples of major revisions include: major procurement specification revision for a new purchase order, major work package revision prior to next use, CGD requiring technical evaluation or critical characteristic revision. Revisions below this threshold are considered minor revisions.

Exact transition date for using NQA-1-2009 in lieu of NQA-1-2000 for new products was July 22, 2014.

#### 4.1 Project Implementation

- 4.1.1 Projects subject to DOE Order 413.3B Critical Decision (CD) process are allowed to follow existing procedures based on NQA-1-2000 if the CD-1 approval was attained before the date of transition to implement 413.3B. An exception to this is the design and construction of SDU-6 which by Federal Project Director direction is implementing NQA-1 2009. All projects become subject to the upgraded NQA-1 2009 requirements embedded in operating procedures at the start of operations.
- 4.1.2 Modifications whose designs have been authorized on the implementation date may remain at NQA-1-2000 as the modification code of record. This includes all aspects of implementation (work planning, CGD, etc.). Modifications authorized after implementation will utilize SRR implementation strategy for NQA-1-2009 processes as Code of Record. For projects/modifications in place prior to implementation, SRR may elect to apply the new standard with the final decision resting with the project based on benefit to quality, safety and cost.
- 4.1.3 The applicable NQA-1 Code of Record for existing projects has been established and is maintained by the project and documented in the applicable project documents.

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

Supply Chain activities and controls associated with these projects will be based on the established NQA-1 Code of Record.

#### 4.2 Procurement Processes

SRR existing Procurement Documents (in facility/stores):

Procurement documents issued prior to transition remain on a NQA-1-2000 basis/flow down including when new procurement releases occur for purchase requisitions and specifications. SRR will upgrade purchase requisitions and specifications to NQA-1 2009 when major technical revisions occur.

New specifications or procurements for new items or services (not in place at the July 22, 2014, transition and subject to code of record allowance described above) will be to NQA-1-2009. In these procurements, NQA-1 Part II Subparts required to be considered for flow down are limited to subparts for CGD, Software Control, and soils studies when applicable.

SRR considers other Part II subparts for flow down when sufficient technical and quality requirements are not provided via other consensus codes and standards, specification/scope of work requirements, Part I requirements included in the specification, etc. Documented justification of the evaluation is not required.

#### 4.3 Commercial Grade Dedication (CGD)

4.3.1 Existing Receipt Inspection Criteria Package (RICP) and CGDs will continue to be utilized following implementation for stores/field bought materials.

4.3.2 NQA-1-2009 is followed on materials/services where no pre-existing RICP or CGD package is applicable to the material/service for use.

#### 4.4 Process System Cleanliness

SRR utilizes SRS procedures/engineering standards for process system cleanliness. These requirements are included in new work packages/procedures or when making planned, routine technical revisions of work packages/procedures and is considered beneficial to the project/activity and not required. Field generated changes, including changes to Radiological Control operational hold points and Automated Hazard Analyses are excluded from requiring cleanliness program upgrades. There are allowances included in the process to not require specific cleanliness checks for routine maintenance or simple tasks (e.g., instrument tube breaks).

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

#### 4.5 Housekeeping Requirements

Housekeeping implementation credits existing work planning and control guidance:

Periodic Operations facility/construction housekeeping review programs have been enhanced to validate work practices not having an impact on the adjacent equipment.

Plant housekeeping zones and placards will not be defined and noted in the facilities. Alignment to housekeeping zone definitions is discussed in the QAMP Criterion 5.

#### 4.6 Records

The original QIP identified that record requirement storage requirements of NQA-2008/9 would be assessed after the July 2014 transition date for possible implementation impacts. This review has been completed and the requirements were implemented as required.

### 5.0 EM-QAP REQUIREMENTS AND IMPLEMENTATION PLAN

#### 5.1 Criterion 1 - Management/Program

ASME NQA-1 requirements used to implement the above criterion:

Requirement 1 – *Organization*

Requirement 2 – *Quality Assurance Program*

**Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 1.0

1Q, 1-1, *Organization*

1Q, 1-2, *Stop Work*

1Q, 2-1A, *LW Quality Assurance Program*

#### 5.2 Criterion 2 - Management/Personnel Training and Qualification

ASME NQA-1 requirements used to implement the above criterion:

Requirement 2 – *Quality Assurance Program*

**Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP Section 2.0

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

1Q, 2-2, *Personnel Training and Qualification*

1Q, 2-4, *Auditor/Lead Auditor Qualification and Certification*

1Q, 2-5, *Training, Qualification, and Certification of Inspection Personnel*

#### 5.3 **Criterion 3 – Management/Quality Improvement**

ASME NQA-1 requirements used to implement the above criterion:

Requirement 2 – *Quality Assurance Program*

Requirement 15 – *Control of Nonconforming Items*

Requirement 16 – *Corrective Action*

##### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 3.0

1Q, 2-1A, *LW Quality Assurance Program*

1Q, 15-1, *Control of Nonconforming Items*

1B 4.23 *Corrective Action Program*

1Q, 19-2A, *Quality Improvement*

12Q, SA-1, *Self-Assessment*

12Q, PA-1A, *LW Performance Analysis*

#### 5.4 **Criterion 4 – Management/Documents and Records**

ASME NQA-1 requirements used to implement the above criterion:

Requirement 5 – *Instructions, Procedures and Drawings*

Requirement 6 – *Document Control*

Requirement 17 – *Quality Assurance Records*

##### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 4.0

1Q, 5-1, *Instructions, Procedures and Drawings*

1Q, 6-1, *Document Control*

1Q, 17-1, *Quality Assurance Records Management*

#### 5.5 **Criterion 5 – Performance/Work Processes**

ASME NQA-1 requirements used to implement the above criterion:

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

- Requirement 5 – *Instructions, Procedures and Drawings*
- Requirement 8 – *Identification and Control of Items*
- Requirement 9 – *Control of Special Processes*
- Requirement 12 – *Control of Measuring and Test Equipment*
- Requirement 13 – *Handling, Storage and Shipping*
- Requirement 14 – *Inspection, Test and Operating Status*
- Subpart 2.1 – *QA Requirements for Cleaning of Fluid Systems and Associated Components for Nuclear Power Plants*
- Subpart 2.2 – *QA Requirement for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants*
- Subpart 2.3 – *QA Requirement for Housekeeping for Nuclear Power Plants*
- Subpart 2.7 – *QA Requirements for Computer Software for Nuclear Facility Applications*
- Subpart 2.15 – *QA Requirements for Hoisting, Rigging, and Transporting of Items for Nuclear Power Plants*
- Subpart 2.18 – *QA Requirements for Maintenance of Nuclear Facilities*
- Subpart 2.20 – *QA Requirements for Subsurface Investigations for Nuclear Power Plants*

#### **Implementing Documents, Manuals and Procedures:**

- S/RID, Functional Area 02, *Quality Assurance*
- QAMP, Section 5.0
- 1Q, 2-7, *QA Program Req. for Analytical Measurement Systems*
- 1Q, 5-1, *Instructions, Procedures and Drawings*
- 1Q, 8-1, *Identification and Control of Items*
- 1Q, 9-1, *Control of Processes*
- 1Q, 9-2, *Control of Nondestructive Examination*
- 1Q, 9-3, *Control of Welding and Other Joining Processes*
- 1Q, 9-4, *Work Planning and Control*
- 1Q, 12-1, *Control of Measuring and Test Equipment*
- 1Q, 12-2, *Control of Installed Process Instrumentation*
- 1Q, 12-3, *Control and Calibration of Radiation Monitoring Equipment*
- 1Q, 13-1, *Packaging, Handling, Shipping and Storage*
- 1Q, 14-1, *Inspection, Test and Operating Status*
- 1Q, 20-1, *Software Quality Assurance*
- E7, 2.05A, *LW Modification Traveler*
- E7, 2.06A, *LW Temporary Modification Control*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

*E9, Geotechnical Engineering Manual*  
*1E6, Construction Management Department Manual*  
*TM-90-7, SRS Hoisting and Rigging Manual*  
*TM-95-1, Engineering Standards Manual*

#### 5.6 Criterion 6 – Performance/Design

ASME NQA-1 requirements used to implement the above criterion:

*Requirement 3 – Design Control*

*Subpart 2.4 - Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities (only for new Hazard Category 1, 2 and 3 nuclear facilities and major modifications to existing Hazard Category 1, 2 and 3 nuclear facilities achieving CD-1 on or after 2/1/2012)*

