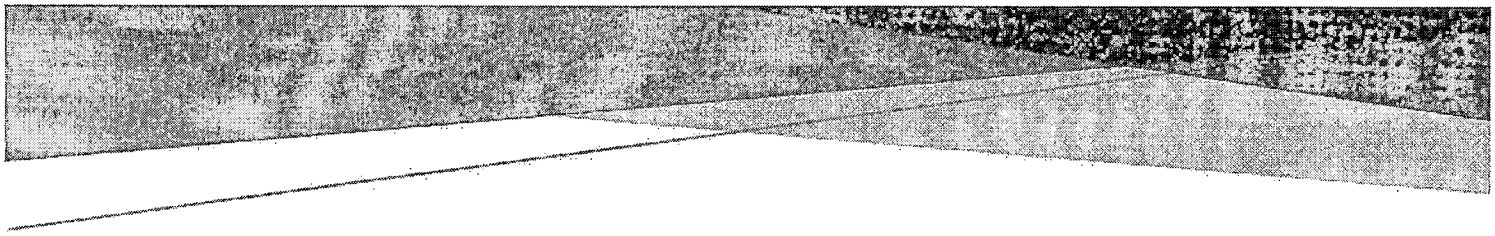

Biennial Update Report for the Three Mile Island, Unit 2 Independent Spent Fuel Storage Installation

STI-NLF-RPT-019

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US Department of Energy
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NRC Licensed Facilities

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1.0 Introduction

The Department of Energy's Idaho Operations Office (DOE-ID) was issued license SNM-2508 to operate the Three Mile Island Unit 2 (TMI-2) Independent Spent Fuel Storage Installation (ISFSI). The date of issuance was March 19, 1999. This update report provides the following reports, which were last updated in March 2015.

- The biennial SAR Update Report pursuant to 10 CFR 72.70 (b) and (c). The SAR Update Report is provided in the section titled "Description of Changes to the Safety Analysis Report."
- The biennial 72.48 Evaluations Report pursuant to 10 CFR 72.48(d)(2). This report, comprised of summaries of evaluations of changes made pursuant to 10 CFR 72.48, is provided in the section titled "Changes, Tests, and Experiments."
- The biennial Technical Specifications Bases Evaluations Report pursuant to TS 5.5.1.d. This report is provided in the section titled "Changes to the Technical Specification Bases."
- The biennial Essential Program Evaluations Report pursuant to TS 5.5.2.6. This report covers changes made during this reporting period to the DOE-ID essential programs as described in the sections titled "Radiological Environmental Monitoring Program Changes," "Training Program Changes" and "Quality Assurance Program Changes." (Note: The changes to the Physical Protection Program and the Emergency Response Program are provided separately because of the reporting time frames required by 10 CFR 72.44 (e) and (f), respectively.)

This report is provided in a combined format because many of the changes described in the SAR Update are also covered by evaluations of changes made without NRC approval pursuant to 10 CFR 72.48, TS 5.5.1, and TS 5.5.2. TS 5.5.1 requires 72.48 evaluations to be performed for any change to the Technical Specification Bases. TS 5.5.2 requires an evaluation of the change in program effectiveness (similar to the requirements of 10 CFR 72.44(e) and (f)) for changes to the ISFSI Radiological Environmental Monitoring Program, Training Program, and Quality Assurance Program. These three programs are contained in the ISFSI SAR.

2.0 Attachments

TMI-2 SAR-II-8.4 Chapter 9, Revision 8.

3.0 Section I - Description of Changes to the Safety Analysis Report

The previous update of the TMI-2 ISFSI SAR made pursuant to 10 CFR 72.70 was provided in March 2015.

In July of 2016, changes were made to the TMI-2 ISFSI SAR Chapter 9 as described below.

A. Revise Section 9.1.2.1 and Figure 9.1-1 to reflect organizational change within DOE-ID.

Attached to this report are the replacement pages for the SAR Chapter 9, as required by 10 CFR 72.70.

4.0 Section II - Changes, Tests, and Experiments

The previous report of changes made pursuant to 10 CFR 72.48 was provided in March 2015. There were no changes made pursuant to 10 CFR 72.48 during the subsequent 24-month period..

5.0 Section III - Changes to the Technical Specification Bases

The previous update of the Technical Specification Bases made pursuant to TS 5.5.1 was provided in March 2015. There were no changes made to the Technical Specification Bases during the subsequent 24-month period.

6.0 Section IV - Radiological Environmental Monitoring Program Changes

The previous update of the Radiological Environmental Monitoring Program made pursuant to TS 5.5.2 was provided in March 2015. There were no changes made to the Radiological Environmental Monitoring Program described in the SAR during the subsequent 24-month period.

7.0 Section V - Training Program Changes

The previous update of the Training Program made pursuant to TS 5.5.2 was provided in March 2015. There were no changes made to the Training Program described in the SAR during the subsequent 24-month period.

8.0 Section VI - Quality Assurance Program Changes

The previous update of the Quality Assurance Program made pursuant to TS 5.5.2 was provided in March 2015. There were no changes made to the Quality Assurance Program described in the SAR during the subsequent 24-month period.

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9. CONDUCT OF OPERATIONS

This chapter describes the organization and general plans for operating the TMI-2 ISFSI. The organization section includes a brief description of the responsibilities of key personnel. The preoperational testing program is described. The training program for the facility staff is described. Procedures that govern routine operations and maintenance and the records developed as a result of those operations are also discussed.

9.1 Organizational Structure

9.1.1 Corporate Organization

The Manager of DOE-ID is authorized to be the license holder for the TMI-2 ISFSI (license SNM-2508). This authority was delegated and responsibility was assigned to the DOE-ID Manager by the Secretary of Energy pursuant to 10 CFR 72.16(b) in Delegation Order No. 10CFR72.512.1. As the facility owner and licensee, DOE retains ultimate responsibility for the safe operation of the facility and for compliance with all license conditions.

