UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

December 2, 2020

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: NRC INSPECTION REPORT NO. 05000238/2020001, U.S. DEPARTMENT OF TRANSPORTATION, N.S. SAVANNAH, BALTIMORE, MARYLAND

Dear Mr. Koehler:

On November 19, 2020, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection under Inspection Manual Chapter (IMC) 2545 , “Research and Test Reactor Inspection Program” at the Nuclear Ship (N.S.) Savannah berthed in Baltimore, Maryland. Additional inspection activities (in-office reviews) were conducted remotely as a consequence of the COVID-19 public health emergency (PHE) during this inspection period. The inspectors examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of ship walkdowns by the inspectors, observations, interviews with ship personnel, and a review of procedures and records. The results of the inspection were discussed with you at the conclusion of the inspection on November 19, 2020 and are described in the enclosed report. Based on the results of this inspection, no findings of safety significance were identified.

In accordance with 10 CFR Part 2.390 of the NRC’s "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of the NRC’s document system (ADAMS). ADAMS is accessible from the NRC Web Site at https://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select Radioactive Waste; Decommissioning of Nuclear Facilities; then Regulations, Guidance and Communications. The current Enforcement Policy is included on the NRC's website at www.nrc.gov; select About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents; then Enforcement Policy (Under 'Related Information'). You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

No response to this letter is required. If you have any questions, please contact Katherine Warner of my staff at Katherine.Warner@nrc.gov or (610) 337-5389.

Sincerely,

/RA/

Anthony Dimitriadis, Chief
Decommissioning, ISFSI, and Reactor Health Physics Branch
Division of Nuclear Materials Safety

Docket No. 05000238
License No. NS-1

Enclosure:
Inspection Report No. 05000238/2020001

cc w/Enclosure: Art Paynter, QA Manager
John Osborne, Licensing and Compliance Manager
State of Maryland

NRC INSPECTION REPORT NO. 05000238/2020001, U.S. DEPARTMENT OF TRANSPORTATION, N.S. SAVANNAH, BALTIMORE, MARYLAND DATED December 2, 2020.

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DATE	12/02/2020		12/02/2020					

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Docket No.	05000238
License No.	NS-1
Inspection No.	05000238/2020001
Licensee:	U.S. Department of Transportation Maritime Administration (MARAD) Washington, DC 20590
Facility:	N.S. Savannah
Location:	Canton Marine Terminal Pier 13 4601 Newgate Avenue Baltimore, MD 21224
Inspection Dates:	August 19, 2020 – November 19, 2020
Inspectors:	Elizabeth Andrews, Health Physicist Decommissioning ISFSI, and Reactor Health Physics Branch Division of Nuclear Materials Safety Region I Katherine Warner, Senior Health Physicist Decommissioning ISFSI, and Reactor Health Physics Branch Division of Nuclear Materials Safety Region I
Approved By:	Anthony Dimitriadis, Chief Decommissioning ISFSI, and Reactor Health Physics Branch Division of Nuclear Materials Safety Region I

Enclosure

EXECUTIVE SUMMARY

U.S. Department of Transportation
Maritime Administration (MARAD)
N.S. Savannah
NRC Inspection Report No. 05000238/2020001

A routine announced safety inspection was conducted on August 19, 2020, by Region I inspectors of the Nuclear Ship (N.S.) Savannah, while berthed at a marine terminal in Baltimore, Maryland. Additional inspection activities (in-office reviews) were conducted remotely as a consequence of the COVID-19 public health emergency (PHE) during this inspection period. NRC oversight of the decommissioning project is managed by staff from the NRC's Reactor Decommissioning Branch, Division of Decommissioning, Uranium Recovery, & Waste Programs (DUWP), Office of Nuclear Material Safety and Safeguards *(*NMSS) with inspection support from the NRC Region I office.

The N.S. Savannah is classified by the NRC as a research and test reactor for inspection purposes. The program for overseeing the decommissioning of research and test reactors is described in Inspection Manual Chapter (IMC) 2545, “Research and Test Reactor Inspection Program.” The inspection included a review of the programs and activities associated with the N.S. Savannah while the vessel is conducting decommissioning activities. The inspection consisted of ship walk-downs, observations by the inspectors, interviews with N.S. Savannah personnel, and a review of procedures and records.

