11 RADIATION PROTECTION EVALUATION

11.1 Conduct of Review

The review of the health physics program of the proposed ISFSI included Chapter 7, Radiation Protection, of the SAR. Information included in the references cited in Section 11.4 was also considered in the review. Chapter 7 of the SAR, Radiation Protection, describes the radiation protection features of the proposed ISFSI that ensure that radiation exposures to workers and members of the public meet the regulatory requirements. The review of Chapter 7 considered how the information in the SAR addresses the following regulatory requirements:

- 10 CFR 20.1101(a) requires that a licensee develop, document, and implement a radiation protection program.

- 10 CFR 20.1101(b) requires that a licensee use sound radiation protection principles to achieve ALARA.

- 10 CFR 20.1101(c) requires that a licensee periodically (at least annually) review the radiation protection program.

- 10 CFR 20.1101(d) requires that a licensee, as part of the radiation protection program, establish a constraint for air emissions of radioactive materials to the environment such that a member of the public is not expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year.

- 10 CFR 20.1201(a) requires that a licensee control occupational dose to the following annual dose limits: A total effective dose equivalent of 5 rem (0.05 Sv) or the sum of the deep-dose equivalent and committed dose equivalent to any individual organ or tissue other than the lens of the eye of 50 rem (0.5 Sv), whichever is most limiting, a dose equivalent of 15 rem (0.15 Sv) to the lens of the eye, and a shallow-dose equivalent of 50 rem (0.50 Sv) to the skin or an extremity.

- 10 CFR 20.1301(a) establishes dose limits for a member of the public, including a total effective dose equivalent of 0.1 rem (1 mSv) in a year, and a maximum dose in any unrestricted areas of 0.002 rem (0.02 mSv) in an hour.

- 10 CFR 20.1301(b) requires that if a licensee permits members of the public to have access to controlled areas, the limits for members of the public continue to apply to those individuals.

- 10 CFR 20.1301(d) requires that the licensee comply with the environmental radiation standards in 40 CFR Part 190.

- 10 CFR 20.1302(a) requires a licensee to perform radiation surveys and monitor radioactive materials in effluents in unrestricted and controlled areas to demonstrate compliance with the dose limits for members of the public in 10 CFR 20.1301.

- 10 CFR 20.1302(b) requires that the licensee show compliance with the limits in 10 CFR 20.1301, by either demonstrating compliance with the dose limit to an individual by calculation or measurement, or by demonstrating that radioactivity in gaseous and liquid effluents to do not exceed the values in table 2 of Appendix B to Part 20, and the dose from external sources would not exceed 0.002 rem (0.02 mSv) in an hour and 0.05 rem (0.5 mSv) in a year.

- 10 CFR 20.1406 requires that an applicant describe how facility design and procedures for operation will minimize contamination and generation of radioactive waste, and facilitate decommissioning.

- 10 CFR 20.1501(a)(1) requires that a licensee make surveys necessary to comply with 10 CFR Part 20.

- 10 CFR 20.1501(c) requires that dosimeters that are used by licensee are processed and evaluated by a processor holding accreditation from the National Voluntary Laboratory Accreditation Program.

- 10 CFR 20.1701 requires that a licensee use process or other engineering controls to control the concentrations of radioactive material in the air.

- 10 CFR 20.1702 requires that when it is not practicable to apply process or other engineering controls, that the licensee shall increase monitoring and limit intakes by use of other controls, including access control, limitation of exposure times, use of respiratory protection, etc.

- 10 CFR 72.104(a) requires that, during normal operations and anticipated occurrences, the annual dose equivalent to any real individual beyond the controlled area must not exceed 25 mrem to the whole body, 75 mrem to the thyroid and 25 mrem to any other organ, from various sources, including planned discharges of radioactive materials to the environment.

- 10 CFR 72.104(b) requires that operational restrictions are established to meet ALARA objectives for radioactive materials in effluents.

