



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, 2012

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 CY2011, 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 CY2011 as Enclosure (1).

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

- o 10 CFR 50.59(d)(2) requires a summary of safety evaluations for activities implemented under 10 CFR 50.59; and,
- o 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.

Respectfully,

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

Enclosure

A020
FSME20
FSME

**Docket No. 50-238; License NS-1; N.S. SAVANNAH
Submittal of Annual Report for CY2011, Revision 0
February 28, 2012**

Enclosure:

- 1. Annual Report for CY2011, Revision 0**

**Docket No. 50-238; License NS-1; N.S. SAVANNAH
Submittal of Annual Report for CY2011, Revision 0
February 28, 2012**

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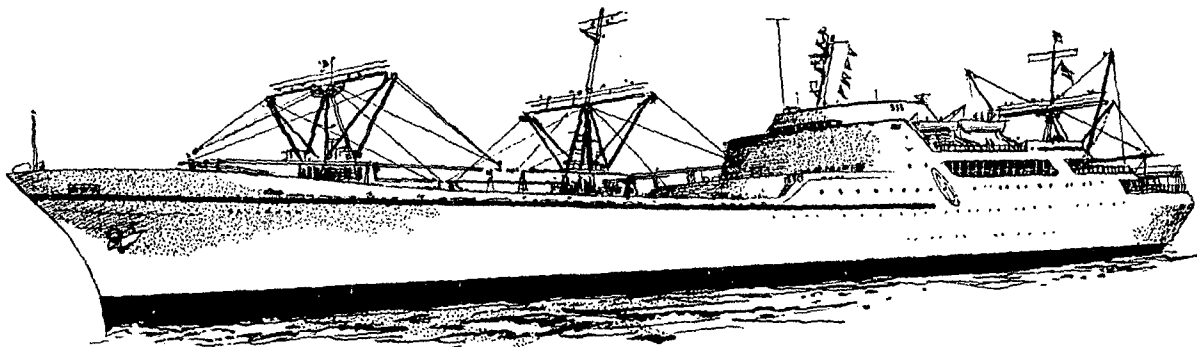
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Docket No. 50-238; License No. NS-1; N.S. *SAVANNAH*

Enclosure 1 to Submittal of Annual Report for CY2011, Revision 0



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



N.S. SAVANNAH

ANNUAL REPORT

2011

STS - 149

Revision 0

Approved: *[Signature]* 02/20/2012
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 2011 Annual Report License NS-1

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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 2011 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 separately reviewed by the Safety Review Committee and Executive Steering Committee 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) 2011, 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).

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,

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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 2011; however, in response to MARAD's letter request of November 8, 2010, the NRC granted MARAD exemptions from certain security requirements of 10 CFR 50.54(p) and 10 CFR 73. The exemptions were effective October 7, 2011.

In 2006, MARAD completed an internal regulatory compliance analysis that identified numerous administrative deficiencies with respect to its conduct of licensed activities. The findings of that analysis were provided to the NRC, and corrective actions were implemented. In September of this year, the Safety Review Committee approved Reports STS-153, License Compliance Review, Final Effectiveness Review of the July 2006 Regulatory Analysis, and STS-154, License Termination Compliance Review, Final Update of the July 2006 Regulatory Analysis. These reports document the satisfactory completion of the outstanding corrective actions.

The USNRC conducted its scheduled facility inspection on December 12, 2011.

2.1.2 Organization

In 2011 MARAD made no substantial changes to its licensee organization. The organization is made up of MARAD direct employees, contractors, and consultants. The major contract for License Technical Services is being extended to June 30, 2012 to permit time for a new contract to be solicited and awarded. The other major contracts, including radiological protection and ship husbandry, remained in force throughout the reporting period. The new contract to replace License Technical Services is expected to combine all three major services for the principal purpose of improving organizational efficiency.

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 2011.

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 2011. 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.*

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

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

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There were no reported violations to Technical Specifications in 2011.

