



U.S. Department
of Transportation

**Maritime
Administration**

SAVANNAH Technical Staff
Office of Ship Operations

400 Seventh Street, S.W.
Washington, D.C. 20590

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

March 23, 2007

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

SUBJECT: Docket No. 50-238; License No. NS-1; N.S. SAVANNAH
Annual Report for CY 2006, Revision 1

- References:**
- (a) Letter from Mr. E. W. Koehler (MARAD) to Document Control Desk (NRC), dated February 28, 2007, License NS-1, Docket No. 50-238; N.S. SAVANNAH Annual Report for CY 2006, Revision 0
 - (b) Letter from Mr. J. Buckley (NRC) to Mr. E. W. Koehler (MARAD), dated January 31, 2007, License NS-1, Docket No. 50-238; Issuance of Amendment No. 13 (License Amendment Request No. 2006-01) for NS SAVANNAH (Docket No. 50-238, License No. NS-1)

Pursuant to Technical Specification 3.4, the United States Maritime Administration (MARAD) is required to submit an annual written report. MARAD hereby submits Revision 1 to the CY 2006 Annual Report as Enclosure (1). The report replaces in its entirety Reference (a) which did not include the results of the analysis of the sediment samples for the Environmental Sample Analysis Surveys.

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

The NS SAVANNAH Service List in Reference (b) should be updated as indicated in Enclosure (2).

This submittal contains no new Regulatory Commitments.

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

Respectfully,

Erhard Koehler
Senior Technical Advisor, N.S. SAVANNAH
Office of Ship Operations

Enclosures

NMSSOI

**Docket No. 50-238; License NS-1; N.S. SAVANNAH
Submittal of Annual Report for CY 2006, Revision 1
March 23, 2007**

Enclosure:

1. Annual Report for CY 2006, Revision 1
2. NS SAVANNAH Service List

**Docket No. 50-238; License NS-1; N.S. SAVANNAH
Submittal of Annual Report for CY 2006, Revision 1
March 23, 2007**

cc:

Electronic copy

NSS ESC
NSS RAC
MRG-7600, 7700

Hardcopy, cover letter only

MAR-600, 610, 610.1, 610.3, 610.5, 611, 612 (em, ship file), 613, 614

Hardcopy w/ all enclosures and attachments

MAR-100, 610.4 (rf)
USNRC (John T. Buckley, Mark C. Roberts)
USNRC Regional Administrator - NRC Region I
MD Department of the Environment (Roland G. Fletcher; George S. Aburn, Jr.)
NC Department of Environment & Natural Resources (Beverly O. Hall)
SC Department of Health & Environmental Control (Henry Porter; T. Pearce O'Kelley)
VA Department of Emergency Management (Michael M. Cline)
VA Department of Health (Leslie P. Foldesi)

EK/jmo



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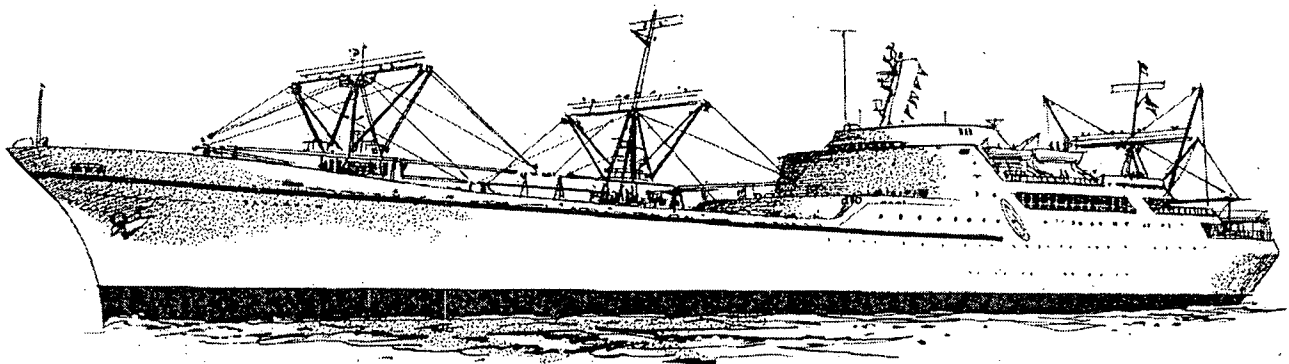
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Docket No. 50-238; License No. NS-1; N.S. SAVANNAH

Enclosure 1 to Submittal of Annual Report for CY 2006, Revision 1



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



N.S. SAVANNAH

**ANNUAL REPORT
2006**

STS-102

Revision 1

Approved: _____

Senior Technical Advisor

March 23, 2007

Date

Prepared by:
Sayres and Associates Corporation

RECORD OF REVISIONS

Revision	Summary of Revisions
0	The original version of the 2006 Annual Report
1	Included sediment data for Section 2.3

LIST OF EFFECTIVE PAGES

Page No.	Rev. No.	Page No.	Rev. No.	Page No.	Rev. No.
1	1	2	1	3	1
4	1	5	1	6	1
7	1	8	1	9	1
10	1	11	1	12	1
13	1	14	1	15	1
16	1	17	1	18	1
19	1	20	1	21	1
22	1	23	1	24	1
25	1	26	1	27	1
28	1	29	1	30	1
31	1	32	1	33	1

