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Introduction

This Quality Assurance Program Plan (QAPP) describes the National Spent Nuclear Fuel Program (NSNFP) quality assurance (QA) policy, the NSNFP organizational structure, the internal and external interfaces of the NSNFP, the general QA program principles applicable to the scope of the NSNFP mission, and the roles and responsibilities of NSNFP functional positions.

The NSNFP adopts applicable requirements from DOE/RW-0333P, "Quality Assurance Requirements and Description," (QARD) for NSNFP activities, including engineering and design-related activities intended to guide the development of a path forward for successful disposition of U.S. Department of Energy (DOE) spent nuclear fuel (SNF). Work performed by the NSNFP that may be used by the Office of Civilian Radioactive Waste Management (OCRWM) to develop design requirements and to demonstrate DOE SNF compliance with repository acceptance requirements will be suitably controlled for its intended use.

This NSNFP QAPP and the NSNFP QARD Requirements Matrix have been developed to communicate the selection of requirements applicable to the objectives and mission set forth in the NSNFP Program Management Plan (DOE/SNF/PP-033).

Attachment A, Organization Diagram, demonstrates the internal and external organizational interfaces of the NSNFP.

Attachment B, Roles and Responsibilities, provides a description of the roles and responsibilities of the functional positions within the NSNFP.

Quality Assurance Policy

The policy of the NSNFP is to institute, implement, and maintain an effective QA Program in all aspects of its work that may affect the safety and protection of workers, the public, and the environment. The NSNFP QA Program has been developed with these objectives and to ensure compliance with DOE/RW-0333P, Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Requirements and Description (QARD). It is the responsibility of the NSNFP personnel to comply with NSNFP QA Program implementing documents.

External Interfaces

The NSNFP interfaces with OCRWM and the DOE SNF sites for technical matters and coordination of QA program acceptance. The NSNFP QA Program has been accepted by OCRWM Office of Quality Assurance (OQA). Each DOE SNF site establishes and implements a QA program to comply with the requirements of the QARD. Through Attachment F of the

Comprehensive Memorandum of Agreement between DOE EM and DOE OCRWM, the NSNFP QAPM provides initial reviews, acceptance, and routine independent oversight of DOE SNF site QA programs.

Separate memorandums of agreement, initiated by the NSNFP, establish the NSNFP and DOE SNF site interfaces.

NSNFP Organization—General Description

As indicated in Attachment A, the NSNFP is composed of three interfacing organizations. The organizations are the DOE NSNFP Program Management Organization, the Program Support Organization (PSO), and the Quality Assurance Staff (QAS). These organizations perform activities in accordance with this NSNFP QAPP and the implementing procedures represented by the NSNFP QARD Requirements Matrix (DOE/SNF/MTX-001).

Staffed by contractor personnel, the PSO and the QAS perform delegated activities that are overseen by the DOE NSNFP Management Organization. QA program roles and responsibilities assigned to the PSO and QAS are consistent with the anticipated work scope of those organizations.

DOE NSNFP Program Management Organization

The DOE NSNFP Program Management Organization is composed of the Manager NSNFP and the NSNFP Quality Assurance Program Manager (QAPM).

The Manager, NSNFP provides overall program management in coordination with a designated representative of the Spent Fuel Team within the DOE Office of Nuclear Material and Spent Fuel (EM-21) and the Manager, DOE Idaho Operations Office. The Manager, NSNFP is responsible for work delegated within the NSNFP.

Reporting to the Assistant Manager for Technical Support within DOE-Idaho, the NSNFP QAPM provides functional support to the Manager, NSNFP. The NSNFP QAPM is responsible for overseeing the effective development and implementation of the NSNFP QA Program.

DOE NSNFP Quality Assurance Program Manager

Through Appendix F of the Comprehensive Memorandum of Agreement between EM and OCRWM (see Reference), the NSNFP QAPM has responsibility for coordinating the development, implementation, and maintenance of the NSNFP QA Program and qualifying the QA Programs of the DOE SNF sites.