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

There were no reportable events in 2011.

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:

- 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).

Additional information regarding Technical Specification Deviations is found in Section 3.3 of this report.

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-146, Review of Regulatory Commitments July 2011;
- STS-148, Technical Specification 3.7.1.7 Deviations Review 2011;
- STS-150, NSS Annual Structures, Systems and Components Degradation Inspection 2011;
- STS-152, Security Task Analysis;
- STS-153, License Compliance Review, Final Effectiveness Review of the July 2006 Regulatory Analysis;
- STS-154, License Termination Compliance Review, Final Update of the July 2006 Regulatory Analysis; and,
- STS- 161, Radiological Program Assessment December 2011.

j. *Annual reports to the NRC.*

The CY 2011 Annual Report (STS-149) and the CY 2011 Decommissioning Funds Status Report (STS-147) were reviewed prior to their submittal to the NRC.

2.1.4 Decommissioning Planning Activities

Decommissioning planning during the reporting period focused on reviewing and updating decommissioning plans and cost estimates. A concept plan to conduct DECON activities on a continuous basis from 2018 - 2031 was prepared and submitted to the Executive Steering Committee for consideration. The 2018 start date coincides with the next scheduled drydocking availability.

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 2011. Radiological survey measurements were taken in various non-Radiological Controlled Areas and Radiological Controlled

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Areas. There were no significant changes found in 2011. All readings in non-Radiological Controlled Areas were insignificant as compared to background radiation levels.

The results of the 2011 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 2011.

The results of the 2011 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 2011 continued to focus on routine preventative maintenance, preservation of the ship's structural integrity, and restoration of ship systems and equipment necessary for husbanding the ship and for its long-term retention and/or decommissioning. In addition, the following significant discrete activities were performed:

2.6.1 American Bureau of Shipping (ABS) 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 integrity (structural, watertight and weathertight as applicable) of the ship's hull. Other classification services can be provided as required.

In 2011, MARAD and ABS agreed to a voluntary survey progression program that accounts for the planned 10-year drydocking interval. Because normal ABS survey programs are based on a five-year progression, 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 2011, MARAD completed the Annual Survey of Lay-Up, and a credited, diver-based underwater hull exam. Other surveys and services included ABS review of the revised electrical one line diagram of the 2010 modifications to the Electrical Load Center for Shore Power Distribution. The review was still pending approval as of 12/31/2011.

2.6.2 Underwater Hull Survey

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 October 28, 2011. 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 July 6, 2010, 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 2011.

2.6.4 Environmental Remediation

Remediation of mold / mildew continued in areas surrounding the perimeter of the Reactor Compartment, particularly in the area surrounding the portside C and D Decks. Asbestos remediation was performed in the Engine Room, and other discrete areas adjacent to habitable zones and routinely-occupied areas of the ship.

2.6.5 Fire Zone Boundary Improvements

Significant improvements to the integrity of fire zone boundaries were made during 2011. This principally involved the removal of obsolete and dead-ended electrical cabling that fouled doors at the fire zone bulkheads. Removal of the cabling permits those doors to be closed. Magnetic fire door holdbacks were tested and found to be functional; restoration of this system is in progress at the end of CY 2011. In addition, the removal and consolidation of transient combustibles, and access modifications to permit the use of cargo holds 6 and 7 for protected storage have improved the fire loading conditions within the occupied zones of the ship.

2.7 *TS 3.4.2.1.g. Unauthorized Entry Into Radiation Control Areas and Corrective Actions Taken to Improve Access Control*

No unauthorized entries were made into any Radiological Controlled Area in 2011.

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 in November and December 2011. There was no notable change in the condition of the primary, secondary and auxiliary

systems since the last inspection in 2010. Forward and Aft RCLL Sump levels continue to be monitored quarterly.