Table of Contents

1.0	INTRODUCTION	5
2.0	Items required by TECHNICAL SPECIFICATION 3.4.1	5
2.1	Status of the Facility	5
2.1.1	Decommissioning Planning Activities	5
2.1.2	Organization	6
2.1.3	License Activities	6
2.1.4	Review of Other Technical Specifications Requirements	7
2.1.5	Decommissioning Funding Status	8
2.1.6	SAVANNAH Emergency Radiological Assistance Team (SERAT)	8
2.2	Radiation Surveys and Monitoring Station Dosimeter Readings	8
2.2.1	Radiation Survey Results	8
2.2.2	Monitoring Station Dosimeter Results	20
2.3	Environmental Sample Analysis Surveys	21
2.4	Quarterly Intrusion Alarm System Checks	21
2.5	Radioactive Materials Removed by Releases, Discharges and Waste Shipments	21
2.5.1	Releases	21
2.5.2	Discharges	21
2.5.3	Shipments	21
2.6	Principal Maintenance Performed	21
2.7	Unauthorized Entry Into Radiation Control Areas & Actions Taken to Improve Access Control	22
2.7.1	Event Discussion	22
2.7.2	Improvements to Access Control	22
2.8	Degradation of Boundaries Containing Radioactive Materials	22
2.8.1	Primary System Degradation	22
2.8.2	Auxiliary System Degradation	22
2.8.3	Secondary System Degradation	22
2.9	Summary of Occupational Exposure	22
3.0	OTHER ISSUES	22
3.1	Quarterly Intrusion Alarm System Checks 2004 and 2005	22
3.2	Radiation Survey Results 2005	23

1.0 INTRODUCTION

In accordance with the requirements of Technical Specification 3.4.1, an annual written report shall be submitted prior to March 1 of each year.

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

2.0 ITEMS REQUIRED BY TECHNICAL SPECIFICATION 3.4.1

The report shall include the following:

- a. The status of the facility;
- b. The results of the radiation surveys and monitoring station dosimeter readings;
- c. The results of environmental sample analysis surveys;
- d. The results of quarterly intrusion alarm system checks;
- e. The amount of radioactive materials removed from the N.S. SAVANNAH (NSS) by releases, discharges, and shipments of radioactive waste material;
- f. A description of the principal maintenance performed on the vessel;
- g. Any unauthorized entry into radiation control areas by visitors or employees and corrective action taken to improve access control;
- h. Any degradation of one of the several boundaries which contain the radioactive materials aboard the NSS; and,
- i. Results of occupational exposure indicated by personal dosimetry.

2.1 STATUS OF THE FACILITY

As of December 31, 2006, the NSS was located at Colonna's Shipyard in Norfolk, VA. The facility is in a SAFSTOR condition. It is permanently defueled. Since 1976, the primary, auxiliary and secondary systems have remained dewatered to the maximum extent practical.

The NSS was not drydocked in 2006. Currently, MARAD is reevaluating drydocking schedule depending availability of funds.

2.1.1 DECOMMISSIONING PLANNING ACTIVITIES

The following significant activities were completed in 2006:

MARAD moved the NSS from the James River Reserve Fleet, Fort Eustis, VA (JRRF) to Colonna's Shipyard in Norfolk, VA for topside repairs and cleaning on August 15th, 2006;

MARAD held public meetings in Charleston, SC; Norfolk, VA; and Wilmington, NC to gauge public interest in decommissioning the NSS in one of these three port complexes;

The Engineering Management and Oversight Services (EMOS) contract was bid and is pending award;

Developed the FY '08 budget submission; and,

Developed and opened the Public Affairs Office Web-site dedicated to the N.S. SAVANNAH and its activities.

2.1.2 ORGANIZATION

In 2006, MARAD continued to improve the technical capabilities of the SAVANNAH Technical Staff (STS) by filling the following positions with experienced personnel:

Quality Assurance Manager;
Licensing and Compliance Manager;
Risk Manager;
Marine Surveyor;
Ship's Electrician; and,
Ship's General Agent (Keystone Shipping).

This increase in staffing has significantly improved the progress of bringing the ship out of the "state of dormancy" as MARAD completes pre-decommissioning activities.

2.1.3 LICENSE ACTIVITIES

MARAD completed three significant licensing actions in 2006:

MARAD submitted a license amendment request (LAR) to allow more efficient performance of pre-decommissioning activities (Amendment 13 was issued 1/31/2007);

MARAD submitted the Quality Assurance Plan to the NRC (following a discussion with NRC Revision 1 to the plan was submitted 2/27/2007); and,

MARAD submitted the Post Shutdown Decommissioning Activities Report to the NRC (Based on funding issues for FY 2007, the report was retracted on 1/27/2007).

