



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), 50.54(w), 50.59(d)(2)**

February 28, 2013

**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 CY2012, Revision 0

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 Annual Report for CY2012 as Enclosure (1).

The annual report is also intended to meet the routine reporting requirements for:

- 10 CFR 50.59(d)(2) requires a summary of safety evaluations for activities implemented under 10 CFR 50.59; and,
- 10 CFR 50.54(w) Insurance Annual Report.

This submittal contains no new Regulatory Commitments; however, one revision to an existing commitment is described in Section 3.4 of the report.

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

FSME20

**Docket No. 50-238; License NS-1; N.S. SAVANNAH  
Submittal of Annual Report for CY2012, Revision 0  
February 28, 2013**

Enclosure:

1. Annual Report for CY2012, Revision 0

**Docket No. 50-238; License NS-1; N.S. SAVANNAH  
Submittal of Annual Report for CY2012, Revision 0  
February 28, 2013**

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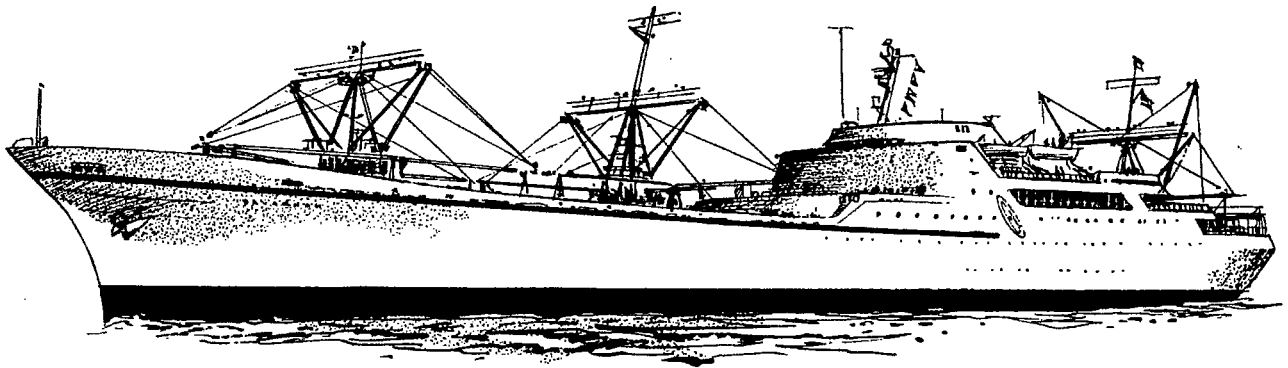
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**Docket No. 50-238; License No. NS-1; N.S. *SAVANNAH***

**Enclosure 1 to Submittal of Annual Report for CY2012, Revision 0**



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



**N.S. SAVANNAH**

**ANNUAL REPORT  
2012**

**STS - 172**

Revision 0

Approved:

02/28/2013

Manager, N.S. SAVANNAH Programs

Date

Prepared by:  
Keystone Shipping Services, Inc.

**RECORD OF REVISIONS**

Revision	Summary of Revisions
0	The original version of the 2012 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	17	0		

