

10 CONDUCT OF OPERATIONS EVALUATION

10.1 Conduct of Review

Chapter 9, “Conduct of Operations,” of the Safety Analysis Report (SAR), describes the organizational structure that will manage and operate the proposed facility, including the associated plans and procedures for preoperational testing and operations, training, normal operations, emergency planning, and decommissioning. The chapter includes descriptions of the responsibilities of key personnel, the training program, standards and procedures that govern daily operations, and records generated as a result of those operations. The controls used to promote safety and ensure compliance with the license and the regulations applicable to the Idaho Spent Fuel (ISF) Facility are included. Audits, assessments, oversight, and reporting are also addressed. This review is to ensure that the applicant will provide an acceptable infrastructure to manage, test, and operate the ISF Facility, including provisions for effective training.

Regulatory requirements in 10 CFR §72.28 require, for the issuance of a license, the applicant to demonstrate its technical qualifications. These include training and experience of the applicant, a description of the personnel training program, a description of the operating organization, and a commitment to maintain an adequate complement of trained and certified personnel. 10 CFR §72.24(h) requires the applicant to provide a plan for the conduct of operations, including planned management and administrative controls, the applicant’s organization, and the program for personnel training. NUREG–1567 (U.S. Nuclear Regulatory Commission, 2000), provides guidance for staff reviewers.

10.1.1 Organizational Structure

Section 9.1, “Organizational Structure,” of the SAR, describes the organizational structure to be used to manage the ISF Facility for design, construction, preoperational testing, startup, operation, and decommissioning. This review considered how information in the SAR addresses the following regulatory requirements.

- 10 CFR §72.24(h) requires a plan for the conduct of operations, including the planned managerial and administrative controls system, and the applicant’s organization, and program for training of personnel.
- 10 CFR §72.28(a) requires that the application include the technical qualifications, including training and experience, of the applicant to engage in the proposed activities.
- 10 CFR §72.28(c) requires that the application include a description of the applicant’s operating organization, delegations of responsibility and authority and minimum skills and experience qualifications relevant to the various levels of responsibility and authority.
- 10 CFR §72.40(a)(4) requires that the applicant is qualified by reason of training and experience to conduct the operations covered by 10 CFR Part 72.

10.1.1.1 Corporate Organization

Section 9.1.1, "Corporate Organization," of the SAR describes the corporate organization that will be used to manage and operate the ISF Facility. Figures 9.1.1–9.1.4 of the SAR depict this organization.

The licensee for the proposed ISF Facility is Foster Wheeler Environmental Corporation. Foster Wheeler Environmental Corporation will, therefore, have full authority and responsibility for designing, engineering, constructing, assuring quality, testing, operating, and maintaining the facility. On March 7, 2003, a substantial portion of Foster Wheeler Environmental Corporation assets was sold to Tetra Tech FW, Inc. Key staff previously involved have continued on the project under an arrangement with Tetra Tech FW, Inc.; these staff members report to and are supervised by managers of the Foster Wheeler Environmental Corporation.

The Foster Wheeler Environmental Corporation Chief Executive Officer has overall corporate responsibility for the ISF Facility. The Chief Executive Officer is elected by, and reports to, the Board of Directors.

The Executive Director, ISF Project, has responsibility for the engineering, construction, and operation of the ISF Facility and reports to the Chief Executive Officer. Reporting to the Executive Director, ISF Project, the ISF Facility Manager leads, directs, and coordinates activities at the facility. The ISF Facility Manager is responsible for the design and construction review of the ISF Facility.

The Safety Review Committee reviews and advises the ISF Facility Manager and the Executive Director, ISF Project, on matters relating to the safe storage of spent nuclear fuel (SNF). At a minimum, the Safety Review Committee will have a chairman and three members, and alternates may be assigned. Members and alternates will be designated in writing by the Executive Director, ISF Project. The Safety Review Committee must meet at least once prior to receipt of SNF and must meet at least annually thereafter or as directed by the Executive Director, ISF Project, or the ISF Facility Manager. The Safety Review Committee will perform or review audits of the following activities:

- Safety evaluations of procedures, or changes thereto, performed by Independent Safety Reviewers to meet the requirements of 10 CFR §72.48;
- Safety evaluations of changes to systems, subsystems, or components important to safety to determine whether such changes require notification of the U.S. Nuclear Regulatory Commission under 10 CFR §72.48(c);
- Conformance to technical specifications or license conditions;
- Training and qualifications of facility personnel;
- Implementation of programs required by the physical security and safeguards contingency plans or the technical specifications;
- Actions to correct deficiencies in equipment or controls important to safety; and
- Operations, modifications, maintenance, and surveillance related to equipment or controls important to safety.

The Safety Review Committee advises the ISF Facility Manager of the results of these audits or reviews. The committee also advises the ISF Facility Manager regarding recommendations for

actions that will assist in correcting identified deficiencies. The Safety Review Committee will notify the Executive Director, ISF Project, within 24 hours of any significant disagreement between the committee and the ISF Facility Manager.

The Safety Review Committee also reviews the following items:

- Tests or experiments involving SNF that were not included in the SAR, to ensure compliance with 10 CFR §72.48(c);
- Proposed changes to the technical specifications or the license;
- Violations of regulations, requirements, or procedures important to safe storage of SNF;
- Indications of unanticipated deficiencies that could affect safe storage of SNF;
- Significant accidental, unplanned, or uncontrolled radioactive releases and corrective actions to prevent recurrence;
- Significant operating abnormalities or deviations from normal and expected performance of equipment that affect safe storage of SNF;
- Performance of the corrective action system; and
- Information that may identify areas for improving facility safety.

The Chief Design Engineer reports to the ISF Facility Manager. The Chief Design Engineer approves design procedures and submittals, assures certification of design documents, and approves design staff assignments. The Chief Design Engineer is responsible for:

- Identifying acceptance tests, developing acceptance test procedures, and determining personnel qualification requirements;
- Defining, planning, controlling, verifying, and documenting design activities;
- Developing, maintaining, and implementing plans and procedures relating to the design process, design interfaces, design verification, and design changes;
- Ensuring design specification requirements are properly included in drawings, procedures, and instructions;
- Preparing, reviewing, approving, and certifying design documents;
- Verifying computational accuracy and appropriate use of analyses and related computer programs; and
- Incorporating as low as is reasonably achievable (ALARA) considerations into facility design.