MARAD continued activities to implement recommendations of the Regulatory Assessment completed in 2005. The most significant of these included developing and implementing a comprehensive action item tracking system and a prioritized procedure development program. Procedures developed and implemented include the Health Physics Manual (revision), Access Control (new), and Posting Requirements (new). The Corrective Action Process (CAP) was developed to include the full spectrum of a corrective action system from identification, management review, reportability determination, trending, development of corrective actions and effectiveness reviews corrective actions. During the latter half of 2006, the CAP was implemented on a trial basis. During the trial period, the process was revised as necessary to implement process improvements and ensure MARAD developed a full appreciation of the benefits of a CAP.

Two training programs were developed and implemented:

General Employee Training; and,
Radiation Protection Training.

On September 11, 2006, the Availability of a Draft Environmental Assessment (EA) for the NSS was noticed in the Federal Register. The draft EA analyzes the impacts associated with the full nuclear decommissioning of the vessel.

Location Surveys were completed for the various port complexes under consideration for decommissioning.

All Radiation Boundaries were audited and upgraded, as needed, prior to moving the NSS to the Colonna's Shipyard.

The following improvements were made to the records management system:

- Completed inventories of all Manuals and Drawings aboard the N.S. SAVANNAH; and,
- Completed a File-Folder inventory of boxed records in number 5 cargo hold.

2.1.4 REVIEW OF OTHER TECHNICAL SPECIFICATIONS REQUIREMENTS

In accordance with Technical Specifications, the Review and Audit Committee is specifically required to review the following items with or without a formal meeting:

- a. Written reports of any deficiency discovered as a result of audits, on-the-spot checks, and evaluations to assure that all work is being done safely and in accordance with established procedures per TS 3.6.3;

Any identified deficiency was documented in the Corrective Action Program. The Quality Assurance Manager provided a summary review of all open CAR Documents at the December Annual Meeting.

A self assessment of Site Access was conducted. Results were discussed at December 2006 Review and Audit Committee meeting.
- b. Proposed changes as required by 10 CFR 50.59 per TS 3.6.4;

This paragraph is intended to meet the reporting requirement of 10 CFR 50.59(d)(2) to provide a brief description of any changes, tests, and experiments, including a summary of the evaluation of each.

No Changes, Tests or Experiments were proposed in 2006 that would require a 50.59 evaluation.
- c. Proposed changes to Technical Specifications per TS 3.6.4;

License Amendment Requests (LARs) and Responses to Requests for Additional Information on LARs were reviewed and approved prior to submittal.
- d. Proposed changes or modifications to the vessel's controlled radiation area entry alarm system or containment system per TS 3.6.4;

No changes were proposed to the controlled radiation area entry alarm system or containment system.
- e. Substantive changes to radiation surveys or security surveillance procedures per TS 3.6.4;

There were no substantive changes radiation surveys.

JRRF security rounds were terminated with the ship move to the Colonna's Shipyard. The shipyard was under contract to provide a security guard onboard who is trained and conducts periodic rounds of the ship and secured boundaries.
- f. Reported violations of Technical Specifications per TS 3.6.4;

Any TS violations during the reporting period were entered into and resolved as required by the Corrective Action Process. These were reviewed as noted in 2.1.4.a above.
- g. Licensee Event Reports (LERs) per TS 3.6.4;

There were no LERs during the reporting period.
- h. Annual reports to the NRC per TS 3.6.4;

The CY 2005 Annual Report was reviewed prior to its submittal on February 28, 2006.

- i. Proposals to access Restricted areas without HP direction per TS 3.3.1;
There were no such proposals.
- j. Surveys that redesignate areas as Unrestricted per TS 3.3.1;
There were no such surveys.
- k. Procedures listed in TS 3.5;
Procedures listed in TS 3.5 were reviewed prior to approval.
- l. Groundings or sinkings per TS 3.6.5;
The following inspection results were reviewed after the October 2, 2006 wet berth shifting incident at Colonna's Shipyard:
 - There were no apparent changes in inner bottom tank soundings; and,
 - Diver surveys and videos of them indicated no apparent damage to the hull.
- m. Events since the previous RAC meeting 5 not discussed elsewhere per TS 3.6.; and,
All notable events since the last meeting were discussed.
- n. TS 3.7.1.7 Deviations from Access Control Requirements per TS 3.7.1.
No TS 3.7.1.7 Deviations were generated in 2006.

2.1.5 DECOMMISSIONING FUNDING STATUS

The following is intended to meet the reporting requirement of 10 CFR 50.75(f)(1). The N.S. SAVANNAH (NSS) and its nuclear reactor are federally owned facilities, represented by the United States Department of Transportation, acting by and through the Maritime Administration. As such, funding for the decommissioning and disposal of the NSS reactor and nuclear systems components and waste must be provided by appropriations from the United States Congress. MARAD maintains no funding reserve, nor does it accumulate or collect funds. As allowed by 10 CFR 50.75(e)(1)(iv), MARAD will obtain funds for decommissioning when necessary. As has been previously noted in correspondence and dialogue, the Congress appropriated funds to commence decommissioning of the NSS beginning in FY2005. Appropriated funds in FY's 2005 and 2006 total \$5.0M less rescissions. The President's FY2007 Budget Request included an additional \$10.0M to continue NSS activities. Additional funding requests are expected to be developed and included in future budgets.

Erhard tell the rest of the story here...