- 10 CFR 72.104(c) requires that operational limits for radioactive materials in effluents are established to ensure that the dose limits in 72.104(a) are met.

- 10 CFR 72.106(b) requires that any individual located on or beyond the nearest controlled area boundary shall not receive a dose greater than 5 rem to the whole body or any organ from any design basis accident, and that the minimum distance from the spent fuel waste handling and storage facilities to the nearest boundary shall be at least 100 meters.

- 10 CFR 72.126(a) requires that radiation protection systems must be provided for areas and operations where onsite personnel may be exposed to radiation or airborne radioactive materials. Structures, systems, and components for which operation, maintenance, and inspections may involve occupational exposure, must be designed, fabricated, located, shielded, controlled and tested to control

external and internal radiation exposures. The design must include means to, among other things, control access to areas of potential contamination or high radiation, measure and control contamination, minimize worker time, shield personnel.

- 10 CFR 72.126(c)(1) requires that, as appropriate for the handling and storage system, effluent systems must be provided, as well as methods for measuring the amount of radionuclides in the effluents.

- 10 CFR 72.126(c)(2) requires that areas containing radioactive materials must be provided with systems for measuring the direct radiation levels in and around these areas.

- 10 CFR 72.126(d) requires that the ISFSI be designed to limit effluents to ALARA levels, and analyses must show that releases to the environment during normal operations and anticipated occurrences will be within the exposure limit given in 10 CFR 72.104.

11.1.1 As Low As Is Reasonably Achievable Considerations

This section evaluates whether the applicant has appropriately considered the goal of maintaining doses ALARA during the operation of the Facility. Section 7.1 of the SAR addressed ALARA considerations.

11.1.1.1 As Low As Is Reasonably Achievable Policy and Program

The ALARA policy and program for the proposed ISFSI are described in Section 7.1.1 of the SAR, Policy Considerations. The primary goal of the Radiation Protection Program is to minimize exposure to radiation such that the individual and collective exposure to personnel in all phases of operation and maintenance are kept ALARA. The ALARA program will maintain radiation exposures ALARA through the following methods:

- controlling and surveillance over internal and external radiation exposures to maintain worker and public exposures within permissible limits;

- ongoing reviews to determine how exposures may be reduced;

- sufficient training for personnel in radiation protection principles and procedures, protective measures, and emergency responses;

- giving radiation protection personnel sufficient authority to enforce safe Facility operation;

- making revisions to operating and maintenance procedures and modifications to Facility equipment and facilities when the proposed revisions will substantially reduce exposures at a reasonable cost; and

- ensuring that adequate equipment and supplies are provided for radiation protection work.

The ALARA program will follow the guidance of Regulatory Guides 8.10 and 8.8 (Nuclear Regulatory Commission, 1977, 1978) to ensure compliance with the requirements of 10 CFR 72.126 and 20.1101, which require radiation protection programs and systems.

The SAR states that the Facility management is committed to compliance with regulatory requirements regarding control of personnel exposures and will establish and maintain a comprehensive program at the Facility to keep individual and collective doses ALARA. The management will ensure that each staff member integrates appropriate radiation protection controls into work activities and each individual understands and follows procedures to maintain their radiation dose ALARA.

The ALARA program, as described in the SAR, includes using pertinent information concerning radiation exposure of personnel in design and operation activities. Applicable experience gained during the operation of nuclear power stations relative to radiation control is factored into procedures to ensure that the procedures continually meet the objectives of the ALARA program. Trends in the Facility personnel and job exposures will be reviewed to permit corrective actions to be taken with respect to adverse trends.

The staff considers that the implementation of the proposed ALARA program will provide reasonable assurance that doses to workers and members of the public will be maintained ALARA in accordance with the requirements of 10 CFR 20.1101(a–c) and 72.104(b) and (c). The proposed program contains the applicable elements in Regulatory Guides 8.8 and 8.10, such as management commitment to the ALARA program and principles, written administrative procedures and instructions for operations involving potential radiation exposures, defining responsibility and authority for implementing the program, and using an effective measurement system to determine the success of the program and any trends in exposures.