The corporate technical staff is directed by the Chief Design Engineer in the overall design and construction of the ISF Facility. This staff includes three project engineers, each of whom has responsibility for specific aspects of the ISF Facility design. The three project engineers are supported by five discipline-area engineers who have design review and approval responsibilities as follows:

- Lead Civil Engineer
 - Facility structures
 - Seismic analysis
 - Structural drawings, calculations, and analyses
- Lead Mechanical Engineer
 - Mechanical structures, systems, and components
 - Mechanical drawings, calculations, and analyses

- Thermal and stress analyses of storage components
- Lead Nuclear Engineer
 - Criticality
 - Decay heat
 - Radiation dose
- Lead Process Engineer
 - SNF and waste handling processes
 - Integration of processes with design
- Lead Electrical Instrument and Control Engineer
 - Electrical distribution
 - Instrumentation and control systems

Additionally, four contractors will support the Chief Design Engineer. Responsibility and approval authority for the design remains with Foster Wheeler Environmental Corporation, and contractors' work is overseen and reviewed by Foster Wheeler Environmental Corporation. Contractor responsibilities are summarized as follows:

- Utility Engineering
 - Civil and structural design support for steel structures in the cask receipt area, transfer area, and storage area
 - Design support for heating, ventilation, and air conditioning systems
- RWE NUKEM, Limited
 - SNF processing area layout
 - Supporting development of design requirements and specifications for systems, subsystems, and components used for SNF receipt and handling
- ALSTEC
 - Design of the canister closure area, storage vault, ISF canister internals, and the canister handling machine
- Tetra Tech FW, Inc.
 - Design of storage tube and canister

All subcontractor work will be performed according to a quality assurance program with oversight by Foster Wheeler Environmental Corporation. The quality assurance program incorporates the applicable aspects of ASME/NQA-1 and will be conducted in accordance with the U.S. Nuclear Regulatory Commission-approved Foster Wheeler Environmental Corporation Quality Program Plan. Suppliers of systems, subsystems, and components important to safety will follow specifications for design, fabrication, construction, installation, and testing. These suppliers also will be overseen using the Foster Wheeler Environmental Corporation Quality Program Plan.

The Tetra Tech FW, Inc., Richland, Washington Operations Office is an ASME International-certified design organization and will be responsible for the ISF canister and storage tube design according to the oversight of an authorized nuclear inspector.

The ISF Facility will be within the Idaho National Engineering and Environmental Laboratory (INEEL). INEEL is a remote site with restricted access and its own full-time security force, fire department, medical staff, and emergency response capabilities. As a result, reliance on outside organizations is not required for these capabilities and services.

During design and construction, other personnel that report to the ISF Facility Manager and their respective responsibilities and authorities are:

- Configuration Manager
 - Establishes and maintains procedures and programs for configuration management of systems and documents
 - Controls, maintains, and implements a configuration management program
 - Ensures configuration management procedures have been properly prepared, reviewed, and approved
 - Establishes, implements, and maintains the document control system
 - Approves configuration management procedures and submittals
 - Approves configuration management staff assignments
- Construction Manager
 - Performs constructability reviews during initial design and for design modifications
 - Oversees procurement during construction
 - Oversees acceptance testing of systems, subsystems, and components before turnover for preoperational testing
 - Stops work during construction, as necessary
 - Obtains properly trained and experienced craft personnel
 - Identifies and recommends vendors and suppliers
- Licensing Manager
 - Ensures all applicable U.S. Nuclear Regulatory Commission requirements (including license conditions) are incorporated into design and administrative programs
 - Establishes procedures to ensure license basis documents remain consistent with design and operation
 - Stops work, as necessary
 - Approves licensing staff assignments
- Operations Manager
 - Provides operations input and operability reviews for design during design and construction
 - Additional responsibilities are described in Section 10.1.1.2, "Onsite Organization," of this SER

Also reporting to the Foster Wheeler Environmental Corporation Chief Executive Officer in the corporate organization is the Director of Environmental Safety and Quality. The Director of Environmental Safety and Quality is responsible for environmental compliance, health, safety, and quality issues. The Environmental Safety and Health Manager and the Quality Manager report to the Director of Environmental Safety and Quality. This arrangement ensures

adequate independence from line management, including independence from cost and schedule issues. The responsibilities and authorities of these positions are as follows:

- Environmental Safety and Health Manager
 - Develops programs and implementing procedures for environmental compliance, radiation, and industrial safety
 - Assists the Chief Design Engineer during design to ensure industrial safety standards are incorporated
 - Assists the Construction Manager during construction to establish safety programs
 - Conducts assessments and audits during construction to ensure safety programs are properly implemented
 - Reviews and qualifies subcontractors before performance of onsite work during construction
 - Provides results of assessments and audits to the Director of Environmental Safety and Quality
 - Requests corporate support for resolving environmental, safety, and health issues
 - Stops work, as necessary
 - Audits and surveys performance of environmental, safety, health, and quality programs
 - Establishes compliance with environmental, safety, and health requirements
 - Approves assignments of environmental, safety, and health personnel
- Quality Manager
 - Develops, maintains, and oversees implementation of the Quality Program Plan
 - Other responsibilities are described in Section 10.1.1.2, “Onsite Organization,” of this SER

10.1.1.2 Onsite Organization

Sections 9.1.2, “Operating Organization, Management, and Administrative Control System;” 9.1.2.1, “Onsite Organization (Operations);” and 9.1.2.2, “Personnel Functions, Responsibilities, and Authorities,” of the SAR describe the structure, functions, and responsibilities of the ISF Facility operating organization.

The ISF Facility onsite functional organization integrates design, engineering, procurement, licensing, business, environmental safety and health, quality, maintenance, and operations functions. Each functional manager ensures that personnel are qualified and authorized to perform assigned duties.

The onsite organization is structured to support any combination of four specific SNF handling activities: (i) receipt operations, (ii) loading operations, (iii) canister handling, and (iv) storage operations. A summary of each of these activities follows.

- Receipt Operations
 - Extends from receipt of transfer cask until cask adapter lid restraint is released
 - Confinement boundary is SNF canister and transfer cask

- Minimum staffing requirements are one shift supervisor and one equipment operator
- Intermittent Radiation Protection Technician coverage may be required for cask receipt surveys, transfer cask movement monitoring, or sampling cask atmosphere
- Loading Operations
 - SNF is in a transfer cask with the cask adapter lid restraint released
 - SNF is in the fuel repackaging area
 - SNF is in an ISF canister that has not completed a leak rate acceptance test
 - Confinement boundaries are the ISF Facility structures and systems
 - Minimum staffing requirements are one shift supervisor, one certified operator, one equipment operator, and one radiation protection technician
- Canister Handling
 - SNF is in an ISF canister that has been welded shut, has completed a leak rate acceptance test, but is not in a sealed storage tube
 - Confinement boundary is the ISF canister
 - Minimum staffing requirement is one shift supervisor
 - Radiation Protection Technician coverage is needed to monitor canister movement and placement into storage
- Storage Operations
 - ISF canister with SNF is in sealed storage tube
 - Confinement barriers are ISF canister and sealed storage tube
 - Decay heat is removed by natural convection
 - Minimum staffing requirement is one shift supervisor

Staffing levels during all modes of operations will ensure that the radiation limits of 10 CFR §20.1201(a) are met.

Onsite personnel activities during operations are conducted by authority of the ISF Facility Manager. The ISF Facility Manager has the following responsibilities during operations:

- Establishing and implementing policies, programs, and procedures for safe, legal, and efficient operation of the ISF Facility;
- Establishing and implementing policies, programs, and procedures to meet requirements of the Quality Program Plan;
- Ensuring regulatory requirements, commitments, and required notifications to the U.S. Nuclear Regulatory Commission and other agencies are satisfied as prescribed in the operating procedures;
- Stopping work or initiating emergency procedures and authorizing resumption of work after corrective actions, as specified in the Emergency Plan;
- Verifying personnel to operate equipment and controls important to safety are operated by certified personnel in accordance with the approved training and certification plan;
- Reviewing and approving facility modifications, procedure changes, and tests consistent with 10 CFR §72.48;
- Ensuring subordinate or delegated responsibilities, assignments, and authorities are adequately understood and implemented; and

- Ensuring that adequate resources, staffing, and training are available for safe operation.

The Safety Review Committee reports to the ISF Facility Manager. The responsibilities of this committee are discussed in Section 10.1.1.1 of this SER.