2.1.6 SAVANNAH EMERGENCY RADIOLOGICAL ASSISTANCE TEAM (SERAT)

The SERAT Team conducted a training exercise on December 19, 2006. The team deployed to the ship.

2.2 *RADIATION SURVEYS AND MONITORING STATION DOSIMETER READINGS*

The quarterly surveys indicated that there were no significant changes in area dose rates. As a result of the NSS moving to Colonna's Shipyard, water and sediment samples were taken prior to moving to the shipyard. Water and sediment samples were taken at the JRRF anchorage after departure.

2.2.1 RADIATION SURVEY RESULTS

The following table contains the correct survey data for 2006.

X = No measurement required

**SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007**

MDA for alpha = 7 dpm/100cm²

MDA for beta = 21.0 dpm/100cm²

Location	μREM/hr	Alpha dpm/100cm ²	Beta dpm/100cm ²
NAVIGATION BRIDGE			
Pilot House at helm	3.0	mda	mda
Bridge Wing port side	2.0	mda	mda
Fire Stat. #1 near chart room	2.0	mda	mda
Fan room port side gen. room	3.0	mda	mda
E.O.G. Room	3.0	mda	mda
BOAT DECK			
Chief Eng. State Room port side	2.0	mda	mda
Capt. State Room starboard side	3.0	mda	mda
Fire Stat #2 port side	4.0	mda	mda
Officers lounge aft	2.5	mda	mda
Hallway floor port side	3.5	mda	mda
Forward State Room starboard side	3.0	14	mda
Hallway floor forward center	3.0	mda	mda
PROMENADE DECK			
Top of reactor hatch	3.5	mda	mda
Starboard side of reactor hatch	3.5	mda	mda
Top of Hatch #4	3.0	mda	mda
Between Hatch #3 & #4	3.0	mda	26
Bow center of deck	3.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Center of Main Lounge	2.5	mda	mda
Center of Veranda	3.0	mda	mda
Fire Stat. #7 starboard side	4.0	mda	mda
Between Veranda & Swimming Pool	4.0	mda	mda
Library	3.0	mda	mda
Hallway in front of Main Lounge	3.0	mda	mda
Veranda port side forward	3.5	mda	mda
Bar at Veranda	3.5	mda	mda
REACTOR SPACE			
Hot pipe forward entry hatch	25	X	X
1 meter forward of lab tank	26	X	X
At lab tank	18	X	X
Pipe elbow port side forward	33	X	X
'Hot' pipe near entry hatch	X	mda	mda
Containment vessel middle of catwalk	11	mda	mda
Lab tank surface	6.0	mda	mda
Open valve next to lab tank	12	X	X
Containment vessel middle of catwalk	8.5	X	X
Piping at the port side forward catwalk	10	X	X
Middle of catwalk port side	20	mda	mda
Piping at the port side middle of catwalk	11	mda	mda
Valve handle port side aft	16	X	X
Damp area on floor middle of catwalk	6.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Containment vessel starboard side aft	44	X	X
Inside entry hatch pipe	X	mda	mda
FAN ROOM			
At floor Room center	3.0	X	X
Electric motor	4.0	mda	mda
Control box	3.5	mda	mda
CABIN B-1 B-3			
On drums of PCs in Cabin B-1	5.0	mda	mda
Average reading of Cabin B-3	3.5	X	X
On floor of Cabin B-1	X	mda	mda
Drum lid in Cabin B-1	X	mda	mda
STBD STABILIZER ROOM			
At entrance door	3.5	X	X
Average background	2.0	X	X
Catwalk Lower level	X	mda	mda
Catwalk Upper level	X	mda	mda
PORT STABILIZER ROOM			
At access hatch	3.5	X	X
At catwalk upper level	5.0	X	X
At internally contaminated strainer	16	X	X

**SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007**

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Diaphragm valve	28	X	X
Pipe to left of diaphragm valve	38	X	X
Internally contaminated valves	X	mda	mda
Control valve lower deck	X	mda	mda
Volume Chambers	X	mda	mda
Elbow diaphragm valve	X	mda	mda
STBD CHARGING PUMP ROOM			
Outside hatch	4.0	X	X
Inside hatch	14	mda	26
Center of floor	X	mda	mda
Pipe back of pump motor	46	mda	mda
Pipe in back of pump	X	mda	mda
Top of pump	X	mda	mda
Backside of pump	X	mda	mda
Center of floor	13	mda	26
Outside of hatch	X	mda	mda
Air duct at pump	X	mda	mda
Pump motor	X	mda	mda
PORT CHARGING PUMP ROOM			
Outside door 1m from deck	3.0	X	X
Between pumps	17	X	X
Deck at hatch	X	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Access hatch	X	mda	38
Deck by pumps	X	mda	mda
Floor between pumps	X	mda	mda
Pump in front of room	X	mda	mda
COLD CHEM LAB			
Background in Cold Chem Lab	8	X	X
Ventilation system/lead blanket	32	X	X
Drain (C deck)	165	X	X
Fume hood (D deck)	31	X	X
Top of storage tank	24	X	X
Air sampler (D deck)	35	X	X
Floor under air sampler (D deck)	15	X	X
Ledge of fume hood	78	X	X
Floor in front of ventilation system	11	X	X
Ventilation system	16	X	X
Ledge of fume hood (D deck)	X	mda	mda
Drain (C deck)	X	mda	mda
Floor under air sampler (D deck)	X	mda	mda
Floor front of vent system (C deck)	X	mda	mda
Air Sampler (D deck)	X	mda	mda
Floor under fume hood	X	14	mda
Shelving (C deck)	X	mda	mda
Top of storage tank	X	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Valve near floor (D deck)	X	mda	mda
HOT CHEM LAB			
Background in Hot Chem lab	4.5	X	X
Waste collection tank	6.5	X	X
Sink	3.0	X	X
Doorway to Hot Chem lab	2.5	X	X
Under sink	3.5	X	X
Sink drain	4.5	mda	mda
Inside waste collection tank	5.5	mda	mda
Fume hood inside	3.0	mda	mda
Floor inside door	3.5	mda	mda
Intake for hood	3.5	mda	mda
CARGO HOLD 2B			
Floor starboard side forward	3.0	mda	mda
Floor starboard side center	3.5	mda	mda
Floor starboard side aft	3.0	mda	mda
Floor aft center	3.0	mda	mda
Floor port side aft	2.0	mda	mda
Floor port side center	3.0	mda	mda
Floor port side forward	3.5	mda	mda
Floor forward center	3.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
CARGO HOLD 2C			
Floor port side center	3.5	mda	mda
Floor port side forward	2.5	mda	mda
Floor forward center	3.0	mda	mda
Floor starboard side forward	2.5	mda	mda
Floor starboard side center	2.5	mda	26
Floor starboard side aft	3.0	mda	mda
Floor aft center	3.0	mda	mda
Floor port side aft	3.5	mda	mda
CARGO HOLD 2D			
Starboard aft	3.0	mda	mda
Starboard amidships left	3.5	mda	mda
Starboard amidships right	3.0	mda	mda
Starboard bow	2.5	mda	mda
Centerline bow	2.5	mda	mda
Port side bow	2.0	mda	mda
Port side amidships	3.0	mda	mda
Port side aft	3.5	mda	mda
Centerline aft	3.0	mda	mda
Average	2.8	X	X
Maximum	3.5	X	X

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
2 TANK TOP			
Floor forward & starboard of sailboat	3.0	mda	mda
Floor sailboat center port side	3.0	mda	mda
Floor sailboat aft starboard	3.0	mda	mda
Floor sailboat center starboard	2.5	mda	mda
CARGO HOLD 3B			
At stairwell entering hold	3.5	mda	mda
Floor center forward	2.5	mda	mda
Floor starboard side forward	2.5	mda	mda
Floor starboard side center	3.5	mda	mda
Floor starboard side aft	2.5	mda	mda
Floor center aft	2.0	14	mda
Floor port side aft	2.5	mda	mda
Floor at display center	3.0	mda	mda
Floor port side forward	3.0	mda	mda
Average	3.0	X	X
Maximum	3.5	X	X
CARGO HOLD 3C			
Floor starboard side	3.0	mda	mda
Floor starboard center	2.5	mda	mda
At door starboard aft	3.5	mda	mda
Center aft vent	3.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Floor port side aft	2.5	mda	mda
Floor port side center	3.0	mda	mda
Floor starboard forward	3.0	mda	mda
Vent center forward	3.0	mda	mda
Average	3.0	X	X
Maximum	3.5	X	X
CARGO HOLD 3D			
Floor port side forward	2.5	mda	mda
Floor port aft	3.5	mda	mda
Floor center aft	2.5	mda	38
Floor starboard aft	3.0	mda	mda
Floor starboard forward	3.0	mda	mda
Floor forward center	3.5	mda	mda
CARGO HOLD 4B			
Men's restroom	3.0	mda	mda
Floor port side center	3.5	mda	mda
Floor by door to 3B port side	2.0	mda	mda
Floor by handrail port side	3.0	mda	38
Floor by handrail starboard side forward	3.5	mda	mda
Floor by handrail starboard side center	3.0	mda	mda
Floor by handrail starboard side aft	3.5	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
CARGO HOLD 4C			
Port side aft	3.5	X	X
Centerline aft	10	X	X
Starboard side aft	3.0	X	X
Max. reading along stern bulkhead	12	X	X
Floor at aft center (@ Max. Reading)	3.5	mda	mda
Starboard forward floor	4.0	mda	mda
CARGO HOLD 4D			
Floor at stern bulkhead	3.5	mda	mda
Floor starboard side	3.5	mda	mda
Under barrier rope	3.0	mda	mda
Floor starboard side forward	3.0	mda	mda
Floor port side forward	3.0	mda	mda
Floor port side center	2.5	mda	mda
Floor port side aft	3.0	mda	mda
4 TANK TOP			
At ladder entering hold forward	3.5	mda	mda
Cylindrical equipment on floor forward	3.5	mda	mda
Cylindrical equipment-center of hold	2.0	X	X
Average background	3.0	X	X
At wall port side aft	2.5	X	X
Platform center aft	2.5	X	X