11.1.1.2 Design Considerations

The description of the ALARA design considerations at the proposed ISFSI is provided in Section 7.1.2 of the SAR, Design Considerations. Specific features of the Facility that consider ALARA include:

- use of thick shielding during all canister handling, transfer, and storage operations to minimize direct radiation levels;

- placement of the storage pads at a sufficient distance from the restricted area fence and controlled area boundary to assure doses are ALARA;

- adequate spacing between storage casks to permit workers to function efficiently during placement and removal of storage casks at the pads and during performance of maintenance and surveillance;

- use of metal canisters that are welded shut to confine radionuclides and prevent release of radioactive effluents from inside the canister;

- use of a passive system to require minimum maintenance and surveillance requirements by personnel;

- use of a temperature monitoring system that allows for remote readout of cask temperatures;

- use of power operated wrenches, where practical, to reduce the time associated with tasks involving bolt insertion and removal; and

- use of temporary shielding where it is determined to be effective in reducing total dose for a task.

The staff finds that the design of the proposed ISFSI will provide reasonable assurance that the doses to workers and members of the public will be maintained ALARA and meet the requirements of 10 CFR 72.126(a) because of the design and operating features listed above, including adequate shielding and features that minimize exposure of operating staff. The staff also finds that the design of the Facility adequately considers the minimization of contamination and generation of radioactive waste as required by 10 CFR 20.1406. The staff also finds that 10 CFR 72.126(d) is satisfied because the Facility uses welded canisters that are not opened at the Facility and, therefore, no effluents are expected.

11.1.1.3 Operational Considerations

The description of the ALARA operational considerations at the proposed ISFSI is located in Section 7.1.3 of the SAR, Operation Considerations. Plans and procedures at the ISFSI will be developed in accordance with Regulatory Guides 8.8 and 8.10 (Nuclear Regulatory Commission, 1978, 1977). Specific Facility operational considerations to achieve ALARA conditions include:

- Canister transfer between the shipping cask and the storage cask will take place within a shielded transfer cask.

- Dry runs will be performed prior to canister transfer operations to train personnel on canister transfer procedures, and to refine procedures to achieve minimum probable exposures.

- Procedures and work practices will be used that reflect ALARA lessons learned from other ISFSIs that use dry cask storage.

- Operations research will be performed to determine types of tools, portable shielding, and equipment to help minimize exposures to workers involved in canister transfer operations.

- Surveys will be conducted as necessary to ensure that doses are maintained ALARA.

The NRC staff finds that the use of Regulatory Guides 8.8 and 8.10 (Nuclear Regulatory Commission, 1978, 1977) to plan operations to maintain doses ALARA is appropriate and will

provide reasonable assurance that doses to workers and members of the public will be maintained ALARA. The use of casks that are welded closed and are surveyed for surface contamination prior to transport to the Facility meets the requirements of 10 CFR 20.1701 in that engineering and process controls are used to prevent airborne radioactivity. Surveys as required by 20.1501(a)(1) will be used to assure that personnel exposures are within 10 CFR Part 20 limits and maintained ALARA, and the surveys are identified as an element of the ALARA program. The operational elements listed above, including dry runs, and using lessons learned from similar operations, are accepted tools in implementing an effective ALARA program.

11.1.2 Radiation Protection Design Features

This section evaluates the radiation protection design features at the proposed ISFSI. Relevant information is contained in the SAR in Section 7.3, Radiation Protection Design Features.

