



U.S. Department of  
Transportation

**Maritime  
Administration**

Savannah Technical Staff  
Office of Ship Disposal

1200 New Jersey Ave., SE  
Washington, DC 20590

**Ref: 10 CFR 50.36(c)(5), 50.54w, 50.59(d)(2), 50.75(f)(1)**

February 27, 2009

**ATTN: Document Control Desk**  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

**SUBJECT: Docket No. 50-238; License No. NS-1; N.S. Savannah**  
Annual Report for CY 2008, Revision 0

**References:** (a) None

Pursuant to Technical Specification 3.4.2, the Maritime Administration (MARAD) is required to submit an annual written report. MARAD hereby submits Revision 0 to the CY 2008 Annual Report as Enclosure (1).

The annual report is also intended to meet the reporting requirements of 10 CFR 50.59(d)(2) to provide a summary of 10 CFR 50.59 evaluations for activities implemented under 10 CFR 50.59 and the reporting requirement of 10CFR 50.75(f)(1) to provide the status of decommissioning funding.

This submittal contains no new Regulatory Commitments.

If there are any questions or concerns with any issue discussed in this report, please contact me at (202) 366-2631, and/or e-mail me at [erhard.koehler@dot.gov](mailto:erhard.koehler@dot.gov).

Respectfully,

Erhard W. Koehler  
Senior Technical Advisor, N.S. Savannah  
Office of Ship Disposal

Enclosure

A020  
FSME

**Docket No. 50-238; License NS-1; N.S. *Savannah***  
**Submittal of Annual Report for CY 2008, Revision 0**  
**February 27, 2009**

Enclosure:

1. Annual Report for CY 2008, Revision 0

**Docket No. 50-238; License NS-1; N.S. Savannah**  
**Submittal of Annual Report for CY 2008, Revision 0**  
**February 27, 2009**

cc:

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NSS ESC  
NSS SRC  
Division of Atlantic Operations  
MAR 615

Hardcopy, cover letter only

MAR-600, 640, 640.2

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MAR-100, 640.2 (rf)  
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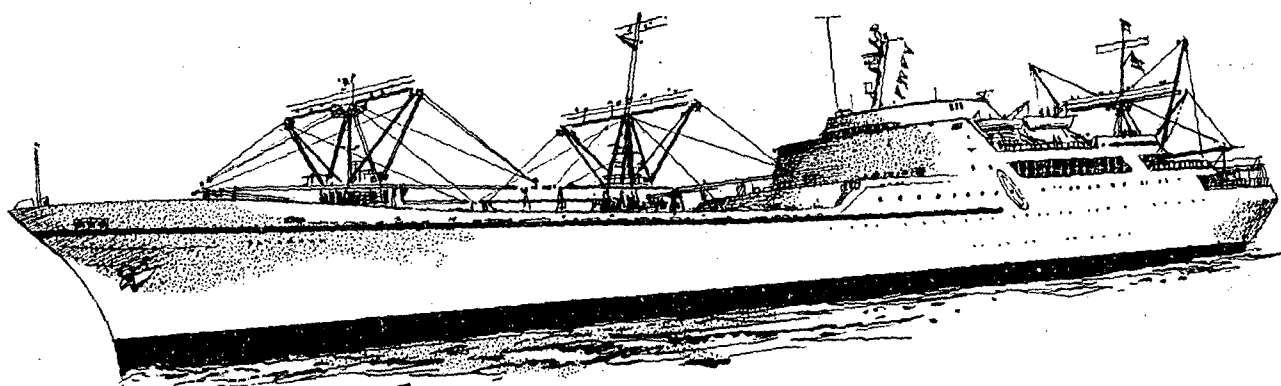
1200 New Jersey Ave., SE  
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**Docket No. 50-238; License No. NS-1; N.S. *Savannah***

**Enclosure 1 to Submittal of Annual Report for CY 2008, Revision 0**

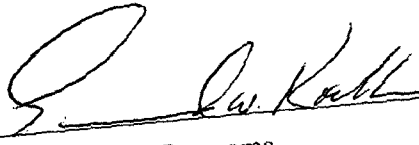


**U.S. Department of Transportation  
Maritime Administration  
Office of Ship Disposal**



**N.S. SAVANNAH  
ANNUAL REPORT  
2008**

**STS - 118**  
Revision 0

Approved:  February 27, 2009  
Date  
Manager, N.S. Savannah Programs  
Prepared by:  
Sayres and Associates Corporation

### **RECORD OF REVISIONS**

Revision	Summary of Revisions
0	The original version of the 2008 Annual Report License NS-1

