N.S. SAVANNAH

Technical Specifications

Docket No. 50-238

Appendix A to

Facility License No. NS-1

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U.S. Department of Transportation

Maritime Administration

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1.0 General

The nuclear ship N.S. SAVANNAH is in a state of protective storage. All fuel assemblies, radioactive fluids, demineralizer resins and contaminated trash have been removed from the ship. Adequate radiation monitoring, environmental surveillance, access control and security procedures will be established under the possession-only license to ensure that the health and safety of the employees, visitors and the public are not endangered.

2.0 Radioactive Releases

2.1 Radioactive Liquid Waste Release

Applicability

Applies only to radioactive liquid waste disposal. No radioactive liquids will be produced as a result of any foreseen operations aboard the ship or from the ship's operation. Incidental amounts of liquid may be generated in the unlikely event decontamination is found necessary in controlled areas. All radioactive liquids have been removed from the primary and auxiliary systems.

Objective

To assure that liquid radioactive waste releases do not present an undue hazard to the general public or the environment.

Specification

Radioactive liquid waste releases shall be as low as reasonably achievable and shall not exceed ten-percent (10%) of limits specified in NRC (10 CFR 20) or other applicable Federal regulations. Radioactive liquid waste shall be solidified in approved media and may be transferred to a properly licensed burial facility. All solidified liquid waste shall be transferred in accordance with applicable NRC (10 CFR 71) and U.S. Department of Transportation, Hazardous Materials Branch regulations and the burial facility's license and acceptance criteria.

2.2 Radioactive Airborne Particulate Releases

Applicability

Applies only to radioactive airborne particulate releases that may occur due to maintenance requirements such as cutting and welding of contaminated components.

Objective

To assure that radioactive airborne particulate releases do not present an undue hazard to the general public or the environment.

Specification

No activities shall be conducted that would result in a release of radioactive airborne particulates in excess of 10% of limits specified in 10 CFR 20, Appendix B, or other applicable Federal regulations.

2.3 Radioactive Liquid Waste Release Surveillance

Applicability

Applies to the surveillance requirements for controlling radioactive liquid waste released to the hydrosphere.

Objective

To verify that liquid radioactive waste discharged to the hydrosphere will not exceed 10% of limits specified in 10 CFR 20 or other applicable Federal regulations.

Specification

Liquid wastes resulting from radiological decontamination shall be analyzed prior to discharge. Concentrations of radioactive liquid waste shall not exceed 10% of the applicable limits of 10 CFR 20 or prescribed by other applicable Federal regulations. Records of analyses and amounts of wastes discharged shall be maintained.

2.4 Solid Radioactive Waste Release

Applicability

Applies only to those solid radioactive wastes generated as the result of general decontamination of controlled areas, ship surveillance, and entry into controlled areas.

Objective

To assure that solid radioactive waste presents no undue hazard to the general public or environment.

Specification

All solid radioactive waste shall be maintained in appropriate containers in accordance with 10 CFR 20 and other applicable Federal regulations and secured in locked storage areas. Transfers of solid radioactive waste may be made to a licensed burial facility in accordance with applicable regulations of the NRC (10 CFR 71), the U.S. Department of Transportation,

Hazardous Materials Branch, and the burial facility's license and acceptance criteria.

3.0 Administrative Controls

3.1 Administrative Responsibility

The N.S. Savannah NS-1 License is held by the Senior Technical Advisor, as the responsible official for the U.S. Maritime Administration, Washington, D.C.

At all times, including the duration of layup at the Maritime Administration's James River Reserve Fleet (JRRF) and any periods when the vessel may be relocated to an off-site ship repair facility, the custody and responsibility for access control, security, environmental surveillance, radiological monitoring, reporting to the U.S. Nuclear Regulatory Commission and maintenance will be with the Senior Technical Advisor, U.S. Maritime Administration (MARAD), Washington, D.C.