11.1.2.1 Installation Design Features

The description of the installation radiation protection design features is provided in Section 7.3.1 of the SAR, Installation Design Features. Applicable portions of Regulatory Position 2 of Regulatory Guide 8.8 were followed in the design of the Facility, and are addressed in the following sections (e.g., access control, radiation shielding, etc.). The installation will be located far from populated areas, with the nearest town from the proposed ISFSI located over 10 miles away. The storage area will be located far from the controlled area boundary. The closest distance from a storage pad to the controlled area boundary will be 646 meters. The storage area will be located within a radiation area. The Canister Transfer Building is located within the same radiation area to minimize the route between the handling facility and storage pads, minimize additional traffic on the route, and maintain substantial distance from the controlled area boundary. Airborne radioactive material will be prevented by the use of the high-integrity welded canisters. The spent fuel will be maintained dry so no radioactive liquid will be available for release. All sources of radiation located on the site will be contained in heavily shielded shipping, storage, or transfer casks, except for low-level waste. The low-level waste consists of low-activity material and the dose rates on the outer surface of the low-level waste containers are expected to be negligible. Onsite work stations are located at large distances from the storage pads or are located in buildings with radiation shielding.

The staff finds that the use of Regulatory Position 2 of Regulatory Guide 8.8 (Nuclear Regulatory Commission, 1978) in designing the radiation protection features of the proposed ISFSI is appropriate. The installation design features include controls to provide reasonable assurance that occupational and public exposures will be limited to levels that are within the limits of 10 CFR 72.104(a) and meet the ALARA requirements of 20.1101(b), and satisfy 10 CFR 72.1701. For example, the use of sealed canisters at the site provides reasonable assurance that contamination of the Facility and the generation of radioactive waste will be minimized in accordance with 10 CFR 20.1406, and will meet the allowable dose for members of the public and the ALARA requirements for effluents in 10 CFR 72.104(a), (b) and (c), and 72.126(d). The staff finds that the distance between the spent fuel handling and storage areas and the nearest boundary of the controlled area of the proposed ISFSI (646 meters) meets the minimum distance specified in 10 CFR 72.106(b), which is 100 meters. The radiation protection design requirements proposed by the applicant are, therefore, acceptable.

11.1.2.2 Access Control

The description of the access control to the proposed ISFSI is contained in Section 7.3.1 of the SAR, Installation Design Features. Access control to the restricted area is provided for both personnel radiological protection and Facility physical protection. The access control boundaries for the controlled areas and restricted areas are established along the site fence lines. The restricted area is the space that is controlled for purposes of protecting workers from exposure to radiation and for providing Facility physical security. The restricted area will contain all areas at the Facility at which the dose rate may exceed 2 mrem/hr. The controlled area is the area inside the site boundary surrounded by the controlled area fence. Dose rates outside the controlled area will not exceed 25 mrem/yr.

Access to the restricted area is controlled through a single access point in the Security and Health Physics Building. Provisions will be located in this building for donning and removing personal protective equipment, such as anti-contamination clothing or respirators, in the event of an accident or off-normal event leading to an area of the site becoming contaminated. This building will also contain provisions for personnel decontamination.

Under normal operations, no high radiation, very high radiation, contamination, or airborne radioactivity areas are expected to exist at the proposed ISFSI. However, radiation protection personnel will monitor radiation levels within the restricted area and may establish additional access requirements and area designations as needed.

The staff finds that the access control at the proposed ISFSI is acceptable, since it provides for security fencing, and limits access to a single point. The access point is controlled within the Security and Health Physics Building. This prevents the entry into radiologically controlled areas of unauthorized personnel. The description of the access control at the proposed ISFSI is acceptable and meets the requirements of 72.126(a)(3), by limiting access to radiologically controlled areas.

11.1.2.3 Radiation Shielding

The evaluation of the radiation shielding is provided in Section 7 of this SER.

11.1.2.4 Confinement and Ventilation

The evaluation of the confinement system (the MPC) is provided in Section 9 of this SER. The confinement system is not vented.