*Subpart 2.5 - QA Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and Foundations for Nuclear Power Plants (only for new Hazard Category 1, 2 and 3 nuclear facilities and major modifications to existing Hazard Category 1, 2 and 3 nuclear facilities achieving CD-1 on or after 2/1/2012)*

*Subpart 2.7 – QA Requirements for Computer Software for Nuclear Facility Applications*

*Subpart 2.8 – QA Requirements for Installation, Inspection, and Testing of Mechanical Equipment and Systems for Nuclear Power Plants (only for new Hazard Category 1, 2 and 3 nuclear facilities and major modifications to existing Hazard Category 1, 2 and 3 nuclear facilities achieving CD-1 on or after 2/1/2012)*

*Subpart 2.14 - Quality Assurance Requirements for Commercial Grade Items and Services*

*Subpart 2.20 – QA Requirements for Subsurface Investigations for Nuclear Power Plants*

#### **Implementing Documents, Manuals and Procedures:**

*S/RID, Functional Area 02, Quality Assurance*

*QAMP, Section 6.0*

*1Q, 2-3, Control of Research and Development Activities*

*1Q, 3-1, Design Control*

*1Q, 20-1, Software Quality Assurance*

*E7, 2.05A, Plant Modification Traveler*

*E7, 2.06A, LW Temporary Modification Control*

*E7, 2.25A, LW Functional Classifications*

*E7, 2.26, Functional Acceptance Criteria*

*E7, 3.46, Replacement Item Evaluation/Commercial Grade Dedication*

*E9, Geotechnical Engineering Manual*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

#### 5.7 Criterion 7 – Performance/Procurement

ASME NQA-1 requirements used to implement the above criterion:

Requirement 4 – *Procurement Document Control*

Requirement 7 – *Control of Purchased Items and Services*

Subpart 2.14 - *Quality Assurance Requirements for Commercial Grade Items and Services*

#### Implementing Documents, Manuals and Procedures:

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 7.0

1Q, 4-1, *Procurement Document Control*

1Q, 7-2, *Control of Purchased Items and Services*

1Q, 7-3, *Commercial Grade Item Dedication*

1Q, 18-3, *Quality Assurance External Audits*

1Q, 18-7, *Quality Assurance Supplier Surveillance*

E7, 3.10, *Determination of Quality Requirements for Procured Items*

E7, 3.46, *Replacement Item Evaluation/Commercial Grade Dedication*

#### 5.8 Criterion 8 – Performance/Inspection and Acceptance Testing

ASME NQA-1 requirements used to implement the above criterion:

Requirement 3 – *Design Control*

Requirement 8 – *Identification and Control of Items*

Requirement 10 – *Inspection*

Requirement 11 – *Test Control*

Requirement 12 – *Control of Measuring and Test Equipment*

Requirement 14 – *Inspection, Test and Operating Status*

Subpart 2.4 - *Installation, Inspection, and Testing Requirements for Power, Instrumentation, and Control Equipment at Nuclear Facilities (only for new Hazard Category 1, 2 and 3 nuclear facilities and major modifications to existing Hazard Category 1, 2 and 3 nuclear facilities achieving CD-1 on or after 2/1/2012)*

Subpart 2.5 - *QA Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and Foundations for Nuclear Power Plants (only for new Hazard Category 1, 2 and 3 nuclear facilities and major modifications to existing Hazard Category 1, 2 and 3 nuclear facilities achieving CD-1 on or after 2/1/2012)*

Subpart 2.7 – *QA Requirements for Computer Software for Nuclear Facility Applications*

Subpart 2.8 – *QA Requirements for Installation, Inspection, and Testing of Mechanical*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

*Equipment and Systems for Nuclear Power Plants (only for new Hazard Category 1, 2 and 3 nuclear facilities and major modifications to existing Hazard Category 1, 2 and 3 nuclear facilities achieving CD-1 on or after 2/1/2012)*

#### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 8.0

1Q, 2-7, *QA Program Req. for Analytical Measurement Systems*

1Q, 3-1, *Design Control*

1Q, 8-1, *Identification and Control of Items*

1Q, 10-1, *Inspection*

1Q, 11-1, *Test Control*

1Q, 12-1, *Control of Measuring and Test Equipment*

1Q, 12-2, *Control of Installed Process Instrumentation*

1Q, 12-3, *Control and Calibration of Radiation Monitoring Equipment*

1Q, 14-1, *Inspection, Test and Operating Status*

1Q, 20-1, *Software Quality Assurance*

E7, 2.26, *Functional Acceptance Criteria*

#### **5.9 Criterion 9 – Assessment/Management Assessment**

ASME NQA-1 requirements used to implement the above criterion:

Requirement 2 – *Quality Assurance Program*

Requirement 16 - *Corrective Action*

Requirement 18 – *Audits*

#### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 01, *Management Systems*

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 9.0

1Q, 2-1A, *LW Quality Assurance Program*

1Q, 19-2A, *LW Quality Improvement*

1B, 4.23, *Corrective Action Program*

12Q, SA-1, *Self-Assessment*

12Q, PA-1A, *LW Performance Analysis*

#### **5.10 Criterion 10 – Assessment/Independent Assessment**

ASME NQA-1 requirements used to implement the above criterion:

Requirement 1 – *Organization*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

Requirement 2 – *Quality Assurance Program*

Requirement 10 - *Inspection*

Requirement 11 – *Test Control*

Requirement 15 – *Control of Nonconforming Items*

Requirement 16 – *Corrective Action*

Requirement 18 – *Audits*

#### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 01, *Management Systems*

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 10.0

1Q, 1-1, *Organization*

1Q, 2-1A, *LW Quality Assurance Program*

1Q, 10-1, *Inspection*

1Q, 11-1, *Test Control*

1Q, 15-1, *Control of Nonconforming Items*

1B, 4.23, *Corrective Action Program*

12Q, SA-01, *Self-Assessment*

12Q, PA-1A, *LW Performance Analysis*

1Q, 18-2, *Surveillance*

1Q, 18-3, *Quality Assurance External Audits*

1Q, 18-6, *Quality Assurance Internal Audits*

1Q, 18-7, *Quality Assurance Supplier Surveillance*

12Q, FEB-1, *Facility Evaluation Board*

#### **5.11 Suspect/Counterfeit Items (S/CI) Prevention**

ASME NQA-1 requirements used to implement the above criterion:

Requirement 7 - *Control of Purchased Items and Services*

Requirement 8 – *Identification and Control of Items*

Requirement 10 - *Inspection*

Requirement 15 - *Control of Nonconforming Items*

#### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Sections 5.0, 7.0 and 8.0

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

1Q, 7-2, *Control of Purchased Items and Services*  
1Q, 8-1, *Identification and Control of Items*  
1Q, 10-1, *Inspection*  
1Q, 15-1, *Control of Nonconforming Items*  
1B, MRP 5.19, *Suspect and Counterfeit Item Program*

#### 5.12 Safety Software Quality Requirements

ASME NQA-1 requirements used to implement the above criterion:

Requirement 3 – *Design Control*

Requirement 11 – *Test Control*

Subpart 2.7 - *QA Requirements for Computer Software for Nuclear Facility Applications*

##### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 3.0, 5.0 and Appendices B, C and D

1Q, 3-1, *Design Control*

1Q, 11-1, *Test Control*

1Q, 20-1, *Software Quality Assurance*

E7, Section 5.0, *Software Engineering and Control*

#### 5.13 Corrective Action Management Program

ASME NQA-1 requirements used to implement the above criterion:

Requirement 2 - *Quality Assurance Program*

Requirement 15 - *Control of Nonconforming Items*

Requirement 16 - *Corrective Action*

##### **Implementing Documents, Manuals and Procedures:**

S/RID, Functional Area 01, *Management Systems*

S/RID, Functional Area 02, *Quality Assurance*

QAMP, Section 3.0

1B, MRP 4.23, *Corrective Action Program*

1Q, 2-1A, *LW Quality Assurance Program*

1Q, 15-1, *Control of Nonconforming Items*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

#### 6.0 REFERENCES

##### 6.1 Regulatory Requirements

10CFR830, Subpart A, *Quality Assurance Requirements*

##### 6.2 DOE Requirements

DOE O 414.1D, *Quality Assurance*

EM-QA-001, Rev. 1, *Environmental Management (EM) Quality Assurance Program (QAP)*,  
October 20, 2008

DOE/RW-0333P, *Quality Assurance Program Requirements for High Level Waste*

##### 6.3 National Consensus Standards

ASME NQA-1-2008 with the NQA-1a-2009 Addenda, *Quality Assurance Requirements for  
Nuclear Facility Applications*