9.1.2 Corporate Functions, Responsibilities, and Authorities

The Manager of DOE-ID is the authorized DOE representative having direct authority and responsibility for compliance with the TMI-2 ISFSI License. The Manager of DOE-ID is responsible for overall executive management of the Idaho Operations Office, has signature authority for the TMI-2 ISFSI license, and is the person ultimately responsible for compliance with the facility's license conditions and overall facility nuclear safety. The DOE-ID Manager shall take any measures needed to ensure acceptable performance of the staff in operating, maintaining, and providing technical support to the facility to ensure nuclear safety and compliant operations. The responsibilities of the personnel reporting directly to the DOE-ID Manager, as depicted in Figure 9.1-1, are described below.

The responsibility of the Deputy Manager for Idaho Cleanup Project (ICP) is the overall execution of EM-funded programs and operations at the INL, under which spent nuclear fuel storage (including NRC-licensed ISFSI operations) falls. The actual day-to-day execution of programs and operations associated with the NRC-licensed ISFSIs is performed by a contractor. The Deputy Manager for ICP and staff provide management direction and oversight of contractor performance in accordance with DOE-ID's Quality Assurance Program and commitments herein.

The Deputy Manager for Operations Support is independent of the facility line management and is responsible for environmental protection, safety, health, quality assurance, and security. This Office provides DOE-ID oversight of the contractor for licensed activities independent of the ICP organization.

The responsibility for developing the appropriate revisions to the contract is delegated to the Assistant Manager for Administration Support.

9.1.2.1 Applicant's In-House Organization

This section continues the description of DOE-ID's organization, as depicted in Figure 9.1-1. The responsibility for DOE-ID's role of providing direction to the contractor for spent fuel management lies with the Deputy Manager for Idaho Cleanup Project. Oversight of the EM owned spent fuel management facilities and activities, including the NRC-licensed ISFSIs, is delegated by the Deputy Manager for ICP to the Assistant Manager for Facility and Material Disposition. Oversight of the NRC- licensed ISFSIs is delegated by the Deputy Manager for ICP to a Principal Project Manager.

Reporting directly to the Principal Project Manager through the Facility Demo and Fuels Disposition Team Supervisor is the TMI-2 Facility Director, who is responsible for oversight of the contractor and to ensure that approved requirements and performance objectives are met for the TMI-2 ISFSI. The TMI-2 Facility Director has an alternate, designated in writing, who meets the training and qualification requirements specified below for the Facility Director. The TMI-2 Facility Director has direct access to the Manager of DOE-ID on issues related to the safety and surety of ISFSI operations.

Also reporting to the Principal Project Manager through the Facility Demo and Fuels Disposition Supervisor is the NRC Licensing Manager. The Licensing Manager is responsible for the preparation and submittal of license applications (including any necessary amendments thereto), timely response to NRC communications and inquiry, and other licensing and interface support to the TMI-2 Facility Director.

The responsibility for oversight of both the contractor's QA Program for the NRC-licensed ISFSIs as well as the DOE-ID oversight program of the ISFSI operations is delegated through the Deputy Manager for Operations Support and Assistant Manager for Operational Support to the Quality and Safety Director. The Quality and Safety Director delegated the responsibility for QA oversight of the ISFSIs to the ISFSI Quality Assurance (QA) Manager. The roles and responsibilities of the ISFSI QA Manager are further described in Chapter 11 of this SAR. As with the TMI-2 Facility Director, the ISFSI QA Manager has direct access to the Manager of DOE-ID on issues related to the safety and surety of ISFSI operations.

9.1.2.2 Interrelationships with Contractors and Suppliers.

The DOE utilizes a contractor for the TMI-2 ISFSI activities. The authority for the management and operation of the facility is contractually delegated and the responsibility for compliance with license requirements and applicable regulations is contractually assigned to the contractor. To exercise DOE's ultimate responsibility, DOE will: (1) retain responsibility for and perform independent audits of the contractor's TMI-2 ISFSI Quality Assurance program (both the achievement of quality by contractor management and the verification of quality by contractor QA personnel), (2) ensure the license requirements for the facility are included in the contract, (3) assess the performance of the contractor against the terms of the contract, (4) retain the responsibility to budget funds necessary and sufficient to safely operate the facility, and (5)

retain the authority to revise the contract in the event contract deficiencies are found relative to proper implementation of license requirements.

The key relationships between DOE-ID's TMI-2 Facility Director, Licensing Manager, and ISFSI QA Manager and its contractor are also depicted in Figure 9.1-1.

9.1.2.2.1 ISFSI Oversight Program

The Facility Director is the day-to-day management DOE-ID employee responsible for the compliance of TMI-2 ISFSI operations. The TMI-2 Facility Director shall verify or audit the TMI-2 ISFSI for compliance with regulatory requirements and license basis commitments and apprise DOE-ID management of TMI-2 ISFSI status based on observations.

The DOE-ID TMI-2 Facility Director or alternate shall perform surveillances of the contractor's ALARA Committee and the ISFSI Safety Review Committee and shall be an ex officio member (and is a quorum requirement) of these committees when they meet to review ISFSI matters to ensure these committees' functions are satisfactory and to report to DOE-ID management as needed. (See Section 9.1.3.1.1 for the duties of the ISFSI Safety Review Committee.)

The DOE-ID TMI-2 Facility Director or alternate shall review the results of management assessments performed for the following contractors' programs: training, security, emergency, quality assurance, and radiation protection.