11.1.2.5 Area Radiation and Airborne Radioactivity Monitoring Instrumentation

The description of the area radiation and airborne radioactivity monitoring instrumentation at the proposed ISFSI is provided in Sections 7.3.5, Area Radiation and Airborne Radioactivity Monitoring Instrumentation, and 7.6.1, Effluent and Environmental Monitoring Program, of the SAR. All spent fuel that will be stored on the site will be contained within canisters that are welded shut and there are no credible events that could result in the release of radioactive material from within the canisters or unacceptable increases in direct radiation levels.

Therefore, area radiation and airborne radioactivity monitors are not needed at the storage pads.

External direct radiation dose rates will be monitored along the restricted area and owner controlled area fences with thermoluminescent dosimeters (TLDs). Sixteen TLDs will be located along the perimeter of each fence. The TLDs will be used to record dose rates at these locations and provide documentation that radiation levels at these boundaries are within regulatory limits. TLDs will also be placed on the outside of several facility buildings and other strategic locations inside the Canister Transfer Building and the Security and Health Physics Building to monitor dose rates. The TLDs will be retrieved and processed quarterly.

The Canister Transfer Building will be equipped with local radiation monitors with audible alarms to provide personnel with warning of abnormal radiation levels. Portable monitors will be used to perform airborne monitoring during canister handling operations to detect minor releases of loose contamination on the exterior of the canisters. Continuous air monitors will be located in the exhaust of each canister transfer cell. There are no anticipated liquid or gaseous effluent releases from the proposed ISFSI during storage.

The staff finds that the radiation monitoring instrumentation described in the SAR meets the requirements of 72.126(c)(2), which requires that areas containing radioactive materials must be provided with systems for measuring the direct radiation levels in these areas. The local area monitors include alarm systems to warn workers of unusual levels of radiation in the area. Continuous air monitoring will be performed during canister handling activities to assure that airborne radioactivity is within allowable levels as required by 10 CFR 20.1501(a)(1). The use of TLD monitoring as described in Section 7.3.5 of the SAR provides reasonable assurance that the licensee will (1) adequately monitor actual dose rates surrounding the Facility during its operation, (2) detect unexpected increases in direct radiation dose rates, and (3) verify compliance with the radiological limits in 10 CFR Parts 20 and 72 for members of the public.

11.1.3 Dose Assessment

Design basis dose rates for a single storage cask and a transfer cask were determined by Holtec for the HI-STORM storage cask and the HI-TRAC transfer cask. As part of the approval process for the Holtec HI-STORM 100 cask system, staff evaluated the shielding evaluation and dose assessment for the cask system. The staff concluded that the design of the radiation shielding features in the HI-STORM 100 Cask System are sufficient to meet the radiation protection requirements of 10 CFR Part 20, 10 CFR 72.104 and 10 CFR 72.106. The staff's shielding evaluation of the HI-STORM 100 Cask System is documented in the HI-STORM 100 SER (NRC, 2000b).

The applicant calculated off-site dose rates for the HI-STORM 100 storage cask based on PWR design basis fuel source terms with a burnup and cooling time of 40,000 MWD/MTU for 10 years as discussed in Section 7.1.1 of this SER. The applicant calculated average contact surface dose rates for the HI-STORM 100 storage cask to be approximately 10 mrem/hr at the sides, 3 mrem/hr on top, and 6 mrem/hour at the vents. Based on these values, the applicant calculated a site boundary dose rate of 0.0029 mrem/hr for 4,000 casks from direct and scattered radiation exposure. As discussed in Chapter 9 of this SER, no release of radioactive material in effluent is expected during normal operations; therefore, the dose due to effluents is

not considered. The applicant extrapolated the site boundary dose rate out to a distance of two miles and calculated an annual dose of 0.0356 mrem to the nearest resident, assuming the resident is continually present for 8,760 hr/yr. The applicant also calculated an annual dose of 5.85 mrem for a hypothetical person at the site boundary (e.g., non-Facility worker), assuming the person is at the site boundary for 2,000 hr/yr which is approximately equal to 40 hr/week. These dose rates are less than the 10 CFR 72.104(a) dose limit of 25 mrem/yr to the whole body to a member of the public.