##### 6.4 Contract Documents

Contract DE-AC09-09SR22505

##### 6.5 Implementing Documents, Manuals and Procedures

SRR-ESH-2011-00061 SRR Integrated Safety Management System: A Comprehensive  
Description of the System, Implementation, and Annual Effectiveness – FY2011

Manual 1-01, *Management Policies*

MP 1.22, *Integrated Safety Management System*

MP 4.2, *Quality Assurance*

Manual 1B, *Management Requirements and Procedures*

1B, MRP 4.23, *Corrective Action Program*

1B, MRP 5.19, *Suspect and Counterfeit Item Program*

Manual 3B, *Asset Management Manual*

Manual 4B, *Training and Qualification Program*

Manual 8B, *Compliance Assurance Manual*

Manual 3E, *Procurement Specification Procedure Manual*

Manual E7, *Conduct of Engineering and Technical Support Manual*

E7, 2.05A, *LW Modification Traveler*

E7, 2.06A, *LW Temporary Modification Control*

E7, 2.25A, *LW Functional Classifications*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

*E7, 2.26, Functional Acceptance Criteria*

*E7, 3.10, Determination of Quality Requirements for Procured Items*

*E7, 3.46, Replacement Item Evaluation/Commercial Grade Dedication*

*E7, Section 5.0, Software Engineering and Control*

*Manual E9, Geotechnical Engineering Manual*

*Manual 1E6, Construction Management Department Manual*

*Manual 1Q, Quality Assurance Manual*

*1Q, 1-1, Organization*

*1Q, 1-2, Stop Work*

*1Q, 2-1A, LW Quality Assurance Program*

*1Q, 2-2, Personnel Training and Qualification*

*1Q, 2-3, Control of Research and Development Activities*

*1Q, 2-4, Auditor/Lead Auditor Qualification and Certification*

*1Q, 2-5, Training, Qualification, and Certification of Inspection Personnel*

*1Q, 2-7, QA Program Req. for Analytical Measurement Systems*

*1Q, 3-1, Design Control*

*1Q, 4-1, Procurement Document Control*

*1Q, 5-1, Instructions, Procedures and Drawings*

*1Q, 6-1, Document Control*

*1Q, 7-2, Control of Purchased Items and Services*

*1Q, 7-3, Commercial Grade Item Dedication*

*1Q, 8-1, Identification and Control of Items*

*1Q, 9-1, Control of Processes*

*1Q, 9-2, Control of Nondestructive Examination*

*1Q, 9-3, Control of Welding and Other Joining Processes*

*1Q, 9-4, Work Planning and Control*

*1Q, 10-1, Inspection*

*1Q, 11-1, Test Control*

*1Q, 12-1, Control of Measuring and Test Equipment*

*1Q, 12-2, Control of Installed Process Instrumentation*

*1Q, 12-3, Control and Calibration of Radiation Monitoring Equipment*

*1Q, 13-1, Packaging, Handling, Shipping and Storage*

## APPENDIX A

### Quality Assurance Implementation Plan for EM-QA-001 rev. 1 (EM-QAP)

1Q, 14-1, *Inspection, Test and Operating Status*  
1Q, 15-1, *Control of Nonconforming Items*  
1Q, 17-1, *Quality Assurance Records Management*  
1Q, 18-2, *Surveillance*  
1Q, 18-3, *Quality Assurance External Audits*  
1Q, 18-6, *Quality Assurance Internal Audits*  
1Q, 18-7, *Quality Assurance Supplier Surveillance*  
1Q, 19-2A, *Quality Improvement*  
1Q, 20-1, *Software Quality Assurance*

Manual 12Q, *Assessment Manual*

12Q, SA-1, *Self- Assessment*

12Q, PA-1A, *LW Performance Analysis*

12Q, FEB-1, *Facility Evaluation Board*

TM-90-7, *SRS Hoisting and Rigging Manual*

TM-95-1, *Engineering Standards Manual*

## APPENDIX B SSC Software Classification Graded Approach

The Life Cycle Documentation associated with these software classifications is provided in Appendix D, Life Cycle Documentation Requirements Matrix/SQA Graded Approach.

The automated software classification process is used for all software except classified software which will continue to use the paper classification process OSR 19-337, Software Classification Document. Both are based on these classification guidelines.

Criteria to classify software important to safety, security, and business are established and reflected in quality levels using a graded approach.

The Graded Approach is the process of ensuring that the levels of analyses, documentation, and actions used to comply with requirements 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 or item
4. The programmatic mission of a facility
5. The particular characteristics of a facility or item
6. The relative importance to radiological and no radiological hazards
7. Any other relevant factors determined by the Design Authority.

The above is the basis applied in Manual E7, Procedure 2.25A and the definitions of A, B, C, D. All software classified as SC, SS, A, or B is treated with the highest level of rigor and maintained on the SSIL.

### **SSC Functional Classification (SC, SS, PS, GS)**

For software that is part of a SSC is to be classified using Manual E7, Procedure 2.25A LW *Functional Classification* and Manual E7, Procedure 2.05A, LW *Modification Traveler*.

## APPENDIX C Non-SSC Software Classification Graded Approach

Software classifications and requirements overview for software that is not part of a Structure, System, or Component (see Manual 1Q, Procedure 20-1).

### Classification = “A”

- Software applications that have an effect on nuclear safety protection systems that keeps exposure to the general public below the off-site regulatory or evaluation guidelines,
- Include software running on hardware that has no output connections to an SSC, but whose output is used without further review or evaluation as an input to the functioning of an SSC, and
- The “A” Classification software for non-SSC definition corresponds with the safety-class SC SSCs. Structures, systems, or components including portions of process systems, whose preventive and mitigative function is necessary to limit radioactive hazardous material exposure to the public as determined by the safety analysis. (Reference 10CFR830)

### Classification = “B”

Software applications whose failure to properly function may have an effect on nuclear safety protection systems or toxic materials hazard systems that are used to keep nuclear or toxic material hazard exposure to the general public and workers below regulatory or evaluation guidelines.

Software applications whose results are used to make decisions that could result in death or serious injury or are part of the evaluation in accident analyses.

- The “B” Classification software Non-SSC definition corresponds with the Safety-significant SS SSCs. SSCs which are not designated as safety-class SSCs but whose preventive or mitigative function is a major contributor to defense in depth and/or worker safety as determined by the safety analysis. (Reference 10CFR830)

However the software application may meet criteria for lower classification if:

- The software output is used for defense-in-depth as determined by the safety analysis.
  - Classification can be changed to “C”.
- The software is used to perform tasks related to hazards routinely encountered in general industry and construction and for which national consensus codes, standards or site programs exist to guide safe design and operation.
  - Classification can be changed to “D”.

## APPENDIX C Non-SSC Software Classification Graded Approach

(Page 2 of 2)

### Classification = “C”

- Software applications whose failure to perform as expected would not affect nuclear
  - safety but would have a severe impact (as defined by the Design Authority) causing
  - loss of:
- Production investment value and/or recovery cost, or
- Primary program capabilities.
  
- Software applications important to continued operations of the business and that which is used to support decisions regarding operating activities,
  
- Software applications used to comply with regulatory laws, environmental permits or regulations and/or commitments to compliance, and
  
- Software applications required by the SRS Emergency Plan for environmental monitoring or for communications with Local, State and Federal Government agencies.
  - Include software that is used in nuclear and non-nuclear facilities for trending and analysis of operational data; or provides operation or maintenance information to management in support of decisions regarding operating activities, causing an unacceptable impact, and
  - Include software whose output is used for defense-in-depth as determined by the safety analysis.

### Classification = “D”

- Software applications whose failure to perform as expected would not affect nuclear safety but would have an unacceptable impact (as defined by the Design Authority) causing loss of:
  - Production investment value and/or recovery cost, or
  - Primary program capabilities.
  
  - Include software used to perform tasks related to hazards that are routinely encountered in general industry and construction and for which national consensus codes, standards or site programs exist to guide safe design and operation.
  
  - Other software not meeting the definition of Level A, B, C, or the exemptions provided in Section 2.0, Scope of this procedure.

## APPENDIX D Life Cycle Documentation Requirements Matrix / SQA Graded Approach

### NOTE

This controlled version of this matrix is contained in Manual 1Q, Procedure 20-1 and is included here for reference only. Refer to the SRS online ACCESS website for the latest version of Manual 1Q, Procedure 20-1.