The DOE-ID TMI-2 Facility Director or alternate shall review and concur with all of the following:

- All 72.48 evaluations and TS Basis evaluations (TS 5.5.1) for the TMI-2 ISFSI
- 10 CFR 72.44(e) – Physical Protection Plan evaluations, 10 CFR 72.44(f) – Emergency Plan evaluations, and evaluations of changes to DOE-ID's other essential programs (TS 5.5.2)
- Changes to TS Bases
- All changes to the SAR
- 10 CFR 72.70 SAR update
- Nuclear Material Status Reports (submitted electronically)
- Annual environmental report
- Other reports which may be submitted to NRC in response to conditions or events which are not submitted by the Manager of DOE-ID.

9.1.2.3 Applicant's Technical Staff.

The DOE Idaho Operations Office has a technical staff representing several areas of expertise with the wide variety of projects and activities at the INL. This staff is available to assist the management and oversight of the DOE activities at the TMI-2 ISFSI. Staff assigned to assist the management and oversight in the areas of security, radiation protection, emergency

preparedness, and quality assurance are trained and qualified in accordance with Licensing Management Procedures, or perform work directly under the supervision of the TMI-2 Facility Director.

9.1.3 Operating Organization, Management, and Administrative Control System

The operating organization, line management, and administrative control systems are provided by DOE's contractor personnel. The DOE and its contractor commit to provide the NRC with ready access to the TMI-2 ISFSI, personnel, and records that NRC considers necessary to carry out its responsibilities.

DOE-ID has assigned responsibility and delegated authority for the management and operation of the facility to the contractor. DOE-ID policy requirements for operating the TMI-2 ISFSI are assigned to the contractor through the contract. Specifically, the contract requires the contractor to manage and operate the TMI-2 ISFSI in compliance with all applicable:

- Human health and safety regulations,
- Environmental regulations,
- NRC regulations and license conditions, and
- Quality assurance requirements.

DOE-ID commits to providing a contractor with management and staff for routine operation and maintenance of the TMI-2 ISFSI and support organizations to implement DOE's program commitments in quality assurance, security, training, radiological protection, environmental monitoring, and spent fuel accountability.

9.1.3.1 Onsite Organization

The contractor corporate structure provides the necessary organizations for operating the TMI-2 ISFSI. The contractor organization supports the missions at the INL, not all of which are applicable to the management and operation of the ISFSI. The following organizational descriptions document the organizations necessary to manage the TMI-2 ISFSI.

The contractor's chief executive officer is responsible for overall management of contractor activities and is accountable for complying with the contract conditions. Authorities are delegated and resources are provided to manage the TMI-2 ISFSI in the areas of emergency preparedness, engineering, environmental management, operations, maintenance, quality assurance, radiological control, safety and health, security, training, and transportation. In addition to the interfaces shown on Figure 9.1-1 personnel assigned to the above functions maintain interfaces with their functional counterparts at DOE-ID.

Reporting to the Manager of ISFSI Management are the FSV ISFSI Manager, the TMI-2 ISFSI Manager, and the Compliance Engineering Lead. Support staff for essential positions within the

ISFSI Management department report to the TMI-2 ISFSI Manager for services provided for the TMI-2 ISFSI. The Manager of ISFSI Management also reports to the DOE-ID TMI-2 Facility Director. This interface is the primary operations interface between DOE-ID and its contractor for the TMI-2 ISFSI.

The Quality Assurance manager assigned to the TMI-2 ISFSI reports to a level equal to or above the reporting level of the Manager of ISFSI Management. The Quality Assurance manager assigned to the TMI-2 ISFSI also interfaces with the DOE-ID ISFSI QA Manager who is responsible for the TMI-2 ISFSI QA Program (see Chapter 11).

9.1.3.1.1 ISFSI Safety Review Committee

Reporting to and chartered by a senior executive for operations is the ISFSI Safety Review Committee. This committee is comprised of senior technical personnel and management personnel with extensive nuclear experience in various areas.

The purpose of this committee is to evaluate the performance of staff level safety review committees, to review performance indicators (such as audit findings, reportable events and conditions, Technical Specification violations); to review 10 CFR 72.48 evaluations (and associated procedure or design changes); to review changes to the Technical Specification Bases, SAR, Emergency Response Plan, and Physical Protection Plan; to approve license amendment requests; and to review preparations for major changes in operation (such as removing fuel from the ISFSI). The ISFSI Safety Review Committee shall also perform special reviews at the direction of the DOE-ID Facility Director.

Core members, appointed in writing by the chartering senior executive, provide the needed technical expertise in engineering, radiological control, criticality safety, nuclear facility operations, and nuclear quality assurance; their technical qualifications are described in section 9.1.4.1 below. Other members may be appointed as considered appropriate by the chartering senior executive.

A quorum shall include 3 core members, the technical disciplines appropriate for the matters under review, and the DOE-ID TMI-2 Facility Director. The DOE-ID TMI-2 Facility Director is informed of all appointments to the Safety Review Committee.

9.1.3.2 Personnel Functions, Responsibilities, and Authorities.

The daily management of the ISFSI operation is provided by the TMI-2 ISFSI Manager. The TMI-2 ISFSI Manager reports to the Manager of ISFSI Management. Assuring requirements are satisfied in the operation of the ISFSI is the responsibility of the ISFSI Manager.

Personnel assigned to TMI-2 ISFSI operations report to the TMI-2 ISFSI Manager. Other personnel from the INL that may be assigned to work at the ISFSI will report to the TMI-2 ISFSI Manager while at the ISFSI site. The TMI-2 ISFSI Manager is responsible for maintaining the Operations log; this log will be used to note the performance of all significant on site activities and conditions.

TMI-2 staff-level committees include an ALARA Committee and staff level safety review committee(s) or board(s) responsible to review changes to license basis documents and any associated evaluations.