**Table of Contents**

<b>1.0</b>	<b>INTRODUCTION</b>	<b>5</b>
<b>2.0</b>	<b>ITEMS REQUIRED BY TECHNICAL SPECIFICATIONS</b>	<b>5</b>
2.1	TS 3.4.2.1.a. 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	SAVANNAH Emergency Radiological Assistance Team (SERAT)	7
2.2	TS 3.4.2.1.b. Radiation Surveys and Monitoring Station Dosimeter Readings	7
2.2.1	Monitoring Station Dosimeter Results	7
2.3	TS 3.4.2.1.c. Environmental Sample Analysis Surveys	8
2.4	TS 3.4.2.1.d Quarterly Intrusion Alarm System Checks	8
2.5	TS 3.4.2.1.e. Radioactive Materials Removed by Releases, Discharges and Waste Shipments	8
2.5.1	Releases	8
2.5.2	Discharges	8
2.5.3	Shipments	8
2.6	TS 3.4.2.1.f. Principal Maintenance and Related Activities	8
2.6.1	American Bureau of Shipping (ABS) Classification Surveys	8
2.6.2	Underwater Hull Inspection	9
2.6.3	Cathodic Protection System	9
2.6.4	Environmental Remediation	9
2.6.5	Ventilation System Repairs	9
2.6.6	Fire Hazards Analysis and Fire Zone Boundary Improvements	9
2.6.7	Reactor Compartment Equipment Access Trunk Repairs	9
2.7	TS 3.4.2.1.g. Unauthorized Entry Into Radiation Control Areas	9
2.7.1	Event Discussion	10
2.7.2	Improvements to Access Control	10
2.8	TS 3.4.2.1.h. Inspection of Primary, Secondary and Auxiliary Systems Degradation	10
2.9	TS 3.4.2.1.i. Summary of 2012 Occupational Exposure	10
<b>3.0</b>	<b>OTHER NRC REPORTS</b>	<b>10</b>
3.1	10 CFR 50.59(d)(2) Report of Changes, Tests or Experiments	10
3.2	10 CFR 50.54(w)(3) Insurance Annual Report	10
3.3	Summary of Technical Specification Deviations	10
3.4	Commitment Management Status	11
<b>4.0</b>	<b>SIGNIFICANT MARAD ISSUES</b>	<b>11</b>
4.1	Remaining Protective Storage Timeline	11
4.2	Public Events, Visitation and Training	11
4.3	Historic Stewardship	11
<b>5.0</b>	<b>REFERENCES</b>	<b>12</b>
<b>Appendix A</b>	<b>2012 Radiation Survey Results in Radiologically Controlled Areas</b>	<b>13</b>
<b>Appendix B</b>	<b>2012 and 2011 (Revised) Radiological Environmental Sampling Results</b>	<b>16</b>



## **1.0 INTRODUCTION**

This Annual Report is submitted by the Maritime Administration (MARAD) as licensee for the Nuclear Ship *SAVANNAH* (NSS) and covers the CY 2012 reporting period. This report is arranged into three sections. Section 2.0 provides the discussion of the various reporting items required by the Technical Specifications. Section 3.0 includes other periodic reports required by the NRC, and issues of regulatory significance. Section 4.0 includes facility issues that MARAD believes may be of interest to the NRC.

In accordance with the requirements of Technical Specification 3.4.2.1, the written annual report shall be submitted prior to March 1 of the following calendar year, and shall specifically include the nine (9) reporting items listed in that specification. These items are addressed in Sections 2.1 through 2.9 inclusive. In addition, Technical Specification 3.6.3 requires the Safety Review Committee to review ten (10) items, one of which is this annual report. Section 2.1.3 includes the status of these ten SRC review items.

## **2.0 ITEMS REQUIRED BY TECHNICAL SPECIFICATIONS**

The nine (9) TS 3.4.2.1 items specifically required to be included in the written annual report are as follows:

- 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.

The status of these subject items were reviewed by the Safety Review Committee at its annual meeting on November 13, 2012 and by the Executive Steering Committee members during signature concurrence routing prior to submission of this annual report to the NRC.

### **2.1 TS 3.4.2.1.a. Status of the Facility**

During Calendar Year (CY) 2012, the ship was berthed at Pier 13, Canton Marine Terminal, 4601 Newgate Ave., Baltimore, MD, and remained "Mothballed" per the requirements of Regulatory Guide (RG) 1.86, "Termination of Operating Licenses for Nuclear Reactors," Reference (a). This June 1974 RG describes the now outmoded Mothballing option of protective storage. This state of protective storage was approved in 1976 by Amendment 8 (Possession-Only) to License NS-1, Reference (b).