**LIST OF EFFECTIVE PAGES**

<b>Page No.</b>	<b>Rev. No.</b>	<b>Page No.</b>	<b>Rev. No.</b>	<b>Page No.</b>	<b>Rev. No.</b>
1	0	2	0	3	0
4	0	5	0	6	0
7	0	8	0	9	0
10	0	11	0	12	0
13	0	14	0	15	0
16	0				

**Table of Contents**

<b>1.0</b>	<b>INTRODUCTION</b>	<b>5</b>
<b>2.0</b>	<b>ITEMS REQUIRED BY TECHNICAL SPECIFICATION 3.4.1</b>	<b>5</b>
2.1	Status of the Facility	5
2.1.1	License Activities	6
2.1.2	Organization	6
2.1.3	Review of Other Technical Specifications Requirements	6
2.1.4	Decommissioning Planning Activities	7
2.1.5	<i>Savannah</i> Emergency Radiological Assistance Team (SERAT)	8
2.2	Radiation Surveys and Monitoring Station Dosimeter Readings	8
2.2.1	2008 Radiation Survey Results in Radiologically Controlled Areas	8
2.2.2	Monitoring Station Dosimeter Results	10
2.3	Environmental Sample Analysis Surveys	10
2.4	Quarterly Intrusion Alarm System Checks	12
2.5	Radioactive Materials Removed by Releases, Discharges and Waste Shipments	12
2.5.1	Releases	12
2.5.2	Discharges	12
2.5.3	Shipments	12
2.6	Principal Maintenance Performed	12
2.7	Unauthorized Entry Into Radiation Control Areas and Corrective Actions Taken to Improve Access Control	14
2.7.1	Event Discussion	14
2.7.2	Improvements to Access Control	14
2.8	Inspection of Boundaries Containing Radioactive Materials	14
2.9	Summary of 2008 Occupational Exposure	14
<b>3.0</b>	<b>OTHER REPORTS</b>	<b>15</b>
3.1	10 CFR 50.59 Biennial report	15
3.2	Summary of Technical Specification Deviations	15
3.3	Decommissioning Funding Status	15
3.4	10 CFR 50.54w Insurance Annual Report	15
3.5	Corrections to Annual Report for 2007	15
<b>4.0</b>	<b>REFERENCES</b>	<b>16</b>



## **1.0 INTRODUCTION**

In accordance with the requirements of Technical Specification 3.4.2, an annual written report shall be submitted prior to March 1 of each year.

This report is arranged into two sections. Section 2.0 provides a discussion of the nine items required by the Technical Specifications. Section 3.0 provides a discussion of optional issues.

## **2.0 ITEMS REQUIRED BY TECHNICAL SPECIFICATION 3.4.1**

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* (NSS) 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 NSS;
- i. Results of occupational exposure indicated by personal dosimetry.

### **2.1 STATUS OF THE FACILITY**

During 2008, the NSS has remained "Mothballed" per the requirements of Regulatory Guide (RG) 1.86, "Termination of Operating Licenses for Nuclear Reactors," Reference (a). This state of protective storage was approved in Reference (b). This RG describes the now outmoded Mothballing option of protective storage.

During calendar year (CY) 2008, the ship was berthed in two locations:

- BAE Systems Norfolk Ship Repair facility in South Norfolk, VA (January 1-May 7).
- Pier 13, Canton Marine Terminal, 4601 Newgate Ave., Baltimore, MD (May 8 – December 31).

Keystone Shipping Company, acting as General Agent for MARAD, awarded BAE Systems Norfolk Ship Repair a contract to perform drydocking and exterior topside maintenance, repairs and painting in August 2007. Work commenced on portions of the topside (i.e., areas above the waterline) in late CY 2007. The NSS was placed onto the Titan drydock on January 19, 2008, and remained there until March 3. While on the drydock, BAE water-jetted, prepared and coated the entire exterior envelope of the ship. MARAD paid particular attention to inspecting and verifying the integrity of the underwater hull repairs made during the 1994 drydocking availability. Hull inspections identified no new degradation. Additional detail regarding the scope of the BAE contract award, and other principal maintenance performed during CY 2008 is listed in section 2.6.