9.1.4 Personnel Qualification Requirements

The following DOE-ID positions require minimum qualifications and training for the management and oversight of the TMI-2 ISFSI:

- ISFSI QA Manager
- TMI-2 Facility Director and designated alternate

The following contractor positions require minimum qualifications and training for the operation of the TMI-2 ISFSI:

- ISFSI Safety Review Committee members
- Manager of ISFSI Management
- TMI-2 ISFSI Manager and designated alternate
- TMI-2 Facility Safety Officer and designated alternate
- Certified ISFSI Operator
- Quality Assurance manager

9.1.4.1 Minimum Qualification Requirements.

In all of the positions below where an academic degree is required, the requirement for a degree may be replaced with an additional five years experience in the technical area (but not necessarily at supervisory level) specified for that position (for a total of ten years experience).

The DOE-ID ISFSI QA Manager shall have a minimum of a Baccalaureate degree in an engineering or physical science field and five years experience in nuclear quality assurance and certification as lead auditor. The minimum training for this position shall include 72.48 process, QA program indoctrination, NRC requirements, and the TMI-2 ISFSI License Basis (consisting of the identification of and orientation to the license and design basis documents).

The DOE-ID TMI-2 Facility Director shall have a minimum of a Baccalaureate degree in an engineering or physical science field and five years experience in nuclear facility operations. The minimum training for this position shall include 72.48 Process, QA program indoctrination, Technical Specifications, NRC requirements, and the TMI-2 ISFSI License Basis. The designated alternate for the TMI-2 Facility Director shall meet the same minimum qualifications and training requirements.

The Chair, Members, and Alternates of the ISFSI Safety Review Committee (SRC) shall have a minimum of a Baccalaureate degree in an engineering or physical science field and five years experience in one or more of the following technical areas at nuclear facilities:

- Radiological Safety
- Nuclear Safety (with at least two years experience in criticality safety analysis)
- Nuclear Facility Operations
- Nuclear Quality Assurance
- Engineering

The minimum training for the Chair, Members, and Alternates of the ISFSI SRC shall include the 72.48 process, QA program indoctrination, Technical Specifications, NRC requirements, and the TMI-2 ISFSI License Basis.

The Manager of ISFSI Management shall have a minimum of a Baccalaureate degree in an engineering or physical science field and five years supervisory experience in nuclear facility operations. No minimum training requirements are associated with this position.

The TMI-2 ISFSI Manager shall have a minimum of a Baccalaureate degree in an engineering or physical science field and five years supervisory experience in nuclear facility operations or equivalents for education and experience as approved by the Manager of ISFSI Management. The minimum training for this position shall include 72.48 Process, TMI-2 ISFSI License Basis, Radiation Worker, Emergency Response, and TMI-2 Facility Qualification training. The designated alternate for the TMI-2 ISFSI Manager shall meet the same minimum qualifications and training requirements.

The TMI-2 Facility Safety Officer shall have a minimum of a Baccalaureate degree in an engineering or physical science field and five year supervisory experience in radiation protection for nuclear facility operations. The minimum training for this position shall be the ISFSI Radiation Protection Program. The designated alternate for the TMI-2 Facility Safety Officer shall meet the same minimum qualifications and training requirements.

The minimum qualifications for the position of Certified ISFSI Operators are successful completion of the biennial medical examination and training and certification in accordance with the requirements in section 9.3.

The minimum qualifications for the QA manager assigned to the TMI-2 ISFSI are a Baccalaureate degree in an engineering or physical science field and five years experience in nuclear operations quality assurance. No minimum training requirements are associated with this position.

9.1.4.2 Qualifications of Personnel.

The resumes or other appropriate documentation of personnel occupying the positions listed in section 9.14.1 will be kept on file to demonstrate compliance with the minimum requirements described in section 9.1.4.1.

9.1.5 Liaison with Outside Organizations

Despite the fact that the TMI-2 ISFSI is a DOE owned facility located on the INL with several other DOE owned facilities and DOE managed programs, the external regulation of the TMI-2 ISFSI by the NRC sets this facility apart in some respects. The INL is a large, remotely located site and has its own large security police force, a fire department, medical staff, emergency response teams, and full-time INTEC shift plant supervision. Thus, the INL infrastructure will be considered to serve equivalent functions as independent local agencies (similar to local city or county) do for typical commercial licensed sites.