The applicant calculated occupational exposures for site personnel at the Facility based on PWR design basis fuel source terms with a burnup and cooling time of 35,000 MWD/MTU for 20 years, as discussed in Section 7.1.1 of this SER. The occupational exposures were calculated for shipping, transfer and storage activities of the spent fuel casks as discussed in Section 7.4 of the SAR. Table 7.4-1 of SAR lists the cask operations, the estimated number of personnel to complete each task, task duration, the cask dose rate in the area of the performed task, and the accumulated dose from each task. Based on Table 7.4-1, the total dose from receipt of a loaded shipping cask, transfer of the canister into a storage cask, movement of the storage cask to the pad, and initial surveillance is approximately 250 person-mrem per cask for the average fuel loaded in the HI-STORM 100 Cask System.

The staff's evaluation of site boundary and nearest residence dose assessments is based on information contained in PFS application and Chapters 5 and 10 of the HI-STORM 100 FSAR (Holtec International, 2000). As discussed in Chapter 9 of this SER, no release of radioactive material in effluents is expected. Therefore, the dose assessment considers only direct and scattered radiation. The shielding evaluation of direct and scattered radiation dose assessments is evaluated in Chapter 7 of this SER.

The staff finds the offsite and occupational dose assessments for the Facility to be acceptable. Results of these assessments and previous evaluations in the HI-STORM SER provide reasonable assurance that the doses to workers and to members of the public will be maintained ALARA and will meet the requirements of 10 CFR 72.104 and 10 CFR Part 20. Actual dose rates during operation of the Facility will be measured by active and passive radiation monitoring in order to verify compliance with the radiological limits in 10 CFR Parts 20 and 72. The applicant will also operate the Facility under a Radiation Protection Program as required in Technical Specification 5.5.3 to assure that radiation fields are continually monitored and radiation doses to workers and members of the public are maintained ALARA as actual dose information is gathered during operations. Radiation monitoring at the Facility and the Radiation Protection Program are evaluated in Sections 11.1.2 and 11.1.4 of this SER.

11.1.4 Health Physics Program

Information about the health physics program is contained in Section 7.5 of the SAR, Radiation Protection Program.

11.1.4.1 Organization

The health physics program organization is described in Section 7.5.1 of the SAR, Organization. The Radiation Protection Manager, who reports to the General Manager, is responsible for administering the radiation protection program and for the radiation safety of the Facility. The responsibilities of the Radiation Protection Manager and the radiation protection technicians are consistent with the guidance contained in Regulatory Guides 8.10 and 8.8 (Nuclear Regulatory Commission, 1977, 1978).

The staff finds that the proposed radiation protection program satisfies 10 CFR 20.1101(a) with regard to the program organization described above, since it provides for a Radiation Protection Manager, who reports directly to the General Manager, and radiation protection technicians.

11.1.4.2 Equipment, Instrumentation, and Facilities

The equipment, instrumentation, and facilities that will be utilized in the health physics program at the proposed ISFSI are described in the SAR in Section 7.5.2, Equipment, Instrumentation, and Facilities. A sufficient inventory and variety of operable and calibrated portable and fixed radiological instrumentation will be maintained to allow for effective measurement and control of radiation exposure and radioactive material and to provide backup capability for inoperable equipment. Equipment will be appropriate to enable the assessment of sources of gamma, neutron, beta, and alpha radiation, including the capability to measure the range of dose rates and radioactivity concentrations expected. The radiological instrumentation proposed at the Facility in the radiological control program is properly selected, operated, maintained, and calibrated and includes the following:

- low-level waste contamination meters,
- beta/gamma portable survey meters,
- alarming beta/gamma personnel friskers,
- portable air samplers,
- external dosimetry devices used for monitoring whole body exposure, including TLDs and self-reading dosimeters or digital alarming dosimeters,
- respiratory protection equipment used to protect against airborne radioactivity,
- anti-contamination clothing to protect against removable contamination, and
- equipment necessary to conduct a bioassay program in accordance with Regulatory Guide 8.26, Application of Bioassay for Fission and Activation Products (Nuclear Regulatory Commission, 1980).