DOE SSIL Classification			Nuclear Safety						Critical			Other		
M&O/LW Software Classification Level			SC, A			SS, B			PS, C			GS, D		
DOE	SQA Activities	Proc. Section s in 1Q, 20- 1 E7- 5.01	Developed	Existing	Purchased	Developed	Existing	Purchased	Developed	Existing	Purchased	Developed	Existing	Purchased
A, J	Software Classification	5.2	R	R	R	R	R	R	R	R	R	R	R	R
A, J	SQA Procedures/Plans	5.3	R	R	R	R	R	R	R	R	R	R	R	R
A, J	<b>Life Cycle Plans</b>	5.4												
E	Requirements	5.4.2	R	R	R	R	R	R	R	G	G	G	G	G
F, G	Design	5.4.3	R	G	G	R	G	G	G	G	G	G	G	G
F	Implementation	5.4.4	R	G	G	R	G	G	G	G	G	G	G	G
H	Testing	5.4.5	R	G	R	R	G	R	G	G	G	G	G	G
H	Installation & Acceptance	5.4.6	R	R	R	R	R	R	R	G	R	G	G	G
H, I	Operation & Maintenance	5.4.7	R	R	R	R	R	R	G	G	G	G	G	G
C	Retirement	5.5.8	R	R	R	R	R	R	G	G	G	G	G	G
A, J	<b>SQA Actions</b>	5.5.10												
C	Configuration Control	5.5	R	R	R	R	R	R	R	R	R	G	G	G
D	Evaluation	5.6	N A	R A	N A	NA	R A	N A	NA	R A	NA	N A	R A	N A
D	Procurement Level	5.7.1	N A	N A	1	NA	NA	2	NA	NA	3	N A	N A	3
D	Dedication of Commercial Grade	5.7.2	N A	N A	R *	NA	NA	R*	NA	NA	NA	N A	N A	N A
I	Problem Reporting & Corrective Action	5.8	R	R	R	R	R	R	G	G	G	G	G	G
B, G	Risk and Safety Analysis	5.x	R	R	R	R	R	R	G	G	G	G	G	G
B, G	Cyber Security Analysis	5.x	C S	C S	C S	CS	CS	C S	CS	CS	CS	C S	C S	C S
A, J	Safety Software Inventory List (SSIL)	5.2 5.10	R	R	R	R	R	R	NA	NA	NA	N A	N A	N A

\* Dedication of Commercial Grade Section 5.7.2 is required for "A,SC,B,SS" classified purchased software, unless you purchase from an ASME NQA-1 Qualified Software supplier.

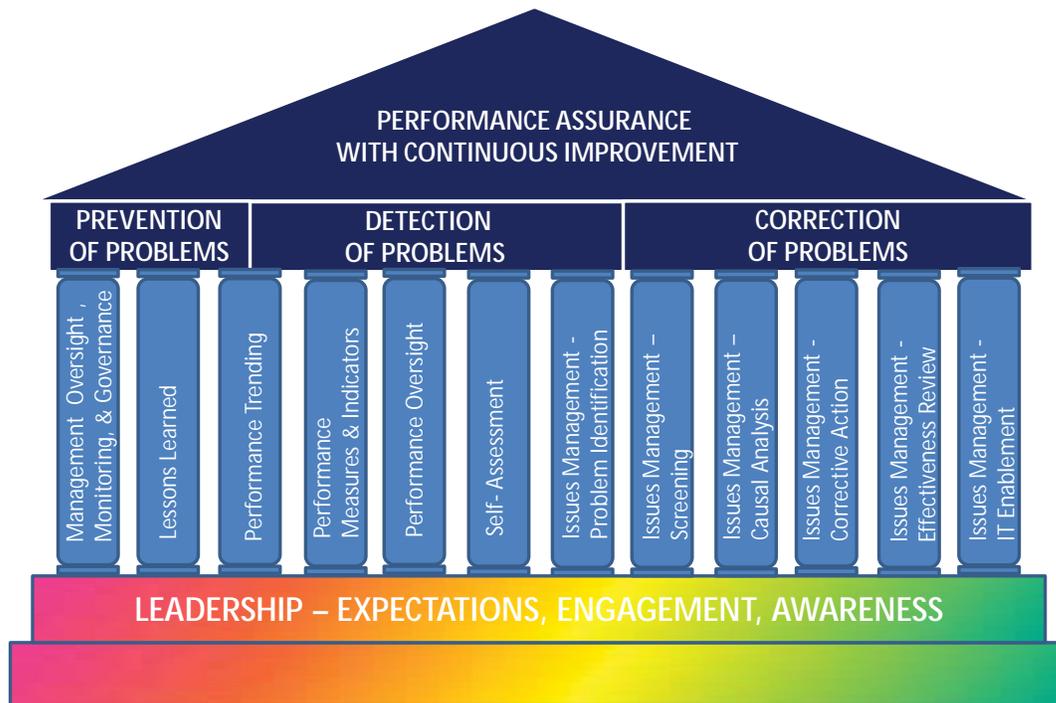
**Definitions**

R = Requirement (shall) must be met and defined in SQAP
G = A graded approach for this requirement should be considered and defined in SQAP
CS = Cyber Security requirements per Manuals 10Q and 7Q must be met
NA = Not applicable

**Attachment 3 – SRR Contractor Assurance System Description**

# SAVANNAH RIVER REMEDIATION LLC

## CONTRACTOR ASSURANCE SYSTEM DESCRIPTION



Approved by:

P. E. Shedd, Manager  
SRR Contractor Assurance

# Contractor Assurance Description Document

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## Revision Log

Revision Number	Pages Affected	Description
1	4 – 6	Cross-reference requirements from DOE O 226.1B Contractor Requirements Document (CRD) to requirement section of this description document.
	All	Minor editorial changes not affecting scope.

# Contractor Assurance Description Document

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## Table of Contents

Introduction .....	4
Requirements .....	4
Verification of Incorporation of Requirements .....	6
Contractor Assurance System and Desired Outcomes .....	6
Contractor or Performance Assurance Definition .....	6
Contractor Assurance System .....	7
Prevention of Problems .....	7
Detection of Problems .....	7
Correction of Problems .....	8
Desired Outcomes.....	11
SRR Contractor Assurance System Program Design .....	12
Management or Self-Assessments .....	16
Independent Assessments/Integrated Safety Management Evaluations .....	16
Other Oversight Assurance Tools .....	17
Issues Management Overview .....	17
Operational Events and Incidents.....	18
Activities Covered by the Price-Anderson Amendment Act .....	18
Safeguards, Security, and Cyber Security.....	18
Trending and Analysis .....	18
Performance Analysis.....	19
Business Operations .....	19
Operating Experience (Lessons Learned) .....	20
Company (Corporate) Metrics .....	20

# Contractor Assurance Description Document

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## Introduction

The SRR Contractor Assurance System (CAS) provides a comprehensive and integrated oversight and assurance system essential to contract and customer mission success. The requirements of Department of Energy (DOE) Policy 226.1B, Department of Energy Oversight Policy, and DOE Order 226.1B, Implementation of DOE Oversight Policy, to maintain a CAS are incorporated throughout the SRR Integrated Safety Management System (ISMS) and support the full implementation of applicable Quality Assurance Management Program (QAMP) requirements. Implementation of the SRR CAS is performed through the Integrated Procedure Management System (IPMS) in the same way other elements of the ISMS process are implemented.

## Requirements

The Contractor Requirements Document (CRD) of DOE O 226.1B establishes the contractor requirements for a performance or contractor assurance system to be as follows:

- a. The contractor must establish an assurance system that includes assignment of management responsibilities and accountabilities and provides evidence to assure both the Department of Energy's (DOE) and the contractor's management that work is being performed safely, securely, and in compliance with all requirements; risks are being identified and managed; and that the systems of control are effective and efficient.<sup>1</sup>
- b. The contractor assurance system, at a minimum, must include the following:
  - 1) A method for validating the effectiveness of assurance system processes. Third party audits, peer reviews, independent assessments, and external certification may be used and integrated into the contractor's assurance system to complement, but not replace, internal assurance systems.
  - 2) Rigorous, risk-informed, and credible self-assessment and feedback and improvement activities. Assessment programs must be risk-informed.
  - 3) A structured issues management system that is formally described and documented and that:

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<sup>1</sup> In this context, performance assurance as used in this description document and contractor assurance as used in the DOE Order are synonymous.