The NSS was temporarily layberthed at the shipyard after completion of the BAE contract work, pending the award of long-term layberthing contract. Keystone solicited bids for the layberthing contract in February - March 2008. Four bids were received from facilities in Norfolk, VA; Philadelphia, PA and

**Savannah Technical Staff**  
**License NS-1 Annual Report 2008, Revision 0**  
**February 27, 2009**

Baltimore, MD. Keystone selected the bid submitted by Vane Bros. Inc., dba Canton Marine Terminals, as the best value, and awarded the contract in April 2008. The NSS was towed from the BAE facility on May 7, and arrived at the layberth location on May 8, 2008. The base year contract continues through May 7, 2009.

Similar to 2007, MARAD and contractor personnel were routinely on board the NSS during normal workdays throughout 2008. This regular attendance had the beneficial effect of improving the ship's physical condition and staff proficiency with the conduct of licensed activities.

#### **2.1.1 LICENSE ACTIVITIES**

MARAD completed two significant licensing actions in 2008.

- License Amendment 14 was approved on April 3, 2008. It redefines Radiological Controlled Areas (RCA), requires visitors to be escorted and resolves conflicts that result from implementation of the Decommissioning Quality Assurance Plan.
- Post Shutdown Decommissioning Activities Report (PSDAR), Rev. 1, Reference (c), was submitted on December 11, 2008.

MARAD continued developing and implementing a prioritized procedure and process development program in accordance with its overall license management program.

An announced facility inspection was conducted by the USNRC assigned Region I inspector on September 10, 2008.

#### **2.1.2 ORGANIZATION**

In 2008 MARAD made no substantial changes to the organization. The individuals filling the positions of Marine Surveyor and Facility Site Manager have left the *Savannah* Technical Staff. MARAD plans to combine these positions at a future date, pending availability of resources to do so.

#### **2.1.3 REVIEW OF OTHER TECHNICAL SPECIFICATIONS REQUIREMENTS**

In accordance with the NSS Technical Specification 3.6.3, the Safety Review Committee (SRC) is specifically required to review the following items with or without a formal meeting:

- a. *Proposed changes to Technical Specifications.*  
License Amendment Requests (LARs) and Responses to Requests for Additional Information on LARs were reviewed and approved prior to submittal.
- b. *Evaluations required by 10 CFR 50.59.*  
No Changes, Tests or Experiments were proposed in 2008 that would require a 50.59 evaluation. *Note that this sentence also meets the reporting requirement of 10 CFR 50.59(d)(2) to provide a brief description of any changes, tests, and experiments, including a summary of the evaluation of each.*
- c. *Proposed changes or modifications to a Radiological Controlled Area entry alarm system or reactor containment vessel system.*  
There were no changes to a RCA entry alarm system or to a reactor containment vessel system.
- d. *Evaluations of substantive changes to the results of radiological surveys.*  
There were no substantive changes to radiation surveys or security surveillance procedures.
- e. *Procedures and revisions per Technical Specification 3.5.*  
Procedures listed in TS 3.5 were reviewed prior to approval.

f. *Evaluations of reported violations of Technical Specifications.*

There were no TS violations during the reporting period.

g. *Evaluations of reportable events per Technical Specification 3.4.3.1.*

There were no reportable events during the reporting period.

h. *Evaluations of deviations allowed by Technical Specification 3.7.1.7.*

All deviations were reviewed prior to implementation. The following limited duration deviations were used as needed in the reporting period:

- Alarm Systems – Testing, Maintenance (Troubleshooting / Repair) and Modification.
- Loss of Electrical Power – invoked during brief periods of power disconnects while the NSS was at BAE Systems prior to, during and following the dry-dock contract.

i. *Audits and self assessments to verify the effectiveness of the Decommissioning Quality Assurance Plan.*

Self assessments were performed in the following functional areas in the reporting period:

- Comprehensive Action Tracking System;
- Security;
- Access Control;
- NSS Records Storage Area at US Merchant Marine Academy, Kings Point, NY;
- Implementation of 2007 Records Assessment Recommendations.

j. *Annual reports to the NRC.*

The CY 2007 Annual Report was reviewed prior to its submittal on February 28, 2008.