2.9 TS 3.4.2.1.i. Summary of 2011 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 2011 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

One new Technical Specification Deviation was approved by the SRC on January 27, 2011. The deviation is titled "Loss of Alarm Coverage of B Deck Reactor Compartment Door" This deviation describes how the underlying intent of Technical Specification 3.7.1.5 is met under any condition that disables the B Deck Reactor Compartment Door. With the approval of this deviation, two deviations were determined to no longer be needed and were deleted:

- a. Loss of Electrical Power deviation can be cancelled because it is a subset of Loss of Alarm Coverage of B Deck Reactor Compartment Door deviation; and,
- b. Alarm Systems – Testing, Maintenance (Troubleshooting/Repair) and Modification deviation can be cancelled because it is a subset of Loss of Alarm Coverage of B Deck Reactor Compartment Door deviation.

3.4 Commitment Management Status

Regulatory Commitments were reviewed as required by STS-004-011, Commitment Management. The CY 2011 review is documented in Report STS-146, Review of Regulatory Commitments July 2011. The review determined that all of the commitments except one are being met as described to the NRC.

The deficient commitment was made in response to a 2001 Notice of Violation. As a result of the review, MARAD determined that the commitment required revision to remove unnecessary detail.

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The original commitment was:

MARAD will fully implement and document the status of the primary and secondary systems in accordance with the TS requirement, by invoking Inspection Procedure No. LAYUP-IS-002. [Continuing action]

While MARAD has performed annual inspections of the primary, auxiliary and secondary systems since the commitment was made, the inspections have not been documented per Inspection Procedure No. LAYUP-IS-002. That procedure has since been superseded by MARAD's current surveillance and monitoring program. The discrepancy was discovered in the course of the commitment review, resulting in the recommendation to revise the commitment. The Safety Review Committee reviewed and approved the commitment revision at its September 21, 2011 meeting.

The revised commitment is:

MARAD will perform and document an annual inspection to determine any degradation of the primary, auxiliary and secondary systems as required by Technical Specification 3.7.3.4. [Continuing action]

MARAD's commitment change process is based on NEI 99-04, Revision 0, "Guidelines for Managing NRC Commitment Changes." The rationale for and the evaluation of the above-described change is documented in attachments to STS-146 per the STS-004-011 commitment change process. The evaluation concluded the NRC should be notified of the change in the next annual report.

3.5 Heavy / Extreme Weather and Earthquake Response

On August 23, 2011, the NSS experienced effects of a magnitude 5.8 earthquake centered in Virginia. The ship's hull girder responded to the seismic wave as it was transmitted through the harbor waters. Neither the ship nor any installed equipment was damaged.

On August 25-26, 2011, the NSS experienced heavy weather associated with Hurricane Irene. Storm forces in the layberth area were lower than forecast, and the ship rode out the weather without incident. The ship's weather station recorded maximum gusting winds of 62 mph, and sustained winds of 40 mph; both of which are well below the design threshold of the ship's heavy weather mooring plan.

Both of these events were monitored by the NRC Region I Storm Center, and MARAD responded to requests for status before and after each event.

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, 2031,¹ based on the Permanent Cessation of Operations milestone date of December 3, 1971. During this calendar year period, MARAD observed both the 50th anniversary of First Criticality (December 21), and the 40th anniversary of Permanent Cessation of Operations. The NSS has now completed two-thirds (2/3) of its allowed 60-year protective storage period.

4.2 Public Events, Visitation and Training

During 2011, the NSS again played host to a number of public events and group tours for a variety of educational, professional and celebratory purposes. Significant events of the year included the Port of Baltimore observance of National Maritime Day on May 21 (coincident with Armed Forces Day, which was also observed); hosting of an offsite panel discussion by the DD&R Division of the American

¹ 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.

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Nuclear Society on November 2 in conjunction with the society's winter meeting in Washington, DC; and an invitational reception observing the 50th anniversary of the First Criticality milestone on December 21st. Over 500 visitors participated in the various public events during 2011.