**SAVANNAH Technical Staff**  
**STS - 172, Annual Report 2012, Revision 0**

As described in MARAD's Post Shutdown Decommissioning Activities Report (PSDAR), Rev 1, Reference (c), in 2008 MARAD committed to a project to bring the NSS into conformance with the contemporary NRC SAFSTOR protective storage criteria. Appropriated funding has not yet been provided for that project. In the interim, MARAD has maintained its active retention program of surveillance, monitoring and maintenance of the nuclear facilities housed onboard the ship, and custody, maintenance and repair of the ship as the primary physical boundary and protective barrier of the licensed site.

**2.1.1 License Activities**

MARAD completed no significant licensing action in 2012.

The USNRC conducted no facility inspection in 2012.

**2.1.2 Organization**

In 2012, MARAD made no substantial changes to its licensee organization. The organization is made up of MARAD direct employees, contractors, and consultants. Of three existing service contracts, the major contract for License Technical Services ended on September 30, 2012. A solicitation to combine the License Technical Services function with the other service contracts for Radiological Protection and Ship Husbandry was in progress during much of the reporting period (note; the solicitation is in the award phase at the time of submittal of this report). The existing radiological protection and ship husbandry contracts remained in force throughout the reporting period, and license consultants were retained to maintain continuity of essential organizational competencies.

**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.***

No changes were proposed to the Technical Specifications in CY 2012.

**b. *Evaluations required by 10 CFR 50.59.***

Safety Evaluation Screenings were performed as required. No screening determined that a 10 CFR 50.59 Evaluation was required; consequently, none were performed. Additional information regarding 10 CFR 50.59 Evaluations is found in Section 3.1 of this report.

**c. *Proposed changes or modifications to a Radiologically Controlled Area entry alarm system or reactor containment vessel system.***

No changes were proposed and no modifications were performed to the Alarm System in 2012. All security systems are functional.

There were no changes to the reactor containment vessel system.

**d. *Evaluations of substantive changes to the results of radiological surveys.***

There were no substantive changes to the results of radiation surveys.

**e. *Procedures and revisions per Technical Specification 3.5.***

**SAVANNAH Technical Staff**  
**STS - 172, Annual Report 2012, Revision 0**

Per Technical Specification 3.5, procedures and their revisions were reviewed prior to approval.

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

There were no reported violations to Technical Specifications in 2012.

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

There were no reportable events in 2012.

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

No new Technical Specification Deviations were approved in 2012.

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

Assessments were performed in the following functional areas in the reporting period:

- STS-169, 2012 Records and Controlled Document Assessment;
- STS-170, Technical Specification 3.7.1.7 Deviations Review 2012;
- STS-171, Review of Regulatory Commitments July 2012;
- STS-174, 2012 Annual Radiation Protection Program Assessment
- STS-175, Annual Structures, Systems and Components Degradation Inspection (T.S. 3.7.3.4) 2012

j. *Annual reports to the NRC.*

The CY 2012 Annual Report (STS-172) and the CY 2012 Decommissioning Funds Status Report (STS-173) were reviewed prior to their submittal to the NRC.

#### 2.1.4 Decommissioning Planning Activities

No new decommissioning planning was conducted during the reporting period other than periodic review and updating of existing decommissioning plans and cost estimates.

#### 2.1.5 SAVANNAH Emergency Radiological Assistance Team (SERAT)

There were no significant changes to the staff or changes to the ship location. All SERAT members are located within a 2-hour response radius of the ship's current location.

### 2.2 ***TS 3.4.2.1.b. Radiation Surveys and Monitoring Station Dosimeter Readings***

A routine radiological survey program continued to be followed in 2012. Radiological survey measurements were taken in various non-Radiological Controlled Areas and Radiological Controlled Areas. There were no significant changes found in 2012. All readings in non-Radiological Controlled Areas were insignificant as compared to background radiation levels.