#### 2.1.4 DECOMMISSIONING PLANNING ACTIVITIES

Decommissioning planning during the reporting period focused on facility and administrative activities necessary to bring the *Savannah* into conformance with SAFSTOR requirements. The underlying intent is described more fully in reference (c). The following significant activities were completed in CY 2008:

- The Engineering, Management and Oversight Services (EMOS) contractor, Areva Federal Services, LLC, completed a “SAFSTOR Plan” (STS-104). This plan defines the activities necessary to implement the protective storage requirements of SAFSTOR, which are more comprehensive and programmatic than the mothballing requirements of Reference (a) that were implemented in 1975. The SAFSTOR Plan was reviewed and approved by the STS organization, including the SRC and the Executive Steering Committee. Upon adoption, the SAFSTOR Plan became the basis for subsequent decommissioning planning activities. Additional plans and reports stemming from the SAFSTOR Plan included:
  - SAFSTOR Cost Estimate, Schedule and Work Breakdown Schedule
  - Historic Site Assessment Report (STS-109)
  - Characterization Survey Plan (STS-110)
  - Electrical Upgrade Plan (STS-113)
  - HVAC Upgrade Plan (STS-114)
  - Mechanical Upgrade Plan (STS-115)
  - Safety Upgrades Plan (STS-116)
- The Maritime Administration published its Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the decommissioning of the N.S. *Savannah* in May 2008. These were submitted to the NRC for information on October 3, 2008 [Reference (d)].

- As noted in section 2.1.1, the revised PSDAR was prepared, approved and submitted to the NRC. The PSDAR combines elements of the SAFSTOR planning activities, and the MARAD EA and FONSI, together with updated decommissioning funding estimates prepared during the 4Q of CY 2008.

#### **2.1.5 SAVANNAH EMERGENCY RADIOLOGICAL ASSISTANCE TEAM (SERAT)**

Composition of the SERAT was reassigned to the ship's retention crew and designated members of the Savannah Technical Staff effective upon the departure of the NSS from the Newport News - Hampton Roads area. All local responders were trained following the ship movement. All SERAT members are located within a 2-hour response radius of the ship's current location.

### **2.2 RADIATION SURVEYS AND MONITORING STATION DOSIMETER READINGS**

Routine radiological surveys were conducted in accordance with the established program. Radiological survey measurements were taken in all RCAs and various non-RCAs. All non-RCA radiation survey results were insignificant as compared to background radiation levels.

#### **2.2.1 2008 RADIATION SURVEY RESULTS IN RADIOLOGICALLY CONTROLLED AREAS**

<b>Area</b>	<b>General Area Radiation levels <math>\mu\text{R/hr}</math> (micro- R/hr)</b>	<b>Highest Radiation Level <math>\mu\text{R/hr}</math> (micro-R/hr)</b>	<b>General Area Contamination Level (DPM/100cm<sup>2</sup>)</b>	<b>Highest Contamination Level (DPM/100cm<sup>2</sup>)</b>
Reactor Compartment Cupola Level	1.0	2.5	<1000	<1000
Reactor Compartment Upper Level	1.0	15 at open hatch to Reactor vessel	<1000	<1000
Reactor Compartment Forward Middle Level	1.0 - 1.5	1.5	<1000	<1000
Reactor Compartment Aft Middle Level	1.5	2.5	<1000	<1000
Reactor Compartment Lower Level	50 - 1000	120,000 on contact with pipe 7 ft in overhead; 10,000 @ 30 cm.	<1000	4041 inside drum
Containment Vessel 1 <sup>st</sup> Level	300- 450	2500 along Steam Drum	<1000	<1000

**Savannah Technical Staff**  
**License NS-1 Annual Report 2008, Revision 0**  
**February 27, 2009**

<b>Area</b>	<b>General Area Radiation levels μR/hr (micro- R/hr)</b>	<b>Highest Radiation Level μR/hr (micro-R/hr)</b>	<b>General Area Contamination Level (DPM/100cm<sup>2</sup>)</b>	<b>Highest Contamination Level (DPM/100cm<sup>2</sup>)</b>
Containment Vessel 2 <sup>nd</sup> Level	200 - 2500	4000 - 5000 along Steam Drum	<1000	<1000
Containment Vessel 3 <sup>rd</sup> Level	300 - 4000	15000 on contact with Steam Generator; 8000 @30cm	<1000	<1000
Containment Vessel 4 <sup>th</sup> Level	1000 - 4000	120,000 on contact with pipe; 12,000 @30cm	<1000	<1000
Port Charge Pump Room	2.0 - 50	250 on contact with pump suction line	<1000	<1000
Starboard Charge Pump Room	3.0 - 25	180 on contact with pump suction line	<1000	<1000
Hot Chemistry Lab	1.5	25 on contact with sink drain trap	<1000	<1000
Health Physics Lab	3.0	30 on contact with Steam Generator Primary Side Samples	<1000	<1000
Port Stabilizer Room	1.0 - 4.5	6.0 Knee level	<1000	<1000
Port Booster Pump Area	15 - 35	1000 on contact with piping	<1000	<1000
Starboard Stabilizer Room	1.5	2.5 Walkway	<1000	<1000
Stateroom B-1 Rad Waste Storage Area	5.0	8.0	<1000	<1000
Fan Room B Deck	1.0 - 2.0	2.0	<1000	<1000