The NSS was also employed as a training site for various U.S. government agencies and organizational elements during CY 2011. Approximately 75 persons were engaged in training activities during three separate exercises.

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 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 2011 Radiation Survey Results in Radiologically Controlled Areas

Area	General Area Radiation levels $\mu\text{R/hr}$ (micro-R/hr)	Highest Radiation Level $\mu\text{R/hr}$ (micro-R/hr)	General Area Contamination Level (DPM/100cm ²)	Highest Contamination Level (DPM/100cm ²)
Reactor Compartment Cupola Level	1.0 – 5.0	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	1.5	1.5	<1000	<1000
Reactor Compartment Aft Middle Level	1 - 3.5	10 on hose	<1000	<1000
Reactor Compartment Lower Level	40 - 4000	120,000 on contact with pipe 8 ft in overhead; 10,000 @ 30 cm.	<1000	4041 inside drum
Containment Vessel 1 st Level	150 - 450	2500 along Steam Drum	<1000	<1000
Containment Vessel 2 nd Level	150 - 2000	4000 - 5000 along Steam Drum	<1000	<1000
Containment Vessel 3 rd Level	200 - 4000	12000 on contact with Steam Generator; 8000 @30cm	<1000	<1000
Containment Vessel 4 th Level	500 - 4000	80,000 on contact with pipe; 10,000 @30cm	<1000	4092 STBD side off Deck
Port Charge Pump Room	1.5 - 40	150 to 250 on contact with pump suction line	<1000	<1000

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Appendix A 2011 Radiation Survey Results in Radiologically Controlled Areas

Area	General Area Radiation levels $\mu\text{R/hr}$ (micro-R/hr)	Highest Radiation Level $\mu\text{R/hr}$ (micro-R/hr)	General Area Contamination Level (DPM/100cm ²)	Highest Contamination Level (DPM/100cm ²)
Starboard Charge Pump Room	1.0 - 25	100 to 180 on contact with pump suction line	<1000	<1000
Hot Chemistry Lab	1.7	4.0 on contact with sink drain trap shielding. 25 on contact with trap.	<1000	<1000
Health Physics Lab	2.0 - 4.0	30 on contact with Steam Generator Primary Side Samples	<1000	<1000
Port Stabilizer Room	1.0 - 4.5	6.0 grate level	<1000	<1000
Port Booster Pump Area	4.0 - 30	1000 on contact with piping with 30cm readings up to 150.	<1000	<1000
Starboard Stabilizer Room	.05 - 1.5	1.5 lower level off walkway	<1000	<1000
Stateroom B-1 Rad Waste Storage Area	2.0 - 5.0	60 on contact with waste container, 10 @ 30cm.	<1000	<1000
Fan Room B Deck	1.0 - 2.0	2.0	<1000	<1000
Cold Chemistry Lab Area C Deck	1.5 - 6.0	26 on contact with the floor	<1000	<1000
Sample Room D-Deck	20 - 500	3200 on contact with overhead line	<1000	5139 inside sample sink
Gas Absorber Room D-Deck	4.0 - 60	450 on Suction Strainer	<1000	<1000

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Appendix A 2011 Radiation Survey Results in Radiologically Controlled Areas

Area	General Area Radiation levels μR/hr (micro-R/hr)	Highest Radiation Level μR/hr (micro-R/hr)	General Area Contamination Level (DPM/100cm²)	Highest Contamination Level (DPM/100cm²)
Cargo Hold D Deck	<1.0 – 50	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

Appendix B 2011 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)	0.00E+00 pCi/g (D)	0.00E+00 pCi/g (D)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	12/21/2011	Sediment (A)	0.00E+00 pCi/g (D)	0.00E+00 pCi/g (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	0.00E+00 pCi/L (D)	0.00E+00 pCi/L (D)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (Aft)	12/21/2011	Water	0.00E+00 pCi/L (D)	0.00E+00 pCi/L (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