The NSNFP QAPM interfaces with the OCRWM OQA to obtain clarification and interpretation of OCRWM QA requirements, resolves QA program issues relative to OCRWM requirements, and provides final interpretation of OCRWM QA requirements within the NSNFP and for the DOE SNF sites.

The NSNFP QAPM is responsible for coordinating the reviews of the NSNFP QARD Requirements Matrix with OCRWM OQA and providing subsequent updates of the matrix to OCRWM OQA.

Within the NSNFP, the NSNFP QAPM responsibility and authority is consistent with the OCRWM-QARD requirements. The QAPM shall:

- Be at the same or higher level as the highest equivalent manager directly responsible for performing work subject to the QARD.
- Be sufficiently independent from cost and schedule considerations.
- Have the organizational freedom to effectively communicate with other senior management positions.
- Be responsible for interpreting and approving QA program requirements.
- Have no other assigned responsibilities unrelated to the QA program that would prevent full attention to QA matters.
- Be responsible for identifying quality problems; initiating, recommending, or providing solutions to quality problems; and verifying solutions to quality problems.
- Be responsible for verifying the proper establishment and execution of the QA program.
- Have authority to stop work when significant conditions adverse to quality warrant such action.

As necessary, the NSNFP QAPM elevates quality disputes or stop work recommendations progressively to successively higher levels of management including the Manager, NSNFP; the responsible Assistant Manager within the Idaho Operations Office, the Manager DOE Idaho Operations Office; or the EM-21 SNF Representative when DOE SNF site interfaces are involved.

The NSNFP, Program Support Organization (PSO)

The PSO within the NSNFP performs technical work and administrative tasks in support of the Manager, NSNFP.

The PSO Structure

As indicated in Attachment A, the PSO is composed of a technical support function interfaced with various internal support staff functions ultimately reporting to a single manager who is responsible for work delegated within the PSO. The functions interact through technical leads to perform activities in accordance with the NSNFP implementing documents in support of the Manager, NSNFP.

The PSO provides facilities, resources, and supporting processes for training coordination, document control, records management, administrative support, communications, and project management for the NSNFP.

The NSNFP, Quality Assurance Staff Organization

The NSNFP QAS organization provides support to the NSNFP QAPM for QA program oversight activities and coordination with external interfaces for QA program-related matters.

The NSNFP QAS Organizational Structure

As indicated in Attachment A, the QAS is composed of an assessment function and a QE function reporting to the QAS manager responsible for work delegated within QAS. The functions interact with the NSNFP QAPM to perform activities in accordance with the NSNFP QA Program documents in support of the NSNFP. NSNFP QAS provides dedicated quality engineering resources to the PSO. The assessment function interfaces with the DOE SNF sites and the NSNFP technical activities.

The PSO quality engineers (QEs) are assigned by the NSNFP QAS and provide a quality engineering function that is integrated with the PSO processes. To resolve QA issues, the PSO QE has a reporting relationship that includes the QAS manager and the NSNFP QAPM.

QA Program Plan

To accomplish the mission of the NSNFP, the following general principles of the QARD apply and are implemented by the NSNFP. The NSNFP QARD Requirements Matrix provides a definitive road map from each applicable QARD section to the NSNFP QA Program implementing documents.

QA Program Documents

The NSNFP provides a NSNFP QARD Requirements Matrix and updates to the OCRWM.

As demonstrated by the NSNFP QARD Requirements Matrix, organizations within the NSNFP develop and implement procedures responsive to the requirements of the QARD for their respective functions. The NSNFP QAPM approves the matrix for the NSNFP.

The NSNFP organizations and implementing procedures shall be structured such that quality is achieved and maintained by those who have been assigned responsibility for performing work. Persons not directly responsible for performing the work verify quality achievement.

NSNFP QA Program documents are contained in the NSNFP Documents Manual. Figure 1 illustrates the hierarchy of the NSNFP Program Documents that implement program requirements from the depicted upper tier documents.