The Operations Manager also reports to the ISF Facility Manager. The Operations Manager oversees and controls ISF Facility operations through the shift supervisors. The specific responsibilities of the Operations Manager are:

- Ensuring safe conduct of operations and maintenance activities;
- Stopping work or initiating emergency procedures, as required;
- Adhering to applicable regulations and technical specifications;
- Implementing Foster Wheeler Environmental Corporation policies, programs, and procedures;
- Identifying and resolving personnel performance weaknesses; and
- Developing and implementing operating procedures.

The Shift Supervisor reports to the Operations Manager. The Shift Supervisor is responsible for safe shift operations in accordance with procedures, policies, and Technical Specifications. In the absence of the ISF Facility Manager and the Operations Manager, the Shift Supervisor is the senior management representative responsible for safe operation of the ISF Facility. The Shift Supervisor has the authority to cease work or initiate emergency procedures.

The Certified Operators report to the Shift Supervisor and are responsible for safe SNF movement activities in accordance with procedures, policies, and the Technical Specifications. Certified Operators conduct surveillances in accordance with the Technical Specifications.

The Equipment Operators also report to the Shift Supervisor. Equipment Operators are responsible for safe conduct of operations involving support systems and components in accordance with policies, procedures, and the Technical Specifications. Equipment Operators are supervised by a Certified Operator. Equipment Operators conduct surveillances as required by the Technical Specifications, monitor systems and components, and perform switching and tagging for maintenance operations.

The Technical Services Manager reports to the ISF Facility Manager and oversees and directs engineering services for ISF Facility design, maintenance, operation, fire protection, licensing, configuration management, and SNF accountability. The Technical Services Manager directs the engineering and technical staffs in the following activities:

- Maintenance
 - Developing and maintaining corrective and preventive maintenance procedures
 - Conducting maintenance activities
- Fire Protection
 - Maintaining a fire hazards analysis
 - Developing and implementing fire protection procedures
 - Developing fire preplan procedures
- Engineering

- Developing and reviewing facility modifications
- Developing and maintaining surveillance procedures
- Providing engineering support to operations and maintenance activities
- Configuration Management
 - Developing and implementing document control procedures
 - Controlling records storage and retrieval
 - Developing and implementing procedures for design configuration control

Shift Engineers report to the Technical Services Manager and support facility operations. Their duties include:

- Monitoring criticality and SNF engineering;
- Serving as staff technical experts for nuclear engineering and nuclear physics;
- Monitoring the performance of systems affecting nuclear safety;
- Reviewing and making recommendations on procedural changes and modifications affecting nuclear safety;
- Reviewing facility data trends that could affect nuclear safety;
- Investigating abnormalities or unusual occurrences in facility operations; and
- Ensuring SNF accountability and management procedures are properly implemented.

The Shift Maintenance Supervisor and the maintenance craft personnel also report to the Technical Services Manager.

The Administrative Services Manager reports to the ISF Facility Manager and oversees and directs administrative and training functions, including:

- Maintaining training records;
- Notifying applicable management of personnel qualifications;
- Establishing and maintaining the training program in accordance with the Operator Training and Certification Plan; and
- Supervising the training instructors.

The Training Instructors report to the Administrative Services Manager. Responsibilities of the Training Instructors are

- Developing training materials;
- Conducting training;
- Developing and administering examinations; and
- Ensuring training records are properly maintained.

The Environmental Safety and Health Manager reports to the ISF Facility Manager for day-to-day operations and also reports to the Director of Environmental Safety and Quality for matters of personnel health or safety. This separate reporting line to the Director of Environmental Safety and Quality ensures independence in health and safety matters and separation from cost and schedule considerations.

The Environmental Safety and Health Manager has the following authorities and responsibilities during operations:

- Administering the radiation safety program;
- Overseeing and directing the environmental, health and safety, emergency planning, and security programs;
- Stopping work, when appropriate;
- Developing and implementing industrial health and safety procedures;
- Complying with Occupational Safety and Health Administration requirements;
- Ensuring compliance with environmental permits;
- Implementing the radiation safety and ALARA programs;
- Developing and implementing radiation protection procedures;
- Packaging, storing, and shipping radioactive waste;
- Advising and informing the ISF Facility Manager on matters relating to radiation safety;
- Maintaining radiation protection records and monitoring trends;
- Maintaining an effective emergency response readiness;
- Ensuring existence of adequate emergency plan implementing procedures, emergency response training, and emergency response equipment and facilities; and
- Establishing and maintaining physical security and complying with the Physical Security Plan.

The Radiation Safety Officer reports to the Environmental Safety and Health Manager. The responsibilities and authorities of the Radiation Safety Officer are as follows;

- Implementing the radiological protection program;
- Stopping work for actions not in compliance with the radiation protection or ALARA programs; and
- Supervising the Radiation Protection Technicians in the following duties:
 - Monitoring radiological and environmental conditions;
 - Identifying and evaluating radiation hazards;
 - Developing and proposing radiological control and protective measures;
 - Conducting radiation surveys;
 - Monitoring worker radiological practices;
 - Packaging and storing radioactive waste;
 - Calibrating survey and analytical instruments;
 - Conducting personnel and environmental surveys and maintaining records of surveys;
 - Maintaining radiation protection logs; and
 - Investigating and reporting any personnel overexposures or excessive contamination events

The Radiation Protection Technicians report to the Radiation Safety Officer. Their responsibilities are to conduct the tasks listed in the previous paragraph and to keep the Radiation Safety Officer and the Shift Supervisor advised of radiation conditions that could result in unusual hazard. The Radiation Protection Technicians are responsible for radiation monitoring and control during emergency conditions in the absence of the Radiation Safety Officer, with the authority to stop work that is not in compliance with radiation protection or ALARA requirements.

The Emergency Planning and Security Coordinator reports to the Environmental Safety and Health Manager. Responsibilities of the Emergency Planning and Security Coordinator include:

- Maintaining a facility-specific accident analysis;
- Ensuring the ISF Facility is integrated into INEEL site-wide emergency response resources;
- Developing and maintaining an emergency plan and implementing procedures;
- Reviewing INEEL site-level emergency planning and security memoranda of agreement or understanding;
- Coordinating and evaluating drills and exercises;
- Collecting, formulating, interpreting, and disseminating emergency preparedness requirements;
- Coordinating and evaluating the emergency preparedness training program;
- Coordinating emergency preparedness issues with the Site Emergency Manager;
- Correcting emergency preparedness deficiencies;
- Evaluating emergency preparedness compliance concerns;
- Coordinating, evaluating, and reporting on emergency training, drills, and exercises;
- Ensuring the emergency response organization is properly staffed and trained;
- Maintaining and distributing emergency response organizational duty and telephone lists;
- Coordinating operation and maintenance of the emergency response facilities;
- Obtaining and maintaining emergency response organization equipment;
- Maintaining records of emergency response actions; and
- Ensuring changes in the ISF Facility or operations are incorporated into emergency preparedness procedures and training programs.

