U.S. Department of
Transportation

**Maritime
Administration**

1200 New Jersey Ave., SE
Washington, DC 20590

Ref: 10 CFR 50.36(c)(5), 50.54(w), 50.59(d)(2)

February 28, 2015

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 CY2014, 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 CY2014 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.

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

Enclosure:
1. Annual Report for CY2014, Revision 0

cc:

Electronic copy
NSS ESC
NSS SRC

MAR 610, 612, 615

Hardcopy, cover letter only
MAR-600, 640, 640.2

Hardcopy w/ all enclosures
MAR-100, 640.2 (rf)
USNRC (Ted Smith, Mark C. Roberts)
USNRC Regional Administrator - NRC Region I
MD Department of the Environment (Roland G. Fletcher; George S. Aburn, Jr.)
VA Department of Emergency Management (Michael M. Cline)
VA Department of Health (Leslie P. Foldesi)

EWK/jmo

U.S. Department of
Transportation

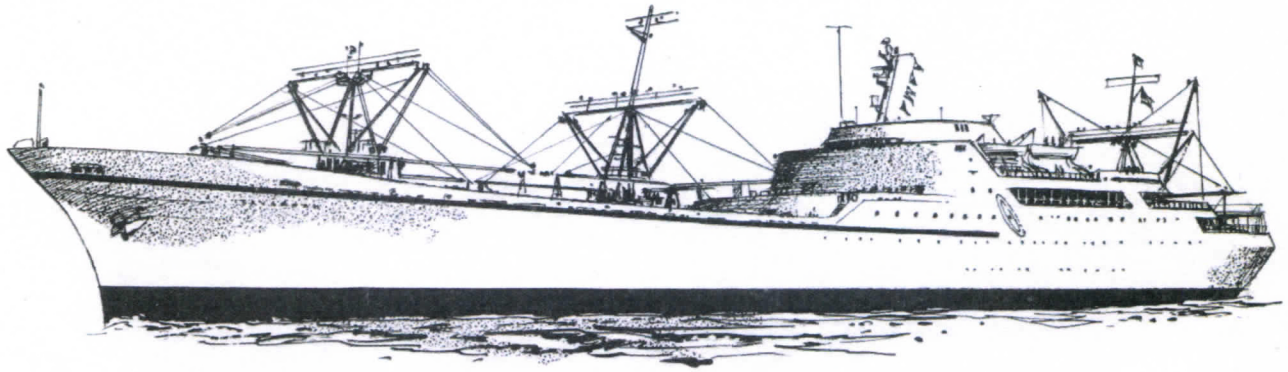
**Maritime
Administration**

1200 New Jersey Ave., SE
Washington, DC 20590

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

Enclosure 1 to Submittal of Annual Report for CY2014, Revision 0

U.S. Department of Transportation
Maritime Administration



N.S. SAVANNAH

ANNUAL REPORT
2014

STS - 191

Revision 0

Approved: _____ Date: 02/28/2015

Manager, N.S. *SAVANNAH* Programs

Prepared by:
TOTE Services, Inc.

RECORD OF REVISIONS

Revision	Summary of Revisions
0	The original version of the 2014 Annual Report License NS-1

LIST OF EFFECTIVE PAGES

Page No.	Rev. No.	Page No.	Rev. No.	Page No.	Rev. No.
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

1.0 INTRODUCTION

This Annual Report is submitted by the Maritime Administration (MARAD) as licensee for the Nuclear Ship *SAVANNAH* (NSS) and covers the Calendar Year (CY) 2014 reporting period. This report is arranged into three sections following the introduction. 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 December 10, 2014 and by the Executive Steering Committee members during its 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 CY 2014, the ship was berthed at Pier 13, Canton Marine Terminal, 4601 Newgate Avenue, Baltimore, MD, and remained "Mothballed" per the requirements of Regulatory Guide (RG) 1.86, "Termination of Operating Licenses for Nuclear Reactors," Reference (a). This 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, 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 2014.

The USNRC conducted a facility inspection on December 11, 2014, as documented in NRC Inspection Report No. 05000238/2014001.

2.1.2 Organization

In 2014, MARAD made one significant change to its licensee organization. The position of Decommissioning Project Manager (DPM) was vacated and will not be filled. A job posting has been created to fill the vacant (since 2008) position of Facility Site Manager with a full time MARAD employee. The position should be filled in 2015. MARAD made no other substantial changes to its licensee organization in 2014. The organization continues to be made up of MARAD direct employees, contractors, and consultants.