Work Planning

The Manager, NSNFP approves budgeted work scope. The PSO further plans the approved work scope in accordance with established procedures that integrate the technical work with the required work controls to implement the QARD. The planning is based on a written evaluation to determine the appropriate work controls when considering the end use of the product.

Training and Personnel Qualification

Training and Personnel Qualification shall be performed in accordance with established procedures. The PSO provides resources for coordination of training activities for the NSNFP.

The NSNFP QAS provides auditor and lead auditor training and qualification processes for the NSNFP.

Personnel experience requirements are established, and methods to verify personnel experience are prescribed by NSNFP procedures.

QA Program Information Management

The NSNFP QAPM reports the status, adequacy, and compliance aspects of the NSNFP QA Program to the NSNFP Management, and as applicable to OCRWM and EM representatives, and the affected DOE SNF sites.

Design Interface

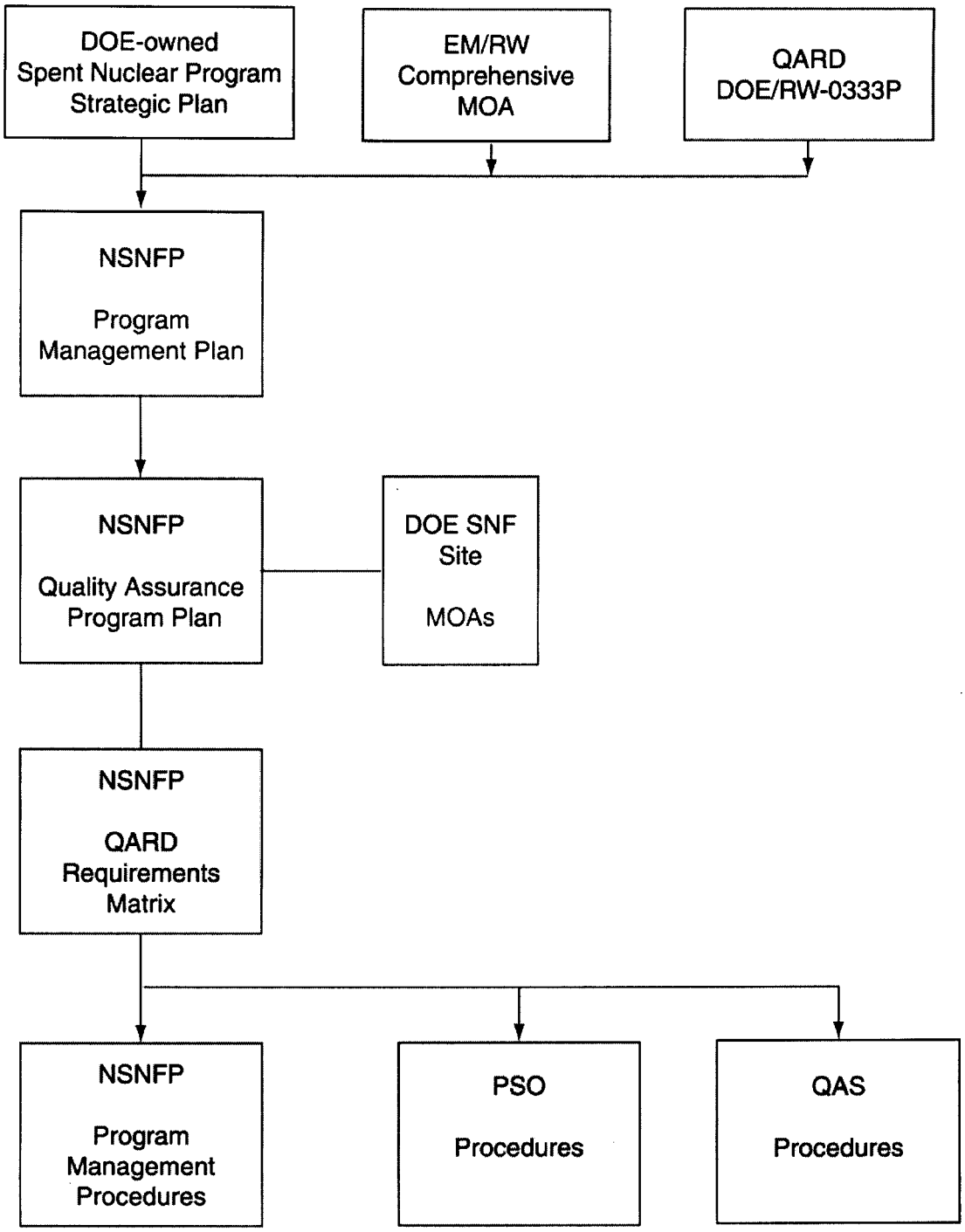
Implementing procedures control the development of conceptual designs; the preparation of performance specifications; interfaces between the NSNFP and OCWRM design authority; and the NSNFP interface with other designated design agents. OCRWM or the designated design agent manages design inputs in the form of technical information from NSNFP. The design authority ultimately determines suitability of the design inputs for use.

