



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

June 12, 2018

Mr. Erhard W. Koehler  
Senior Technical Advisor, N.S. *Savannah*  
U.S. Department of Transportation  
Maritime Administration (MAR-640.2)  
1200 New Jersey Avenue, SE W25-209/212  
Washington, DC 20590-0001

SUBJECT: NUCLEAR SHIP *SAVANNAH* - ISSUANCE OF AMENDMENT 16 TO REVISE  
THE TECHNICAL SPECIFICATIONS TO ESTABLISH CONTROLS FOR ALL  
ACCESSES TO THE CONTAINMENT VESSEL IN SUPPORT OF TWO  
STRUCTURAL MODIFICATIONS

Dear Mr. Koehler:

By application dated March 30, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18093A377), the United States Maritime Administration (MARAD), requested U.S. Nuclear Regulatory Commission (NRC) approval of an Amendment revising the Nuclear Ship *SAVANNAH* (NSS) Technical Specifications.

The proposed amendment would revise the Technical Specifications to establish controls for all accesses to the Containment Vessel (CV) in support of two structural modifications. One modification will construct a horizontal access portal to the CV that will be secured by a new D Deck CV Door. The other modification will restore the original forward access between the Cold Chemistry Laboratory (CCL) at D Deck and the Reactor Compartment (RC) Lower Level.

The NRC staff has completed its review of the proposed amendment to your license. The amendment approving the proposed changes is provided in Enclosure 1. Enclosure 2 contains the NRC staff's associated safety evaluation.

A notice of issuance of amendment has been forwarded to the Office of *Federal Register* for publication.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

E. Koehler

- 2 -

If you have any questions, please contact me at 301-415-3017, or via e-mail at john.hickman@nrc.gov.

Sincerely,

***/RA/***

John B. Hickman, Project Manager  
Reactor Decommissioning Branch  
Division of Decommissioning, Uranium Recovery  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

Docket Nos. 50-238

Enclosures:

1. Amendment No. 16 to NS-1
2. Safety Evaluation

cc w/enclosures: Distribution

E. Koehler

- 2 -

SUBJECT: NUCLEAR SHIP SAVANNAH - ISSUANCE OF AMENDMENT 16 TO REVISE  
THE LICENSE TO ALLOW DISMANTLEMENT AND DISPOSAL,  
DATED JUNE 12, 2018

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NAME	JHickman	CHolston	BWatson	SClark**	BWatson	JHickman
DATE	04/23/2018	04/25/2018	05/9/2018	05/31/2018	06/12/2018	06/12/2018

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ENCLOSURE 1

AMENDMENT NO. 16 TO LICENSE NO. NS-1

UNITED STATES MARITIME ADMINISTRATION

NUCLEAR SHIP SAVANNAH

DOCKET NO. 50-238



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

UNITED STATES MARITIME ADMINISTRATION  
DOCKET NO. 50-238  
NUCLEAR SHIP SAVANNAH  
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 16  
License No. NS-1

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
  - A. The application for a license amendment filed by the United States Maritime Administration (MARAD, the licensee), dated March 30, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and applicable portions of the Commission's regulations set forth in 10 CFR Chapter I, and all required notifications to other agencies or bodies have been duly made;
  - B. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the applicable rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amended license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with applicable portions of the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this license will not be inimical to the common defense and security or to the health and safety of the public;
  - E. The issuance of this license is in accordance with 10 CFR Part 51, of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended as indicated in the attachment to this license amendment, and Facility Operating License No. NS-1 is hereby amended as follows.

Paragraph 2.C.(3) of Facility Operating License No. NS-1 is hereby amended to read:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 16, are hereby incorporated in the license. The licensee shall maintain the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Bruce A. Watson, CHP, Chief  
Reactor Decommissioning Branch  
Division of Decommissioning, Uranium Recovery  
and Waste Programs  
Office of Nuclear Material Safety  
and Safeguards

Attachment:  
Change to Facility  
Operating License No. NS-1

Date of Issuance: June 12, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 15

TO FACILITY OPERATING LICENSE NO. NS-1

DOCKET NO. 50-238

Replace the following page of the Technical Specifications with the attached revised page. Revised pages are identified by amendment number and contains marginal lines indicating the area of change.