The staff finds that the requirements of 10 CFR 20.1101(a) are met in that the health physics equipment, instrumentation, and facilities described in the SAR are adequate to perform

surveys of direct radiation and airborne radioactivity, as one element of a health physics program.

11.1.4.3 Policies and Procedures

The health physics program policies and procedures at the proposed ISFSI are described in Section 7.5.3 of the SAR, Procedures. Radiological practices used to control exposure include the following procedures:

- performing badging functions for access authorization to the restricted area;
- issuing personnel dosimetry and monitoring, recording, and tracking individual exposures;
- performing radiological safety training and refresher training;
- performing ALARA reviews of plant procedures and monitoring of operations;
- determining radiation doses on a periodic basis at restricted area and controlled area boundaries using TLDs;
- issuing, revising, and terminating radiation work permits and standing radiation work permits;
- roping off, barricading, and posting radiation control zones;
- decontaminating personnel, equipment, and areas;
- performing radiation surveys and smear swab sampling, counting, and calculation;
- calibrating detection, monitoring, and dosimetry instruments;
- quantifying airborne radioactivity; and
- maintaining records of the radiation protection program, including audits and other reviews of program content and implementation; radiation surveys; instrument calibrations; individual monitoring results; and records required for decommissioning.

The staff finds that the description of the health physics program policies and procedures, including the elements listed above, is sufficient to provide reasonable assurance that the health physics program will be implemented in accordance with 10 CFR 20.1101(a) and (b). The use of TLDs to determine dose rates at the edge of the controlled area satisfies 10 CFR 20.1302(a), which requires that surveys of radiation levels are made to assure compliance with the dose limits for individual members of the public. The radiation protection program procedures provide reasonable assurance that the Facility will minimize contamination of the Facility and the environment in accordance with 10 CFR 20.1406 by the use of smear surveys

to identify areas of contamination and limiting access to contamination areas. Performing radiation surveys and smear swab sampling, counting, and calculation are used as required by 10 CFR 20.1501(a)(1). Procedural controls to limit intakes of radioactive materials are in accordance with 10 CFR 20.1702, in that access may be limited, and respiratory protection may be used if engineering controls are not effective in limiting airborne radioactivity. The staff notes that the SAR does not indicate the frequency of review of the health physics program. The provisions of 10 CFR 20.1101(c) require that the health physics program be reviewed at least annually.

11.2 Evaluation Findings

Based on a review of the information in the SAR, the following evaluation findings can be made regarding the proposed ISFSI:

- The staff has reviewed the description of the ALARA program of the ISFSI and found reasonable assurance that occupational radiation exposures will be limited to levels that are ALARA, in compliance with 10 CFR 20.1101(b) and 72.104(b). The staff found that this will be achieved by acceptable means including minimizing contamination in accordance with 10 CFR 20.1406, using proper surveys in accordance with 10 CFR 20.1501, and using controls in compliance with 10 CFR 20.1701, 20.1702 and 72.126(a).

- The staff has reviewed the Health Physics program at the ISFSI and found that it has been adequately described. The staff found that the Health Physics program provides reasonable assurance that radiation exposures will be ALARA in accordance with 10 CFR 20.1101(b). The staff found that contamination will be minimized in accordance with 10 CFR 20.1406. The staff found that the description of the Health Physics program provides reasonable assurance that controls will be used as necessary to limit intakes of radionuclides in compliance with 10 CFR 20.1702. The staff found that the description of the Health Physics program provides reasonable assurance that compliance with dose limits will be demonstrated through surveys of radiation levels for workers and members of the public in accordance with 10 CFR 20.1302(a), 20.1501(a), and 72.126(c).

11.3 References

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