10 CONDUCT OF OPERATIONS EVALUATION

10.1 Conduct of Review

Chapter 9, Conduct of Operations, of the SAR, describes the organizational structure that will manage and operate the 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, 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 Facility are also included. The purpose of the review is to ensure that the infrastructure to manage, test, and operate the Facility, including provisions for effective training, is acceptable.

10.1.1 Organizational Structure

Section 9.1, Organizational Structure, of the SAR, describes the organizational structure to be used to manage and operate the Facility. 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 operation covered by 10 CFR Part 72.

10.1.1.1 Corporate Organization

Section 9.1, Organizational Structure, of the SAR describes the corporate organization that will be used to manage and operate the Facility.

The PFS organization is structured to be operated by a Board of Managers during the prelicensing, licensing and construction, and operational phases of the Facility. Representatives to the Board of Managers are chosen by the eight member utilities. The Board is under the direction of a chairman, selected by the Board members. Voting rights of each representative are in proportion to the associated member utility's respective ownership interest in PFS.

The Board of Managers is responsible for:

- supervising the General Manager/Chief Operating Officer,
- long-range planning,
- preparation of the license application,
- ensuring establishment and effective implementation of the QA program, and
- ensuring compliance with the conditions of the license.

The Facility Safety Review Committee is responsible for reviewing and advising the Board of Managers on all matters relating to structures, systems, and components important to safety. Committee responsibilities include, but are not limited to, the review of:

- safety evaluations for procedures and changes thereto,

- changes to structures, systems, and components classified as important to safety,
- tests or experiments involving structures, systems, and components classified as important to safety,
- review of QA audits related to safety,
- proposed changes to the technical specifications of the license, and
- violations of codes, regulations, orders, license requirements, or internal procedures/instructions which pertain to structures, systems, and components classified as important to safety.

The committee consists, as a minimum, of members from the following functional areas:

- Chairman - Facility General Manager/Chief Operation Officer,
- Quality Assurance,
- Radiation Protection,
- Nuclear Engineering, and
- Maintenance/Operations.

During construction, PFS will have a team of three persons available for oversight of Facility design, procurement, and construction. This staff will be led by the PFS Facility Project Manager and will include a construction engineer and a procurement specialist. They will ensure oversight of the Architect/Engineer, contractors, and vendors and will be assisted as needed (at the discretion of the PFS Facility Project Manager) by utility staff from the member utilities in a full range of specialties appropriate to the design, construction, startup, and operation of an ISFSI. These three persons will be available for initial training of the site staff prior to Facility operation.

At the completion of Facility design, construction, licensing, and testing, the responsibility for daily operation of the Facility will be turned over to the General Manager who reports to the Chairman of the Board. The General Manager will be responsible for the receipt, handling, storage, and consolidation of the spent fuel. The General Manager will also be responsible for the safe maintenance and operation of the Facility; reconfiguration of spent fuel storage areas, if required; and refurbishing degrading facilities to ensure safety and environmental compliance.

The staff review finds the corporate organizational structure acceptable because it defines the relationships between corporate organizations and delineates authority and responsibility. Responsibility is clear to specific individuals and parts of the organization and the functions of radiation protection and other safety agencies are provided organizationally separate lines of reporting from Facility operations. The staff has also determined that a Safety Review Committee will be formed and will be properly organized and staffed and therefore is acceptable.

10.1.1.2 Onsite Organization

Sections 9.1.2.1, Onsite Organization, and 9.1.2.2, Personnel Functions, Responsibilities, and Authorities, in the SAR present the onsite organization, including responsibilities and reporting relationships.

During the operational phase, the Board of Managers has overall responsibility for safe operation of the Facility and the authority to ensure continued safe operation. The General Manager will also function as the Chief Operating Officer during the operational phase and ensure safe and efficient operations and maintenance activities at the Facility. The functions represented by the PFS organization have the authority to control various aspects of the Facility including engineering and design, QA, fuel accountability, maintenance, radiation protection, training, operations, and decommissioning.