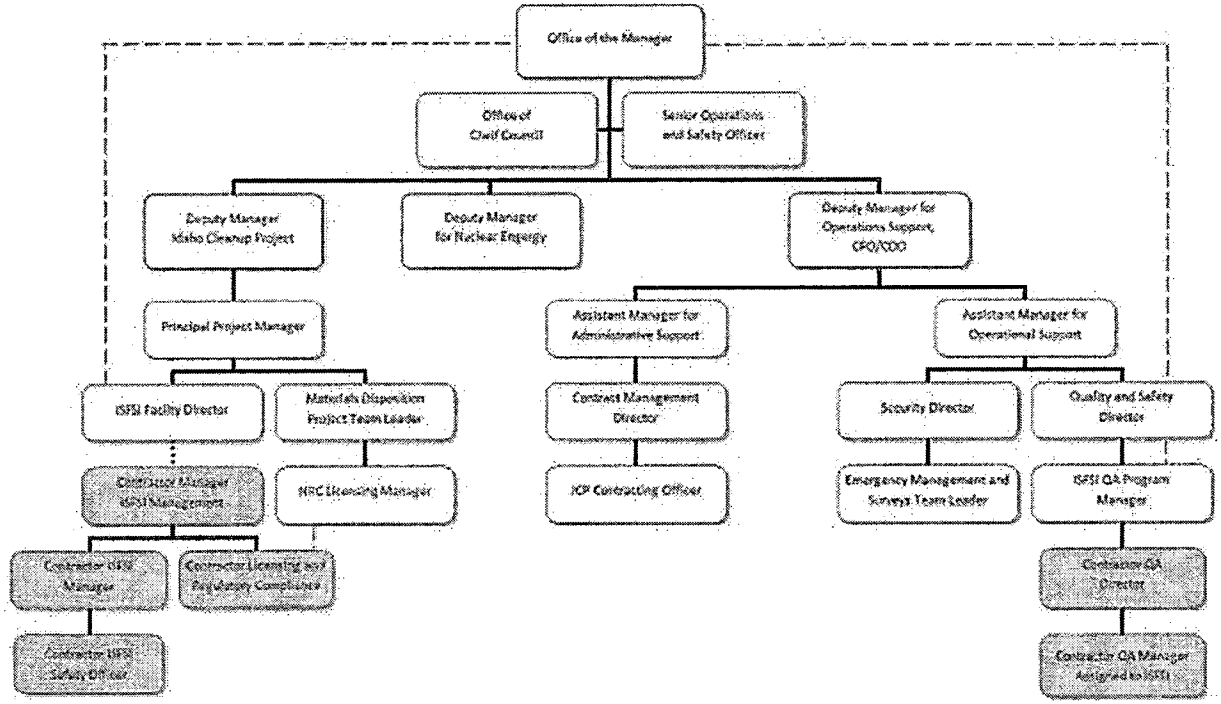

Figure 9.1-1 TMI-2 ISFSI Organization

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9.2 Preoperational Testing And Operation

Prior to loading the ISFSI with the TMI-2 canisters, a series of preoperational, startup and performance tests will be developed and implemented. The tests will include functional tests of the in-plant operations, the on-site transport operations, and DSC insertion and retrieval (operations at the ISFSI). These tests are intended to verify that the storage system components (e.g., DSC, HSM, transfer cask, transfer equipment, etc.) operate safely and effectively.

9.2.1 Administrative Procedures for Conducting Test Programs

Test procedures will be developed as part of the spent fuel storage system. Approval of procedures, performance of tests, evaluation of test results, and incorporation of any needed system modifications or procedure changes (based on the results of the tests) will be performed by the contractor using administrative controls existing at the INL.

9.2.2 Test Program Description

The testing program to be conducted utilizes a DSC loaded with mock-up fuel, the transfer cask and associated transfer equipment, and an HSM. The tests will simulate, as nearly as possible, the actual operations involved in preparing a DSC for storage and ensure that they can be performed safely during actual emplacement of TMI-2 core debris in the ISFSI. Verification of ALARA practices, which are not completely achievable during dry runs, will take place during the initial fuel loading. Guidelines for such tests are provided in the following paragraphs.

1. An actual DSC will be utilized for preoperational testing. The DSC will be loaded into the transfer cask to verify fit and adequacy of the cask/DSC annulus seal. Additionally, the DSC may be used in operational testing of the transfer equipment and HSM.

2. Functional testing is to be performed with the transfer cask and lifting devices. These tests are to ensure that the transfer cask can be safely lifted from the trailer, to the upending skid, to the cask work area.

3. The transfer cask will be placed on the transport trailer, which will then be transported to the ISFSI along a predetermined route and aligned with an HSM. Compatibility of the transport trailer with the transfer cask, verification of the transfer route to the ISFSI, and maneuverability within the confines of the ISFSI will be verified.

4. The transfer trailer will be aligned and docked with the HSM. The hydraulic ram will be functionally tested and then used to insert a DSC loaded with test weights into the HSM, and then retrieve it. A weighted DSC will also be loaded into and retrieved from the HSM with the DSC overpack. This testing will be completed after initiation of the loading operations, but prior to the shutdown of the TAN Hot Shop. Until such time, the TAN Hot Shop will be used for recovery of a challenged DSC. Transfer of the DSC to the HSM should verify that the support skid positioning system and the hydraulic ram system operate safely for both insertion and retrieval of a DSC.

In addition, since a vented system is proposed to address concerns over radiolysis in the TMI-2 canisters, monitoring will be performed at three phases of the loading and storage campaign. First, a representative sample of canisters will be monitored in their current storage location in the TAN pool for generation of off-gases. Second, a sample of actual TMI-2 core debris will be dried and tested for potential release of fissile material. This will aid in the design of the canister dewatering and drying system. Third, each individual DSC (containing up to 12 TMI-2 canisters) will be monitored during storage at the ISFSI for internal build-up of hydrogen and radiological releases in accordance with the corresponding Technical Specifications.

The HEPA filter design for the DSCs will also be tested prior to operation of the ISFSI. This testing will be done in accordance with typical industry testing and acceptance methods for HEPA filters.

9.2.3 Test Discussion

Implementation of the test program is discussed in the paragraphs which follow.

1. The purpose of the preoperational tests is to ensure that a DSC can be properly and safely placed in the TAN hot cell, loaded with TMI-2 fuel, transported to the ISFSI, inserted in the HSM, and retrieved from the HSM. Proper operation of the DSC, transfer cask, and transfer equipment, as well as the associated auxiliary equipment (e.g., automatic welding equipment and vacuum drying system), provides such assurance.

   The purpose of the TMI-2 canister demonstration test program is to ensure that the TMI-2 canisters can be properly and safely dried and stored in the ISFSI.

2. Detailed procedures will be developed and implemented by contractor personnel who are responsible for ensuring that the test requirements are satisfied.

3. The expected results of the preoperational tests are the successful completion of the following: placement of a DSC into the transfer cask, loading of the DSC with TMI-2 canisters, transporting the transfer cask loaded with a DSC and test weights to the ISFSI, and transfer of a DSC to/from the HSM. The tests are deemed successful if the expected results are achieved safely and without damage to any of the components or associated equipment. The expected results of the TMI-2 canister demonstration test program are the successful completion of canister drying and successful ongoing DSC vent performance.

