



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415

November 17, 2008

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

SUBJECT: INSPECTION 05000238/2008001, N.S. SAVANNAH, BALTIMORE, MD

Dear Mr. Koehler:

On September 10, 2008, the United States Nuclear Regulatory Commission completed an announced inspection of the N. S. Savannah, located at the Canton Marine Terminal, Pier 13, Baltimore, MD. The preliminary results of the inspection were discussed with you and representatives of your staff at the conclusion of the inspection. The enclosed report presents the results of this inspection.

This inspection was an examination of activities conducted under your license as they relate to safety and security, compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. Based on the results of this inspection, no violations were identified.

In accordance with 10 CFR Part 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

No response to this letter is required. Your cooperation with us is appreciated.

Sincerely,

/RA/

Raymond Lorson, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 05000238
License No. NS-1
Enclosure: Inspection Report No. 05000238/2008001
w/Attachment: Supplemental Information

cc w/ encl:
see next page

E. Koehler

2

cc w/ encl:

John C. Wiegand, Decommissioning Program Manager

Greg Thornton, N.S. Savannah Facility Site Manager

Jeffrey McMahon, Ship Operations and Maintenance Officer (SOMO)

Roland Fletcher, Manager, Radiological Health Program

State of Maryland

E. Koehler

2

cc w/ encl:

John C. Wiegand, Decommissioning Program Manager
Greg Thornton, N.S. Savannah Facility Site Manager
Jeffrey McMahon, Ship Operations and Maintenance Officer (SOMO)
Roland Fletcher, Manager, Radiological Health Program
State of Maryland

Distribution w/encl: (via E-mail)

S. Collins, RA
M. Dapas, DRA
J. Kinneman, DNMS
D. S. Collins, DNMS
E. Cobey, DNMS
R. Lorson, DNMS
M. Roberts, DNMS
D. Screnci, PAO
N. Sheehan, PAO
S. Williams, OEDO
J. Buckley, FSME

DOCUMENT NAME: T:\DNMS\WordDocs\Current\Insp Report\RNS-1.2008001.doc

SUNSI Review Complete: MRoberts

After declaring this document "An Official Agency Record" it will be released to the Public.

To receive a copy of this document, indicate in the box: "C" = Copy w/o attach/encl "E" = Copy w/ attach/encl "N" = No copy

OFFICE	DNMS/RI	N	DNMS/RI				
NAME	MRoberts/MCR		RLorson/RKL				
DATE	11/18/08		11/17/08				

ML083260297

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection No. 05000238/2008001

Docket No. 05000238

License No. NS-1

Licensee: U. S. Department of Transportation
Maritime Administration
Washington, DC 20590

Facility: N. S. Savannah

Location: Canton Marine Terminal
Pier 13
4601 Newgate Ave
Baltimore, MD 21224

Inspection Date: September 10, 2008

Inspector: Mark C. Roberts, Senior Health Physicist
Decommissioning Branch
Division of Nuclear Materials Safety

Approved By: Raymond Lorson, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

N. S. Savannah
U. S. Department of Transportation
Maritime Administration
NRC Inspection Report No. 05000238/2008001

The inspection was an onsite and onboard review of the licensee's programs for preserving the ship during its extended storage (berthing) and preparation for future decommissioning. The report covers an announced safety inspection conducted by one regional inspector. The inspection consisted of field observations and an evaluation of the licensee's programs for organization, staffing and reporting; radiation protection; environmental monitoring; surveillance and maintenance; and emergency response and security.

The licensee implemented its radiation protection and environmental monitoring programs in accordance with its license, Technical Specifications, and applicable regulations. Reports required by the Technical Specifications were complete and timely. The licensee maintained appropriate surveillance and maintenance programs to ensure that equipment and systems would be adequately inspected, maintained, and tested. Emergency response and security programs were effectively implemented.

A. NRC Identified Findings

None

REPORT DETAILS

Background and Summary of Ship Status

The Nuclear Ship (N.S.) Savannah is the property of the U. S. Department of Transportation, Maritime Administration (MARAD). The N.S. Savannah was the first nuclear-powered merchant ship and 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 some of the radioactive material from the ship or isolate radiologically contaminated systems. These activities included removing 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.

The ship was maintained for a period as a museum in Charleston, SC and was subsequently moved to the James River Reserve Fleet in Virginia. In 2006, the ship was towed to Norfolk, VA, where hull maintenance, topside repairs, and preservation work were conducted. In May 2008, the ship was towed to its present location in Baltimore Harbor in Maryland. A final schedule for completion of decommissioning is not available because sufficient funds to complete decommissioning have not been authorized.

1. Organization, Staffing, and Reporting

a. Inspection Scope

The inspector interviewed licensee staff and reviewed selected documents to verify compliance with the license, technical specifications, and applicable regulations.

b. Observations and Findings

No findings of significance were identified.