Managing Procurement Activities

The PSO manages the day-to-day activities associated with procurement of services from government sector suppliers. The NSNFP QAPM with NSNFP QAS support performs or causes the performance of audits/surveillance of government sector suppliers and the qualified procurement services used by NSNFP.

The PSO interfaces with a qualified procurement service for procurement of services and items from private sector suppliers. The qualified procurement service provides audits/surveillance of the private sector suppliers that are periodically observed by NSNFP QAS.

The NSNFP procedures require flow down of requirements to suppliers that are consistent with the QARD for the proposed scope of work.



*NSNFP Documents Manual general content (in shaded areas).

Figure 1. National Spent Nuclear Fuel Program document hierarchy.

Development and Control of Implementing Documents

Written processes establish criteria for implementing documents and control of documents that specify technical requirements or quality requirements. Work shall be performed in accordance with controlled implementing documents. When work cannot be accomplished as described in the implementing document or accomplishment of such work would result in an undesirable condition, the work shall be stopped. Work shall not resume until the implementing document is formally changed in accordance with NSNFP document control processes to reflect the correct work practices.

Test Control

Processes for test control are developed, maintained, and implemented by the PSO.

Corrective Action

Methods to ensure prompt identification and correction of conditions adverse to quality are established. Conditions adverse to quality are documented and reported to appropriate levels of management. Conditions adverse to quality are evaluated for significance against established criteria, tracked, trended and followed to closure. Significant conditions adverse to quality are evaluated for stop work.

Records Management

Records resulting from the performance of NSNFP procedures are captured and protected until turnover to designated recipients.

Assessments/Audits

The NSNFP performs assessments including internal surveillances and audits.

The NSNFP QAPM performs or causes the performance of audits and surveillance of DOE SNF sites and government sector suppliers.

OCRWM performs or causes the performance of audits, surveillances, and QA Management Assessments of the NSNFP.

Software Control

Processes for software control are developed, maintained, and implemented by the PSO.

Scientific Investigation

Processes to obtain appropriate scientific investigations are developed, maintained, and implemented by the PSO.

Control of the Electronic Management of Data

As applicable, processes for control of the electronic management of data are developed, maintained, and implemented by the PSO.

Storage and Transportation

The communication or translation of repository criteria for SNF storage and transportation systems is performed in accordance with established NSNFP procedures responsive to the QARD.