The Quality Manager reports to the Director of Environmental Safety and Quality. The Quality Manager is responsible for developing and implementing the auditing and verification functions defined in the Quality Program Plan. Through audits and surveillances, the Quality Manager ensures compliance with the Quality Program Plan. The responsibilities of the Quality Manager include the following:

- Stopping work when necessary to ensure compliance with the Quality Program Plan;
- Directing implementation of the Quality Program Plan;
- Overseeing implementation of the Quality Program Plan procedures;
- Verifying activities important to safety are conducted in accordance with appropriate procedures, standards, policies, and regulations;
- Coordinating corporate and onsite quality activities;
- Developing, maintaining, and implementing audit programs and schedules;
- Providing feedback to functional managers on the results of audits, surveillances, inspections, and monitoring activities; and
- Informing the Shift Supervisor of significant conditions adverse to quality for systems, subsystems, and components important to safety.

The quality organization will be staffed by Quality Engineers and Quality Control Inspection Personnel. The required numbers will be determined by the level of quality affecting activities.

The ISF Facility staff may be assigned to conduct independent safety reviews of new activities or changes to existing activities. Independent Safety Reviewers shall be individuals other than those originating or developing the proposed new activities or changes to existing activities. The Chairman of the Safety Review Committee will designate Independent Safety Reviewers in writing by selecting them from qualified individuals. Independent safety reviews must be

completed before implementing new or revised activities. The Independent Safety Reviewers will evaluate if the proposed activities must have prior U.S. Nuclear Regulatory Commission approval in accordance with 10 CFR §72.48.

Section 9.1.2.2.14 of the SAR describes plans for succession of operational authority and responsibility at the ISF Facility to ensure continuity of operations and responsiveness to off-normal situations. The ISF Facility Manager, who has overall responsibility and authority for the ISF Facility, will designate, in writing, persons qualified to act in his absence. Likewise, because the Operations Manager is the senior onsite manager with authority and responsibility for safe receipt, packaging, and storage of SNF and compliance with the technical specifications, the on-shift Shift Supervisor will assume responsibilities in the absence of the Operations Manager. Delegations of authority for other administrative, technical, and services support functions will be addressed by facility procedures or administrative controls.

All SNF operations are performed by ISF Facility personnel. Security force personnel are provided by INEEL as a condition of the contract with the U.S. Department of Energy. Potable water, fire-fighting water, and electrical power are also provided by INEEL, as are fire alarms monitoring and security control.

10.1.1.3 Management and Administrative Controls

Section 9.2.1, "Administrative Procedures for Conducting Test Program," of the SAR commits to using administrative control procedures for preparing, reviewing, approving, and conducting test procedures and instructions and for evaluating, documenting, and approving test results for preoperational testing and operations. Additionally, Section 9.4.1, "Procedures," of the SAR states during operations, procedures will be used to document performance of activities important to safety and to ensure regulatory compliance. Requirements for planning and conducting tests are in Chapter 11 of the ISF Quality Program Plan. Procedures are to be followed verbatim to ensure safety and compliance with regulatory requirements.

The applicant has committed that, if procedures cannot be performed as written, the affected activity will be stopped and the ISF Facility will be placed in a safe condition. Activity will not be resumed until corrective action has been taken.

Written procedures will be used, as appropriate, for administrative, radiation protection, maintenance, surveillance, operations, and quality assurance activities. The procedural coverage for each category is summarized in the following descriptions.

- Administrative Procedures
 - Provide understanding of operating philosophy and management policies
 - Include instructions for personnel conduct and development and the review, change, and approval of facility procedures
 - Describe activities related to personnel safety, working environment, and procurement
- Radiation Protection Procedures
 - Implement radiation control program
 - Ensure compliance with 10 CFR Part 20 and ALARA principles

- Describe use of monitoring and measurement equipment
- Define methods to train and qualify radiation protection personnel
- Describe performance of surveys, measurements, and assessments
- Provide techniques for control of radiation hazards
- Describe preparation, review, and control of radiation work permits
- Maintenance Procedures
 - Implement preventive and corrective maintenance programs, including calibrations and repairs to broken or degraded equipment
 - Identify level of qualification required for performance
 - Provide record of activities, dates, and personnel performing the activities
 - Identify prerequisites and postmaintenance testing requirements
- Surveillance Procedures
 - Implement surveillance requirements of operating license, including the technical specifications
 - Verify operations and equipment comply with conditions of operating license
 - Identify level of qualification required for performance
 - Establish requirements for recording activities, dates performed, and personnel performing the activities
 - Identify source requirements for surveillances, periods of performance, acceptance criteria, and corrective actions
- Operating Procedures
 - Provide instructions for normal and off-normal operations important to safety such as receiving, handling, repackaging, and storing SNF
 - Specify qualification and certification requirements of personnel performing procedures
 - Provide instructions for operation of equipment
- Quality Assurance Procedures
 - Specify quality oversight necessary to ensure activities important to safety are conducted in accordance with the Quality Program Plan

Preparation, review, and revision of procedures will be controlled by administrative procedures. These procedures will specify the format, review process, and approval requirements. New and revised procedures will be reviewed by subject matter experts. Additionally, Independent Safety Reviewers will determine if prior U.S. Nuclear Regulatory Commission approval is required in accordance with 10 CFR §72.48. All procedures or revisions to procedures will be approved by the ISF Facility Manager, or designee, and the review and approval process will be documented in accordance with the Quality Program Plan.

Section 9.4.2, "Records," of the SAR describes procedures and requirements for maintaining records at the ISF Facility. The procedures will ensure records are identifiable and retrievable. Other than maintaining training records, which is the responsibility of the Administrative Services Manager until the training records become historical records, the recordkeeping function is the responsibility of the Technical Services Manager. ISF Facility personnel will be responsible for ensuring that quality assurance records are legible, complete, accurate, and identifiable to the applicable activity. Quality assurance records include:

- Operating records, including maintenance records on significant equipment;
- Records of off-normal occurrences and events associated with radioactive releases;
- Environmental survey records and reports;
- Radiation monitoring readings or records;
- Reports of preoperational test acceptance criteria and test results; and
- Written procedures.

Other records required by regulations include the following:

- Spills or other abnormal occurrences involving the spread of radiation in and around the ISF Facility, equipment, or site [10 CFR §72.30(d)(1)];
- As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used or stored and locations of possible inaccessible contamination [10 CFR §72.30(d)(2)];
- A list, updated at least every 2 years, of areas designated or formerly designated as restricted areas and areas outside restricted areas that require decontamination [10 CFR §72.30(d)(1), §72.30(d)(3), and §20.1003];
- Cost estimates for the decommissioning funding plan [10 CFR §72.30(d)(4)];
- Receipt, inventory, disposal, acquisition, and transfer of SNF and high-level waste in storage [10 CFR §72.72(a)];
- Physical inventories and current material control and accounting procedures [10 CFR §72.72(b) and §72.72(c)];
- Changes in facility design, procedures, and tests and experiments in accordance with 10 CFR §72.48(c)(1), including bases for the determination these changes do not require a license amendment in accordance with 10 CFR §72.48(c)(2) and 10 CFR §72.48(d)(1);
- Employee certifications [10 CFR §72.44];
- Quality assurance records [10 CFR §72.174];
- Radiation protection program records required by 10 CFR Part 20, Subpart L;
- Changes to the Physical Protection Plan and other physical protection records [10 CFR §73.21, §72.44(e), §72.186, and §73.70];
- Occurrence and severity of natural phenomena [10 CFR §72.92]; and
- Record copies of:
 - SAR and updates [10 CFR §72.70]
 - Reports of accidental criticality or loss of nuclear material [10 CFR §72.74 and 10 CFR §73.71]
 - Material status reports [10 CFR §72.76]
 - Nuclear material transfer reports [10 CFR §72.78]
 - Physical Protection Plan [10 CFR §72.180]
 - Other required records and reports [10 CFR §72.82].