As discussed in Section 9.1.4, Liaison with Outside Organizations, of the SAR, the oversight of the outside organizations which manufacture canisters is provided by the General Manager/Chief Operating Officer and the Nuclear Engineering staff, who will conduct oversight activities in accordance with the QA program. Fabrication of canisters to appropriate standards and storage, transfer, and transportation technology are monitored by the nuclear engineering staff. The oversight of outside organizations is audited periodically by the QA staff.

The staff review finds the on-site organizational structure acceptable because it defines relationships between on-site organizations and liaisons with outside organizations, and delineates authority and responsibility. The position responsible for oversight of outside organizations that manufacture canisters is clearly defined.

10.1.1.3 Management and Administrative Controls

Section 9.4.1, Procedures, of the SAR commits to preparing and using administrative, radiation protection, maintenance and surveillance, QA, and training procedures that will be employed at the Facility. Use of these procedures encompasses preoperational testing as well as normal operations. These procedures and subsequent changes thereto will be reviewed and approved by the Health Physics and QA organizations, independent of the operating organizations. The applicant has committed that procedures will contain sufficient detail to allow qualified and trained personnel to perform the actions without incident or abnormal event.

Section 9.4.2, Records, of the SAR describes the procedures and requirements for maintaining records at the Facility. These procedures will be developed specifically for the Facility. The scope of the record keeping procedures includes records retention period; QA requirements; operating records that document principal maintenance, alterations, and additions to facilities; records of off-normal occurrences and events associated with radioactive releases; records for decommissioning; and environmental surveys. The record keeping function falls under the responsibility of the Administrative Assistant. Unless otherwise noted, records will be maintained until termination of the Facility license by the NRC.

The record keeping system discussed in Section 9.4.2, Records, of the SAR includes documentation of the receipt, inventory, location, and transfer of spent fuel. The time period for keeping the various records will be specified and duplicate records will be retained in both the Administration Building and the Security and Health Physics Building that will ensure both sets of records could not be destroyed by a single event.

The staff found that the management and administrative controls committed to in the SAR are adequate and, if fully implemented, provides reasonable assurance that the 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 generating and maintaining adequate records. The staff finds this organizational system acceptable based on the descriptions and commitments given in the SAR.

10.1.2 Pre-Operational Testing and Startup Operations

10.1.2.1 Pre-Operational Testing Plan

Section 9.2, Pre-Operational Testing and Operation, of the SAR includes Subsections 9.2.1, Administrative Procedures for Conducting Test Programs; 9.2.2, Pre-Operational Test Plan; and 9.2.3, Operational Readiness Review Plan. 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 operation covered by 10 CFR Part 72.

Prior to receipt and storage of fuel at the Facility, a series of preoperational, startup, and performance tests will be developed and implemented. The scope of these tests will include construction testing, physical facilities testing, operational testing, and associated auxiliary equipment. The objective of the preoperational and startup testing program is to verify that the storage system components can operate safely and effectively.

Section 9.2.1, Administrative Procedures for Conducting Test Operations, of the SAR states that appropriate test procedures will be developed to support the preoperational testing and startup programs. These test procedures will be prepared, reviewed, modified, and controlled by a responsible line manager and the Operations Review Committee.

Section 9.2.2, Pre-Operational Test Plan, of the SAR provides a description of the test program and commits that the tests will simulate, as nearly as possible, the actual operations at the Facility. Testing will be performed for (i) construction, (ii) physical facilities, and (iii) operational procedures.

Construction testing will be performed on:

- cask storage pad construction,
- Canister Transfer Building construction, and
- Facility yard and yard infrastructure construction.