The annual radiation surveys, semi-annual environmental sampling and surveillance, and laboratory analyses will be the responsibility of MARAD and performed for MARAD by the U.S. Army Center for Public Works, Humphries Engineering Center (formerly the U.S. Army Engineering and Housing Support Center, Safety and Occupational Health Office). Staff members or contractor personnel performing these functions for MARAD will be health physicists with at least two years specialized training in health physics or equivalent and three years of work experience related to radiological health and safety.

MARAD shall have a health physicist on duty or on call within two (2) hours to provide health physics support for radiological emergencies or entry into radiation control areas. In addition to the services of a health physicist, MARAD shall provide an Emergency Radiological Assistance Team in the event of radiological emergencies.

3.2 Records

In addition to the records required by applicable regulations, the Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C., and other assigned personnel shall maintain the following records:

1. Health Physics Records

a. Personnel Exposure
b. Ship's Radiological Surveys
c. Environmental Surveillance and Laboratory Analyses

2. Radioactive Liquid Waste Disposal Log

3. Solid Radioactive Waste Disposal Log

4. Quarterly Inspections of Physical Barriers and Intrusion Alarms

5. Licensee Event Reports (LER)

6. Records of Review and Audit Committee Meetings

7. File of Annual Reports to the U.S. Nuclear Regulatory Commission

8. Drawings, prints, layouts and specifications for the ship.

3.3 Radiological Criteria for Radiation Control Areas

Any authorized visitor aboard the ship will be accompanied by representatives of the license holder until all radiation control areas are locked and sealed. All entries into radiation control areas by visitors or employees shall be under the direction of a health physicist in accordance with the licensee's health physics procedures manual. However, in the event of fire, entry may be made into all radiation control areas except the reactor containment vessel, without the direction of a health physicist.

A radiation control area is defined as an area of the ship with radiation levels from reactor generated radioactive materials in excess of 0.25mR/hr above natural background as measured at one meter from any surface, and/or surface contamination in excess of those limits prescribed in Table I of NRC Reg. Guide 1.86.

For radiological protection of visitors and employees, all radiation control area entrances will be posted with appropriate caution and warning signs, locked and secured with chains, and sealed with numbered seals. Keys and seals will be maintained by a designated representative of the license holder, and a log maintained.

An intrusion alarm with an interlock will be maintained on the B Deck entry door into the reactor compartment with audible and visual signals located at a manned security guard post. These signals shall be both seen and heard by the security guard on duty.

3.3.1 Radiological Criteria for Unrestricted Areas

An unrestricted area is defined as an area that is accessible to employees, contractor personnel, escorted guests and official visitors. These areas include those areas not previously defined as Radiation Control Areas (para. 3.3). The radiation levels from reactor generated radioactive materials for unrestricted areas shall be less than 5uR/hr above natural background as measured at one meter from any surface. All surfaces shall be decontaminated and maintained at levels less that those prescribed in Table I of NRC Reg. Guide 1.86.

The radiation levels from reactor generated radioactive materials for all areas of the ship identified as being restricted to only employees, contractor personnel, escorted guests and official visitors shall be less than 5uR/hr above natural background as measured at one meter from any surface except as discussed below. Surface contamination levels shall be less that those prescribed in Table I of NRC Reg. Guide 1.86 in all cases, however. Restricted areas of the ship with radiation levels in excess of 5uR/hr but less than 0.25mR/hr may be entered without health physics supervision under the following conditions:

a. A health physicist has determined that potential exposures to any individual will not exceed 5% of 10 CFR 20.101 exposure limits.

b. The Review and Audit Committee has reviewed and accepted the proposed use of the space.

Prior to any areas being opened for uncontrolled access, the licensee shall survey the areas for radiation levels with appropriate portable instrumentation and make a contamination survey of the areas in accordance with his established health physics procedures to determine that the areas meet the criteria for access. Records of these surveys shall be maintained for inspection and review by the Review and Audit Committee.

3.3.2 Access Control and Security

The license holder shall control all access to the vessel through assignment of designated personnel with appropriate administrative procedures and physical security provisions.