The results of the 2012 Radiation Survey Results in Radiologically Controlled Areas are listed in Appendix A.

#### 2.2.1 Monitoring Station Dosimeter Results

Forty-five (45) permanently placed thermoluminescent dosimeter (TLD) monitoring stations are dispersed throughout the non-radiological controlled areas 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 TS 3.4.2.1.c. 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 potential ship's movement to new piers.

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 2012.

The results of the 2012 Radiological Environmental Sampling Results are listed in Appendix B.

### **2.4 TS 3.4.2.1.d Quarterly Intrusion Alarm System Checks**

Routine security surveillances were conducted as required by Technical Specification 3.7.2.1 and the Key and Seal log was reviewed on a quarterly basis. Other monitored doors were tested. Identified deficiencies were corrected on the spot.

### **2.5 TS 3.4.2.1.e. Radioactive Materials Removed by Releases, Discharges and Waste Shipments**

No radioactive materials were removed from the ship by any of the methods 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 TS 3.4.2.1.f. Principal Maintenance and Related Activities**

The major maintenance activities of CY 2012 continued to focus on routine preventative maintenance, preservation of the ship's structural and weather integrity, and restoration of ship systems and equipment necessary for husbanding the ship and for its long-term retention and decommissioning. In addition, the following significant discrete activities were performed:

#### **2.6.1 American Bureau of Shipping (ABS) Classification Surveys**

The NSS is maintained in ABS Class as a barge in river service. This classification status permits the ABS to exercise independent oversight of the material condition and integrity (structural, watertight and weathertight as applicable) of the ship's hull. Other classification services can be provided as required.

Material condition surveys are normally based on a five-year cycle. Because the NSS is not an active seagoing vessel, MARAD and ABS employ a 10-year survey and drydocking cycle in which surveys are progressed voluntarily. The NSS is recorded as Laid-Up so as to prevent

suspension of Class. This program is functionally equivalent to that employed by MARAD with a certain number of its national defense retention vessels in the Ready Reserve Force. In 2012, MARAD completed the Annual Survey of Lay-Up, and a credited, diver-based underwater hull exam. Other surveys and services included ABS surveys of operational mooring and lifting equipment and ground tackle; surveys of various steel repairs and renewals; and continued review of the revised electrical one line diagram from the 2010 modifications to the Electrical Load Center for Shore Power Distribution. The electrical review was complete pending approval of one outstanding requirement as of 12/31/2012.

#### 2.6.2 Underwater Hull Inspection

TS 3.7.3.3 requires that an underwater inspection of the hull be conducted at least every four years. A diver-based underwater hull inspection was performed on August 14, 2012. The overall condition of the coating system was found to be good, with no breakdown. Moderate marine growth (1/2 inch to 1 inch) was noted to be accumulating on the vessel's hull from the waterline to a depth of approximately 10 feet over the length of the vessel. The previous inspection was carried out on October 28, 2011, with similar findings.

#### 2.6.3 Cathodic Protection System

As required by TS 3.7.3.2, the impressed-current cathodic protection system was maintained and tested periodically during CY 2012.

#### 2.6.4 Environmental Remediation

Remediation of environmental concerns and hazards continued in 2012 on an as-needed basis. Typical examples of environmental remediation activities include mold / mildew removal, asbestos removal or encapsulation, and removal of various other substances that are features of the vintage construction techniques employed when the NSS was built and operated.

#### 2.6.5 Ventilation System Repairs

Interior repairs to two reactor compartment structural ventilation enclosures were completed in early 2012. These repairs were the last required repairs to address active water ingress based on inspections to date. The remaining exterior ventilation terminals will be repaired or renewed as necessary based on the results of future inspections. The severity of the degradation and availability of resources will dictate the priority for addressing the degradation.