Physical facilities testing will be performed on:

- storage system transfer casks,
- canister downloader equipment,
- lifting yokes,
- Canister Transfer Building overhead bridge cranes and interlocks,
- storage cask transporter vehicles,
- heavy haul transport trailers,
- concrete storage casks,
- storage cask temperature monitoring equipment,

- area radiation monitoring equipment,
- electrical power system,
- standby diesel generator,
- security systems equipment,
- communications systems, and
- fire truck and fire protection equipment.

Operational testing will include:

- removing the personnel barrier, impact limiters, and shipping cask from the heavy haul trailer or rail car using the canister transfer overhead bridge crane;

- up-righting the shipping cask on the shipping cradle and moving the cask from the shipping cradle to the Canister Transfer Building floor using the shipping cask lifting yoke and overhead crane;

- moving the shipping cask from the cask unloading bay into one of the canister transfer cells using the overhead crane;

- unbolting the shipping cask lid using automated wrenches and inserting lifting attachments on the canister;

- setting the transfer cask on top of the shipping cask, using the transfer cask lifting yoke and overhead crane;

- transferring the canister from the shipping cask to the transfer cask using the vendor-supplied canister lifting slings and equipment;

- moving the transfer cask from the top of the shipping cask to the top of the concrete storage cask using the overhead crane;

- transferring the canister from the transfer cask into the storage cask using the vendor-supplied canister lifting slings and equipment;

- ensuring that all steps throughout the transfer process are performed in an ALARA manner to minimize radiation doses;

- transporting the storage cask from the Canister Transfer Building cell to the storage pads and back again using both the cask transporter vehicle and a combination of the overhead crane and cask transporter; and

- transferring the canister from the storage cask back to the shipping cask using the overhead crane as required when shipping fuel offsite.

Section 9.2.3, Operational Readiness Review Plan, of the SAR commits to an Operational Readiness Review to be performed by the Facility staff in order to verify the readiness of the Facility and personnel to begin full operations.

The Operational Readiness Review team will consist of a team leader and safety and technical experts representing the areas of operations, engineering and technical support, maintenance and surveillance, and organization and management. The Operational Readiness Review team is expected to conduct internal meetings with the applicable organizations to ensure that all activities reviewed in the Operational Readiness Review are accomplished prior to operation. The Operational Readiness Review team will prepare and issue a report addressing the scope of the Operational Readiness Review and all conclusions, findings, and observations of each review item. The report will be signed off by the Operational Readiness Review Team Leader, Facility General Manager, and other appropriate managers.

The staff review found that the preoperational test plan includes the necessary tests and provides for proper evaluation, approval, and use of the test results. Appropriate administrative procedures will be developed to support the preoperational testing and startup programs, and a Facility staff review of operational readiness will be performed prior to operation.

10.1.2.2 Startup Plan

The SAR did not include a startup plan. Therefore, a license condition requires PFS to submit a startup plan to the NRC prior to receipt and storage of fuel at the Facility.

NUREG-1567 provides guidance on the elements that should be included in a startup plan. The operating startup plan should identify those specific operations involving the initial handling of radioactive material to be placed into storage. Although plant procedures to be used for normal operations or during steady-state conditions would not necessarily be included in the operating startup plan, the evaluation of the effectiveness of those procedures should be elements of the operating startup plan. For ALARA considerations, as many of the operating startup actions as feasible should be performed during preoperational testing (i.e., before sources of exposure are present).

The operating startup plan should include the following elements:

- tests and confirmation of procedures and exposure times involving actual radioactive sources (e.g., radiation monitoring, in-pool operations);
- direct radiation monitoring of casks and shielding for radiation dose rates, streaming, and surface “hot-spots”;
- verification of effectiveness of heat removal features; and
- documentation of results of tests and evaluations.

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 operation 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, QA, and training procedures that will be employed at the Facility. Use of these procedures encompasses preoperational testing as well as normal operations. These procedures and changes thereto will be reviewed and approved by the Health Physics and QA organization, independent of the operating organization. The SAR states that procedures will contain sufficient detail to allow qualified and trained personnel to perform the actions without incident or abnormal event.