<b>Area</b>	<b>General Area Radiation levels <math>\mu\text{R/hr}</math> (micro- R/hr)</b>	<b>Highest Radiation Level <math>\mu\text{R/hr}</math> (micro-R/hr)</b>	<b>General Area Contamination Level (DPM/100cm<sup>2</sup>)</b>	<b>Highest Contamination Level (DPM/100cm<sup>2</sup>)</b>
Cold Chemistry Lab Area C Deck	2.0- 6.0	35 on contact with the floor	<1000	<1000
Sample Room D-Deck	25 - 500	4000 on contact with overhead line	<1000	5139 inside sample sink
Gas Absorber Room D-Deck	2.0 - 35	500 on Suction Strainer	<1000	<1000
Cargo Hold D Deck	<1.0 – 6.0	150 on contact behind aft deck plates along Port side	<1000	<1000
Hold Deck Aft of Reactor space port side	5.0 - 7.0	50 on contact with piping under the deck plate	N/A	N/A

### 2.2.2 MONITORING STATION DOSIMETER RESULTS

Forty (40) permanently-placed thermoluminescent dosimeter (TLD) monitoring stations are dispersed throughout the non-RCAs of the NSS and in those areas of the NSS that are routinely occupied. Fixed point radiation surveys are performed during TLD change outs. Results from the TLDs from all monitoring stations indicated that readings were insignificant as compared to the background radiation levels. No fixed point radiation dose rate exceeded 5  $\mu\text{R/hr}$  (micro-R/hr).

### 2.3 ENVIRONMENTAL SAMPLE ANALYSIS SURVEYS

Environmental water and sediment samples were taken adjacent to the ship at various times during the calendar year as required by TS and ship's movement. Sediment samples were taken at the intended layberth location at Pier 13, Canton Marine Terminal, Baltimore, Maryland prior to the ship's arrival. Those samples indicated the presence of low level concentrations of Cs-137. The levels of Cs-137 at 1.03E-01 pCi/g and 1.21E-01 pCi/g are consistent with Cs-137 concentrations typically found in the environment. NSS sediment samples taken in October 2008 were below detectable levels. To establish local environmental radiological concentrations in and around the Pier 13 site, additional background sampling may be performed.

The environmental sample results indicate that the radiological conditions in the environment surrounding NSS are insignificant as compared to expected background conditions. Therefore, based on the results of the radiological environmental monitoring program, NSS operations did not have any adverse effects on the health and safety of the public or on the environment in 2008.

**2008 RADIOLOGICAL ENVIRONMENTAL SAMPLING RESULTS**

<b>Sample Location</b>	<b>Sample Date</b>	<b>Type of sample</b>	<b>Co-60</b>	<b>Cs-137</b>
BAE Shipyard Norfolk, VA NSS Port Side (Aft)	01/09/2008	Sediment (A)	8.58E-02 pCi/g (B)	8.47E-02 pCi/g (B)
BAE Shipyard Norfolk, VA NSS Stbd Side (Aft)	01/09/2008	Sediment (A)	4.72E-02 pCi/g (B)	4.76E-02 pCi/g (B)
BAE Shipyard Norfolk, VA NSS Port Side	04/30/2008	Sediment (A)	5.92E-02 pCi/g (B)	7.07E-02 pCi/g (B)
BAE Shipyard Norfolk, VA NSS Stbd Side	04/30/2008	Sediment (A)	5.74E-02 pCi/g (B)	5.57E-02 pCi/g (B)
BAE Shipyard Norfolk, VA NSS Port Side (Aft)	01/09/2008	Water	2.98E+00 pCi/L (B)	3.03E+00 pCi/L (B)
BAE Shipyard Norfolk, VA NSS Stbd Side (Aft)	01/09/2008	Water	3.48E+00 pCi/L (B)	3.29E+00 pCi/L (B)
BAE Shipyard Norfolk, VA NSS Port Side	04/30/2008	Water	4.67E+00 pCi/L (B)	4.64E+00 pCi/L (B)
BAE Shipyard Norfolk, VA NSS Stbd Side	04/30/2008	Water	3.42+00 pCi/L (B)	3.14E+00 pCi/L (B)
Pre arrival Pier #13, Canton Marine Terminal, Baltimore, MD (Mid)	04/28/2008	Sediment (A)	8.16E-02 pCi/g (B)	1.03E-01 pCi/g (C)
Pre arrival Pier #13, Canton Marine Terminal, Baltimore, MD (South)	04/28/2008	Sediment (A)	7.44E-02 pCi/g (B)	1.21E-01 pCi/g (C)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Mid)	10/02/2008	Sediment (A)	5.67E-02 pCi/g (B)	6.42E-02 pCi/g (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Stbd Side (Aft)	10/02/2008	Sediment (A)	9.90E-02 pCi/g (B)	1.26E-01 pCi/g (B)
Pre arrival Pier #13, Canton Marine Terminal, Baltimore, MD (Mid)	04/28/2008	Water	3.50E+00 pCi/L (B)	3.21E+00 pCi/L (B)
Pre arrival Pier #13, Canton Marine Terminal, Baltimore, MD (South)	04/28/2008	Water	2.39E+00 pCi/L (B)	3.12E+00 pCi/L (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Mid)	10/02/2008	Water	3.30E+00 pCi/L (B)	4.72E+00 pCi/L (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Stbd Side (Aft)	10/02/2008	Water	3.26E+00 pCi/L (B)	3.86E+00 pCi/L (B)