Glossary

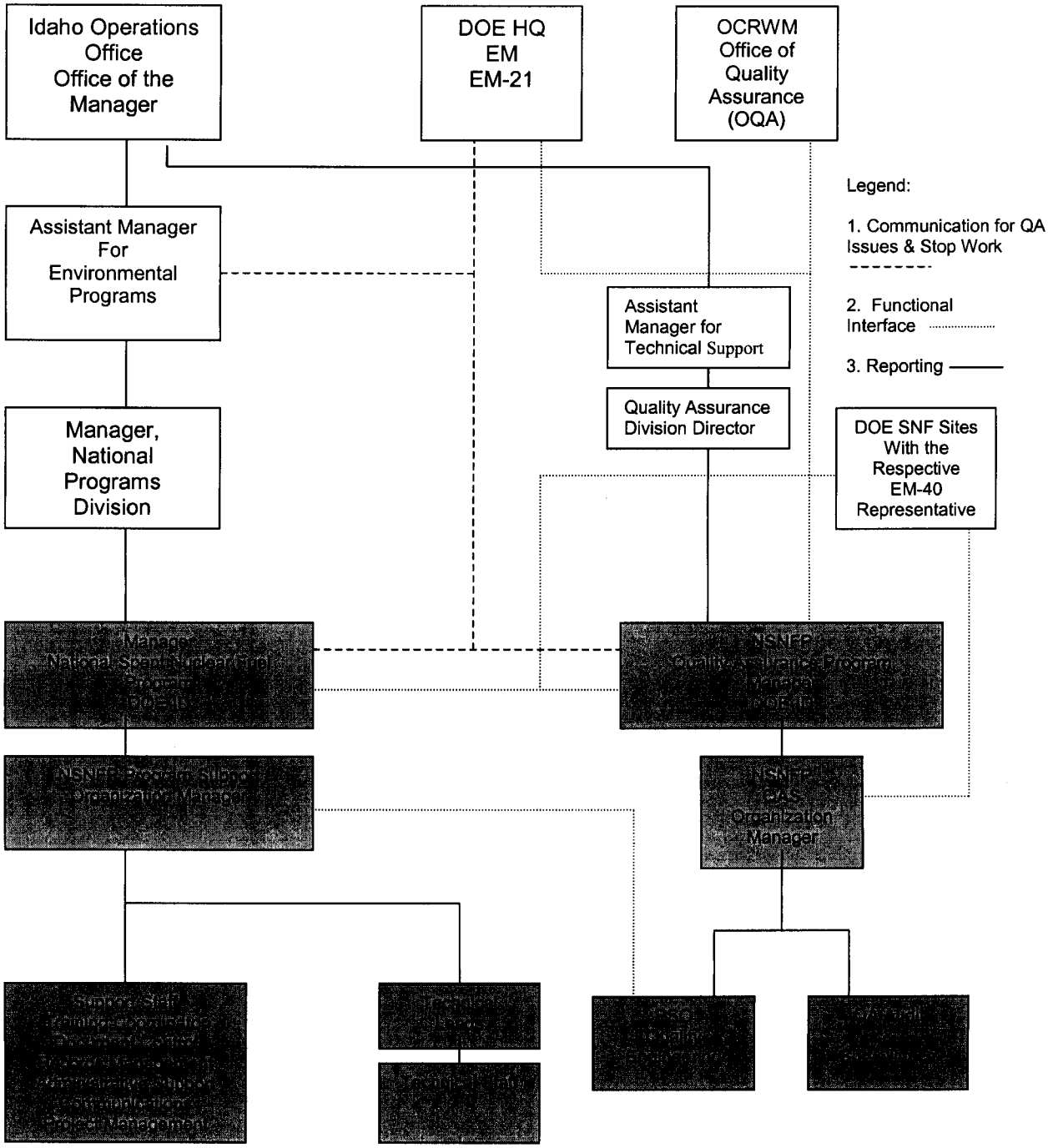
The NSNFP uses the QARD glossary of terms and establishes a glossary of terms used exclusively by NSNFP. The NSNFP glossary of terms is not used in lieu of the QARD glossary.

Reference

DOE, *Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste,* Revision 1, between the Assistant Secretary for DOE-EM, Washington, D.C., and the Director of DOE-RW, Washington, D.C., January 1999. This document is also known as the Comprehensive Memorandum of Agreement.

