

N.S. Savannah
Technical Specifications
Docket No. 50-238

Appendix A to
Amended Facility License No. NS-1

Patriots Point Development Authority
and
Maritime Administration
U. S. Department of Commerce

July 1981

Technical Specifications

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1.0 General

The Nuclear ship N.S. Savannah is in a state of protective storage. Certain areas of the vessel will be open to the public as a Maritime museum, lodging of visitors and employees, and restaurant and concession facilities. 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 is 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 the ship's operation. Incidental amounts of liquid may be generated as a result of decontamination 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 10 CFR 20 limits. Radioactive liquid waste shall be solidified in an approved media and may be transferred to a properly licensed burial facility. All solidified liquid waste shall be transferred in accordance with applicable NRC regulations (10 CFR 71) and the burial facility's license and acceptance criteria.

2.2 Radioactive Airborne Particulate Releases

Applicability

Applies to only 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.

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 discharge liquid radioactive waste to the hydrosphere will not exceed 10% of 10 CFR 20 limits.

Specification

Liquid wastes resulting from radiological decontamination shall be analyzed prior to discharge. Records of analysis 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 present 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 secured in locked storage areas. Transfers of solid radioactive waste may be made to a licensed burial facility in accordance with 10 CFR 71 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 presently administered by the Director, Office of Advanced Ship Development, M-920 of the Maritime Administration, U.S. Department of Commerce. The administration of the license will remain under the present status until the vessel is relocated to the S.C. Patriots Point Development Authority facility at Mt. Pleasant, South Carolina.

When the vessel is relocated to the S.C. Patriots Point Development Authority facility, the custody and responsibility for access control, security, environmental surveillance, radiological monitoring, reporting to the U.S. Nuclear Regulatory Commission and maintenance as stipulated

in the Bareboat Charter will be the Executive Director of the S.C. Patriots Point Development Authority.

The semi-annual radiation surveys, environmental sampling and surveillance, and laboratory analysis will be performed by the S.C. Department of Health and Environmental Control, Bureau of Radiological Health. Staff members of the Bureau of Radiological Health performing these functions will be health physicists with two years specialized training in health physics or equivalent and three years of work experience related to radiological health and safety.

The Patriots Point Development Authority 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, the S.C. Department of Health and Environmental Control, Bureau of Radiological Health shall provide an Emergency Radiological Assistance Team in the event of radiological emergencies.

While the N.S. Savannah is located at the U.S. Army Depot Berth in North Charleston, S.C., the ship will be under the custody of U.S. Army base contractors for security control and maintenance.

3.2 Records

In addition to the records required by applicable regulations, the Patriots Point Development Authority shall maintain the following records:

1. Health Physics Records
 - a. Personnel Exposure
 - b. Ship's Radiological Surveys
 - c. Environmental Surveillance and Laboratory Analysis
2. Reportable Incident Report Log
3. Radioactive Liquid Waste Disposal Log
4. Solid Radioactive Waste Disposal Log
5. Quarterly Inspections of Physical Barriers and Intrusion Alarms
6. Abnormal Occurrences Log
7. Records of Review and Audit Committee Meetings
8. File of Annual Reports to the U.S. Nuclear Regulatory Commission
9. Drawings, prints, layouts and specifications for the ship.

3.3 Radiological Criteria for Radiation Control Areas

Any visitor aboard the ship will be accompanied by representatives of the Patriots Point Development Authority 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 the Executive Director or Deputy Director 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. This 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 the general public and employees. These areas include those designated as museum tour routes and displays, lodging accommodations for visitors and employees, and restaurant and concession facilities. 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 than those prescribed in Table 1 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 than those prescribed in Table 1 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:

* Reactor generated radioactive materials means Cobalt 60 and Cesium 137.

- 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 Patriots Point Development Authority shall control all access to the vessel with appropriate administrative procedures and physical security provisions.

The vessel shall be positioned alongside a pier with controlled access. The pier entrance shall be under 24 hour security and surveillance. Security personnel shall patrol and visually inspect the vessel at the close of each day, and ensure that areas not in use are secured. The security personnel shall also patrol and inspect the vessel at least once each shift for possible fire, flooding and other abnormal occurrences.

3.4 Reports

The Patriots Point Development Authority shall make the following reports:

1. A written annual report shall be submitted to the 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 semi-annual radiation surveys.
 - c. The results of semi-annual 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 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 the controlled radiation areas.
- 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% or concentration limits of 10 CFR Part 20, Appendix B, Table II.
- 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 Director, U.S. Nuclear Regulatory Commission, Region II, Atlanta, Georgia and followed by a written report within two weeks.

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 will be reviewed and approved by the Executive Director of the Patriots Point Authority or his designate alternative, and the Review and Audit Committee.

3.6 Review and Audit Committee

1. After the vessel has been located at the Patriots Point Authority facility, there shall be a Review and Audit Committee (Committee) consisting of the following personnel:
 - a. Committee Chairman, Executive Director, Patriots Point Development Authority.
 - b. Deputy Director, Patriots Point Development Authority :
Alternate Chairman, Co-Licensee.
 - c. Director, Office of Advanced Ship Development Safety and Licensing, Maritime Administration, Washington, D.C. 20230

- d. Program Manager, Office of Advanced Ship Development Safety and Licensing, Maritime Administration, Washington, D.C. 20230
 - e. Chief, Division of Ship Management, Ship Management and Conventional Ship Safety, Maritime Administration, Washington, D.C. 20230
 - f. Project Engineer, Division of Ship Management, Ship Management and Conventional Ship Safety, Maritime Administration, Washington, D.C. 20230
 - g. Chief, Bureau of Radiological Health, South Carolina Department of Health and Environmental Control or his designate, Director, Division of Radioactive Material License and Compliance.
 - h. Four members shall constitute a quorum provided that at least:
 - I. One member of such quorum shall be either the Director or Deputy Director of the Patriots Point Authority.
 - II. One member of such quorum shall be either the Director or Program Manager of the Office of Advanced Ship Development, Safety and Licensing.
 - III. One member of such quorum shall be from the Maritime Administration, Division of Ship, Management, Ship Management and Conventional Ship Safety.
 - IV. One member of such quorum shall be either the Chief, Bureau of Radiological Health, S.C. Dept. of Health and Environmental Control, 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 Maritime Administration Director, Office of Advanced Ship Development, Washington, D.C. is to be notified immediately. The Executive Director, Patriots Point Development Authority 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.
 - g. Public use of restaurant, food concession facilities, and hotel accommodations prior to use.

4. The Committee shall be convened by the Chairman and shall meet annually to review and discuss results 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, normally, unless entries are administratively controlled.
 - 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 after normal museum visiting hours.
 - 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, after normal museum hours, security personnel will patrol the vessel at least once during a twenty-four (24) hour period.
2. Surveillance
 - 2.1 Periodically and at least once a quarter, Patriots Point Authority personnel will inspect the seals on the control area doors and test the intrusion alarm in Item 1.5.
 - 2.2 Semi-annually, radiation surveys of the ship and environmental surveillance will be made by the S.C. Department of Health and Environmental Control, Bureau of Radiological Health.

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 Semi-annually, water samples and bottom sediment will be taken adjacent to the ship and analyzed by a qualified laboratory for radioactivity, namely the S.C. Department of Health and Environmental Control, Bureau of Radiological Health.

3. Two draft levels stripes will be painted fore and aft (at the draft markers), one will be just above the water level and 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 is 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.
6. An inspection will be conducted at least annually by Maritime Administration personnel to determine any degradation of the primary and secondary systems.