The Savannah Technical Staff (STS) is a multi-disciplinary group of MARAD and contractor personnel responsible for all N.S. Savannah program activities. The STS includes the senior technical advisor (STA). The STA leads the Safety Review Committee and many of the STS are members of this committee. This committee, which is required by the Technical Specifications (TS), meets at least annually to review proposed TS changes, certain procedure changes, audits and self assessments, alarm system modifications and reports to the NRC. The MARAD staff and contractors perform the periodic surveillances, inspections, and report preparation required by TSs and regulations. Daily ship operations are conducted by a four-person crew under contract through the port general agent.

The inspector reviewed the 2006 and 2007 annual reports and determined that the reports provided the information required by the TS. No special reports were issued in accordance with TS requirements; however, information that had not been included in

Enclosure

the 2004 and 2005 reports was presented in the two later reports. This issue is discussed in Section 6 of this inspection report. The staff provided the required written notification to the NRC prior to moving the ship from Norfolk, VA to Baltimore Harbor.

c. Conclusion

Organization and staffing met TS requirements. Annual reports for 2006 and 2007 were complete and contained the information required by the TS.

2. Radiation Protection Program

a. Inspection Scope

The inspector reviewed the facility's radiation protection program to verify compliance with the license, technical specifications, and applicable regulations. The inspector evaluated personnel monitoring records, radiation and contamination surveys, instrumentation, and radiological work control (Radiation Work Permits (RWPs)).

b. Observations and Findings

No findings of significance were identified.

The licensee utilizes contractors to provide most of its radiological protection needs, including personnel monitoring, environmental monitoring, radiation survey meter calibration, and radiological and contamination surveys. Work within the radiologically controlled area was controlled through the use of RWPs, although there are no current major decommissioning or dismantling work activities. An annual review of the radiation protection program was conducted with no significant findings. The principal recommendation from the annual program review was to complete work on the radiation protection procedures that will be required once the active decommissioning activities commence. The licensee monitored personnel through the use of thermoluminescent dosimeters (TLDs) and self-reading dosimeters for entries to the radiologically controlled areas of the ship. All personnel exposures were zero for 2007.

The licensee maintains radiation survey meters for routine and emergency needs. Instruments are calibrated annually by the contractor. Emergency instrumentation is available in a locked cabinet in an offsite trailer and instruments for routine use are stored on the ship. Radiation and contamination surveys were performed annually as required by the TS. Areas where there is residual radioactive contamination or elevated radiation exposure rates from contaminated systems are locked with appropriate caution signs displayed. No loose radioactive contamination was found outside these areas. The locked areas included the reactor compartment, hot chemistry laboratory, cold chemistry laboratory, port and starboard charging pump rooms and the port and starboard stabilizer rooms. Based on the inspector's review of the most recent survey data, the highest exposure rate that was measured by the licensee was 120 mR/hour at contact with an overhead pipe in the lower reactor compartment. The inspector also reviewed the General Employee Training information and found that the content of the program satisfied the requirements of 10 CFR 19.

c. Conclusion

The licensee implemented its radiation protection program in accordance with its technical specifications and applicable regulations.

3. Environmental Monitoring

a. Scope

The inspector reviewed the licensee's environmental monitoring program TLD results for 2006 and 2007, and the results from environmental water and sediment sampling that was performed while the ship was located at the James River Reserve Fleet in Virginia, and also when it was berthed in Norfolk, VA.

b. Observations and Findings

No findings of significance were identified.

The licensee monitored for direct radiation at 36 locations outside the radiologically controlled areas of the ship using environmental TLDs. The environmental TLDs are required to be exchanged at least semi-annually in accordance with the TS, but are currently being exchanged quarterly. The TLD results were not substantially different than the background radiation exposure rates for the area.

The inspector reviewed the data for the environmental water and sediment samples taken in the vicinity of the ship when it was anchored at the James River Reserve Fleet in Virginia and berthed at a private shipyard in Norfolk, VA. Sample results were less than detectable for radionuclides that could be attributable to ship operations. Because there are no current, active decommissioning operations in radiologically controlled areas, there have been no liquid or gaseous effluents released.

c. Conclusions

The licensee established and maintained an environmental monitoring program in accordance with TSs. The dose rate measurements and environmental sample results were not substantially different from background levels.

4. Surveillance and Maintenance

a. Inspection Scope

The inspector reviewed the licensee's surveillance and maintenance program to verify compliance with the TSs and applicable regulations. In addition, the inspector reviewed the licensee's corrective action process. The inspector toured the facilities, interviewed individuals, and reviewed selected procedures and records.

b. Observations and Findings

No findings of significance were identified.

The inspector reviewed the 2006 and 2007 annual reports and selected additional reports to confirm that surveillance activities were conducted in accordance with TS requirements. The licensee uses a database tracking system to identify the periodic maintenance and surveillance requirements. The surveillance and maintenance actions are discussed and assigned in weekly planning meetings. The licensee did not encounter any major issues during the periodic maintenance activities. The licensee also maintained a corrective action process to identify potential safety issues and areas for quality improvement. The inspector reviewed selected reports and found the licensee to be effectively using this process to identify issues and implement quality improvements.

c. Conclusion

The licensee implemented its surveillance and maintenance program in accordance with the license and the TSs. The licensee also maintained an adequate corrective action program.