4. Should any equipment or components require modification in order to achieve the expected results, it will be retested to confirm that the modification is adequate. Should any preoperational procedures change in order to achieve the expected results, the changes will be incorporated into the appropriate operating procedures.

5. INTEC operations are not affected by testing of the ISFSI. Testing operations can generally be conducted concurrently with plant operation. All normal prerequisites for safe handling of components will be satisfied, and normal safety and radiological practices will be employed.

9.3 Training Program

This section of the SAR comprises DOE's TMI-2 ISFSI Training Program and is submitted pursuant to Subpart I of 10 CFR Part 72. The requirements of this TMI-2 ISFSI Training Program are implemented by contractor procedures providing for the administration of training programs. A management assessment of the contractor's implementation of this training program shall be performed biennially. Changes which do not decrease the effectiveness of this program will be documented with annual SAR updates

The objective of this TMI-2 ISFSI Training Program is to use a systematic approach to training to provide competent contractor personnel to perform all functions related to the operation of the TMI-2 ISFSI. The application of the systematic approach to training will use a graded approach, with the training of Certified ISFSI Operators subject to the most rigorous application.

This training program ensures that qualified individuals will be available to perform planned and unplanned tasks while protecting the health and safety of plant personnel and the public. DOE, through its contractor, commits to maintain additional training to support the emergency plan, physical protection plan, quality assurance plan, and administrative and safety requirements, as required. Procedures and lesson plans used to implement this training program will be developed and maintained by the contractor.

9.3.1 Administration

The Training Supervisor is responsible for the administration of training programs and for maintaining up-to-date records on the status of contractor trained personnel, training of new employees, and refresher or upgrade training of present personnel.

The TMI-2 ISFSI Manager is responsible for ensuring that training requirements are specified for personnel assigned to support the TMI-2 ISFSI. In this role, the ISFSI Manager or designee will approve all TMI-2 specific lesson plans.

The TMI-2 ISFSI Manager is responsible for ensuring that training requirements have been satisfied for personnel assigned to the TMI-2 ISFSI.

9.3.2 Records

The following records on the status of trained personnel will be maintained for a minimum of five years in accordance with Section 9.4.2 below:

a. Results of each Certified ISFSI Operator's biennial medical examination.

b. The completed records of certification.

9.3.3 Instructor Qualifications and Development

The contractor shall provide for and document the qualification and training of Training Staff.

9.3.4 Development of Training Material

The contractor shall maintain procedures providing for the analysis of jobs, design of initial and continuing training, development of instructional material, implementation (conduct of training), and evaluation (examinations, boards, performance demonstration, etc.) The development of training material shall be performed by qualified and trained staff. The contractor shall maintain all training materials, both academic lesson plans and On-the-Job training (OJT) guides, developed in accordance with this training program.

9.3.5 Training Improvement

The contractor shall provide for and document the evaluation of training programs in order to ensure the continued improvement of training material and the conduct of training.

9.3.6 Waivers of Training Requirements

Applications for waivers of training requirements shall be approved by the TMI-2 ISFSI Manager. Successful completion of equivalent training programs may be used as a basis for waiver from academic training requirements. This training should be comparable in content, performance criteria, and duration. Any information used in the evaluation for a waiver should be verified. Previous work experience may be used as a basis for waiver from OJT requirements.

9.3.7 Frequency of Training

Training requirements must be completed within the period specified in the sections below for General Employee Training and Certified ISFSI Operator Training; however, a grace period of 25% is allowed. Not completing the retraining requirements within the specified frequency will require completion of the initial training course in order to have qualification reinstated.

9.3.8 General Employee Training

General employee training will be provided to all qualified or certified ISFSI operators and their direct supervision. Topics required for certified operators may be included in the generalized training.

The GET training program is composed of an initial training course and required annual retraining.

A score of <80% on the examination will require a retest. Individuals who write or review lesson plans or tests are excused from taking GET exams.

The GET course shall consist of material dealing with:

- Physical description of the TMI-2 ISFSI (Structural characteristics)
- Heat transfer design characteristics, including engineering principles of passive cooling
- Applicable regulations and standards
- Radiological shielding

— General ISFSI information on access control
— 10 CFR 19.12

The annual retraining for GET will be composed of the topics covered in the initial GET course. Additional topics may be added as needed.

9.3.9 Certified ISFSI Operator Training

Operations are performed in two locations: the TAN Hot Shop and the ISFSI. Handling equipment and activities inside the TAN Hot Shop such as DSC preparation and handling, fuel loading, transfer cask preparation and handling, and transfer trailer loading are performed under DOE authorization. Procedures and training for these operations are governed by DOE requirements.

The training for Certified ISFSI Operators and supervisor shall provide for initial training and testing of personnel who operate equipment identified as important to safety and will also provide for retraining, proficiency testing, and requalification as required. Certified ISFSI Operators will be actively maintained during transport and HSM loading and unloading operations. During the extended storage period, qualifications will be required for HSM and DSC monitoring activities. During periods when Certified ISFSI Operators are not required, the appropriate lesson plans will be retained as records.

TMI-2 ISFSI equipment and controls that have been identified as important to safety in this SAR and in the license shall be operated by either personnel who have been trained and certified in accordance with this section or who are under the direct visual supervision of a trained, certified individual. Only qualified individuals will operate equipment, machinery, and cranes.

Instructors designated to teach the Certified ISFSI Operator Program shall possess subject matter expertise for a particular subject or topic. Instructors initially qualified will maintain qualifications by instructing classes, and administering or grading examinations and OJT guides, and preparing, reviewing, or revising Certified ISFSI Operator instructional material.

Each individual will be given instructions regarding the hazards and safety precautions applicable to the type of work to be performed, general workplace hazards, and the procedures for protecting themselves from injury. These instructions are normally given during pre-job briefs prior to operations.