When in layup, the vessel shall be positioned in a secure position in the James River Reserve Fleet, Fort Eustis, Virginia, alongside or in close proximity to the decommissioned U.S. Army MH-1A Floating Nuclear Power Plant STURGIS. Security for the vessel shall be provided by the license holder at all times, whether in layup in the JRRF or off-site for infrequent required ship maintenance, in which case 30-days prior notice in writing shall be given to NRC Region II.

3.4 Reports

The Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C. shall make the following reports:

1. A written annual report shall be submitted to the Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, prior to March 1 of each year. The report shall include the following:

a. The status of the facility.

b. The results of the radiation surveys and monitoring station dosimeter readings.
c. The results of environmental sample analysis surveys.
d. The results of quarterly intrusion alarm system checks.
e. The amount of radioactive materials removed from the N.S. Savannah by releases, discharges, and shipments of radioactive waste material.
f. A description of the principal maintenance performed on the vessel .
g. Any unauthorized entry into radiation control areas by visitors or employees and corrective action taken to improve access control.
h. Any degradation of one of the several boundaries which contain the radioactive materials aboard the N.S. Savannah.
i. Results of occupational exposure indicated by personal dosimetry.

2. Licensee Event Report (LER)

A LER shall be made to the USNRC Regional Office, Region II, by telephone within 24 hours of a reportable event. Reportable events are as follows:

a. The entrance of an unauthorized person or persons into any controlled radiation area.
b. A significant change in the radiation or contamination levels in the vessel.
c. Any release of radioactive material to the environment in excess of 10% of the limits of applicable sections of 10 CFR Part 20.
d. Any major damage to the vessel due to severe weather conditions or other causes.
e. Major floodings or sinking of the vessel.

Such information shall be reported within 24 hours by telephone, telecopier, or telegraph to the Administrator, U.S. Nuclear Regulatory Commission, Region II, Atlanta, Georgia, and followed by a written report within two weeks, with a copy to the Director, Office of Nuclear Reactor Regulation of the U.S. NRC in Washington, D.C.

3.5 Procedures and Operating Instructions

All modifications and maintenance of the vessel which may affect the safety of visitors, employees, or maintenance personnel shall be carried out in accordance with written procedures that cover the following:

a. Emergency conditions involving potential or actual release of radioactivity, e.g., fire and flooding.
b. Surveys in controlled areas.
c. Access control.
d. Radiation protection.

These procedures and any subsequent revisions shall be reviewed and approved by the Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C. or his designated alternate, and the Review and Audit Committee.

3.6 Review and Audit Committee

1. There shall be a Review and Audit Committee (Committee) consisting as a minimum of the following personnel:

   a. Committee Chairman: Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C.

   b. Alternate Chairman: Chief, Division of Ship Maintenance and Repair, U.S. Maritime Administration, Washington, D.C. 20590.

   c. Member: Fleet Superintendent, James River Reserve Fleet.

   d. Member: Fleet Captain or Fleet Engineer, James River Reserve Fleet.

   e. Designated representative of U.S. Army Center for Public Works, Humphries Engineering Center (formerly the U.S. Army Engineering and Housing Support Center, Safety and Occupational Health Office)

   f. Four members shall constitute a quorum provided that at least:

      I. One member of such quorum shall be either the Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C. or the Chief, Division of Ship Maintenance and Repair, U.S. Maritime Administration, Washington, D.C. 20590.

      II. One member of such quorum shall be either the Chief, Division of Ship Maintenance and Repair, U.S. Maritime Administration, Washington, D.C. 20590, or the Superintendent, JRRF, or the Fleet Engineer, JRRF, or his designated alternate.

      III. One member of such quorum shall be either the designated representative of U.S. Army Center for Public Works, Humphries Engineering Center (formerly the U.S. Army Engineering and Housing Support Center, Safety and Occupational Health Office), or his designated alternate.

2. Members of the Committee shall conduct audits, on-the-spot checks, and evaluations to assure that all work is being done safely and in accordance with established procedures. If a deficiency is discovered,

the Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C., is to be notified immediately. The license holder is to take the necessary immediate corrective action, and a written report of the deficiency is to be prepared for review by the Committee.