Based on the results of this inspection, no findings of safety significance were identified.

REPORT DETAILS

1.0 Background

The N.S. Savannah is the property of the U. S. Department of Transportation (DOT), Maritime Administration (MARAD). The N.S. Savannah was designed, constructed, and operated as a joint research and development project of MARAD and the Atomic Energy Commission. The ship operated from 1961 until it was removed from service in 1970. In 1971, the ship was defueled and various dismantling activities were conducted through 1976 to remove much of the radioactive material from the ship and to isolate radiologically contaminated systems. These activities included removal of ion exchange systems and resins and most of the water from the primary, secondary, and auxiliary systems. A "Possession Only" license was issued in May 1976. The N.S. Savannah is a registered National Historic Landmark. In May 2008, the ship was towed from Norfolk, Virginia to Baltimore, Maryland. The program for overseeing the decommissioning of research and test reactors is described in IMC 2545.

2.0 Research and Test Reactor Decommissioning

a. Inspection Scope (Inspection Procedure 69013)

In an October 31, 2017 letter, MARAD representatives submitted a license amendment request to modify the license to remove the License Condition that prohibited dismantling and disposal of the facility without prior approval of the Commission. This condition was a hold-over from a period of time when the license was under an earlier regulatory framework and did not reflect the current language of Title 10 of the Code of Federal Regulations, Chapter 50.82. DUWP, NMSS staff approved this action via a letter and associated safety evaluation on April 23, 2018 (ML18081A134). The licensee is currently in the process of planning for decommissioning and is performing certain dismantlement activities under the 10 CFR 50.59 process.

The inspection consisted of observations and tours by the inspectors, interviews with N.S. Savannah personnel, and a review of procedures and records to evaluate the organization and staffing and work controls. The inspectors reviewed the status of activities related to the site decommissioning to verify activities are in accordance with licensed requirements. The inspectors conducted document reviews and interviews with ship personnel to verify that procedures and processes conform to the regulations and guidance associated with 10 CFR 50.59 and changes made under 10 CFR 50.59 did not require prior NRC approval. The inspectors reviewed documents and interviewed ship personnel to verify that management performed audits and self-assessments, review the ship's radiation protection program, and review whether issues were identified and corrected in accordance with the ship's corrective action program (CAP).

b. Observations and Findings

N.S. Savannah was allocated funds from the U.S. Congress for decommissioning starting fiscal year 2017. The licensee has developed a three-phase plan for decommissioning. The plan includes two years for DECON planning and engineering, four years for industrial dismantlement activities, and one year for license termination. It should be noted that these phases will overlap as work progresses. As of the date of this inspection, the licensee had completed the majority, if not all Phase 1 activities,

including eliminating all current radiologically controlled areas (RCAs) outside the reactor compartment. These RCAs include the hot chemistry laboratory, the port and starboard buffer seal charging pump rooms, the port and starboard stabilizer rooms, the A deck health physics laboratory and the B-1 stateroom. Phase 2 activities, including major dismantlement and decommissioning are scheduled to begin in 2021.

The inspectors determined that 10 CFR 50.59 screenings and evaluations had been performed and that the licensee had appropriately trained and qualified individuals to perform the evaluations. The inspectors determined that changes under 10 CFR 50.59 did not require prior NRC approval and safety reviews were performed for design changes and modifications in accordance with applicable regulatory requirements, and license conditions.

Based on the areas of the ship accessed, there have been no issues identified with the material condition of any of the ship's boundaries that contain radioactive materials. All radioactive material is currently being stored on the ship so there has been no release of radioactive material as effluents or as radioactive material. The inspectors confirmed that the waste generated from recent dismantlement activities is currently being stored on the ship and the area is posted appropriately. The inspectors noted that several low-level radioactive shipments occurred in the spring of 2020. The inspectors reviewed the shipping paperwork and found it to be satisfactory.

The inspectors determined that issues had been identified and entered into the corrective action program (CAP) in a timely manner and the issues were effectively screened, prioritized and evaluated commensurate with their safety significance. The site appropriately assigned significance levels to the corrective action reports (CARs). The site has three significance levels: Levels 1, 2, and 3 with level 1 CARs being of the highest significance. The inspectors noted that all the CARs reviewed were of Level 3 significance, which is typical for this ship. The inspectors noted that the ship had implemented timeliness goals for closing out corrective action reports in STS-003-002, Corrective Action Program, and had been adequately implementing them since the last inspection. Appropriate characterization and timely resolution of issues will continue to be an inspection focus area as the ship project moves into Phase 2 decommissioning activities. The inspectors have reasonable assurance that the site has a robust corrective action program prior to the start of major deactivation and demolition activities.