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 2014.

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.*

The SRC reviewed all changes to alarm systems prior to installation.

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.*

Procedures and their revisions were reviewed prior to approval.

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

There was one reported violation to Technical Specifications in 2014. The incident is documented in Corrective Action Report 2014-003, Missed Surveillance. Technical Specification 3.7.3.1 states “Two draft level stripes will be painted fore and aft (at the draft marks), one will be just above the water level and the upper stripe will be one foot above the lower. These will be observed daily to check if the draft has increased. Both stripes must always be visible.”

Surveillance TS-D-2 was not completed as required on Saturday, 1/18/2014. Corrective actions were implemented to prevent reoccurrence.

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

There were no reportable events in 2014.

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

No new Technical Specification Deviations were approved and no existing deviations were revised in 2014.

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:

- QSA-2014-001, Technical Specification 3.7.1.7 Deviations Review 2014.
- QSA-2014-003, Commitment Periodic Review 2014.
- QSA-2014-002, Procedure Annual Review 2014.
- QSA-2014, 2013, Annual Radiological Program Assessment.

j. *Annual reports to the NRC.*

During the reporting period, the CY 2013 Annual Report (STS-183) and the CY 2013 Decommissioning Funds Status Report (STS-189) were reviewed prior to their submittal to the NRC.

2.1.4 Decommissioning Planning Activities

During the reporting period, MARAD completed the planning for the environmental remediation of the Cold Chemistry Laboratory (CCL) that was reported last year, and performed work based on that planning. Based on the work completed within the CCL, similar work was planned for two additional radiologically controlled areas (RCAs) in 2014 - the Health Physics Laboratory (HPL) and the Hot Chemistry Laboratory (HCL). As with the CCL, the contemplated environmental remediation falls within the scope of the SAFSTOR preparations described in Reference (c). See Section 2.6 for information about the work performed within the three spaces in 2014.

Regarding the other two decommissioning planning activities that were reported in 2013, no further planning or related actions took place in 2014. Resources were not provided or obtained to commence pre-requisites to characterization; nor did the National Historic Preservation Act consultation work progress.

Other than the above, and the routine periodic review and updating of existing plans and cost estimates, no new decommissioning planning took place in the reporting period.

2.1.5 *SAVANNAH* Emergency Radiological Assistance Team (SERAT)

Except for the new DPM vacancy, there were no significant changes to the personnel composition of the SERAT or changes to the ship location. All SERAT members are located within a 2-hour response radius of the ship's current location. The incumbent DPM was not a 2-hour responding member of the SERAT.

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 2014. Radiological survey measurements were taken in various non-RCAs and RCAs. Evaluations of all surveys over the course of the year found no significant changes in 2014. All readings in non-RCAs were insignificant as compared

to background radiation levels. The results of the 2014 Radiation Survey Results in RCAs are listed in Appendix A.

2.2.1 Monitoring Station Dosimeter Results

Forty-six (46) permanently placed thermo luminescent dosimeter (TLD) monitoring stations are dispersed throughout the non-radiologically 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 μR/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 the samples taken shortly before the NSS arrived at Pier 13. 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 2014.

The results of the 2014 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.

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

Annually, MARAD's major maintenance activities focus on occupational and visitor safety, TS-required equipment, routine preventative maintenance, repairs and upgrades, 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. The following significant discrete activities were performed in 2014:

2.6.1 Underwater Hull Inspection

TS 3.7.3.3 requires that an underwater inspection of the hull be conducted at least every four years. MARAD performs this inspection annually as part of its hull classification program. The 2014 inspection was the normal diver-based visual examination of the underwater hull surface.

The underwater hull inspection was conducted by Marine Technologies Inc. (Baltimore, MD) on October 30, 2014. The survey was performed from pier-side at the Canton Marine Terminal - Pier 13, Baltimore, MD. The results of the inspection were satisfactory overall and within expectations. Two small areas of concern were noted, and close-up re-inspection of the areas will be performed in 2015.

2.6.2 Cathodic Protection System

As required by TS 3.7.3.2, the impressed-current cathodic protection system was maintained and tested periodically during CY 2014. The current Original Equipment Manufacturer (OEM) representatives inspected and serviced the system in early 2014, and made recommendations for upgrading the automatic control features of the 1960's vintage equipment. The controls upgrade is discretionary at this time, and has been added to the work package for the next maintenance drydocking. The system operates satisfactorily in manual control.