Technical Specifications

Remove  
9

Insert  
9

### 3.7.1 Access Control

3.7.1.1 All containment vessel entrances shall be either manned or secured.

3.7.1.2 All Radiological Controlled Areas entrances will be manned or secured.

3.7.1.3 All Radiological Controlled Area entrances will be posted with appropriate caution and warning signs.

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

3.7.1.5 The B Deck Reactor Compartment Door at Frame 122, the C Deck Door to the Cold Chemistry Laboratory and the D Deck Containment Vessel Door shall be either:

a) Manned or

b) Locked from the outside and fitted with an intrusion alarm that alerts a security monitoring station.

3.7.1.6 MARAD trained personnel will patrol the vessel at least once during a twenty-four (24) hour period.

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

### 3.7.2 Surveillance

3.7.2.1 Periodically and at least once a quarter, MARAD's designated personnel will inspect the Radiologically Controlled Area entrances to verify they are properly secured and test the intrusion alarms in Technical Specification 3.7.1.5.

3.7.2.2 Radiological surveys of the ship will be performed at least annually and as necessary to support ship activities in accordance with 10 CFR 20.

3.7.2.3 Thermoluminescent dosimeters (TLDs) or equivalent monitoring devices shall be placed at strategic location 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.

3.7.2.4 Semi-annually, water samples and bottom sediment will be taken adjacent to the ship and analyzed for radioactivity.

### 3.7.3 Vessel and System Maintenance

3.7.3.1 Two draft level stripes will be painted fore and aft (at the draft marks), 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 water



ENCLOSURE 2

SAFETY EVALUATION  
UNITED STATES MARITIME ADMINISTRATION  
NUCLEAR SHIP SAVANNAH  
DOCKET NO. 50-238



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY  
THE OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
RELATED TO THE N.S. SAVANNAH  
AMENDMENT TO TECHNICAL SPECIFICATIONS TO SUPPORT CONTAINMENT  
VESSEL AND REACTOR COMPARTMENT MODIFICATIONS  
DOCKET NO. 50-238  
FACILITY OPERATING LICENSE NO. NS-1

1.0 INTRODUCTION

By application dated March 30, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18093A377), the United States Maritime Administration (MARAD), requested U.S. Nuclear Regulatory Commission (NRC) approval of an Amendment revising the Nuclear Ship SAVANNAH (NSS) Technical Specifications (TS).

The proposed amendment would revise the TS to establish controls for all accesses to the Containment Vessel (CV) in support of two structural modifications. One modification will construct a horizontal access portal to the CV that will be secured by a new D Deck CV Door. The other modification will restore the original forward access between the Cold Chemistry Laboratory (CCL) at D Deck and the Reactor Compartment (RC) Lower Level

2.0 BACKGROUND

The NSS has been shutdown since 1970, and was defueled in 1971. In 1973, the U.S Atomic Energy Commission (NRC's predecessor agency) issued an amendment placing the reactor in a SAFSTOR condition. The license was changed to possession-only in 1976. Presently, the ship is scheduled to remain at the Canton Marine Terminals in Baltimore under a long-term lay berth contract. MARAD is a modal agency of the United States Department of Transportation (DOT). It is a Federal licensee as defined by the NRC. As such, funds for decommissioning and termination of the NSS license are provided by Federal appropriations. The Consolidated Appropriations Act for FY 2017 provides \$24 million to MARAD for N.S. SAVANNAH decommissioning. One of the projects envisioned to support decommissioning is constructing a horizontal access portal to the CV. The walk-through portal will provide safer access to and egress from the CV, and improve efficiency and productivity of work activities, such as removal of hazardous materials from the CV, including insulation containing asbestos. The horizontal access portal will be secured by a marine grade watertight door installed on the outside of the CV in the vicinity of Frames 107 through 110 on D Deck starboard. The watertight door is designated the D Deck Containment Vessel Door.

### 3.0 REGULATORY EVALUATION

The license no longer has any special nuclear material on the vessel and as a result was exempted from the requirements of 10 CFR 50.54(p) and 10 CFR Part 73 on October 12, 2011 (ML103370140). The current security program is equivalent to general industrial security with a focus on protection from radiation exposure in accordance with the licensee's determination that the current configuration of radioactive materials on the vessel does not require a 10 CFR Part 37 security plan.

The licensee's 2017 annual report (ML18058A746) documented the highest radiation level in the radiologically controlled area (RCA) as 36 mR/hr on contact with an overhead pipe. Therefore the vessel has no high or very high radiation areas. 10 CFR 20.1101, "Radiation protection programs," provides general requirements for a radiation protection program.