Attachment A

Organization Diagram



Attachment B

The Manager, NSNFP

1. Interfaces with the Manager, DOE Idaho Operations Office and the EM-21 Representative for overall policy and direction.

2. Approves the National Spent Nuclear Fuel Program (NSNFP) Quality Assurance Program Plan (QAPP) and the Program Management Plan including:

   - The management and structure of the NSNFP organization

   - The NSNFP Quality Assurance (QA) Program Policy directing mandatory compliance with the NSNFP QA Program.

3. Establishes and maintains an organizational structure to implement the NSNFP QA Program described by the QAPP.

4. Establishes the responsibilities and authorities of the NSNFP organizations and management.

5. Ensures a QA organization for program assessments is established and maintained and is sufficiently independent from cost and schedule.

6. Directs the preparation of controlled documents for acceptance by the Office of Civilian Radioactive Waste Management (OCRWM) Office of Quality Assurance (OQA). The documents describe the internal and external organizational interfaces, organizational structures, requirements, and responsibilities.

7. Assigns NSNFP technical work tasks to the Program Support Organization (PSO) through approved budget documents.

8. Limits NSNFP assignments made to the DOE NSNFP QA Program Manager (QAPM) and ensure that the QAPM has no other assigned responsibilities that would prevent full attention to NSNFP QA matters.

9. Establishes methods to escalate differences of opinion involving the NSNFP QA Program through the management chain to obtain resolution.

10. Participates in the development and approval of memorandums of agreement between the NSNFP and DOE SNF sites.

11. Participates in the development and approval of memorandums of agreement between the DOE EM Program and OCRWM.

12. Approves NSNFP procedures.

Attachment B

The NSNFP Quality Assurance Program Manager

1. Participates in the development and approval of the NSNFP QAPP.
2. Freely communicates with senior management positions within the NSNFP, the DOE Idaho Operations Office, and the EM-21 Representative.
3. Interfaces with OCRWM OQA.
4. Interprets and approves QA program requirements.
5. Provides QA program reviews and acceptance of DOE SNF sites.
6. Provides QA program assessments.
7. Establishes internal controls and external interfaces for QA program oversight.
8. Assigns tasks to the NSNFP Quality Assurance Staff (QAS) and monitors the NSNFP QAS for performance to baseline documents.
9. Maintains a process to evaluate significant conditions adverse to quality and administer stop work actions if required.
10. Participates in the development and approval of memorandums of agreement between the NSNFP and DOE SNF sites.
11. Participates in the development and approval of memorandums of agreement between the DOE EM Program and the DOE OCRWM.
12. Approves NSNFP procedures.

Representative from the Spent Fuel Team within the DOE Office of Nuclear Material and Spent Fuel (EM-21)

1. Coordinates approved EM-1 programmatic policy and direction to the NSNFP.
2. Participates in the development and approval of the NSNFP Program Management Plan, which addresses the following:
   - The mission and objectives of the NSNFP Program
   - The interfaces among DOE-Headquarters (DOE-HQ), the DOE field sites, OCRWM, and related projects
   - A summary of the planning process including schedules, key milestones, and the budgeted work

Attachment B

- The management strategies for key projects within the NSNFP.

3. Participates in the development and approval of memorandums of agreement between the NSNFP and DOE SNF sites.

4. Participates in the development and approval of memorandums of agreement between the DOE EM Program and the DOE OCRWM.

The PSO Manager

By direct action or through assignments to the PSO staff, the PSO Manager provides support to the Manager, NSNFP for implementing the QA program by:

1. Assisting in the establishment and maintenance of the NSNFP QAPP.

2. Creating NSNFP QA Program documents including Program Management Procedure drafts and provides support for processing those documents for approval and use by the NSNFP.

3. Creating PSO procedures and processes with integrated QE functions.

4. Establishing processes for training coordination, document control, and records management for use by the NSNFP, and staffing those functions.

5. Determining training and qualification needs of the PSO staff.

6. Adhering to and requiring all PSO staff to adhere to the NSNFP Program Policy directing mandatory compliance with the NSNFP QA Program.