**2008 RADIOLOGICAL ENVIRONMENTAL SAMPLING RESULTS - Data notes from lab reports**

- (A) Sediment samples are reported on a dry weight basis and are decay corrected to the Sample Collect date
- (B) Calculated MDA as an a-posteriori values at the 95% Confidence Level
- (C) Water was decanted off of sediment samples

**2.4 QUARTERLY INTRUSION ALARM SYSTEM CHECKS**

Routine security surveillances were conducted as required and the Key and Seal log was reviewed on a quarterly basis. No deficiencies were noted.

Alarms were tested monthly and as needed following security system maintenance and modifications.

**2.5 RADIOACTIVE MATERIALS REMOVED BY RELEASES, DISCHARGES AND WASTE SHIPMENTS**

No radioactive materials were removed from the ship as described below:

**2.5.1 RELEASES**

There were no releases.

**2.5.2 DISCHARGES**

There were no discharges.

**2.5.3 SHIPMENTS**

There were no shipments.

**2.6 PRINCIPAL MAINTENANCE PERFORMED**

The major maintenance activity of CY 2008 was the drydocking and topside maintenance shipyard availability completed at BAE Systems Norfolk Ship Repair. In addition to the routine need to inspect and repair the ship's underwater hull, MARAD used this maintenance availability to perform a comprehensive assessment of the physical condition of the ship's primary structure and exterior envelope. As part of the assessment, MARAD entered into an agreement with the American Bureau of Shipping (ABS) to return the *Savannah* to hull classification. Once classed, the ABS will provide independent monitoring and review of the ship's structural condition.

At the previous drydocking availability in 1994, extensive repairs were made to the underwater hull by clad-welding deep pits; renewal of several hundred linear feet of welded butts and seams; and installation of steel doubler plates over four areas of generalized erosion and pitting at the "wind and water" interface. These repairs were subjected to intense survey and inspection by ABS and STS during the 2008 drydocking. All of the repairs were found to be in satisfactory condition. Three of the doubler plates were removed, and several of the underlying locations were inserted with new steel plates. The fourth doubler plate is located adjacent to the Cold Chemistry Laboratory, and was thus not removed because of the need to dismantle the laboratory equipment (with requisite radiological controls) to provide access for the required hot work in that area.

No record of ballast tank or other innerbottom tank inspections was found for the 1994 or the preceding 1975 drydocking availabilities. Consequently, planning for the 2008 drydocking availability included inspection and survey of all innerbottom and ballast tanks. All tank surveys and inspections were



completed, except for the number 4 centerline ballast tank<sup>1</sup>, and ballast and innerbottom tanks within the Reactor Compartment. Ultrasonic thickness gaugings were taken of the cargo hold tank tops (a principal structural member of the ship), and the ship's exterior hull structure. Additional gaugings were taken adjacent to each cargo hatch opening in the main deck; on the cargo hatch covers themselves, and at selected areas of structural concern and interest.

The entire exterior surface of the ship was prepared by waterjetting. The underwater hull, freeboard and main deck areas were prepared to bare steel, with all previous and original coating materials removed. A new high performance epoxy coating system was applied, with high gloss acrylic urethane topcoat. The underwater hull received one coat of conventional anti-fouling coating. Other areas of the topside exterior were prepared to a slightly lesser standard, with some original coating materials left intact. All previously existing hydraulic oils and similar materials were removed from non-functioning deck equipment, to minimize the risk of discharge of such materials into the environment.