2.6.3 Alarm System Repairs

The ship's Siemens (formerly referred to as Hiller) combined fire and smoke detection and internal flooding and intrusion alarm system failed in June 2014. The system was installed in 2009, and has been prone to periodic failures since 2010. Numerous OEM repair attempts did not adequately resolve the problems. In July 2014, an independent Siemens-authorized vendor started a comprehensive hand-over-hand diagnosis and repair effort. Numerous installation faults were discovered and corrected in the process. Repairs continued to the end of the reporting period, with restoration projected in early CY 2015.

The Motorola (formerly referred to as TYCO) alarm system provides TS-required intrusion coverage and other redundant intrusion and heat detection. That system remained in service throughout the year. Compensatory actions were implemented to monitor for fire and smoke after the failure of the Siemens system.

2.6.4 Environmental Remediation within RCA spaces

In accordance with plans developed in 2013 and amended during 2014, environmental remediation (consisting of general housekeeping and maintenance of lighting systems) was conducted inside three RCAs. The affected spaces were the Cold Chemistry Laboratory, Hot Chemistry Laboratory, and the Health Physics Laboratory (CCL, HCL and HPL respectively; also see 2.1.4). The work was performed using own-staff resources trained for the purpose. Accumulated trash and debris was removed, scanned and classified. Clean trash was disposed. No hazardous materials were handled or disposed in this effort. Work was suspended in the CCL until a method to remove accumulated paint chips and flakes was determined; the paint is presumed to be lead-bearing in concentrations requiring controlled remediation by certified personnel. Work in the HCL and HPL was substantially complete by the end of the reporting period. Minor electrical repairs and close-out surveys will continue in 2015.

2.6.5 Safety Improvements

Three safety items were addressed during 2014:

a) Fire Doors. After restoration of the Fire Screen Door magnetic holdback system in 2013, several fire doors on the uppermost decks were still mechanically secured in the open position. Those remaining doors were repaired and restored to automatic operation in 2014.

b) Stair Tower Weather Egress. The exterior doors at the terminal ends of the aft, port and starboard fire stairs were secured in 1994 and sealed when the ship was placed under dehumidification. Those doors were unsealed and restored to function in 2014. The end-of-

day checklist was updated to include the doors to ensure Technical Specification 3.7.1.4 requirements continue to be met.

c) Accommodation Ladder Modifications for Permanent Means of Emergency Egress. A steel landing platform for the accommodation ladder was constructed and attached to the ship's side in April 2014. The free end of the ladder was landed onto the platform after installation. A short gangway section extends from the landing platform to the pier. This arrangement is designed and intended for emergency egress only. The modification prevents damage to the accommodation ladder itself by eliminating twisting motions imparted to the ladder when it is landed to the pier and the ship surges and heaves due to weather effects. The effects of such motions are much less pronounced on the short gangway section, which can easily be lifted and secured when weather conditions warrant.

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

No unauthorized entries were made into any RCAs in 2014.

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 between September 22, 2014 and October 2, 2014. It is documented in Surveillance TS-A-2-2014, Annual SSC Degradation Inspection. There was no notable change in the condition of the primary, secondary and auxiliary systems since the last inspection in 2013. Forward and Aft RCLL Sump levels continue to be monitored.

2.9 TS 3.4.2.1.i. Summary of 2013 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 percent of the limits specified in 10 CFR 20.1201. Seventy-eight individuals were monitored with TLD and self-reading dosimetry during their entries into RCAs. All personnel received less than five mRem 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 2014 that would require a 10 CFR 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.

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. As of December 3, 2014, 43 years of protective storage had elapsed; more than two-thirds (⅔) of the allowed 60-year protective storage period.

4.2 Public Events, Visitation and Training

Similar to past years, MARAD continued its program of public access and training support during 2014. In addition to several group tours, there were two public open house events. The first was on Sunday, May 18 as part of the Port of Baltimore observance of National Maritime Day, with a concurrent Port Exposition on Pier 13. The event had an estimated attendance of 2,000 persons. The second event was observed over the five day span of the Star Spangled Spectacular – the Bicentennial celebration of the Battle of Baltimore and the birth of the National Anthem. *SAVANNAH* was open to general public visitation from Thursday, September 11 through Monday, September 15. A total of 790 persons visited the ship, with the highest daily total (377) on Sunday. Other controlled-access public events included a technical tour and presentation in conjunction with the annual meeting of the Health Physics Society, and two Science, Technology, Engineering and Mathematics (STEM) related Boy Scout activities in October. The first Scout activity was a Nuclear Science Merit Badge workshop, timed to coincide with National Nuclear Science Week. The second activity, held on the same day, was an all-day international radio communications activity for Cub Scouts participating in the "Jamboree on the Air/Jamboree on the Internet." MARAD also participated in the second annual Baltimore "Port Fest", providing STEM presentations and technical tours of the NSS to middle and high school students in Maryland and Pennsylvania.