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Platform starboard side aft	3.5	X	X
At wall starboard side aft	3.0	X	X
Cylindrical equipment on floor forward	3.0	mda	mda
Floor starboard side forward	3.5	mda	mda
Floor starboard side center	3.0	mda	mda
Floor starboard side aft	3.0	mda	mda
Wall center aft	2.5	mda	26
Floor port side aft	2.5	mda	mda
Floor port side center	3.5	mda	mda
Floor port side forward	3.0	mda	mda

2.2.2 MONITORING STATION DOSIMETER RESULTS

Badge Number	TLD Location	First Half of 2006 JRRF	Second Half of 2006 JRRF and Colonna's Shipyard	Total
0 area	Control	28	36	64
1 area	Pilot House	28	-	28
2 area	Navigation Deck Chart Room	31	60	91
3 area	Navigation Deck Cabin NB 4	22	-	22
4 area	Navigation Deck Sea Cabin	24	-	24
5 area	Navigation Deck Officer Lounge	24	-	24
6 area	Promenade Deck Main Lounge Fwd	24	-	24
7 area	Promenade Deck Main Fire Station 10	22	28	50
8 area	Promenade Deck Main Purser Station	23	44	67
9 area	Stbd Ventilation Room at Pool	22	37	59
10 area	A Deck Fire Station 15	26	29	55
11 area	A Deck Fire Station 14	22	54	76
12 area	B Deck Fire Station 20	20	33	53
13 area	B Deck Fire Station 20A	21	64	85
14 area	B Deck Entrance to Reactor Compartment	22	40	62
15 area	Fan Room Door	21	56	77
16 area	Cabin C-9	26	48	74
17 area	C Deck Fire Station 31	31	40	71
18 area	C Deck Fire Station 34	21	39	60
19 area	Cold Chemistry Room Door	21	35	56
20 area	Between C & D Deck Frame 96 Port	21	48	69
21 area	Stbd Stabilizer Room Door	19	34	53
22 area	D Deck Frame 118 Stbd	34	64	98
23 area	D Deck Frame 118 Port	21	43	64
24 area	Port Stabilizer Room Door	19	36	55
25 area	B Deck Hold 4 Aft Port	20	63	83
26 area	C Deck Hold 4 Aft Stbd	21	42	63
27 area	C Deck Fire Station 28	19	71	90
28 area	Sturgis Stbd Side	20	43	63
29 area	Turbine Viewing Station Stbd Side	20	40	60
30 area	Turbine Viewing Station Port Side	23	35	58
31 area	Control Room Fwd	17	67	84
32 area	Stbd Charging Pump Room	18	71	89
33 area	Port Charging Pump Room	17	49	66

2.3 ENVIRONMENTAL SAMPLE ANALYSIS SURVEYS

The water activity appears high because of high salinity in the samples. High salinity results in thick deposits when the sample is evaporated off. As a result, only a 10 - 20 ml sample is used and the alpha and beta particles will not be shielded. Sea water or brackish water contains K-40 a beta emitter. At low sample volumes, even 0.5 c/min (most likely from K-40) can result in 150 pCi/l for the sample. The alpha beta count should only be considered a screening count.

Time Period	Water (pCi/l)	Sediment (pCi/l)
2 nd Qtr Fwd	115.0	16.6
2 nd Qtr Aft	76.0	7.72
4 th Qtr Fwd	151.0	27.5
4 th Qtr Aft	174.0	25.4

2.4 QUARTERLY INTRUSION ALARM SYSTEM CHECKS

Routine security surveillances were conducted as required. No deficiencies were noted.

2.5 RADIOACTIVE MATERIALS REMOVED BY RELEASES, DISCHARGES AND WASTE SHIPMENTS

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

2.5.1 RELEASES

None

2.5.2 DISCHARGES

None

2.5.3 SHIPMENTS

None

2.6 PRINCIPAL MAINTENANCE PERFORMED

The NSS was moved to Colonna's Shipyard, Norfolk, VA on August 15, 2006 for maintenance generally on A deck and above that included the following:

- Repaired deck drains;

- Removed Cargo booms and wires;

- Repaired corroded topside structures to reduce water intrusion into the ship's interiors;

- Removed mildewed/molded items such as bedding, carpet, curtains;

- Removed loose floor tiles;

- Painted ship interiors;

- Relocated the dehumidification system (B Deck); and,

- Removed transient combustibles.

2.7 *UNAUTHORIZED ENTRY INTO RADIATION CONTROL AREAS & ACTIONS TAKEN TO IMPROVE ACCESS CONTROL*

No unauthorized entry was made into any Radiation Control Area in the previous year.

2.7.1 EVENT DISCUSSION

None

2.7.2 IMPROVEMENTS TO ACCESS CONTROL

None

2.8 *DEGRADATION OF BOUNDARIES CONTAINING RADIOACTIVE MATERIALS*

The results of the annual inspections required by Technical Specification 3.7.6 follow:

2.8.1 PRIMARY SYSTEM DEGRADATION

There was no noticeable change in the condition of the primary system since the last inspection. The sampling hole plug in the Reactor Pressure Vessel was inspected and found tight.

2.8.2 AUXILIARY SYSTEM DEGRADATION

There was no noticeable change in the condition of the auxiliary system since the last inspection.