#### 2.6.6 Fire Hazards Analysis and Fire Zone Boundary Improvements

The restoration of the magnetic fire zone door holdbacks that was in progress at the end of CY 2011 was not completed during CY 2012. A Fire Hazards Analysis commenced during the reporting period, and covered non-RCA areas of the ship. The Baltimore City Fire Department completed a walk-through and facility re-familiarization tour during CY 2012.

#### 2.6.7 Reactor Compartment Equipment Access Trunk Repairs

Work commenced to unseal the reactor compartment lower secondary access trunk (at Frame 99) for eventual use as a second means of access and emergency egress from the lower secondary; during the reporting period the exterior clam shell steel doors were opened and examined. Work did not progress to the point of opening the main deck hatch, which is the RCA entry point. Work was suspended in October 2012, and will be resumed in CY 2013 as weather permits.

#### 2.7 *TS 3.4.2.1.g. Unauthorized Entry Into Radiation Control Areas*

No unauthorized entries were made into any Radiological Controlled Area in 2012.

**2.7.1 Event Discussion**

None

**2.7.2 Improvements to Access Control**

None

**2.8 TS 3.4.2.1.h. Inspection of Primary, Secondary and Auxiliary Systems Degradation**

The annual inspection required by Technical Specification 3.7.3.4 was conducted October 17 through October 24, 2012. It is documented in STS-174, NSS Annual Structures, Systems and Components Degradation Inspection 2012. There was no notable change in the condition of the primary, secondary and auxiliary systems since the last inspection in 2011. Forward and Aft RCLL Sump levels continue to be monitored.

**2.9 TS 3.4.2.1.i. Summary of 2012 Occupational Exposure**

As a result of the NSS 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. Ninety (90) individuals were monitored with TLD and self reading dosimetry during their entries into radiological controlled area. 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 NRC REPORTS**

**3.1 10 CFR 50.59(d)(2) Report of Changes, Tests or Experiments**

The regulations require each power reactor licensee to submit, at intervals not to exceed 24 months, a report containing a brief description of any changes, tests, and experiments, including a summary of the evaluation of each.

No Changes, Tests or Experiments were proposed in 2012 that would require a 50.59 evaluation, and, consequently, no evaluations were completed.

**3.2 10 CFR 50.54(w)(3) 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. MARAD adheres to the federal rules of self-insurance as a matter of established policy.

**3.3 Summary of Technical Specification Deviations**

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

- Loss Of Alarm Coverage of B Deck Reactor Compartment Door

- Failure to patrol the vessel at least once during a twenty-four (24) hour period per Technical Specification 3.7.1.6 (Severe Weather prevents daily security patrols).

An annual review of all deviations was conducted as documented in STS-170, Technical Specification 3.7.1.7 Deviations Review 2012.

### **3.4 Commitment Management Status**

Regulatory Commitments were reviewed as required by STS-004-011, Commitment Management. The CY 2012 review is documented in Report STS-171, Review of Regulatory Commitments July 2012. The review determined that all of the commitments are being met as described to the NRC.

## **4.0 SIGNIFICANT MARAD ISSUES**

### **4.1 Remaining Protective Storage Timeline**

As described in Reference (c), and elsewhere, the license termination deadline for the NSS is December 3, 2031,<sup>1</sup> based on the Permanent Cessation of Operations milestone date of December 3, 1971. As of December 3, 2012, 41 years of protective storage had elapsed; slightly more than two-thirds (2/3) of the allowed 60-year protective storage period.

### **4.2 Public Events, Visitation and Training**

During 2012, the NSS again played host to a number of public events and group tours for a variety of educational, professional and celebratory purposes. The significant shipboard events of the year included the Port of Baltimore observance of National Maritime Day on May 19 (coincident with Armed Forces Day, which was also observed); and hosting of the annual meeting and first annual “ShiPosium” of the Steam Ship Historical Society of America on May 18. The NSS was honored as the recipient of the 2012 “Ship of the Year” award by the SSHSA. The NSS hosted a MARAD employee and family open house on June 16 during the Baltimore “Sailabration” weekend kick-off for the War of 1812 Bicentennial. Over 500 visitors participated in the various shipboard public events during 2012.