## Contractor Assurance Description Document

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- a) Captures program and performance deficiencies (individually and collectively) in systems that provide for timely reporting, and taking compensatory corrective actions when needed.
- b) Contains an issues management process that is capable of categorizing the significance of findings based on risk and priority and other appropriate factors that enables contractor management to ensure that problems are evaluated and corrected on a timely basis. For issues categorized as higher significance findings, contractor management must ensure the following activities are completed and documented:
  - 1) A thorough analysis of the underlying causal factors is completed;
  - 2) Timely corrective actions that will address the cause(s) of the findings and prevent recurrence are identified and implemented;
  - 3) After completion of a corrective action or a set of corrective actions, an effectiveness review is conducted using trained and qualified personnel that can validate the effectiveness of corrective action/plan implementation and results in preventing recurrences; and
  - 4) Documentation of the analysis process and results described in (1) above, and maintenance and tracking to completion of plans and schedules for the corrective actions and effectiveness reviews described in (2) and (3) above in a readily accessible system.
  - 5) Communicates issues and performance trends or analysis results up the contractor management chain to senior management using a graded approach that considers hazards and risks, and provides sufficient technical basis to allow managers to make informed decisions and correct negative performance/compliance trends before they become significant issues.
  - 6) Timely and appropriate communication to the Contracting Officer, including electronic access of assurance-related information.
  - 7) Continuous feedback and improvement, including worker feedback mechanisms (e.g., employee concerns programs, telephone hotlines, employee suggestions forms, labor organization input), improvements in work planning and hazard identification activities, and lessons learned programs.
  - 8) Metrics and targets to assess the effectiveness of performance, including benchmarking of key functional areas with other DOE contractors, industry, and research institutions.

# Contractor Assurance Description Document

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- c. The contractor must submit an initial contractor assurance system description to the Contracting Officer for DOE review and approval. That description must clearly define processes, key activities, and accountabilities. An implementation plan that considers and mitigates risks should also be submitted if needed and should encompass all facilities, systems, and organization elements. Once the description is approved, timely notification must be made to the Contracting Officer of significant assurance system changes prior to the changes being made.
- d. To facilitate appropriate oversight, contractor assurance system data must be documented and readily available to DOE. Results of assurance processes must be analyzed, compiled, and reported to DOE as requested by the Contracting Officer (e.g., in support of contractor evaluation or to support review/approval of corrective action plans).

## Verification of Incorporation of Requirements

The requirements of DOE Order 226.1B, *Implementation of DOE Oversight Policy*, to maintain a CAS, are incorporated throughout the SRR ISMS. Implementation of the SRR CAS is performed through the IPMS in the same way other elements of the ISMS process are implemented.

The Compliance Assessment and Implementation Report (CAIR) for DOE O 226.1B, SRR-RP-2009-00871-705, is maintained in accordance with DOE O 251.1C, Departmental Directives Program, and Manual 8B Procedure 5, *Conduct of Performing Entity Phase I Compliance Assessment – Source Documents Within S/RID*, provides the identification of how each of these requirements are implemented for SRR. The CAIR is prepared by the SRR Contractor Assurance organization under the general supervision of the SRR Regulatory Compliance Program Manager by the Regulatory Compliance Lead Engineer. It is then reviewed by the responsible Functional Area Program Manager (FAPM) and informally by the responsible DOE representative. Following incorporation/addressing of all comments, the CAIR is approved for SRR by the responsible manager and the Contractor Assurance Manager (or designee). It is then forwarded to DOE-SR for concurrence.

## Contractor Assurance System and Desired Outcomes

### Contractor or Performance Assurance Definition

In the context of this description document, performance assurance is defined to include those activities performed at every level to assure safe and effective mission

# Contractor Assurance Description Document

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performance. This begins with the SRR President who provides the leadership for effective organizational learning, open communication, trust and reporting of issues errors and problems in an environment free from retribution, as well as other important attributes of a good safety culture. It permeates through line management, support organizations, supervision, and the workforce, and even includes the client and regulator. All levels of the project and organization have their role to play in assuring the appropriate mission outcomes are achieved. Performance assurance is NOT solely the domain of an oversight organization. The CAS provides the framework for effective performance assurance.

## Contractor Assurance System

Clear lines of authority from the top level Project Manager to the floor level worker; effective lines of communication up, down and between organizational elements of the project; and a philosophy of continuous improvement drives the SRR organization to exceed goals through innovation.

There are a number of functions that support the SRR CAS. The functions include the following:

### Prevention of Problems

- **Management Oversight , Monitoring, and Governance** – provides the means by which the project leadership team maintains awareness of project performance in order to (1) detect performance deterioration early and react to prevent consequential problems with informed, balanced and timely decisions; (2) assure that when problems occur, they are managed and resolved; and (3) assure the performance assurance system is effectively and efficiently functioning in alignment with supporting the project mission.
- **Lessons Learned** – includes identification and implementation of operating experience (both internal and external to the project) that affects any and each level of the organization.
- **Performance Trending** – typically includes statistical trending processes, and cognitive trending. Performance trending is a function that benefits both prevention and detection of problems.

### Detection of Problems

- **Performance Measures and Indicators** – includes periodic reporting of performance data and associated measures including both lagging and leading indicators.

# Contractor Assurance Description Document

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- **Performance Oversight** – includes elements such as independent assessments or audits, and surveillances.
- **Self-Assessment** – includes elements such as management assessment, management observations or walk-through processes/worksites visits, and behavior observations.
- **Issues Management** – has several elements, including issue identification, which specifically support detection of problems.

## Correction of Problems

- **Issues Management** – has several elements including: screening, causal analysis, corrective action development and implementation, effectiveness review, and information technology enablement which specifically supports correction of problems.

The following table provides an overview of the SRR contractor assurance strategy and how the various functions align with this strategy. Included in the table is the performance expectation for each specific function that is used to define metrics to monitor effective use of the function.

## Contractor Assurance Description Document

Performance Outcome	Contractor Assurance Program Function	Performance Expectation
<b>Prevention</b>	1. Lessons Learned at the project or program level are used to prevent a consequential event.	Opportunities for improvement are gleaned from industry experience, analyzed relative to project and program risk, and action taken to address project/program risk.
	2. Lessons Learned are used at the activity level such that workers avoid repeating mistakes that have caused consequential events or substantial rework.	Opportunities for improvement are gleaned from project work activities, analyzed relative to the work activity and action taken to improve the work process.
	3. Performance Trending reveals warning signs of declining performance before a consequential event is realized.	Latent organizational weaknesses are identified and the performance gap closed using the issues management system.
	4. Management Oversight, Monitoring and Governance enable decisions to prevent consequential events and repeated mistakes that can result in substantial rework.	Informed and balanced decisions are made regarding declining performance or issues management trends to reduce project and program risks.
<b>Detection</b>	5. Self-Assessments are used to detect performance gaps, such that people find the little problems before they become big problems.	The number of self-identified issues from line organizations is significantly more as compared to internal oversight groups and external agencies.
	6. Performance Oversight activities are detecting latent organizational weaknesses and other performance gaps.	The number and significance of oversight-identified issues is significantly more than external agencies.
	7. Performance Measures and Indicators are sufficiently comprehensive to detect the signs of declining performance.	Adverse trends with performance measures/indicators are identified and the performance gap closed using the corrective action management system.
<b>Correction</b>	8. The Issues Management system is used to correct all levels of performance gaps.	The use of the issues management system reflects a high volume low threshold reporting culture.
	9. The effort spent analyzing problems is commensurate with their importance.	The percentage of issues closed to immediate actions reflects a majority of the issues.

# Contractor Assurance Description Document

Performance Outcome	Contractor Assurance Program Function	Performance Expectation
	10. There are a low number of repeat issues.	The quality of cause analysis and corrective actions targets prevention of subsequent high consequence issues.
	11. The Issues Management system performance reflects a bias toward effective action.	The cycle time for issue closure supports prevention of subsequent high consequence issues.

The following table illustrates how personnel at every level within SRR contribute towards mission performance assurance. The examples are not all-inclusive and may not be exclusive to any particular role.