The NSS was again employed as a training site for various U.S. government agencies and organizational elements during CY 2014. No major exercises were conducted onboard, but two groups from the Weapons Intelligence Non Proliferation and Arms Control Center (WINPAC) were among the organizations hosted in 2014. Technical training was provided to the State University of New York Maritime College in April 2014. The college's training ship, EMPIRE STATE, made a port call to Baltimore in May, and a "sail by" was arranged for EMPIRE STATE to come in close proximity to *SAVANNAH*. The two ships are the oldest active vessels in MARAD's inventory, and share many common design characteristics and features. This was the first time that the two ships are known to have been visible together.

4.3 Historic Stewardship

MARAD maintained its robust historic stewardship program in 2014. 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

[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.

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. Please also see 2.1.4.

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 2014 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/100cm^2)	Highest Contamination Level (DPM/100cm^2)
Reactor Compartment Cupola Level	1.0 – 4.0	10	<1000	<1000
Reactor Compartment Upper Level	1.0 – 2.0	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	1.0 – 2.5	8 on hose	<1000	<1000
Reactor Compartment Lower Level	30 – 2000	40,000 on contact with pipe 8 ft in overhead; 10,000 @ 30 cm.	<1000	4041 inside drum (historical value from 2007)
Containment Vessel 1st Level	150 – 360	2500 along Steam Drum	<1000	<1000
Containment Vessel 2nd Level	100 - 2400	3500 along Steam Drum	<1000	<1000
Containment Vessel 3rd Level	150 - 4000	10000 on contact with Steam Generator; 6000 @30cm	<1000	<1000
Containment Vessel 4th Level	500-4000	50,000 on contact with pipe; 4,500 @30cm	<1000	3200 STBD side off Deck
Port Charge Pump Room	1.5 - 30	100 to 120 on contact with pump suction line	<1000	<1000

Area	General Area Radiation levels µR/hr (micro-R/hr)	Highest Radiation Level µR/hr (micro-R/hr)	General Area Contamination Level (DPM/100cm^2)	Highest Contamination Level (DPM/100cm^2)
Starboard Charge Pump Room	1.0 - 18	66 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	17 on drain pipe	<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	80 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	15 on contact with the floor	<1000	<1000
Sample Room D-Deck	10.0 – 480	3400 on contact with overhead line	<1000	1521 inside sample sink
Gas Absorber Room D-Deck	5.0 – 22	160 on Suction Strainer	<1000	<1000
Cargo Hold D Deck	0.5 – 40	60 on contact behind aft deck plates along Port side	<1000	<1000

Area	General Area Radiation levels µR/hr (micro-R/hr)	Highest Radiation Level µR/hr (micro-R/hr)	General Area Contamination Level (DPM/100cm^2)	Highest Contamination Level (DPM/100cm^2)
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 2014 Radiological Environmental Sampling Results

Sample Location	Sample Date	Type of sample	Co-60	Cs-137
Pier #13 Canton Marine Terminal, Baltimore, MD NSS STBD Side (AFT)	04/22/2014	Sediment (A)	1.26E-03 pCi/g (B)	1.34E-02 pCi/g (C)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS STBD Side (FWD)	10/16/2014	Sediment (A)	-3.37E-04 pCi/g (B)	1.91E-02 pCi/g (C)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (FWD)	04/22/2014	Sediment (A)	6.43E-03 pCi/g (B)	1.77E-02 pCi/g (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (AFT)	10/16/2014	Sediment (A)	-1.34E-02 pCi/g (B)	2.72E-02 pCi/g (B)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS STBD Side (AFT)	04/22/2014	Water	4.34E-01 pCi/L (B)	1.06E+00 pCi/L (B)
Pier #13 Canton Marine Terminal, Baltimore, MD NSS STBD Side (FWD)	10/16/2014	Water	-8.23E-01 pCi/L (B)	1.08E+00 pCi/L (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (FWD)	04/22/2014	Water	-1.39E+00 pCi/L (B)	1.45E-01 pCi/L (B)
Pier #13, Canton Marine Terminal, Baltimore, MD NSS Port Side (AFT)	10/16/2014	Water	-7.50E-01 pCi/L (B)	2.77E+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 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)