The staff finds that the management and administrative controls committed to in the SAR are adequate and, if fully implemented, will provide reasonable assurance that operations at the site will be properly controlled and documented. The applicant has described an organizational system for the preparation and control of procedures, including changes to procedures, and for the generation and maintenance of adequate records. The staff finds this organizational system acceptable based on the descriptions and commitments given in the SAR.

10.1.1.4 Evaluation Findings

The staff finds that the applicant's organizational structure will be adequate to manage the proposed ISF Facility for design, construction, preoperational testing, startup, operation, and decommissioning. The staff reviewed the corporate organization, the onsite organization, and the management and administrative controls presented in the SAR. On the basis of this review, the staff has determined that the proposed organizational structure will comply with the requirements of 10 CFR §72.24(h), §72.28(a), §72.28(c), and §72.40(a)(4). The basis for this determination is as follows:

- In accordance with 10 CFR §72.24(h), a plan for the conduct of operations, including the planned managerial and administrative controls system, and the applicant's organization and program for training of personnel pursuant to 10 CFR Part 72, Subpart I, has been presented in the SAR. The SAR adequately describes the corporate organizational structure including the reporting relationships and assigning responsibilities. Specific responsibilities during design and construction and operations are defined. Relationships to subcontractors and other outside agencies are discussed. Stop work authorities are delineated, and minimum staffing requirements are prescribed for the different operational scenarios. Responsibilities for developing and implementing a training and retraining program are presented, and further details are included in Section 9.3, "Training Programs," of the SAR. Management and administrative controls are detailed, including requirements for use of formally prepared and approved procedures and the maintenance of records. Written procedures will be used, as appropriate, for administrative, radiation protection, maintenance, surveillance, operations, and quality assurance activities. The staff determines that the plan is acceptable for the conduct of operations.
- In compliance with 10 CFR §72.28(a), the SAR discusses the technical qualifications of the applicant to engage in the proposed activities. Specific qualifications of corporate and onsite staff will be examined prior to startup of the facility. Section 9.1.3, "Personnel Qualification Requirements," of the SAR presents additional information regarding qualifications for key positions. Based on the description in the SAR, the staff determines that the applicant will possess adequate technical qualifications to conduct the proposed operations.
- In compliance with 10 CFR §72.28(c), the SAR includes a description of the applicant's operating organization, delegations of responsibility, and authority and minimum skills and experience qualifications relevant to the various levels of responsibility and authority. The SAR adequately describes the corporate organizational structure, including the reporting relationships and assigned responsibilities. Specific responsibilities during design and construction and operations are defined. Relationships to subcontractors and other outside agencies are discussed. Stop work authorities are delineated, and minimum staffing requirements are prescribed for the different operational scenarios. Responsibilities for developing and implementing a training and retraining program are presented, and further details are included in Section 9.3, "Training Programs," of the SAR. Section 9.1.3.1, "Minimum Qualification Requirements," of the SAR defines the minimum skills and experience required for various positions, which are consistent with those for similar nuclear facilities. The staff

determines that the applicant's operating organization, delegations of responsibility and authority, and minimum skills and experience qualifications are adequate to support the proposed activities.

- In accordance with 10 CFR §72.40(a)(4), the applicant has presented sufficient information to demonstrate that it will be qualified by reason of training and experience to conduct the operations included in 10 CFR Part 72. The staff determined that the information in the SAR is adequate and sufficient to demonstrate that this requirement will be met.

10.1.2 Preoperational Testing and Startup Operations

Section 9.2, "Preoperational Testing and Operation," of the SAR includes Subsections 9.2.1, "Administrative Procedures for Conducting Test Program;" 9.2.2, "Test Program Description;" and 9.2.3, "Test Discussion." The review considered how the information in the SAR addresses the following regulatory requirement:

- 10 CFR §72.40(a)(4) requires that the applicant be qualified to conduct the operations covered by 10 CFR Part 72.

10.1.2.1 Preoperational Testing Plan

The preoperational testing will ensure that SNF can be safely received, packaged, loaded into canisters, and stored at the ISF Facility.

The first component of preoperational testing is acceptance testing of systems, subsystems, and components. The construction organization performs this testing to verify compliance with construction specifications, procurement documents, and design requirements. One aspect of acceptance testing is functional testing to ensure proper component and system operation. Any off-site testing of vendor-supplied ITS structures, systems, or components performed by equipment suppliers or contractors will be controlled in accordance with the approved quality program plan. Purchased items will have the necessary documentation of conformance to requirements. The Chief Design Engineer is responsible for developing acceptance tests and inspection procedures and for reviewing and approving vendor-developed testing and inspection requirements. Resolution of any nonconformances will be in accordance with the Quality Program Plan.

After acceptance testing is completed, the construction organization will deliver the systems, subsystems, and components for startup and preoperational testing, which will include dry runs using mock SNF assemblies and canisters. Dry run testing will be performed using mock SNF assemblies and canisters, which will have the weights and dimensions of the actual components. The dry-run testing ensures proper system interface operations, verifies procedures and their use, and confirms adequacy of operator training prior to receipt of the SNF. The overall goals of the preoperational testing program are to: demonstrate functionality of equipment; verify adequacy of procedures; verify adequacy of staff training and qualifications; develop proficiency with procedures for operational activities that might result in radiation exposure, and modify procedures as necessary to minimize those exposures.

Identification of acceptance tests, development of acceptance test procedures, and verification of personnel qualifications are the responsibility of the Chief Design Engineer. Once prepared, the acceptance test procedures will be reviewed and approved by the ISF Facility technical staff. Test performance will be coordinated with the Construction Manager. Acceptance testing performed offsite by other organizations or contractors will be conducted in accordance with the Quality Program Plan. Testing control or development procedures will provide a means for incorporating lessons learned into the follow on dry-run testing.

Identification, development, and performance of dry-run test procedures are the responsibilities of the Operations Manager. This testing uses mockups of fuel assemblies and canisters to confirm that operations can be safely performed by personnel qualified in accordance with the Operator Training and Qualification plan before first receipt of SNF. These tests will be reviewed for technical adequacy by the ISF Facility technical staff. Additionally, dry-run testing will use tabletop reviews or plant walkdowns by qualified personnel.

Dry-run testing will use mock SNF assemblies to evaluate the following activities:

- Receipt Operations
 - Reviewing the SNF; unloading the receipt cask from the transporter, and transferring it to the SNF receipt port in the fuel processing area.
- Packaging Operations
 - Removing SNF from the receipt containers; inspecting and placing SNF inside a canister in preparation for canister closure.
- Canister Closure Operations
 - Preparing new canisters and baskets for loading, receiving loaded canisters from the fuel processing area, and closing the canister; closure includes lid welding, vacuum drying, helium backfilling and leak testing.
- Loading Operations
 - Transferring sealed canisters from the canister closure area to the storage area and loading into storage tubes.
- Unloading Operations
 - Retrieving a canister from a storage tube and transferring it to the fuel processing area or into a licensed transportation device.
- Waste Processing Operations
 - Handling and processing liquid and solid radioactive wastes.