The Certified ISFSI Operator Training Program will consist of lesson plans and associated examinations in, but not limited to, the following topics, as applicable to personnel job functions:

A. Fuel Characteristics

- configuration of TMI-2 Canisters (3 types)
- contents of TMI-2 Canisters
- condition of TMI-2 core debris

B. Equipment, Component, and Design Description

- Dry Shielded Canister (DSC)
- Horizontal Storage Module (HSM)
- Transfer Cask (TC)
- alignment of the cask skid with the HSM
- assembly of the hydraulic ram system
- normal and off-normal operation of the hydraulic ram
- maintenance of the vent and purge system

C. Major Licensed Operations

D. Regulations, Procedures, and Limitations

- administrative control of Certified ISFSI Operator actions
- description of events and sequence of operations (ISFSI Overview)
- Technical Specifications

E. Safety Concepts

- accident analysis from the TMI-2 ISFSI SAR for off normal operations and accidents.
- confinement barriers/systems
- criticality prevention

The Certified ISFSI Operator Training Program will include operational training (OJT) involving actual and/or mock control manipulations of the following, as applicable. Manipulations will include Certified ISFSI Operator responses, instrumentation, indications, abnormal situations and corrective measures, prerequisites, and procedures. Actual manipulation and operations are preferred to mock manipulations to the extent practicable based upon equipment availability.

A. transfer trailer

B. hydraulic ram

C. vent and purge system.

Biennial retraining applicable to active and ongoing TMI-2 ISFSI operations will be conducted as necessary for ISFSI operators and supervisory personnel who operate equipment or controls that have been identified as important to safety in this SAR and in the license. Any OJT required for recertification will be repeated biennially. The classroom material and written examinations associated with the OJT will be presented and completed prior to the OJT. Additionally, classroom material will be presented as needed in order to convey pertinent modifications, procedure changes, regulatory changes, or other significant material in a timely manner.

Certification as a TMI-2 ISFSI Certified ISFSI Operator is contingent upon meeting the following criteria: obtaining a score of $\geq$80% on all Certified ISFSI Operator academic examinations; and satisfactory performance of all OJT practical evaluations. . A score of < 80% on any certification academic examination will require retesting. A score of < 80% on the retest will constitute cause for dismissal from the Certified ISFSI Operator or Supervisor Training Program. A score of < 80% on any three initial academic examinations will constitute cause for dismissal from the Certified ISFSI Operator or Supervisor Training Program. Failure to demonstrate satisfactory performance of the OJT practical examinations will require retesting. Failure to demonstrate satisfactory performance of a second OJT practical examination will constitute cause for dismissal from the Certified ISFSI Operator Training Program.

The evaluation criterion for initial certification of Certified ISFSI Operators shall not be waived; nor shall the evaluation criterion be waived for two or greater consecutive recertification cycles.

The physical condition and general health of certified personnel will be verified by physical examination before initial certification and biennially thereafter. These physical examinations consider conditions which might cause impaired judgement or motor coordination. In addition, if an employee's behavior or condition creates a hazard to health or safety, then stop work may be imposed.

9.3.10 Technical Support Positions

Training for the applicable support positions will include the administrative and management controls associated with ensuring compliance with the TMI-2 ISFSI license conditions.

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9.4 Normal Operations

The ISFSI provides for independent storage of TMI-2 core debris separate from the existing INL facilities. With the exception of some limited physical monitoring, maintenance of the DSC vent systems, and security systems, the ISFSI functions as a passive system once the TMI-2 core debris has been placed in dry storage. Placement of TMI-2 core debris in the ISFSI requires specific procedures that are separate from those of normal operations.

9.4.1 Procedures

Detailed written procedures will be developed and maintained for the applicable ISFSI operations, maintenance, surveillance, and testing and are described in Sections 5.1.1 and 5.1.2. Procedure changes in Section 5.1.1 are subject to DOE Unreviewed Safety Question analysis as they are conducted under the parameters and cognizance of the TAN SAR under DOE regulation. However, any procedure changes that could have an impact or bearing on the design basis or the safety basis of TMI ISFSI components, performance specifications, or requirements in the TMI SAR or Technical Specifications shall also be subject to 10 CFR 72.48. Such applicable activities will be clearly denoted in the Section 5.1.1 procedures. The procedures listed in Section 5.1.2 shall be subject to 10 CFR 72.48. All TMI ISFSI procedures will be developed, reviewed, revised, approved, and controlled by the contractor in accordance with approved administrative procedures.

The format and content of written procedures include

- Introduction (includes purpose and scope)
- precautions and limitations
- prerequisites
- instructions (sequence, forms to be completed, acceptable conditions, actions if conditions aren't acceptable, approvals)
- records

Maintenance of the written procedures shall be in accordance with Sections 11.5 and 11.6 as implemented by established INL management control procedures. The INL document control system provides written requirements for review, approval, revision, and controlled distribution of the written procedures.

9.4.2 Records

The following TMI-2 ISFSI records will be maintained:

- QA records relating to design, construction, testing, surveillance, operation, and maintenance of the ISFSI

- Decommissioning records

  (1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site.

  (2) As-built drawings and modifications of structures and equipment in restricted or inaccessible areas.

  (3) A list contained in a single document of all areas designated and formerly designated as restricted areas and all areas outside of restricted areas that require documentation due to spread of contamination.

  (4) Records of the cost estimate performed for decommissioning.

- Security records

  (1) Records of changes to the Physical Protection Plan made without prior NRC approval

  (2) The Physical Protection Plan and the Safeguards Contingency Matrix

  (3) Other security records as specified in the Physical Protection Plan

- Training records as specified in the TMI-2 ISFSI Training Plan (Section 9.3.2)

- Changes, Tests and Experiments made without prior NRC approval, including the safety evaluations

- Spent fuel material records, including current inventory and material control and accountability procedures

- Emergency preparedness records as specified in the TMI-2 ISFSI Emergency Response Plan

- ISFSI Safety Review Committee records

- Records required by the operating, maintenance, and testing procedures described in Section 9.4.1.