The inspectors noted several deficiencies regarding the radiation protection program during the inspection, including a number of paperwork deficiencies and an untimely completion of the annual audit. These issues have been entered into the corrective action program and the inspectors will review the resolution of these issues during the next inspection. The inspectors determined that, while there were no major consequences of these deficiencies, they do indicate a weakness in the radiation protection program. This observation was discussed with the licensee and will be further reviewed during the next inspection. The inspectors noted that reasonable assurance for safe operations was given by the planned corrective actions proposed in recent radiation protection audit. The inspectors further noted that the radiation protection department had undergone significant leadership changes the results of which indicate an initial positive improvement in the program. One example includes the performance of the annual audit which will be performed in quarterly segments rather than on an annual basis so any potential deficiencies are expected to be identified and resolved earlier.

In March 2013, MARAD awarded a contract to TOTE Services that integrates radiation protection and emergency response, custodial care of the vessel, and nuclear professional support services. Routine maintenance, surveillance tests, and environmental and radiological monitoring in support of technical specification requirements continue under the contract. Radiation Services Organization, Inc., of Laurel, Maryland is subcontracted to provide radiation protection and emergency response services.

c. Conclusions

No findings of significance were identified during this inspection, but the effectiveness of the radiation protection program will continue to be reviewed during the next inspection.

3.0 Exit Meeting Summary

On November 19, 2020, the inspectors presented the inspection results to Mr. Erhard Koehler, Senior Technical Advisor, N.S. Savannah. No proprietary information was retained by the inspectors or documented in this report.

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee and contractors

J. Bowen, Project Manager, TOTE
E. Koehler, Senior Technical Advisor, MARAD
J. Osborne, Licensing and Compliance Manager, Savannah Technical Staff
A. Paynter, Quality Assurance Manager, Savannah Technical Staff
D. Roberson, Radiation Safety Officer, RSCS

PARTIAL LIST OF DOCUMENTS REVIEWED

10 CFR 50.59 Applicability and Screening Forms, 2019-026, Modify Reactor Compartment Hatch Cover for Ease of Access to Containment Vessel, January 24, 2020
10 CFR 50.59 Applicability and Screening Forms, 2019-045, New HVAC Systems for CV, RC, CH3, and CH4, June 22, 2020
ACM Shipment 8200-NSS-2020-001, April 3, 2020
ACM Shipment 8200-NSS-2020-002, April 3, 2020
ACM Shipment 8200-NSS-2020-003, April 3, 2020
QSA-2020-003, 2019 Annual Radiation Protection Program Assessment, Revision 0
STS-005-008, Radiological Instrument and Survey Documentation, Various from CY 2020
STS-005-020, RI Offsite Dose Calculation Manual (ODCM), Revision 1
STS-005-022, R0 Radioactive Waste Process Control Program, Revision 0
STS-007-001 Abnormal and Emergency Conditions, Revision 10
STS-209, Annual Report for CY 2019, Revision 0
STS-211, Compliance with Technical Specification 2.4.2, Interlaboratory Comparison Program, Revision 0
STS-212, Annual Radiological Environmental Monitoring and Radioactive Effluent Release Reports, May 7, 2020
WO-2018-383, Remove and Dispose of Radioactive Liquid Waste Inventory in Cargo Hold No. 4, August 26, 2019

Corrective Action Reports and Resolutions
2019-074
2020-003
2020-004
2020-005
2020-006
2020-008
2020-009
2020-014
2020-015
2020-016
2020-017
2020-018
2020-019
2020-021
2020-022

Corrective Action Reports and Resolutions (Cont'd)
2020-023
2020-025
2020-029
2020-030
2020-031
2020-032
2020-033

ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DOT	U. S. Department of Transportation
DUWP	Division of Decommissioning, Uranium Recovery, & Waste Programs
IMC	Inspection Manual Chapter
MARAD	U. S. Maritime Administration
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	Nuclear Regulatory Commission
N.S.	Nuclear Ship