The staff review found that the control of procedures, including procedure changes, described in the SAR was adequate. Preparation of procedures and procedure changes will have the appropriate level of detail and safety review.

10.1.3.2 Records

Section 9.4.2, Records, of the SAR describes the procedures and requirements for maintaining records at the Facility. The procedures will be developed specifically for the Facility. The scope of the record keeping procedures includes record retention period; QA requirements; operating records that document principal maintenance, alterations, and additions to facilities; records of off-normal occurrences and events associated with radioactive releases; records for decommissioning; and environmental surveys. The record keeping function falls under the responsibility of the Administrative Assistant. Unless otherwise noted, records will be maintained until termination of the Facility license by the NRC.

The staff review found that the record keeping procedures committed to in the SAR are adequate to assure that records will be properly developed and maintained.

10.1.4 Personnel Selection, Training, and Certification

Section 9.1.2.2, Personnel Functions, Responsibilities, and Authorities, of the SAR defines the Management and Operating contractor positions that specify minimum qualifications and training for the operation of the Facility. Section 9.1.3, Personnel Qualification Requirements, of the SAR contains Subsections 9.1.3.1, Minimum Qualification Requirements, and 9.1.3.2, Qualifications of Personnel. Section 9.3, Training Program, of the SAR contains Subsections 9.3.1, Program Description; 9.3.2, Retraining Program; and 9.3.3, Administration and Records. The review 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, 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 Program, of the SAR states that PFS commits to providing training using a systematic approach to training to support the Emergency Plan, Physical Security Plan, QA plan, and administrative and safety requirements. Section 9.3.4, Administration and Records, of the SAR assigns responsibility for the training program to the Emergency Preparedness Coordinator. This responsibility includes implementing the training program and maintaining up-to-date training records for trained personnel, new employees, and refresher or upgrading training. Records to be maintained in accordance with the record keeping program described in Section 9.4.2, Records, of the SAR will include written examinations, records of practical examinations that include delineation of operator strengths, weaknesses, and recommendations for additional training or retesting; training topics and hours for each operator; and job performance.

The staff review found that the personnel organization and systematic 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. Specific requirements are identified for the General Manager, the Radiation Protection Manager, Radiation Protection Technicians, Lead Mechanic/Operator, Mechanics, Lead Instrument and Electrical Technician, Lead QA Technician, QA Technician and Auditor, Lead Nuclear Engineer, Nuclear Engineers, Security Captain, Emergency Preparedness Coordinator, and the engineer positions on the Safety Review Committee. The qualifications listed in the SAR for these positions are consistent with those of similar positions for other nuclear facilities. Operation of equipment and controls is limited to trained and certified personnel, or is performed under their direct visual supervision.

In Section 9.1.3.2, Qualifications of Personnel, of the SAR, PFS commits to maintaining personnel having specific training requirements so that compliance with the minimum requirements can be demonstrated.

In Section 9.3, Training Program, of the SAR, PFS commits to use of the systematic approach for training personnel for Facility operations including the Emergency Plan, Physical Security Plan, QA plan, and administrative and safety requirements.

General Employee Training will be provided for all Facility operators and supervisory personnel. Topics will include applicable regulations and standards, the engineering principles of radiological shielding, basic health physics, fuel handling, the structural characteristics of the Facility, administrative procedures, and the Emergency Plan and procedures.

Detailed operator training will be provided for those individuals requiring it. The training will include:

- canister transfer system design and operations,
- canister transfer system normal and off-normal procedures,
- storage Facility normal and off-normal procedures,
- on-site transportation normal and off-normal procedures,
- maintenance,
- storage cask temperature monitoring system,
- radiation detection, monitoring, sampling, and survey instruments,
- layout and functions of the Facility,
- operator responsibility and authority,
- technical specifications,
- normal and emergency communications,
- on-site transportation, and
- topics covered in General Employee Training, addressed with specific emphasis on operations.