The exterior envelope of the ship forms the perimeter boundary for licensed activities. Maintenance of the envelope ensures that the nuclear facilities housed inside the ship are protected. Based on the review of available records, it is surmised that the 2008 drydocking was the first comprehensive examination of the ship's structural fabric since 1967, when the ship underwent "Special Survey No. 1" for the ABS.

- Major drydocking work completed:
  - Underwater hull cleaning, surface preparation and coating;
  - Inspection and repair of 1994 hull repairs;
  - Freeboard preservation from deep loadline to top of the rails;
  - Topside and superstructure preservation including weather exposed decks;
  - Audio gauge exterior hull, decks, superstructure, tank tops and tanks;
  - Cathodic protection system; service and repair;
  - Removed ship's propeller and stored it on No. 7 cargo hold hatch cover;
  - Permanently sealed and capped the stern tube opening after removal of the propeller;
  - Examined, tested and repaired (as required) all hull blanks;
  - Examined and repaired as required bilge keel and bilge strake rivets;
  - Performed miscellaneous steel renewals, as needed, to side shell, bottom and main deck plating;
  - Removed ceramic tiles and magnesite underlayment from the Promenade Deck to permit inspection, repair and coating of underlying steel decks;
  - Internally inspected double bottom ballast tanks, forward and after peak tanks, No. 1 Deep Tank, and various voids and pipe tunnels;
  - Replaced the weathertight seals on main deck hatch covers at cargo holds 1, 2, 3, 4 and 7.

In summary, the structural condition of the ship was found to be very good. In particular, the innerbottom structure was found to have little-to-no structural degradation, and the original tank coatings were found intact and serviceable. All major hull strength components were inspected, repaired if necessary, and coated for long-term preservation. The thorough inspections and surveys of the ship's structural condition were documented to provide a baseline for the balance of the protective storage period.

Maintenance activities continued once the ship was moved to its Baltimore layberth. From that point onward, the maintenance strategy focused on routine preventative maintenance, and restoration of ship systems and equipment necessary for husbanding the ship, and long-term retention. In addition, discrete

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<sup>1</sup> The No. 4 centerline ballast tank is filled with water containing chemical compounds of indeterminate origin. The tank will be inspected at a future date after the water is processed and discharged. Structural inspections were completed of the exterior of the tank boundaries, however.

activities were performed to provide for more secure access control, security surveillance, and protection of shipboard personnel. Infrastructure improvements required to employ shipboard habitability areas for routine administrative purposes such as offices and meeting rooms are ongoing.

- Completed and Ongoing Maintenance Activities at Layberth:
  - Modification of port-side Passenger Sideport for secure daytime access;
  - Modification of Stateroom A-18 to Ship Security Office (adjacent to sideport);
  - Installed a new security gate key card system at the sideport entrance;
  - Reactivated the General Alarm to be audible throughout the ship;
  - Cleaned and painted numerous interior areas of the ship;
  - Guttled three adjoining crew staterooms on B Deck and converted area to Radiological Control Station;
  - Guttled six adjoining crew staterooms on C Deck and converted area to climate-controlled Records Vault;
  - HVAC installation on "B" Deck for offices / conference room; and "C" Deck Technical Library and Baggage Room (document storage);
  - Electrical distribution system surveys and inspections; restoration of interior and exterior lighting;
  - Repairs to aft mooring capstans and controllers.

## **2.7 UNAUTHORIZED ENTRY INTO RADIATION CONTROL AREAS AND CORRECTIVE ACTIONS TAKEN TO IMPROVE ACCESS CONTROL**

No unauthorized entries were made into any Radiation Control Area in the previous year.

### **2.7.1 EVENT DISCUSSION**

None

### **2.7.2 IMPROVEMENTS TO ACCESS CONTROL**

None

## **2.8 INSPECTION OF BOUNDARIES CONTAINING RADIOACTIVE MATERIALS**

The annual RCA boundary inspections required by Technical Specification 3.7.6 were conducted in December 2008.

There was no notable change in the condition of the primary and auxiliary systems since the last inspection series in December 2007. The exception is a more detailed inspection of the lower level Reactor Compartment port aft corner noted a small amount of standing water. A follow-up inspection in January 2009 noted significantly less water. This area will be monitored on a quarterly basis until the source of water is determined.