The test procedures for preoperational testing will have the following minimum content:

- Personnel qualifications;
- Objectives;
- Prerequisites for the specific test;
- Design, procurement, or license requirements;
- Test configuration description;
- Test instructions;

- Quality assurance inspection hold points;
- Acceptance criteria;
- Test equipment and measuring requirements; and
- Test requirements and acceptance limits

Following the preoperational test, a test report will be prepared to document the following:

- Test item;
- Test date;
- Results and acceptability;
- Responsible personnel identification and signature;
- Evaluation results; and
- Nonconformance actions.

Test reports will be reviewed to determine if modifications are required to systems or procedures. If any such changes are identified, these will be reviewed by Independent Safety Reviewers to determine if the changes require prior U.S. Nuclear Regulatory Commission approval in accordance with 10 CFR §72.48.

After all preoperational testing is completed, a Fuel Acceptance Readiness Review will be conducted before receipt of the first SNF assemblies and commencement of startup testing. The Fuel Acceptance Readiness Review will verify the readiness to safely receive, repackage, and store SNF. Aspects of the Fuel Acceptance Readiness Review include a programmatic and procedural review, an equipment and staffing review, and a performance assessment of facility staff. The Fuel Acceptance Readiness Review will include the following assessment areas:

- Construction
 - Completeness of construction activities, availability and update of drawings, resolution of open items, correction of nonconformances, completion and approval of acceptance testing, and completion and acceptance of inspections.
- Engineering and Technical Support
 - Adequacy and availability of staffing, approval of design control procedures, information and manuals from vendors, calculations of design bases, and availability of approved as-built drawings.
- Operations
 - Availability of approved operating, off-normal, surveillance, and emergency response procedures; completion of preoperational testing, including associated corrective actions; and adequacy of personnel.
- Training
 - Availability of approved procedures and completion of training
- Radiological Controls

- Implementation of approved radiation protection procedures, training of health physics personnel, completion of radiation posting, and testing and operation of radiation monitoring equipment.
- Maintenance and Surveillance
 - Approval of maintenance and surveillance procedures, identification and availability of required spare parts, completion of post maintenance testing, and completion of surveillances necessary to receive SNF.
- Organization and Management
 - Availability of approved organizational and management procedures and training and qualification of personnel.
- Security
 - Implementation of approved security procedures, training and qualification of personnel, and testing and operation of security equipment.
- Fire Protection
 - Implementation of approved fire protection procedures, operation and testing of detection and suppression systems, and training and qualification of personnel.
- Emergency Response
 - Implementation of approved emergency plan procedures and agreements for support organizations, testing and operation of emergency equipment, and training and qualification of personnel.
- Nuclear Safety
 - Implementation of approved criticality control and SNF accountability control procedures and approved SNF acceptance verification procedures.

The Fuel Acceptance Readiness Review team will have a leader and support personnel with experience in operations, technical support, maintenance and surveillance, document control, security, fire protection, emergency response, and nuclear safety. The team will prepare a written report to document its findings. This report will be presented to the ISF Facility Manager, who has approval authority for receipt of SNF, before commencing startup testing.

Preoperational testing will closely simulate actual operations to ensure that qualified facility personnel can conduct operations safely using the operating procedures. Mock fuel assemblies, modules, rods, and canisters will be used. Verification of ALARA practices will be done during initial SNF loading.

Requirements for preoperational testing are:

- Verification of personnel trained in accordance with the approved training program;
- Performance of pretest briefing;
- Identification of hold and testing points;
- Establishment of stop-work criteria and contingency plans for placing the ISF Facility in a safe condition;
- Awareness of compensatory measures;

- Establishment of oversight, command and control, and notification requirements; and
- Identification of radiological hazards and controls.

Test procedures and instructions will identify the methods to accomplish the testing, the testing objectives, the acceptance criteria, the general prerequisites, and any special conditions to simulate normal and off-normal operating conditions.

10.1.2.2 Startup Plan

Startup testing will be conducted for the first two receipts of each SNF type. This testing will verify calculated dose projections and heat removal capabilities. The startup test plan will include at least the following elements:

- Confirmation of exposure times and procedures for handling radioactive materials;
- Monitoring of direct radiation for dose rates, streaming, and hot spots;
- Verification of effectiveness of the passive heat removal features associated with storage system;
- Verification of effectiveness of controls on radiological activities, including
 - ALARA reviews and planning
 - Radiation work permits
 - Hot particle controls
 - Contamination, exposure, and airborne controls
 - Alarm and monitoring systems
 - Contingency plans to place the ISF Facility in a safe condition; and
- Documentation of startup test results

After startup testing, results will be reviewed to determine if modifications or corrective actions are required for systems, procedures, or operator training deficiencies. If any such changes are identified, these will be reviewed by Independent Safety Reviewers to determine if the changes require prior U.S. Nuclear Regulatory Commission approval in accordance with 10 CFR §72.48. Approval from the ISF Facility Manager or designee is required before implementing any changes.

10.1.2.3 Evaluation Findings

The staff finds that the preoperational testing and startup operations will be adequately and safely conducted. The staff reviewed the applicant's proposal for preparing and conducting the preoperational testing plan and the startup plan. On the basis of this review, the staff determined that the preoperational testing plan and the startup plan will comply with the requirements of 10 CFR §72.40(a)(4). The basis for this determination follows:

The applicant has presented the testing programs to be used to ensure that SNF can be safely received, packaged, loaded into canisters, and stored at the facility. Section 9.2, "Preoperational Testing and Operation," of the SAR describes the processes to be used for acceptance testing; start-up; and preoperational testing of systems, subsystems, and components. The discussion includes the responsibilities of personnel involved, the use of dry runs with mock assemblies and canisters, qualifications of personnel, and the procedural and documentation requirements for testing. Requirements of the Fuel Acceptance Readiness

Review and associated reports to demonstrate the readiness to receive SNF are delineated and are consistent with such reports for similar facilities. Startup testing will be conducted for the first two receipts of each SNF type. The startup testing will verify calculated dose projections and heat removal capabilities. Any facility or procedural modifications required as a result of preoperational or startup testing will be adequately implemented and documented.

In summary, the staff determined that the preoperational and startup testings will be adequate to ensure that systems, subsystems, and components will be adequately tested prior to receipt of SNF.

10.1.3 Normal Operations

Section 9.4, "Normal Operations," of the SAR includes Subsections 9.4.1, "Procedures," and 9.4.2, "Records." The review considered how the information in the SAR addresses the following regulatory requirement:

- 10 CFR §72.40(a)(4) requires that the applicant be qualified to conduct the operations covered by 10 CFR Part 72.

10.1.3.1 Procedures

Section 9.4.1, "Procedures," of the SAR commits to preparing and using administrative, radiation protection, maintenance, surveillance, operating, quality assurance, and training procedures at the ISF Facility. These procedures encompass preoperational testing and normal operations. These procedures and changes thereto will be reviewed and approved as discussed in Section 10.1.1.3 of this SER. The procedures will contain sufficient detail to allow qualified and trained personnel to perform the actions without incident or occurrence of nonroutine events.

10.1.3.2 Records

Section 9.4.2, "Records," of the SAR describes the procedures and requirements for maintaining records at the ISF Facility. The scope of the recordkeeping includes record retention period; quality assurance requirements; environmental surveys; operations records that document principal maintenance, alterations, and additions to facilities; records of off-normal occurrences and events associated with radioactive releases; and records for decommissioning. The recordkeeping function is the responsibility of the Technical Services Manager as discussed in Section 10.1.1.3 of this SER. Records will be maintained for the periods required by the regulations.