ROLE	PREVENT	DETECT	CORRECT
Workers	<ul style="list-style-type: none"> <li>• Work to instructions</li> <li>• Identify improvement opportunities</li> <li>• Use time outs</li> </ul>	<ul style="list-style-type: none"> <li>• Self-checking of self and others</li> <li>• Share concerns openly with others</li> </ul>	<ul style="list-style-type: none"> <li>• Complete assigned tasks</li> <li>• Stop work on issues and pursue workable solutions</li> </ul>
Supervisors /Line Management	<ul style="list-style-type: none"> <li>• Set clear expectations and act accordingly</li> <li>• Align work to the mission, strategy and constraints</li> </ul>	<ul style="list-style-type: none"> <li>• Competence commensurate with responsibilities</li> <li>• Field presence and seek input</li> <li>• Monitor performance</li> </ul>	<ul style="list-style-type: none"> <li>• Actively consider stakeholder inputs</li> <li>• Manage issues (hard on the issues, easy on the people)</li> </ul>
Functional Organizations	<ul style="list-style-type: none"> <li>• Team with workers and line managers to deliver success</li> <li>• Speak up! Do not assume.</li> </ul>	<ul style="list-style-type: none"> <li>• Competence commensurate</li> <li>• Field presence and give input</li> <li>• Monitor performance</li> </ul>	<ul style="list-style-type: none"> <li>• Actively support line management corrective action efforts with input and completing actions</li> </ul>
Audit/Assessment Organizations	<ul style="list-style-type: none"> <li>• Align reviews to areas of known weakness or desired improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Plan and conduct periodic verification reviews</li> </ul>	<ul style="list-style-type: none"> <li>• Provide timely, authoritative feedback aligned to published standards and expectations</li> </ul>
Corporate	<ul style="list-style-type: none"> <li>• Support and reward sharing, benchmarking, best practices</li> <li>• Clearly articulate expectations</li> </ul>	<ul style="list-style-type: none"> <li>• Sponsor and conduct periodic verification reviews</li> </ul>	<ul style="list-style-type: none"> <li>• Exercise accountability for performance</li> </ul>
Client	<ul style="list-style-type: none"> <li>• Clearly articulate expectations and live to them</li> </ul>	<ul style="list-style-type: none"> <li>• Competence commensurate</li> <li>• Read and understand reports</li> </ul>	<ul style="list-style-type: none"> <li>• Act consistently</li> </ul>
Regulators	<ul style="list-style-type: none"> <li>• Clearly articulate regulations and live to them</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct periodic inspections</li> </ul>	<ul style="list-style-type: none"> <li>• Enforce consistently</li> <li>• Act within regulatory scope</li> </ul>
Executive Management	<ul style="list-style-type: none"> <li>• Establish clear policies and strategic direction</li> <li>• Actively support Performance Assurance as a core business value and process</li> </ul>	<ul style="list-style-type: none"> <li>• Support with resources and respect Performance Assurance-related activities</li> </ul>	<ul style="list-style-type: none"> <li>• Reward those who succeed through good planning and execution.</li> </ul>

# Contractor Assurance Description Document

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## Desired Outcomes

The overall goal of the SRR CAS is to enable successful mission delivery through continuous improvement. This includes effectively addressing known shortfalls to prevent recurrence, monitoring and improving current performance, and using experience and standards to drive performance to new levels through identification and resolution of latent issues and pre-cursors. Each of these outcomes can be tied to specific performance assurance functions, such as Lessons Learned, Self-Assessment, and Performance Measures and Indicators. The functions, in turn, can be tied to performance expectations. Performance expectations can be general, such as “reduce the number of discrepant conditions found by external oversight”, or specific, such as “reduce overdue corrective actions to less than 5% of total”.

Figure 1 illustrates the desired outcome of performance assurance as it relates to work in the field. Typically, management fully expects that people are working and achieving results based on expectations relative to procedure compliance, work document development, work release, stopping work when safety issues arise, etc. Because of poor communications and/or human weaknesses, expectations over time can be misunderstood or can change such that work as performed declines and drifts from management’s expectations. Some work environments have built-in margins that allow for some degree of drift before reaching a hazard<sup>2</sup>, others do not. As actual work performance continues to decline and the gap widens, an event or accident can occur. This has the potential to affect the health and safety of the public, our workers, and the environment, as well as impact project performance and the organization’s image in a very negative way. The purpose of performance assurance is to identify the performance gap and close it before the margin is degraded to the point where an event or accident can occur.

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<sup>2</sup> A hazard can be anything such as an industrial hazard, nuclear hazard, commercial, performance or regulatory compliance issue.

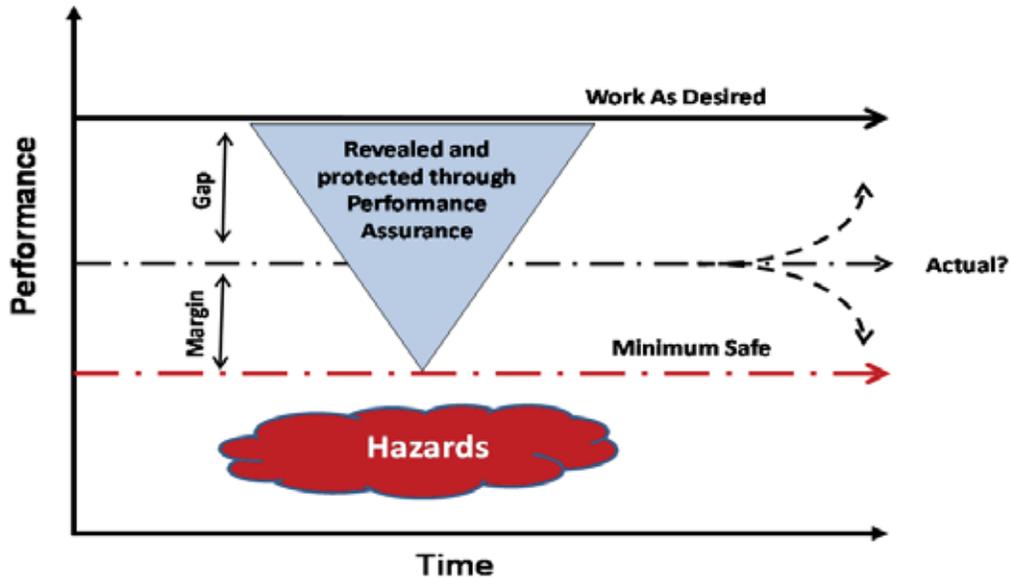


Figure 1

## SRR Contractor Assurance System Program Design

The SRR CAS is part of the framework to implement management responsibility for the safety and health of workers at SRR. Implementation of the CAS is used to accomplish the following:

- provide the means and requirements to report deficiencies and observations to responsible managers and authorities,
- correct program and performance deficiencies,
- follow up on opportunities for improvement, and
- share operating experience (lessons learned) across all aspects of operations.

Functional Area Program Managers, who possess the experience, knowledge, skill, and ability in their particular area of expertise (1Q and 4B Manuals), are charged with establishing effective programs and procedures and enforcing their implementation. The CAS also establishes the expectation for workers to implement procedures, comply with applicable requirements, deliver effective and efficient performance essential to mission success, and take a time out (8Q Manual) to reevaluate the activity before recommencing work.

There are four essential elements to the SRR CAS:

1. Regulatory Compliance – these are the processes necessary to ensure Environmental, Safety and Health (ESH) requirements are flowed down from

## Contractor Assurance Description Document

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upper-tier sources into policy/program implementing procedures and are then flowed down (as required) to both individual facility or organization implementing procedures and to subcontractors working in support of the SRR mission and operations. The process for performance of this function is contained in Manual 8B, *Compliance Assurance*. The identified source document requirements are verified to be included in the necessary SRR or site procedures in accordance with the IPMS.