2.8.3 SECONDARY SYSTEM DEGRADATION

There was no noticeable change in the condition of the secondary system since the last inspection.

2.9 *SUMMARY OF OCCUPATIONAL EXPOSURE*

As a result of the N.S. SAVANNAH being in a 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 in 10 CFR 20.1201. This is based on current survey data, area TLD readings and personnel entries into Radiation Control Areas (RCAs). 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 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.

When MARAD can reasonably expect that an individual may receive a dose in excess of 10% of the limits as pre-decommissioning activities are planned, a personnel dosimetry program will be established.

3.0 OTHER ISSUES

The information in Section 3.0 is MARAD's response to two of the three deficiencies noted in Inspector Follow-up Item 50-238/2006-201-01 and CAR 2006-015. The deficiency regarding the Summary of Occupational Exposure for 2004 and 2005 is still under investigation.

3.1 *QUARTERLY INTRUSION ALARM SYSTEM CHECKS 2004 AND 2005*

Routine security surveillances were conducted as required. No deficiencies were noted in CY2004 and 2005.

3.2 RADIATION SURVEY RESULTS 2005

The following table contains the correct survey data for 2005. The 2004 Survey data was inadvertently submitted with the 2005 Annual report.

X = No measurement required

MDA for alpha = 8 dpm/100cm²

MDA for beta = 25.0 dpm/100cm²

Location	μREM/hr	Alpha dpm/100cm ²	Beta dpm/100cm ²
NAVIGATION BRIDGE			
Pilot House at helm	3.0	mda	mda
Bridge Wing port side	3.0	mda	mda
Fire Stat. #1 near chart room	3.5	mda	mda
Fan room port side gen. room	3.5	mda	mda
E.O.G. Room	4.5	mda	mda
BOAT DECK			
Chief Eng. State Room port side	3.5	mda	mda
Capt. State Room starboard side	4.0	mda	mda
Fire Stat #2 port side	3.0	mda	38
Officers lounge aft	3.0	mda	mda
Hallway floor port side	3.0	mda	mda
Forward state Room starboard side	3.5	mda	mda
Hallway floor forward center	3.5	mda	mda
PROMENADE DECK			
Top of reactor hatch	4.0	mda	mda
Starboard side of reactor hatch	4.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Top of Hatch #4	3.5	mda	mda
Between Hatch #3 & #4	3.0	mda	27
Bow center of deck	3.5	mda	mda
Center of Main Lounge	4.0	mda	mda
Center of Veranda	4.0	mda	mda
Fire Stat. #7 starboard side	3.5	mda	mda
Between Veranda & Swimming Pool	4.0	mda	mda
Library	3.5	mda	mda
Hallway in front of Main Lounge	3.5	mda	mda
Veranda port side forward	4.0	mda	mda
Bar at Veranda	4.0	mda	mda
REACTOR SPACE			
Hot pipe forward entry hatch	35	X	X
1 meter forward of lab tank	23	X	X
At lab tank	25	X	X
Pipe elbow port side forward	40	X	X
'Hot' pipe near entry hatch	X	mda	mda
Containment vessel middle of catwalk	15	mda	mda
Lab tank surface	6.5	mda	mda
Open valve next to lab tank	10	X	X
Containment vessel middle of catwalk	8.5	X	X
Piping at the port side forward catwalk	9.0	X	X
Middle of catwalk port side	21	mda	38

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Piping at the port side middle of catwalk	13	mda	mda
Valve handle port side aft	14	X	X
Damp area on floor middle of catwalk	10	mda	mda
Containment vessel starboard side aft	50	X	X
Inside entry hatch pipe	X	mda	mda
FAN ROOM			
At floor Room center	3.5	X	X
Electric motor	4.5	mda	mda
Control box	2.5	mda	mda
CABIN B-1 B-3			
On drums of PCs in Cabin B-1	3.0	14	mda
Average reading of Cabin B-3	3.0	X	X
On floor of Cabin B-1	X	mda	mda
Drum lid in Cabin B-1	X	mda	mda
STBD STABILIZER ROOM			
At entrance door	3.0	X	X
Average background	4.0	X	X
Catwalk Lower level	X	mda	27
Catwalk Upper level	X	mda	mda
PORT STABILIZER ROOM			

**SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007**

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
At access hatch	4.0	X	X
At catwalk upper level	8.0	X	X
At internally contaminated strainer	22	X	X
Diaphragm valve	32	X	X
Pipe to left of diaphragm valve	54	X	X
Internally contaminated valves	X	mda	mda
Control valve lower deck	X	mda	mda
Volume Chambers	X	mda	mda
Elbow diaphragm valve	X	mda	mda
STBD CHARGING PUMP ROOM			
Outside hatch	3.5	X	X
Inside hatch	12	mda	mda
Center of floor	X	mda	38
Pipe back of pump motor	56	mda	mda
Pipe in back of pump	X	mda	mda
Top of pump	X	mda	mda
Backside of pump	X	mda	mda
Center of floor	18	mda	mda
Outside of hatch	X	mda	mda
Air duct at pump	X	mda	mda
Pump motor	X	mda	mda
PORT CHARGING PUMP ROOM			