The NSS was also employed as a training site for various U.S. government agencies and organizational elements during CY 2012. Approximately 75 persons were engaged in training activities during three separate exercises.

CY 2012 marked the end of the formal 50<sup>th</sup> Anniversary program of events to commemorate the construction of the ship. The last recognized milestone was the Maiden Voyage to Savannah, Georgia, which was marked in that city by the unveiling of a state historical marker at the Savannah International Trade and Conference Center on August 22<sup>nd</sup>. The principal speaker at the unveiling ceremony was Deputy Maritime Administrator Paul Jaenichen.

### **4.3 Historic Stewardship**

Under the provisions of the National Historic Preservation Act (NHPA) of 1966, as amended, the highest standard of care for historic objects falls upon federal owners of National Historic Landmarks (NHL). The NSS was designated as a NHL in 1991, and is the only NHL property

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<sup>1</sup> December 3, 1971 is the de facto date of permanent cessation of operations date based on completing the reactor defueling that date by tensioning the reactor vessel head with six studs.

in the Department of Transportation inventory. MARAD maintains a continuous focus on its historic stewardship responsibilities when conducting activities on the NSS site. All work on the ship, whether radiological or not, is sensitive to maintaining the historic fabric and appearance of the ship. MARAD's Federal Preservation Officer (FPO) provides expert advice and guidance to licensee staff in these matters, particularly with respect to the implementation of the Secretary of the Interior's Standards for the Treatment of Historic Properties and Historic Vessel Preservation Projects.

Decommissioning activities are subject to the provisions of the NHPA, and MARAD includes such planning and consultation as is necessary to ensure that decommissioning activities are in compliance with all applicable historic preservation statutory and regulatory requirements, as well as the relevant executive orders.

## **5.0 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. Letter from Mr. Erhard W. Koehler (MARAD) to U.S. Nuclear Regulatory Commission (NRC), dated December 11, 2008, Submittal of Post Shutdown Decommissioning Activities Report, Revision 1



**Appendix A 2012 Radiation Survey Results in Radiologically Controlled Areas**

<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>
Reactor Compartment Cupola Level	1.0 – 4.0	10	<1000	<1000
Reactor Compartment Upper Level	1.0 – 1.5	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	1.0 – 2.5	10 on hose	<1000	<1000
Reactor Compartment Lower Level	30 - 3000	120,000 on contact with pipe 8 ft in overhead; 10,000 @ 30 cm.	<1000	4041 inside drum
Containment Vessel 1 <sup>st</sup> Level	150 - 450	2500 along Steam Drum	<1000	<1000
Containment Vessel 2 <sup>nd</sup> Level	150 - 2000	3500 along Steam Drum	<1000	<1000
Containment Vessel 3 <sup>rd</sup> Level	200 - 4000	10000 on contact with Steam Generator; 6000 @30cm	<1000	<1000
Containment Vessel 4 <sup>th</sup> Level	400 - 3500	50,000 on contact with pipe; 4500 @30cm	<1000	4092 STBD side off Deck
Port Charge Pump Room	1.5 - 30	100 to 120 on contact with pump suction line	<1000	<1000

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**STS - 172, Annual Report 2012, Revision 0**