10.1.3.3 Evaluation Findings

The staff reviewed the applicant's plan for the conduct of normal operations and finds that the plan is adequate and operations will be conducted safely. On the basis of this review, the staff determined that the plan for normal operations will comply with the requirements of 10 CFR 72.40(a)(4). The basis for this determination follows:

The applicant has presented plans for preparing and using formally approved procedures to conduct administrative, radiation protection, maintenance, surveillance, operating, quality assurance, and training procedures during normal operations. The staff finds the description of the control of procedures, including procedural changes, in the SAR to be acceptable. Preparation of procedures and procedural changes will have the appropriate level and detail of safety review. The applicant has also presented procedures and requirements for maintaining records at the facility. The staff finds that these procedures are adequate.

In summary, the staff has determined that the applicant's plan for the conduct of normal operations is adequate to safely conduct the proposed operations.

10.1.4 Personnel Selection, Training, and Certification

Sections 9.1.1.1, "Corporate Functions, Responsibilities, and Authorities;" 9.1.1.2, "In-House Organization;" 9.1.1.4, "Technical Staff;" and 9.1.2.2, "Personnel Functions, Responsibilities, and Authorities," of the SAR identify positions that specify personnel minimum qualifications and training for the operation of the ISF Facility. Section 9.1.3, "Personnel Qualification Requirements," of the SAR describes the minimum qualifications for these personnel. Section 9.3, "Training Programs," of the SAR includes Subsections 9.3.1, "Program Description;" 9.3.2, "Retraining Program;" and 9.3.3, "Administration and Records." In its review of these sections, the staff considered how the SAR addresses the following regulatory requirements:

- 10 CFR §72.40(a)(4) requires that the applicant be qualified to conduct the operation covered by 10 CFR Part 72.
- 10 CFR §72.40(a)(9) requires that the personnel training program comply with Subpart I of 10 CFR Part 72. Subpart I, Training and Certification of Personnel, consists of 10 CFR §72.190, §72.192 and §72.194, as summarized below.
- 10 CFR §72.190 requires that operators of equipment and controls that are important to safety must be trained and certified, or be under the direct visual supervision of such an individual. Supervisory personnel who direct such operations must also be certified.
- 10 CFR §72.192 requires that the applicant establish a program for training, proficiency testing, and certification of personnel, and that the program be submitted to the Commission for approval.
- 10 CFR §72.194 requires that the physical condition and general health of personnel certified for the operation of equipment and controls that are important to safety must not adversely affect safe operation of the Facility. For example, a condition that might cause impaired judgment or motor coordination must be considered in the selection of personnel.

10.1.4.1 Personnel Organization

Section 9.3, "Training Programs," of the SAR states that the purpose of the ISF Facility training program is to ensure that personnel have the knowledge and skills to operate and maintain the ISF Facility so that site personnel and public health and safety are protected. Section 9.1.2.2, "Personnel Functions, Responsibilities, and Authorities," of the SAR assigns the ISF Facility Manager responsibility for establishing and implementing policies, programs, and procedures to ensure the safe, legal, and efficient operation of the ISF Facility. This responsibility includes certifying personnel to operate equipment and controls important to safety and ensuring adequate training is available to safely operate the ISF Facility. Also, the Operations Manager has the responsibility to identify and resolve shift personnel performance weaknesses. The Administrative Services Manager directs the training functions at the ISF Facility, including maintaining training records and establishing and maintaining the ISF Facility training programs and the Operator Training and Certification Plan. Section 9.3.1, "Program Description," of the SAR further defines training responsibilities. The Quality Manager is responsible for training quality assurance personnel in accordance with the Quality Program Plan. Security personnel and emergency response personnel are trained in accordance with the Physical Protection Plan and the Emergency Plan. Finally, the Technical Services Manager is responsible for establishing training and qualification requirements for maintenance personnel based on site-specific training assessments. Training records will be maintained in accordance with the recordkeeping program described in Section 9.4.2, "Records," of the SAR and will include records of personnel certification required by 10 CFR §72.44.

In addition to regular training, the ISF Facility Manager will implement a program of retraining to ensure that personnel maintain adequate knowledge and skills and to correct identified deficiencies. Accordingly, general personnel training is required to be repeated annually, emphasizing radiation protection, emergency planning, and management policies. Other annual training will include respirator protection training and radiation worker training. The Operator Training and Certification Plan includes the retraining process for certified operators. Retraining requirements also exist for quality assurance, security, and emergency response personnel.

Training program effectiveness will be monitored using written examinations and practical performance assessments. Written examinations require a passing grade of 80 percent, and practical performance assessment is graded as pass/fail.

Changes in training needs may result from changes to processes, programs, procedures, equipment, and relevant nuclear industry events. These areas will be evaluated in accordance with approved facility procedures to identify changes or additions to training needs.

The staff finds that the personnel organization and approach to training are acceptable. The personnel organization identifies the position that has responsibility for the training program, including implementing the program and maintaining training records.

10.1.4.2 Selection and Training of Operating Personnel

Section 9.1.3.1, "Minimum Qualification Requirements," of the SAR defines the qualifications required for specific job assignments. All ISF Facility personnel will be trained to perform their assigned tasks before performing independent work at the ISF Facility. Only qualified

personnel will be allowed to operate equipment and controls important to safety. Until they are qualified, trainees will be directly supervised by qualified individuals when performing work. Minimum qualification requirements are established based on meeting the requirements of ANSI N18.1–1971 for comparable positions. All facility technical and operations personnel must have a high school diploma or general equivalency degree.

Specific requirements are identified for the ISF Facility Manager, the Operations Manager, the Technical Services Supervisor, Shift Engineers, Shift Supervisors, Certified Operators, the Environmental Safety and Health Manager, the Radiation Safety Officer, Supervisory Personnel, the Quality Manager, the Safety Review Committee Members, and Independent Safety Reviewers. The qualifications listed in the SAR for these positions are consistent with those of equivalent positions in other similar nuclear facilities.

ISF Facility training includes general employee training, radiation worker training, operator training, emergency plan training, job/task specific training, and security force training. These various aspects of the training program are discussed in SAR Section 9.3.1, “Program Description.”

Any persons, including subcontractors and consultants having unescorted access to the ISF Facility, must have successfully completed general employee training. This training includes receiving information on elementary radiation effects and the basic aspects of radiation protection and complies with 10 CFR Part 19. General employee training also addresses facility operations, security, emergency plan, and quality assurance requirements. Successful completion of general employee training will be documented by a written examination.

ISF Facility staff requiring access to radiologically controlled areas (radiation workers) are required to complete additional training in site-specific radiological controls. The minimum topics that must be addressed by this training are:

- Nature and sources of radiation;
- Methods of controlling exposure and contamination;
- Maintaining exposure ALARA;
- Radiation monitoring;
- Shielding;
- Dosimetry;
- Biological effects;
- Criticality hazards control;
- Applicable ISF Facility radiation protection procedures;
- Workers rights and responsibilities in accordance with 10 CFR Part 19;
- Minimizing radioactive waste and preventing mixed waste exposures; and
- Protective clothing use.

Respirator protection training is provided for those individuals who require it in accordance with 10 CFR Part 20 and 29 CFR §1910.134.

Successful completion of this training will be documented by an examination and a demonstration of skills.