5. Emergency Response and Security

a. Inspection Scope

The inspector reviewed the licensee's emergency response and security programs. The inspector performed walkdowns of areas and equipment in the ship and trailer, conducted interviews with personnel, and reviewed selected documents and records.

b. Observations and Findings

No findings of significance were identified.

The licensee maintains a response organization to comply with the TS requirement for response to a fire, flooding, or intrusion event. A health physicist is available within two hours to provide response and direction for radiological emergencies. Measuring and sampling equipment are available onboard the ship and in an offsite emergency supply cabinet. The inspector reviewed the licensee's physical program for maintaining access control and also for notification of security-related events and found that those programs were consistent with TS requirements.

c. Conclusions

The licensee's emergency response and security programs were in compliance with the TS requirements.

6. Follow-up on Previously Identified Issues

a. Inspection Scope

The inspector reviewed one inspector follow-up item (IFI) that had been identified and documented in Inspection Report 50-238/2006-201. The inspector reviewed relevant documents and discussed the actions taken by the licensee to resolve the issues.

b. Observations and Findings

No findings of significance were identified.

During the inspection conducted on October 10-11, 2006, the inspector reviewed the 2004 and 2005 annual reports that were required to be transmitted to the NRC in accordance with the TS. Based on the review, the inspector determined that some of the information required to be submitted was not specifically documented in the reports. The information missing from these reports included the results of quarterly intrusion alarm system checks and the results of occupational exposure measurements (IFI 50-238/2006-201-01). During the current inspection, the inspector reviewed supplemental information contained in the 2006 and 2007 reports that documented the information that was missing from the 2004 and 2005 reports. The licensee used its corrective action process to document the conditions and to track and complete corrective actions. The inspector further determined that the required information for 2006 and 2007 was in the respective reports for these subsequent years. Based on this review, IFI 50-238/2006-201-01 is closed.

c. Conclusions

Corrective actions were taken by the licensee and previously identified items involving one IFI were closed as a result of this inspection.

7. Exit Meeting

On September 10, 2008, the inspector presented the preliminary inspection results to the licensee's staff. The inspector confirmed that proprietary information was not provided or examined during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

E. Koehler, Senior Technical Advisor
J. Osborne, Licensing Compliance Manager
A. Paynter, Radiation Safety Officer
B. Sheranko, Business Manager
J. Weigand, Decommissioning Program Manager

INSPECTION PROCEDURES (IPs) USED

IP 69001 Class II Research and Test Reactors
IP 69002 Class III Research and Test Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Items Opened and Discussed

None

Items Closed

IFI 50-238/2006-201-01 Follow-up on information that was not included in the licensee's annual reports to the NRC that was required to be submitted by the TS and follow-up on the revision of the 2005 Annual Report to ensure that the correct radiation readings were reported.

LIST OF ACRONYMS

CFR	Code of Federal Regulations
IFI	Inspector Follow-up Item
IP	Inspection Procedure
MARAD	U. S. Maritime Administration
mR	MiliRoentgen
N.S.	Nuclear Ship
QA	Quality Assurance
RWP	Radiation Work Permit
STA	Senior Technical Advisor
STS	Savannah Technical Staff
TLD	Thermoluminescent Dosimeter
TS	Technical Specifications

LIST OF DOCUMENTS REVIEWED

- N.S. Savannah Annual Report 2006, STS-102, Rev.1, March 23, 2007
- N.S. Savannah Annual Report 2007, STS-105, Rev.0, February 28, 2008
- N.S. Savannah Updated Final Safety Analysis Report, STS-004-002, Rev. IV, April 20, 2007
- Radiation Protection Assessment, N.S. Savannah, June 24 & 25, 2008
- Radiation Work Permit No. 08-001, Routine Inspection, Minor Maintenance, Surveys – Reactor Compartment
- Radiation Work Permit No. 08-002, Routine Inspection, Minor Maintenance, Surveys – All Radiologically Controlled Areas Outside Reactor Compartment
- N.S. Savannah Radiation Control Area Photographs and Characterization Data, May 18, 2006
- 2008 N.S. Savannah General Employee Training, Baltimore MD
- N.S. Savannah Safstor Plan, STS-104, Rev.0, October, 2007
- N.S. Savannah, Notification of Planned Ship Movement from the Port of Hampton Roads / Norfolk, Virginia to Baltimore, Maryland, April 8, 2008
- N.S. Savannah, Amendment to Facility Operating License, Amendment No. 14, (Includes Technical Specifications and Safety Evaluation Report), April 3, 2008
- N.S. Savannah, Savannah Emergency Radiological Assistance Team (SERAT) Inspection Protocol, STS-007-001, Rev. 8, August 5, 2008
- Regulatory Analysis for N.S. Savannah, Decommissioning/License Termination, July 19, 2006
- N.S. Savannah Corrective Action Process, STS-003-002
- N.S. Savannah Decommissioning Quality Assurance Plan, STS-003, Rev.0, October 31, 2006