9.5 Emergency Planning

The TMI-2 ISFSI Emergency Planning requirements are maintained in the TMI-2 ISFSI Emergency Response Plan (ERP). The ERP does not cover detailed security related planning for the ISFSI. These events are accounted for in the TMI-2 ISFSI Physical Protection Plan.

The TMI-2 ISFSI ERP describes the overall process developed to respond to and mitigate any consequences of emergencies that might arise at the TMI-2 ISFSI. The plan incorporates a number of emergency elements, including: (a) demonstrating hazards and credible events that could result in emergency situations; (b) preparing for those situations with a trained emergency response organization; (c) maintaining emergency equipment and facilities; (d) determining protective actions; (e) maintaining standards and techniques for notifications. classification, consequence assessment, reentry, medical support, and program administration; (f) providing timely and accurate public information; and (g) identifying the diverse elements involved in recovery and reentry.

All emergency assistance off site with respect to the TMI-2 ISFSI is obtained from DOE-ID and contractor personnel at the INL. There are no credible accidents at the TMI-2 ISFSI which would require emergency assistance off site with respect to the INL site boundary.

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9.6 Decommissioning Plan

The Conceptual Plan for Decommissioning the TMI-2 ISFSI is included as an enclosure to the TMI-2 ISFSI License Application. This decommissioning plan describes the proposed program (approaches, elements, and cost estimates) for decommissioning the TMI-2 ISFSI.

9.6.1 Decommissioning Program

The tentative selection of decommissioning alternatives is based on providing decontamination and removal of radioactivity from the site and leaving the basemat intact for unlimited use. DECON is the preferred decommissioning alternative. The program includes preparation (engineering and planning, filing a decommissioning plan with the NRC, and site preparation), decommissioning operations and license termination, and site restoration. The program is described in more detail in the Conceptual Plan for Decommissioning the TMI-2 ISFSI.

Near the end of operations at the TMI-2 ISFSI, a decommissioning plan will be developed to provide specific details of decommissioning based on the technologies that exist at that time. The DOE expects to develop decommissioning and decontamination technologies during the ISFSI license period and will select and define the appropriate approaches at the time of decommissioning.

9.6.2 Cost of Decommissioning

The Conceptual Plan for Decommissioning the TMI-2 ISFSI contains cost estimates for decommissioning the TMI-2 ISFSI. The DOE Office of Environmental Management has included the TMI-2 ISFSI decommissioning program in its overall cost estimate for the Environmental Management Program at the INL. DOE will request appropriate funding from Congress at the time of decommissioning.

9.6.3 Decommissioning Facilitation

Decommissioning of a NUHOMS® ISFSI can be performed in a manner consistent with that for decommissioning other INL facilities. The NUHOMS®-12T DSCs can be retrieved from the HSMs and transferred to an on-site facility where the TMI-2 canisters will be unloaded and placed in a 10 CFR Part 71 licensed transportation cask for shipment off-site to a federal facility.

All components of the NUHOMS® system are manufactured of materials similar to those found at existing plants (e.g., reinforced concrete, carbon steel, and stainless steel). These components can, therefore, be decommissioned by the same methods in place to handle those materials at the INL. Any of the components that may be contaminated can be cleaned and/or disposed of using the decommissioning technologies available at the time of decommissioning.

The NUHOMS® system is a dry containment system that effectively confines all contamination within the DSC. When the DSC is removed from the HSM, the freestanding HSM can be manually decontaminated for any radioactive material, dismantled, and removed from the site. It is possible that a thin layer of material comprising the inner wall of the HSM could become activated by the neutron flux after an extended period of time. The specific activity of the HSM

inner wall surfaces may be measured at the time of decommissioning and compared with the existing guidelines to determine whether the values are below those acceptable for free release. Disposal procedures can be developed which comply with existing requirements at the time of decommissioning.

The NUHOMS® DSCs are manufactured from carbon and stainless steel material which can be decontaminated. If the activity levels are reduced below the level for free release of the material, the steel could be sold for scrap and shipped off-site. If the activity levels cannot be reduced, the steel material can be disposed of in accordance with requirements existing at the time of decommissioning. Other NUHOMS® components (transfer equipment, vacuum drying equipment, etc.) are expected to be decontaminated and made available for use at other NUHOMS® facilities.

Removal of the TMI-2 canisters from the DSC can be accomplished as described in Chapter 5. The transfer of the TMI-2 canisters from the DSC can be made by use of an existing fuel pool or dry cask transfer in a hot cell.

9.6.4 Recordkeeping for Decommissioning

Records that support decommissioning will be treated as quality assurance records. The Conceptual Plan for Decommissioning the INEL TMI-2 ISFSI identifies the types of records that will be maintained to facilitate the ISFSI decommissioning.

9.7 Physical Protection Program

The purpose of the TMI-2 ISFSI physical protection program is to establish and maintain a physical protection program that has the capabilities for the protection of spent fuel stored in the TMI-2 ISFSI, in accordance with Subpart H, "Physical Protection," of 10 CFR Part 72 and applicable portions of 10 CFR Part 73.

The TMI-2 ISFSI physical protection program is described in the Physical Protection Plan for the TMI-2 ISFSI. This plan includes, as appendices, the TMI-2 ISFSI Security Training and Qualification Plan and the TMI-2 ISFSI Safeguards Contingency Plan

This Physical Protection Plan for the TMI-2 ISFSI contains Safeguards Information, is controlled and protected in accordance with 10 CFR 73.21 and 10 CFR 2.790, and has been submitted for NRC review under separate cover.

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