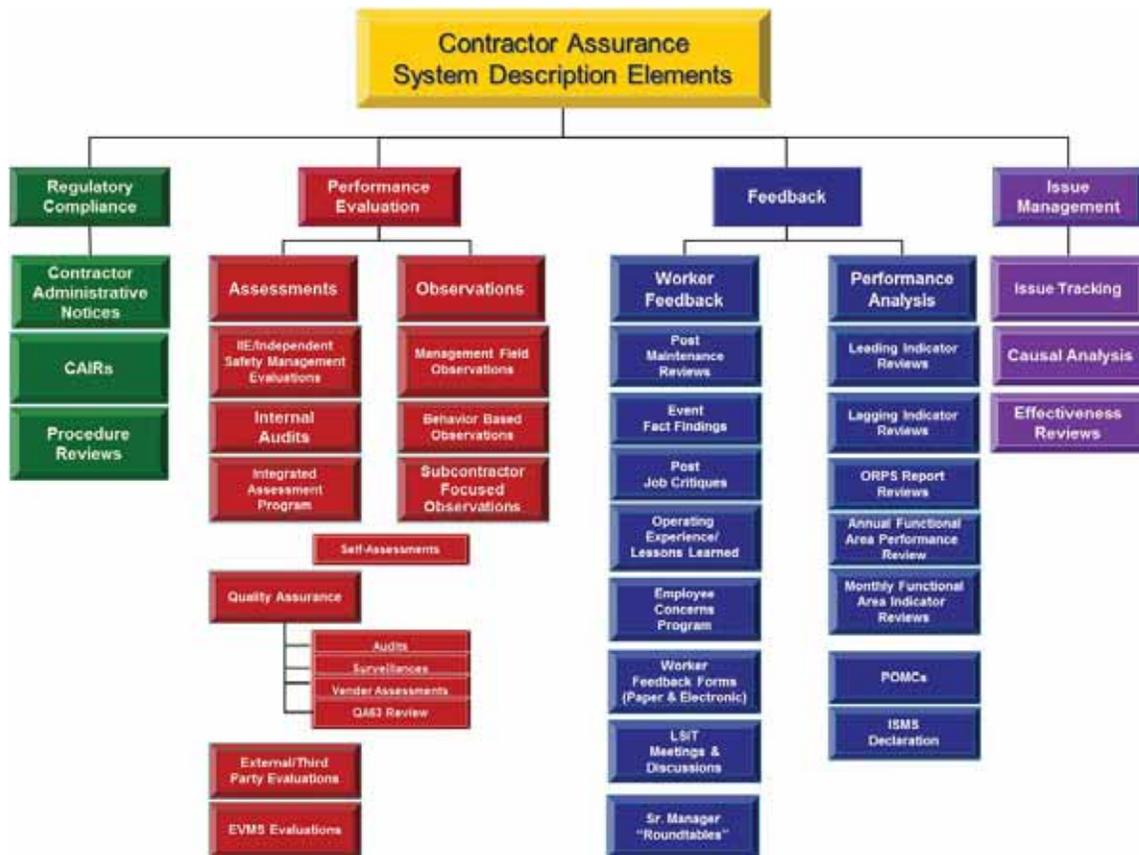
2. Evaluations – SRR evaluation activities include, but are not limited to:
  - a. assessments (both management and independent safety management evaluations),
  - b. monitoring/observations (Management Field Observations, Behavior Based Safety Observations, Subcontractor Focused Observations),
  - c. evaluations (such as external/third party evaluations, Earned Value Management System [EVMS] evaluations),
  - d. Quality Assurance (such as audits, surveillances, vendor assessments and the Quality Assurance Program DOE-EM Lines of Inquiry (QA63 LOI) reviews),
  - e. benchmarking,
  - f. effectiveness reviews,
  - g. extent of condition/extent of problem determinations,
  - h. peer reviews/verifications,
  - i. inspections,
  - j. investigations (such as accident/incident),
  - k. physical surveys (such as radiological protection surveys),
  - l. screenings (such as potential unreviewed safety question determinations), and
  - m. data analysis, tracking and data management.
3. Issue Management – issues (either findings or improvement opportunities) are analyzed and tracked to ensure effective resolution occurs, using a tiered approach based on issue significance.
4. Feedback – there are three general types of feedback making up this element of the CAS:
  - a. Worker Feedback, which includes such activities as direct conversations with supervisors, Local Safety Improvement Team (LSIT) discussions, Senior Management “round table” meetings, post maintenance reviews, event/occurrence fact findings, post job critiques, Nuclear Safety Culture/Safety Conscious Work Environment (NSC/SCWE) surveys and

# Contractor Assurance Description Document

evaluations, feedback forms and feedback kiosks, and the Employee Concerns Program,

- b. Management Evaluations, which include the evaluation of leading and lagging indicators, ORPS reports, quarterly and annual performance evaluations, Performance Objectives, Measures, and Commitments, and the annual ISMS effectiveness declaration, and,
- c. Oversight Reviews – these are second or third level reviews of data evaluated under the management evaluations processes, but these are performed by teams of managers (ranging from facility/organization for management reviews to the SRR Company executive level reviews by the Executive Quality and Safety Board [ESQB] for SRR corporate issue reviews).

These assurance activities are integrated into the various SRR ISMS programs and procedures. Where applicable, these requirements are flowed down through the procurement system to subcontractors. The following displays this functional relationship pictorially:



## Contractor Assurance Description Document

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The SRR CAS is implemented throughout operational, program and business elements using a graded approach based on factors such as risk, hazard, and experience. The performance assurance activities previously identified are included in Assessments, Event Reporting, Worker Feedback, Issues Management, Operating Experience (Lessons Learned) and Performance Measures. Managers at all levels are directly involved in these processes and are able to provide the necessary resources to establish and effectively implement corrective and preventive actions as well as effectively distribute required information across the organization.

These activities are performed by knowledgeable, trained, and capable personnel. The reporting relationships are dependent on the particular assurance activity being performed. The overall organizational structure and functional responsibilities are determined by the SRR President, who has the responsibility to ensure that DOE and assurance personnel have unfettered access to the appropriate information and facilities required to implement an effective oversight program, consistent with applicable laws and requirements. The SRR President is also responsible for ensuring the various elements of the ISMS are in place and effectively implemented.

The information obtained from the various assurance system activities is documented, compiled, analyzed, and reported to management periodically. Various components of this information are regularly provided to DOE through corporate metrics, Business Meetings (DOE Directed and 1-01 Manual), Performance Analysis reports (12Q Manual), or contract performance evaluations (1-01 Manual). Much of this information is available on a real-time basis through the Corrective Action Program using the Site Tracking, Analysis, & Reporting (STAR database described in Manual 1B Procedure 4.23, *Corrective Action Program*).

SRR has a mature oversight and assurance system in place. Third-party assurance activities include corporate audits and external reviews that are performed as required. The corporations comprising the SRR team provide additional contractor assurance functions, by providing ad hoc corporate and third party assist and oversight visits. Senior management determines the need for such support and arranges visits through their corporate contacts. Other external review options available include DOE Headquarters, Voluntary Protection Program (VPP), Partner corporate reach-back reviews, benchmarking of SRR by other sites and societal organizations; and independent consultant reviews.

As part of the CAS, the procurement process ensures the flow down of applicable requirements using contract clauses to subcontractors performing work. Oversight and assurance of subcontracted work are accomplished through a number of

# Contractor Assurance Description Document

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methods, such as procurement management, supplier surveillance, supplier audit, assessment, and subcontract management, and implemented by the 7B, 11B, S-18 and 1Q manuals.

In the area of Safeguards and Security, vulnerabilities and threats are treated the same as safety hazards by the incorporation of requirements and controls through the IPMS. The 7Q Security Manual is the primary procedural document for determining threat level and tailoring controls to the type and level of threat. In the area of Cyber Security, Manual 10Q serves effectively to protect the integrity, confidentiality, and availability of classified and unclassified information, networks, systems, and applications. In the area of Emergency Management, the 6Q Emergency Management Program Procedures Manual and the SRS Emergency Plan (SCD-7) are used to coordinate the emergency management aspects of fire protection, radiological control, environmental management, safeguards and security, and transportation safety. These emergency management documents also provide the required coordination with offsite emergency planning and response authorities.

## Management or Self-Assessments

The assessment processes for SRR are established and mature. The Management Assessment process (NQA-1, Criterion 9), detailed in the 1Q and 12Q Manuals, consists of the Management Assessment and Performance Analysis Programs. The management assessment component uses subject matter experts to perform evaluation of performance, effectiveness, and implementation of programs, processes, and procedures. The scope is based on factors such as facility activity hazard, risk, contract, and previous performance. These assessments generally involve workers, supervisors, and managers who are encouraged to identify issues, opportunities for improvement, and best practices. Issues and opportunities for improvement resulting from assessments are documented and entered into the STAR database to support effective issues management.

## Independent Assessments/Integrated Safety Management Evaluations

The Independent Assessment process is established, mature, and used as a benchmark by other DOE sites. Internal independent assessment (10 CFR 830 Subpart A, Criterion 10) is accomplished using an assessment process combining the Facility Evaluation Board (FEB) concept previously used to perform independent assessments to support the Integrated Safety Management Evaluation (ISME) function with other independent audit and assessment activities into the Integrated Independent Evaluation (IIE) process. Details of this process are contained in Manual S12, Procedure ADM.08, *Integrated Safety Management Evaluation Implementation Procedure*. In the IIE process, SRR company independent assessment resources are

# Contractor Assurance Description Document

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combined with both Quality Assurance auditors and external evaluators (corporate resources) to perform a single, combined evaluation rather than three separate ones. This enhancement is beneficial both to the operating organizations being evaluated (fewer evaluations each year) and for the evaluators (synergy generated from diverse backgrounds and perspectives).