3. The Committee will review all of the following, including the determination of whether any proposed change involves an unreviewed safety question as defined in 10 CFR 50.59. These reviews may be accomplished and concurred with by members of the Committee without a formal meeting.

   a. Proposed changes to Technical Specifications.
   b. Proposed changes or modifications to the vessel's controlled radiation area entry alarm system or containment system.
   c. Substantive changes to radiation surveys or security surveillance procedures.
   d. Reported violations of Technical Specifications.
   e. Licensee Event Reports.
   f. Annual reports to the NRC.

4. The Committee shall be convened by the Chairman and shall meet annually to review and discuss events of the preceding period. The Committee will meet when necessary in the event of grounding or sinking of the vessel. Written minutes of all meetings shall be prepared and distributed to all committee members.

3.7 Ship Access Control and Surveillance

Applicability

Applies to routine access control and surveillance of the ship.

Objective

To prevent unauthorized entry into radiation control areas and to determine change in radiation levels or integrity of the ship.

Specification

1. Access Control

   1.1 Containment vessel entry shield plugs will be in place, sealed, and the lifting equipment partially disassembled.

   1.2 All entrances into the reactor compartment will be secured from the outside except the B Deck entry at Frame 122, which will be chained, posted, sealed, and double locked.

1.3 All radiation control areas will be posted, locked and sealed.

1.4 All entrances to the ship not in use will be secured at all times.

1.5 The entrance in Item 1.2 above, will be fitted with an intrusion alarm with audible and visual signals located at a location that is manned by a guard or security officer.

1.6 At night, on weekends and holidays, and after normal museum hours, security personnel will patrol the vessel at least once during a twenty-four (24) hour period.

1.7 Deviations from the above access control conditions will be in accordance with appropriate parts of Section 3 of these Technical Specifications, Administrative Controls.

2. Surveillance

2.1 Periodically and at least once a quarter, MARAD's designated personnel will inspect the seals on the control area doors and test the intrusion alarm in Item 1.5.

2.2 Radiation surveys of the ship shall be made annually, and environmental surveillance shall be made semi-annually by the designated representative of U.S. Army Center for Public Works, Humphries Engineering Center (formerly the U.S. Army Engineering and Housing Support Center, Safety and Occupational Health Office) or alternative contractor personnel designated by the license holder.

2.3 Radiological surveys will be made:

a. In unrestricted and restricted employee areas of the ship.
b. In the compartment below the containment vessel for radiation levels and water leakage.
c. In the Port and Starboard Stabilizer rooms.
d. In the Forward control areas.
e. In Charge pump rooms.
f. In the Hot Chem. Lab. in the control room area.
g. In the accessible areas adjacent to the entries to the controlled areas.

2.4 In addition to the periodic radiological surveys, thermoluminescent dosimeters (TLDs) or equivalent monitoring devices shall be placed at strategic locations throughout the vessel to monitor the radiation from reactor generated materials. MARAD shall determine these locations on the vessel and

shall require dosimeter readings at least semi-annually.

2.5 Semi-annually, water samples and bottom sediment will be taken adjacent to the ship and analyzed by a qualified laboratory for radioactivity.

3. Two draft level stripes will be painted fore and aft (at the draft markers), one will be just above the water level and the upper stripe will be one foot above the lower. These will be observed daily to check if the draft has increased. Both stripes must always be visible. If the lower stripe is not visible, the ship shall be surveyed and the water leakage located. The source of leakage will be determined, the ship pumped out, and repairs made as may be required, including drydocking if determined necessary, in order to assure that the integrity of the hull is maintained.

4. A cathodic protection system will be provided and properly maintained to protect the underwater areas of the vessel's hull to minimize corrosion damage to the hull.

5. An underwater inspection of the hull will be conducted at least every four (4) years. The vessel will be drydocked if the inspection determines that such action is necessary due to localized severe pitting, underwater plate thinning in excess of 40 percent, or other damage that would require corrective action and/or removal of the vessel to an off-site ship repair facility.

6. An inspection will be conducted at least annually by MARAD's designated personnel to determine any degradation of the primary and secondary systems.