7. Establishing the internal responsibilities and authorities of the PSO staff.

8. Assigning NSNFP technical work tasks to PSO technical leads.

9. Participating in the development of memorandums of agreement between the NSNFP and DOE SNF sites.

10. Participating in the development of memorandums of agreement between the DOE EM Program and the OCRWM.

11. Approving procurement requisitions for items and services from the private sector that are within the PSO scope established by budget baseline documents.

12. Generating responses to deficiencies identified during independent assessments in accordance with processes established or approved by the NSNFP QAPM and implementing the approved responses.

13. Supporting the performance of assessments in accordance with NSNFP procedures.

14. Interfacing with PSO QE, NSNFP QAS, or the NSNFP QAPM to resolve QA issues.

Attachment B

Delegation of Internal PSO Work

As represented by the Work Breakdown Structure (WBS) within the NSNFP Program Management Plan, support tasks that contribute to the objectives of the NSNFP are grouped by control accounts. The PSO Manager assigns a group of tasks to a PSO technical lead, who in turn delegates individual tasks to PSO staff members. The PSO technical staff interfaces with PSO support staff to perform the technical work in accordance with approved NSNFP procedures.

The PSO Technical Lead

1. Provides guidance and direction to PSO staff for assigned tasks.
2. Participates in document reviews as stipulated by NSNFP procedures.
3. Performs work in accordance with NSNFP procedures.
4. Oversees development and maintenance of NSNFP Work Planning/Quality Program Applicability Evaluations for the group of assigned tasks.
5. Approves NSNFP-generated Task Management Agreements associated with the group of assigned tasks.
6. Approves NSNFP-generated technical documents associated with the group of assigned tasks.
7. Coordinates annual performance evaluations of active suppliers.

The PSO Technical Staff

1. Performs work in accordance with NSNFP procedures.
2. Prepares draft documents in accordance with NSNFP procedures and interfaces with the PSO support staff and PSO Manager or the appropriate technical lead to issue approved documents.
3. Participates in formal reviews of documents prepared by others.
4. Prepares Task Management Agreements associated with assigned tasks.
5. Prepares procurement requisitions for items and services from the private sector that are within the scope of the assigned task.
6. Interfaces with the approved procurement service to facilitate or perform actions within the NSNFP-approved processes established by the procurement service.
7. As authorized, provides day-to-day internal and external coordination for PSO/supplier interactions and formal communication to suppliers supporting assigned tasks.

Attachment B

8. Participates in the initial acceptance of suppliers to the NSNFP and an annual supplier performance review of each active supplier associated with assigned tasks.

9. Accepts the products of suppliers on behalf of the PSO based on internal PSO reviews.

10. Prepares and submits records stipulated by NSNFP procedures.

The PSO Quality Engineer

1. Participates in the establishment of PSO procedures and processes that are integrated in the QE functions.

2. Assists in the generation of responses to deficiencies identified during independent assessments in accordance with processes established or approved by the NSNFP QAPM and implements the approved responses.

3. Plans and performs assessments in accordance with NSNFP procedures.

4. Interfaces with the PSO Manager, QAS Manager, or the NSNFP QAPM to resolve QA issues.

5. Provides guidance to the PSO staff for QA Program implementation and seeks interpretations from the NSNFP QAPM as necessary to support the PSO.

6. Participates in document reviews as stipulated by NSNFP procedures.

7. Performs work in accordance with NSNFP procedures.

8. Participates in the development and maintenance of NSNFP Work Planning/Quality Program Applicability Evaluations.

9. Reviews NSNFP-generated task management agreements.

10. Reviews NSNFP-generated technical documents.

11. Participates in annual performance evaluations of active suppliers.

12. Prepares draft implementing documents in accordance with NSNFP and PSO procedures and interfaces with the PSO support staff and PSO Manager to issue approved implementing documents.