To establish their qualifications, certified operators must complete general employee training, radiation worker training, and the appropriate portions of the Operator Training and Certification Plan. This plan is based on standard industry practices and employs a systematic approach to training wherein job performance needs are used to establish the necessary knowledge and skills requirements. Training needs, learning objectives, and performance measures are derived from task analyses. Finally, the training needs are incorporated into lesson plans that include learning objectives and training settings.

The administration of the ISF Facility training program is the overall responsibility of the ISF Facility Manager. That position is responsible for ensuring ISF Facility personnel are adequately trained to perform their tasks, is the certifying authority, and designates in writing those personnel authorized to supervise or operate equipment and controls important to safety.

Reporting to the ISF Facility Manager, the Administrative Services Manager implements and maintains the training program, including:

- Keeping records on identification of training requirements, development of lesson plans, and conduct of training;
- Developing training plans;
- Scheduling and conducting training;
- Maintaining records on personnel qualification status; and
- Meeting specific training requirements in the Operator Training and Certification Plan, the Emergency Plan, and the Physical Security Plan.

Also reporting to the ISF Facility Manager, the Operations Manager has the following training program responsibilities:

- Performing job/task analyses to identify training requirements for the Operator Training and Certification Plan;
- Identifying weaknesses in the training program; and
- Recommending changes to or enhancements in the training program.

The Technical Services Manager also has responsibilities for administering the training program by:

- Ensuring maintenance training requirements are identified, lessons plans are developed, and training is conducted;
- Identifying qualification requirements for maintenance positions; and
- Ensuring only qualified personnel are assigned to maintenance tasks.

Shift Supervisors are responsible for ensuring that personnel assigned to them are properly trained for their assignments and that activities are conducted in accordance with facility procedures.

The Administrative Services Manager maintains completed training records. These records will include the following minimum information:

- Plans for lessons;
- Lists of personnel attending training functions;

- Names of instructors;
- Dates of training functions;
- Copies of written examinations;
- Evaluations and results of job performance; and
- Results of evaluations for walkthrough or oral examinations

Training records are considered quality documents and will be maintained in accordance with the Quality Program Plan.

10.1.4.3 Selection and Training of Security Guards

The requirements for the security organization are addressed separately in the staff's review of the applicant's proposed Physical Protection Plan, which includes the Security Training and Qualification Plan.

10.1.4.4 Evaluation Findings

The staff finds that the ISF Facility program for selection, training, and retraining of operating personnel will provide adequately trained operations and supervisory staffs, acceptable documentation, and appropriate records of the training. The staff reviewed the personnel qualification requirements and training program commitments described by the applicant in the SAR. On the basis of this review, the staff has determined that the described personnel training and certification program will comply with 10 CFR Part 72, Subpart I. The basis for this determination follows:

- Pursuant to 10 CFR Part 72, Subpart I, a plan and program for training and certification must be defined in a license application at a level of detail that provides reasonable assurance that facility personnel will be trained and qualified to perform SNF storage activities without undue risk to the health and safety of workers and the public. NUREG-1567 (U.S. Nuclear Regulatory Commission, 2000) provides guidance to the staff for the acceptable level of detail of descriptions of the training program, its administration, commitments for its implementation, and the principles to be applied when developing the training and certification program. The applicant committed to conduct training using a systematic approach to training. The staff considers the five elements of a systematic approach to training (or equivalent) as described in ANSI/ANS 3.1-1993 to be an acceptable method for training program implementation at an ISFSI. The applicant's proposed training plan commits to using a systems approach to training, including the five elements, as defined in ANSI/ANS 3.1-1993.
- The staff reviewed the personnel qualification requirements specified in Section 9.1.3 of the SAR and compared them with the requirements of Regulatory Guide 1.8 (U.S. Nuclear Regulatory Commission, 1987) and associated American National Standards Institute/American National Society (ANSI/ANS) standards. Regulatory Guide 1.8 and the ANSI/ANS standards referenced in the regulatory guide address the qualification and training of personnel for nuclear power plants. For various positions, the regulatory guide and referenced ANSI/ANS standards specify particular qualifications, such as education, training, examination, and experience. The regulatory guide and ANSI/ANS standards are applicable to the operating organization at a

commercial nuclear power reactor. Because the ISF Facility is a passive facility with significantly less complex operations than a commercial nuclear power reactor, there is a significant reduction in the size of the management staff proposed for the ISF Facility compared with a reactor facility. The staff determined that the ISF Facility operating organization and designation of responsibilities are acceptable and appropriate, given the passive nature and operating requirements of an ISFSI.

- The staff determined that the SAR provides an acceptable level of detail with respect to operator experience, instruction and training courses, examination and testing requirements, and criteria for qualifications or revocations. Qualifications for operators must include applicable training and experience, which may be at facilities other than dry storage facilities. The minimum personnel qualification requirements are comparable to similar positions at power reactor facilities described in Regulatory Guide 1.8 (U.S. Nuclear Regulatory Commission, 1987) and are generally equivalent to the qualification requirements in place at other ISFSIs, including the requirements for general managers and operators or Certified ISFSI Specialists. The applicant will evaluate certified operator trainee mastery of training objectives and provide pass/fail criteria. The staff concludes that the personnel qualification requirements stated in the SAR are equivalent to those specified for similar nuclear facilities and are, therefore, acceptable.
- In summary, the staff determined that the applicant has provided sufficient details concerning personnel training and qualifications to provide reasonable assurance that the applicant's training and certification program will satisfy the requirements of 10 CFR Part 72, Subpart I. Certain operations will be performed only by trained and certified operators, and the physical condition and general health of operators will be considered in the qualification of operators, as required by 10 CFR §72.192 and §72.194 of Subpart I. The qualifications and certifications of the operators will be inspected and evaluated following the issuance of a license to ensure regulatory compliance prior to the conduct of licensed operations at the ISF Facility.
- The applicant's training program includes specific training in ALARA principles. Based on the applicant's description of its training program, the staff concludes that the training commitments are consistent with Regulatory Guide 8.8 (U.S. Nuclear Regulatory Commission, 1978), which provides guidance on training and instruction in ALARA principles for nuclear power plant personnel, and that the description also provides reasonable assurance that NRC requirements related to radiation protection training and ALARA principles will be satisfied.

10.1.5 Emergency Planning

The Emergency Plan is addressed in Chapter 16 of this SER.

10.1.6 Physical Security and Safeguards Contingency Plans

The NRC staff's approval of the ISF Facility Physical Protection Plan, including the Safeguards Contingency Plan and the Security Training and Qualification Plan, was previously documented in a letter dated September 15, 2004.

10.2 References

American Nuclear Society, ANS/ANSI-3.1-1993, *Selection, Qualification, and Training of Personnel for Nuclear Power Plants*.

U.S. Nuclear Regulatory Commission. NUREG–1567, *Standard Review Plan for Spent Fuel Dry Storage Facilities*. Washington, DC: U.S. Nuclear Regulatory Commission. 2000.

U.S. Nuclear Regulatory Commission. Regulatory Guide 1.8, *Qualification and Training of Personnel for Nuclear Power Plants*. Rev. 2. Washington, DC: U.S. Nuclear Regulatory Commission. 1987.

U.S. Nuclear Regulatory Commission. Regulatory Guide 8.8, *Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be ALARA*. Rev. 3. Washington, DC: U.S. Nuclear Regulatory Commission. 1978.