The original design basis of the CV was to be the final barrier of releasing to the environment any fission products that had breached the fuel cladding and reactor coolant pressure boundary during a core-damaging accident. With issuance of the Possession-only license on May 19, 1976, the CV design basis was revised to become a barrier to prevent inadvertent access to a radiologically controlled area where a majority of the remaining radioactive material on the NSS was located i.e., the reactor pressure vessel. When the CV was no longer needed to meet its original design functions, the Possession-only license effectively revised its design function to become that "substantial structure" to "prevent inadvertent exposure of personnel" to radiation areas.

### 4.0 TECHNICAL EVALUATION

#### 4.1 Physical Modifications

The licensee is currently in the process of planning for decommissioning. One of the projects envisioned to support decommissioning is construction of a horizontal access portal to the CV. The walk-through portal is intended to provide safer access to and egress from the CV, and improve efficiency and productivity of work activities, such as removal of hazardous materials from the CV, including insulation containing asbestos. The horizontal access portal will be secured by a marine grade watertight door installed on the outside of the CV in the vicinity of Frames 107 through 110 on D Deck starboard. The watertight door will be called the D Deck Containment Vessel Door.

The licensee has completed a modification to improve personnel access to the RC Lower Level by restoring the original forward access between the CCL at D Deck and the RC Lower Level. Until this modification had been completed, there was only one access to the RC Lower Level – one approximately 36 ft. vertical ladder access. Currently and since November 1995, the C Deck entrance to the Cold Chemistry Laboratory has been controlled in a manner equivalent to the TS 3.7.1.5, controls for the B Deck RC entrance; locked from the outside and fitted with an intrusion alarm that alerts a security monitoring station. When opened, the door has been manned and protected.

In support of the modification to add the horizontal access portal to the CV, MARAD has proposed that 3.7.1.1, be revised to generically require controls over all CV entrances.

Additionally, in support of the modifications which effectively expand the boundary of the RC, MARAD has proposed that the scope of TS 3.7.1.5 be modified to apply to all active entrances into the RC. Specifically TS 3.7.1.5 should be revised to include the C Deck Door to the Cold Chemistry Laboratory and the D Deck Containment Vessel Door.

The staff has evaluated the facility modifications completed or planned and the access controls implemented for those modification and determined that the changes provide improved access for active decommissioning while ensuring adequate radiological protection.

#### 4.2 Technical Specification Changes

Currently TS 3.7.1.1, states: "The 42 inch containment vessel entrances shall be manned or secured." The licensee has proposed to change TS 3.7.1.1, to state: "All containment vessel entrances shall be either manned or secured." This proposed change broadens the requirement that CV entrances be appropriately monitored or secured in support of the modification that add entrance pathways. Since this change maintains the prior level of control, only expanding the scope of controlled areas to include the new pathways, the change is appropriate and acceptable.

Currently TS 3.7.1.5, states: "The B Deck Reactor Compartment entrance at Frame 122 will be fitted with an intrusion alarm with audible and visual signals that will alert a manned security guard post." The licensee has proposed to change TS 3.7.1.5, to read: "The B Deck Reactor Compartment Door at Frame 122, the C Deck Door to the Cold Chemistry Laboratory and the D Deck Containment Vessel Door shall be either: a) Manned or, b) Locked from the outside and fitted with an intrusion alarm that alerts a security monitoring station." This proposed change broadens the requirement that reactor compartment entrances be appropriately monitored or secured in support of the modification that add entrance pathways. Since this change maintains the prior level of control and just expands the scope to include the new pathways, the change is appropriate and acceptable.

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements related to installation and use of a facility component located within the restricted area as define in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant hazards consideration, no significant change in the types or increase in the amounts of any effluents that may be released offsite, and no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration (83 FR 20863; May 8, 2018), and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusions set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

### 6.0 STATE CONSULTATION

On May 8, 2018, the State of Maryland was notified of the proposed change to the NSS license to permit active radiological decommissioning of the ship. Eva S. Nair, Program Manager,

Radiological Health Program, Maryland Department of the Environment, responded on May 10, 2018, with no comments or concerns.

## 7.0 CONCLUSION

The changes proposed by this license amendment will expand the TS controls over the CV and reactor compartment entrances to include the physical modifications to be performed in support of commencing active decommissioning. The changes maintain appropriate controls while permitting the desired modifications. On the basis of its review, NRC staff concluded that the licensee's request will adequately address the regulatory safety requirements for the facility while facilitating the dismantlement and disposal of the radiologically contaminated materials at the facility. The staff, therefore, concludes that the license amendment request is acceptable.

The staff has concluded, based on the considerations discussed above, that: 1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; and 2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: John Hickman

Date: June 12, 2018