13. Interfaces with the approved procurement service to facilitate or perform QE-related actions within the NSNFP-approved processes established by the procurement service.

14. Coordinates with NSNFP QAS during the initial acceptance of suppliers to the NSNFP and an annual supplier performance review of each active supplier.

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15. Participates in reviews for acceptance of the products from suppliers.

16. Reviews submitted records stipulated by NSNFP procedures.

The PSO Support Staff

NSNFP Training Coordinator

1. Performs work in accordance with NSNFP procedures.

2. Interfaces with the Manager, NSNFP; the NSNFP QAPM; the PSO Manager; and the NSNFP QAS Manager to establish training and qualification needs for their respective staffs.

3. Facilitates verification of experience for NSNFP personnel and NSNFP staff augmentation personnel.

4. Tracks training and qualification status and reports delinquencies or omissions to the respective managers.

5. Interfaces with document preparers to confirm applicable training has been accomplished prior to entering a document into the review cycle.

6. Interfaces with NSNFP personnel to confirm applicable training requirements are met prior to releasing a new or revised document or adding personnel to existing distribution lists.

NSNFP Document Control Coordinator

1. Performs work in accordance with NSNFP procedures.

2. Interfaces with the Manager, NSNFP; the NSNFP QAPM; the PSO Manager; and the NSNFP QAS Manager and their staffs to establish controlled document distribution for their respective documents.

3. Prepares tables of content for the NSNFP Documents Manual.

4. Maintains the NSNFP documents homepage and makes hard copy distribution of selected documents.

5. Controls document numbering to provide a unique numbering scheme for NSNFP documents.

6. Provides records management support to the NSNFP in accordance with procedures.

7. Safeguards NSNFP records and supports records turnover to others as authorized by the Manager, NSNFP or NSNFP QAPM.

Attachment B

8. Enforces limits and controls for access to NSNFP records.

9. Maintains a NSNFP file guide list for NSNFP records including QA records and makes the list available to NSNFP personnel.

The QAS Manager

By direct action or through assignments to QAS personnel, the QAS Manager provides support to the NSNFP QAPM for implementing the QA program by:

1. Providing draft QAS procedures for NSNFP Management approval.

2. Determining training and qualification needs of QAS personnel and providing confirmation that the needs have been met.

3. Adhering to and requiring all QAS personnel to adhere to the NSNFP policy directing mandatory compliance with the NSNFP QA Program.

4. Assigning NSNFP work tasks to NSNFP QAS personnel.

5. Interfacing with PSO QE, the PSO Manager, DOE SNF sites, NSNFP QAPM , and the Manager, NSNFP as applicable to resolve QA issues

6. Assisting in the generation of responses to deficiencies identified during independent assessments in accordance with processes established or approved by the NSNFP QAPM and implementing the approved responses.

7. Providing guidance to the QAS Organization for QA Program implementation and seeking interpretations from the NSNFP QAPM as necessary to support the NSNFP.

8. Participating in document reviews as stipulated by NSNFP procedures.

9. Performing designated action steps within NSNFP procedures.

10. Providing resources, procedures, and processes for qualification of audit personnel, conduct of audits and surveillances, corrective action tracking and trending, and QA information management for the NSNFP.

11. Provides guidance and direction to NSNFP PSO QE.

NSNFP QAS Personnel

1. Performs assigned work in accordance with NSNFP procedures.

2. Provides draft QAS procedures and processes for approval.

3. Adheres to the NSNFP policy directing mandatory compliance with the NSNFP QA Program.

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4. Generates responses to deficiencies identified during independent assessments in accordance with approved processes and implements the approved responses.

5. Interfaces with PSO QE, the PSO Manager, DOE SNF sites, NSNFP QAPM, and the Manager, NSNFP as applicable to resolve QA issues.

6. Participates in assigned document reviews.

7. Prepares and reviews QA records.

8. Performs audits and surveillances.

NSNFP Corrective Action Coordinator

1. Performs administrative functions related to the corrective action process in accordance with NSNFP procedures.