Section 9.3.3, Continuing Training, of the SAR commits to preparing procedures to implement retraining, proficiency testing, and requalification for ISFSI personnel, as required.

The staff review found that PFS's program for selection and training of operating personnel will provide an adequately trained operations and supervisory staff, acceptable documentation, and records of the training. The staff has 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 is as 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 spent fuel storage activities without undue risk to the health and safety of workers and the public. NUREG–1567 (Nuclear Regulatory Commission, 1998) 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 in the development of the training and certification program. For example, NUREG–1567, Section 10.4.4.2, states that the type and level of training to be provided for each job description, including specific training provided to specific job description, must be listed. Alternately, the basis used to identify the type and level of training may be described. 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 defined in 10 CFR 55.4 to be an acceptable method for training program implementation at an ISFSI. The proposed training plan commits to using the five elements, as defined in 10 CFR 55.4.

The staff reviewed the personnel qualification requirements specified in Section 9.1.3 of the SAR and compared those qualifications to the requirements of Regulatory Guide 1.8 (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 PFS 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 Facility as compared to a reactor facility. The staff has determined that the Facility operating organization and designation of responsibilities is acceptable, given the passive nature and operating requirements of an ISFSI.

The staff has determined that the SAR provides an acceptable level of detail with respect to operator experience, instruction and training courses, examination and testing requirements, and the 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 (Nuclear Regulatory Commission, 1987) and are generally equivalent to the qualification requirements that are in place at other ISFSIs, including the requirements for general managers and operators or Certified ISFSI Specialists. 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.

The applicant will evaluate certified operator trainee mastery of training objectives and provide pass/fail criteria. In the SAR, Section 9.4.1.1, the applicant committed to evaluate the physical condition and general health of personnel who are certified for operations that are important to safety. These personnel will be evaluated according to NRC Form 396, which is used to evaluate licensed operators at commercial nuclear reactors. The staff concludes that these commitments are acceptable.

In summary, the staff has determined that the applicant has provided sufficient details concerning its personnel training and qualifications to provide reasonable assurance that its 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 Facility.

As described in the previous text, the staff has determined that the Facility training program, including the commitments made by the applicant, provide reasonable assurance of compliance with the standards in 10 CFR Part 72, Subpart I, and are consistent with the applicable

regulatory guidance. This training program includes specific training in ALARA principles. Based on the Facility description of its training program, the staff concludes that the training commitments are consistent with Regulatory Guide 8.8 (Nuclear Regulatory Commission, 1978), which provides guidance in training and instruction in ALARA principles for nuclear power plant personnel, and provide reasonable assurance that NRC requirements related to radiation protection training and ALARA principles will be satisfied.

10.1.4.3 Selection and Training of Security Guards

The requirements for the security organization is addressed in Chapter 18 of this SER.

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

Physical Security is addressed in Chapter 18 of this SER.

10.2 Evaluation Findings

The staff has reviewed the SAR and has determined that PFS has established an acceptable plan to conduct the operations of the Facility. The staff has determined that:

- The conduct of operations described for the Facility meets the requirements of 10 CFR 72.40(a)(4) in that PFS will be qualified by training and experience to conduct the operations included in the license.

- The conduct of operations described for the Facility meets the requirements of 10 CFR 72.40(a)(9), 72.190, 72.192, and 72.194 in that PFS has provided a description of the procedures and policies that assure that operation of equipment and controls that are important to safety is limited to trained and certified personnel; has provided an adequate operator training and certification program; and has operator qualifications that assure that the physical condition and general health of operators will not cause operational errors that could endanger other workers or the health and safety of the public.

License Condition

LC10-1 PFS must submit a startup plan to the NRC prior to receipt and storage of fuel at the Facility.

10.3 References

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