**Appendix A 2012 Radiation Survey Results in Radiologically Controlled Areas**

<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>
Starboard Charge Pump Room	1.0 - 18	60 on contact with pump suction line	<1000	<1000
Hot Chemistry Lab	0.5 - 1.0	4.0 on contact with sink drain trap shielding. 25 on contact with trap.	<1000	<1000
Health Physics Lab	1.5 - 3.0	20 on contact with Steam Generator Primary Side Samples	<1000	<1000
Port Stabilizer Room	1.0 - 4.0	4.5 grate level	<1000	<1000
Port Booster Pump Area	3.0 - 28	800 on contact with piping with 30cm readings up to 120.	<1000	<1000
Starboard Stabilizer Room	1.0 - 1.5	1.5 lower level off walkway	<1000	<1000
Stateroom B-1 Rad Waste Storage Area	2.0 - 4.0	90 on contact with waste container, 16 @ 30cm.	<1000	<1000
Fan Room B Deck	0.5 - 1.5	1.5	<1000	<1000
Cold Chemistry Lab Area C Deck	1.0 - 6.0	20 on contact with the floor	<1000	<1000
Sample Room D-Deck	9.0 - 400	2000 on contact with overhead line	<1000	5139 inside sample sink
Gas Absorber Room D-Deck	5.0 - 26	340 on Suction Strainer	<1000	<1000

**SAVANNAH Technical Staff**

**STS - 172, Annual Report 2012, Revision 0**

**Appendix A 2012 Radiation Survey Results in Radiologically Controlled Areas**

<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>
Cargo Hold D Deck	0.5 – 40	60 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

**Appendix B 2012 and 2011 (Revised) Radiological Environmental Sampling Results**

2012 Radiological Environmental Sampling Results

Sample Location	Sample Date	Type of Sample	Co-60	Cs-137
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Mid)	05/16/2012	Sediment (A)	1.09E-01 pCi/g (B)	1.09E-01 pCi/g (C)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	05/16/2012	Sediment (A)	1.12E-01 pCi/g (B)	1.09E-01 pCi/g (C)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Fwd)	10/24/2012	Sediment (A)	1.95E-01 pCi/g (B)	2.16E-01 pCi/g (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	10/24/2012	Sediment (A)	1.05E-01 pCi/g (B)	9.41E-02 pCi/g (B)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Mid)	05/16/2012	Water	3.57E+00 pCi/L (B)	3.15E+00 pCi/L (B)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	05/16/2012	Water	3.85E+00 pCi/L (B)	3.69E+00 pCi/L (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Fwd)	10/24/2012	Water	3.21E+00 pCi/L (B)	3.33E+00 pCi/L (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	10/24/2012	Water	3.64E+00 pCi/L (B)	3.36E+00 pCi/L (B)

Table Data Notes

- (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) Results are statistically positive at the 95% Confidence level (Activity is greater than or equal to the two sigma uncertainty)

**SAVANNAH Technical Staff**  
**STS - 172, Annual Report 2012, Revision 0**  
**Appendix B 2012 and 2011 (Revised) Radiological Environmental Sampling Results**

2011 (Revised) Radiological Environmental Sampling Results

Sample Location	Sample Date	Type of Sample	Co-60	Cs-137
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Mid)	05/20/2011	Sediment (A)	7.76E-02 pCi/g (B)	8.73E-01 pCi/g (C)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	05/20/2011	Sediment (A)	6.19E-03 pCi/g (B)	9.61E-01 pCi/g (C)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Fwd)	12/21/2011	Sediment (A)	8.53E-02 pCi/g (B,D)	1.20E-01 pCi/g (C,D)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	12/21/2011	Sediment (A)	1.05E-01 pCi/g (B,D)	1.12E-01 pCi/g (C,D)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Mid)	05/20/2011	Water	4.78E+00 pCi/L (B)	4.48E+00 pCi/L (B)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	05/20/2011	Water	5.14E+01 pCi/L (B)	2.98E+00 pCi/L (C)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Fwd)	12/21/2011	Water	4.10E+00 pCi/L (B,D)	4.59E+00 pCi/L (B,D)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	12/21/2011	Water	5.54E+00 pCi/L (B,D)	4.39E+00 pCi/L (B,D)

Table Data Notes

- (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) Results are statistically positive at the 95% Confidence level (Activity is greater than or equal to the two sigma uncertainty)
- (D) Analytical results from the vendor laboratory are not available at this time. Results will be included in next year's report