The IIE process, detailed in the Manual 12Q Procedure FEB-1, focuses independent evaluation resources on facilities, programs, or processes. These assessments are primarily performance-based and focus on observing work activities and process implementation. The FEB function resides in the ESH&QA and Contractor Assurance organization. A similar method is used to accomplish Operational Readiness Reviews (ORRs) and Readiness Assessments (RAs) consistent with the requirements of DOE O 425.1D. ORR and RA performance requirements are implemented through Manual 12Q procedures.

The Contractor Assurance Manager is responsible for ensuring that IIE and ORR/RAs assessors are independent of areas assessed. When engaged in evaluations, the Contractor Assurance Manager and the IIE Team Manager/Lead report directly to the SRR President on matters related to the IIE or ORR/RA being performed. IIE members are typically either proven field professionals in their areas of expertise from within SRR or contracted to perform the function. The IIE Team Manager/Lead may use additional technical/operational personnel as subject matter experts to provide expert knowledge as required to support the evaluation.

## Other Oversight Assurance Tools

In addition to management and independent assessments, SRR uses various programs to identify, gather, verify, analyze, trend, disseminate, and improve performance. These programs and tools include Behavior Based Safety (1-01 Manual), management observations (12Q and 2S Manuals), QA audits (1Q Manual), internal audits (1B, 1Q, S12 Manuals), contract audits (1Q and 1B Manuals), QA surveillance (1Q Manual), nuclear facility start-up/restart authorizations (12Q Manual), and subcontractor focused observations (8Q Manual). These programs supplement the assessment program and provide additional feedback and improvement opportunities.

## Issues Management Overview

SRR has established formal programs and processes to identify, investigate, report, and respond to operational events, incidents, and the more serious occupational injuries, and illnesses. These programs and processes are integrated with the Corrective Action Program (Manual 1B Procedure 4.23) to ensure identification, reporting, evaluation, tracking, closure, operating experience (lessons learned), and

# Contractor Assurance Description Document

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effectiveness evaluation using a graded approach based on significance. Additionally, SRR is in the process of developing an additional information system to support receipt of worker feedback through kiosk stations. Worker-originated information (issues or improvement opportunities) is collected in a database and evaluated for action. Where required, issues will be transferred to the site corrective action program or other established systems for monitoring to closure. Feedback to individuals on the result of their submittal will be available in the collection database.

## Operational Events and Incidents

The requirements of DOE O 232.2, *Occurrence Reporting and Processing of Operations Information* are implemented in the 9B Manual. The thresholds and DOE reporting guidelines for reportable occurrences are clearly defined through the SRS-wide program to promote reporting consistency. The associated corrective actions from both reportable and non-reportable events are documented, evaluated, and entered into the corrective action system (1B and 1Q Manuals) for processing via the STAR database.

## Activities Covered by the Price-Anderson Amendment Act

SRS has an established procedural process outlined in Manual 8B to evaluate, using a graded approach, items reported in the corrective action database. Potential events and activities, including potential repetitive or recurrent issues revealed in performance assessments or trending evaluations, are screened and evaluated against established reporting thresholds. Items exceeding the thresholds are reported to the senior management and DOE using the DOE-wide Noncompliance Tracking System (NTS). The process also provides management with the option to self-identify a noncompliance that does not trip established thresholds as NTS reportable. As part of the feedback and improvement process, events and activities occurring across the complex are reviewed and evaluated for applicability to activities.

## Safeguards, Security, and Cyber Security

The identification and reporting of safeguards, security, and cyber security events are detailed in the 7Q, 10Q, and 14Q Manuals. These events are also entered, tracked, and managed using the corrective action system via the STAR database.

## Trending and Analysis

SRR uses several trending and analysis tools to monitor and improve processes and performance. These structured, formal processes are described in the 8B and 12Q

# Contractor Assurance Description Document

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Manuals and are utilized to capture, trend, and evaluate information. In order to achieve a goal of zero injuries, management conducts reviews of occupational injuries/illnesses as well as a monthly review of performance indicators. At the company level, the requirement for quarterly reporting is implemented by the quarterly performance analysis review that is performed in accordance with the 12Q Manual. This review uses data from the corrective action system to identify precursor or repetitive events in order to prevent more serious events from occurring.

SRR has established a set of leading indicators, which are used by senior management to monitor performance and identify adverse trends in time to reduce the probability of events. Leading indicators display trends are discussed during ESQB reviews and actions are developed to address adverse trends.

## Performance Analysis

As part of the Contractor Assurance Program, performance analysis is used to analyze, correlate, and evaluate data to identify improvements, areas of potential future problems, and recurring problems. The performance analysis process, which includes metrics for disciplined operations and trending of performance data, is detailed in Manual 12Q Procedure PA-1A, *LW Performance Analysis*.

## Business Operations

SRR's Earned Value Management System Description (EVMSD) specifically addresses earned value topics in a single, summary document at a manageable level of detail to allow it to remain compliant with SRR procedures as well as with the EVMS guidelines required by DOE Order 413.3B. The EVMSD provides the framework and criteria for performance of SRR Project Control activities, deliverables, and responsibilities categorized according to the guidelines found in the ANSI/EIA-748-B Standard. SRR has various procedures, mostly found in Manual S-14, *SRR Business Management*, and SRR Manual S-15, *SRR Finance and Accounting*, that compliment and support the various processes described in the SRR EVMSD.

Feedback on business processes is also valued and used to make process improvements or investigate concerns. Feedback on financial accounting practices is provided by the Internal Oversight organization in accordance with Manuals S-14 and S-15 as well as the Internal Oversight department procedures manual. Feedback on human resource issues (e.g., Equal Employment Opportunity, employee discrimination, sexual harassment) is obtained through a variety of sources and investigated in accordance with the S-21 Manual, *Equal Employment Opportunity (EEO) and Employee Concerns Program (ECP) Administrative Procedures*. Feedback

## Contractor Assurance Description Document

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on procurement issues is obtained through the processes contained in the 7B Manual/Manual S18, *SRR Procurement Services Manual*, and where subcontractors are involved, the 11B Manual.

Management of resources for business operations is controlled in accordance with requirements contained in Manual S-16, *LW Human Resource Manual*.

Managers obtain feedback on their programs for efficient operation in accordance with the various councils and committees identified in Manual 1-01, perform assessments in accordance with 12Q Manual requirements, and meet contractual requirements in accordance with SRR's Standards/Requirement Identification Document.

### Operating Experience (Lessons Learned)

SRS has an established formal Operating Experience Program (Manual 1B, MRP 4.14, *Lessons Learned Program*) that communicates operating experience/lessons learned during work activities, process reviews, event analyses, and post-job work histories for application to future activities. The Operating Experience Program promotes safe, effective operation and enhances the safety and health of employees and the public. The program is responsible to identify, review, apply, and exchange operating experience/lessons learned from events at SRS facilities, other DOE complex facilities, commercial nuclear facilities, and other external sources to prevent similar occurrences.

Typical documents reviewed for applicability include: DOE Complex Occurrence Reports; Suspect/Counterfeit Items; DOE ESH Operating Experience; Special Reports; Safety Bulletins; Just-In-Time Reports; Advisories; Operating Experience (Lessons Learned) Alerts; Office of Independent Oversight and Performance Assurance reviews; DOE Accident Investigation Reports; INPO Operating Experience Reports; PAAA items; Defense Nuclear Facility Safety Board information; OSHA Safety and Health Bulletins; etc.

The Operating Experience Coordinator (OEC), in conjunction with the affected program FAPMs, determines which organizations need to take action on identified issues. The OEC monitors progress of corrective actions via the STAR database.

### Company (Corporate) Metrics

SRR uses a series of performance indicators to measure the performance of facilities, programs, and organizations. These indicators show performance improvement or deterioration relative to established goals. These corporate metrics focus on

## Contractor Assurance Description Document

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measuring performance across the company in safety and security; technical capability and performance; community, state and regulatory relationships; cost effectiveness; and contract performance. The metrics provide a view of trends emerging over the past twelve (12) months. Senior management reviews these corporate metrics and holds the responsible managers accountable for performance improvement where identified issues require improved performance.