## **2.9 SUMMARY OF 2008 OCCUPATIONAL EXPOSURE**

As a result of the N.S. *Savannah* being in the Mothballed state of protective storage, no individual is expected to receive in one year, from sources external to the body, a dose in excess of 10% of the limits specified in 10 CFR 20.1201. Thirty (30) individuals were monitored with TLD and self-reading dosimetry during their entries into radiological controlled areas. All personnel received zero dose from occupational sources during the monitoring period. Therefore, MARAD has no requirement under 10 CFR 20.1502, "Conditions requiring individual monitoring of external and internal occupational dose" to reasonably anticipate that there is a need to "monitor exposure to radiation and radioactive materials at levels sufficient to demonstrate compliance with the occupational of dose limits." Likewise, MARAD

has no requirement under 10 CFR 20.2106, "Records of individual monitoring results" to maintain records of doses when an individual is not required to be monitored.

### **3.0 OTHER REPORTS**

#### **3.1 10 CFR 50.59 BIENNIAL REPORT**

Historically, the Biennial Summary Report has been included in each Technical Specification Annual Report (see 2.3.1.b of this report). No 10 CFR 50.59 Evaluations were completed in 2008.

#### **3.2 SUMMARY OF TECHNICAL SPECIFICATION DEVIATIONS**

No new Technical Specification Deviations were generated.

#### **3.3 DECOMMISSIONING FUNDING STATUS**

The following is intended to meet the reporting requirement of 10 CFR 50.75(f)(1). The N.S. *Savannah* and its nuclear reactor are federally-owned facilities, represented by the United States Department of Transportation, acting by and through the Maritime Administration. As such, funding for the decommissioning and disposal of the NSS reactor and nuclear systems components and waste must be provided by appropriations from the United States Congress. MARAD maintains no funding reserve, nor does it accumulate or collect funds. As allowed by 10 CFR 50.75(e)(1)(iv), MARAD will obtain funds for decommissioning when necessary. Appropriated funds for FY 2008 were \$4.7 million and were sufficient to support long-term layberthing following the drydocking. At the onset of FY 2009 (October 1, 2008), \$3.0 million had been requested to continue NSS licensed activities and SAFSTOR preparations<sup>2</sup>. Once SAFSTOR preparations are completed, and until 2023, funding can be reduced to a level commensurate with maintaining the facility and license in a SAFSTOR condition.

#### **3.4 10 CFR 50.54W INSURANCE ANNUAL REPORT**

The regulations require each power reactor licensee to obtain insurance available at reasonable costs and on reasonable terms from private sources or to demonstrate to the satisfaction of the NRC that it possesses an equivalent amount of protection covering the licensee's obligation. As a federal agency, MARAD is self-insured.

#### **3.5 CORRECTIONS TO ANNUAL REPORT FOR 2007**

Certain data elements in the Section 2.2.1 table in the 2007 Annual Report were inadvertently shown as milli-Rem/hr, rather than micro-Rem/hr. The data should have been reported as marked below.

<b>Area</b>	<b>General Area Radiation levels μR/hr (micro-R/hr)</b>	<b>Highest Radiation Level μR/hr (micro-R/hr)</b>
Reactor Compartment Lower Level	0.2 200	120,000 on contact with pipe 7 ft in overhead; 10,000 @ 30 cm.
Reactor Vessel 1 <sup>st</sup> Level	0.3—2.5 300-2500	2.5 2500
Reactor Vessel 2 <sup>nd</sup> Level	0.6—1.5 600-1500	2.5 2500 along Steam Drum
Reactor Vessel 3 <sup>rd</sup> Level	0.7—2.0 700-2000	7.3 7300 on contact with Port Steam Generator
Reactor Vessel 4 <sup>th</sup> Level	0.7—1.8 700-1800	1.8 1800 along Port side of Reactor

<sup>2</sup> At the time of submittal, the Federal Government is operating on a Continuing Resolution through March 6, 2009.

## **4.0 REFERENCES**

- a. Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, June 1974.
- b. Letter from Mr. Robert W. Reid (NRC) to U.S. Department of Commerce, Maritime Administration, dated May 19, 1976, No Title [Issuance of Amendment 8, Possession-only License].
- c. N.S. *Savannah* Post Shutdown Decommissioning Activities Report (PSDAR), Revision 1, submitted December 11, 2008, under cover letter from Mr. Erhard W. Koehler (MARAD) to U.S. Nuclear Regulatory Commission.
- d. Letter from Mr. Erhard W. Koehler (MARAD) to U.S. Nuclear Regulatory Commission, dated October 3, 2008, Submittal of Finding of No Significant Impact and Environmental Assessment.