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Outside door 1m from deck	3.5	X	X
Between pumps	19	X	X
Deck at hatch	X	mda	mda
Access hatch	X	mda	mda
Deck by pumps	X	mda	mda
Floor between pumps	X	mda	mda
Pump in front of room	X	mda	mda
COLD CHEM LAB			
Background in Cold Chem Lab	8	X	X
Ventilation system/lead blanket	45	X	X
Drain (C deck)	190	X	X
Fume hood (D deck)	29	X	X
Top of storage tank	33	X	X
Air sampler (D deck)	29	X	X
Floor under air sampler (D deck)	15	X	X
Ledge of fume hood	63	X	X
Floor in front of ventilation system	11	X	X
Ventilation system	18	X	X
Ledge of fume hood (D deck)	X	mda	mda
Drain (C deck)	X	mda	mda
Floor under air sampler (D deck)	X	mda	mda
Floor front of vent system (C deck)	X	mda	27
Air Sampler (D deck)	X	mda	mda

**SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007**

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Floor under fume hood	X	mda	mda
Shelving (C deck)	X	mda	mda
Top of storage tank	X	mda	mda
Valve near floor (D deck)	X	mda	mda
HOT CHEM LAB			
Background in Hot Chem lab	4.5	X	X
Waste collection tank	8.0	X	X
Sink	3.5	X	X
Doorway to Hot Chem lab	3.5	X	X
Under sink	3.5	X	X
Sink drain	4.0	mda	mda
Inside waste collection tank	7.0	mda	mda
Fume hood inside	3.5	mda	mda
Floor inside door	3.5	mda	mda
Intake for hood	3.0	mda	mda
CARGO HOLD 2B			
Floor starboard side forward	3.5	mda	mda
Floor starboard side center	3.0	mda	mda
Floor starboard side aft	2.0	mda	mda
Floor aft center	4.0	mda	mda
Floor port side aft	2.5	mda	mda
Floor port side center	5.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Floor port side forward	3.5	mda	mda
Floor forward center	3.5	mda	mda
CARGO HOLD 2C			
Floor port side center	3.0	mda	mda
Floor port side forward	2.5	14	mda
Floor forward center	2.0	mda	mda
Floor starboard side forward	2.5	mda	mda
Floor starboard side center	3.5	mda	mda
Floor starboard side aft	3.5	mda	mda
Floor aft center	3.5	mda	mda
Floor port side aft	3.5	mda	mda
Floor 1C cargo hold	3.0	mda	mda
CARGO HOLD 2D			
Starboard aft	3.5	mda	mda
Starboard amidships left	2.5	mda	mda
Starboard amidships right	3.5	mda	mda
Starboard bow	3.0	mda	mda
Centerline bow	2.0	mda	mda
Port side bow	3.0	mda	mda
Port side amidships	3.0	mda	mda
Port side aft	3.0	mda	mda
Centerline aft	2.5	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Average	3.0	X	X
Maximum	3.5	X	X
2 TANK TOP			
Floor forward & starboard of sailboat	2.5	mda	mda
Floor sailboat center port side	2.5	mda	mda
Floor sailboat aft starboard	3.5	mda	mda
Floor sailboat center starboard	3.0	mda	mda
CARGO HOLD 3B			
At stairwell entering hold	3.5	mda	mda
Floor center forward	2.5	mda	mda
Floor starboard side forward	3.0	mda	mda
Floor starboard side center	3.0	mda	27
Floor starboard side aft	2.0	mda	mda
Floor center aft	2.5	mda	mda
Floor port side aft	3.5	mda	mda
Floor at display center	2.5	mda	mda
Floor port side forward	3.0	mda	mda
Average	3.0	X	X
Maximum	3.5	X	X
CARGO HOLD 3C			
Floor starboard side	3.0	mda	mda
Floor starboard center	3.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
At door starboard aft	3.0	mda	mda
Center aft vent	2.5	mda	mda
Floor port side aft	3.0	mda	mda
Floor port side center	3.5	mda	mda
Floor starboard forward	3.5	mda	mda
Vent center forward	3.0	mda	mda
Average	3.0	X	X
Maximum	3.5	X	X
CARGO HOLD 3D			
Floor port side forward	3.0	mda	mda
Floor port aft	3.5	mda	mda
Floor center aft	3.0	mda	mda
Floor starboard aft	2.0	mda	mda
Floor starboard forward	3.5	mda	mda
Floor forward center	3.0	mda	mda
CARGO HOLD 4B			
Men's restroom	3.0	mda	mda
Floor port side center	2.5	mda	mda
Floor by door to 3B port side	2.5	mda	mda
Floor by handrail port side	3.0	mda	mda
Floor by handrail starboard side forward	4.0	mda	mda
Floor by handrail starboard side center	3.5	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Floor by handrail starboard side aft	3.0	mda	mda
CARGO HOLD 4C			
Port side aft	4.0	X	X
Centerline aft	9.0	X	X
Starboard side aft	3.5	X	X
Max. reading along stern bulkhead	11	X	X
Floor at aft center (@ Max. Reading)	4.0	mda	mda
Starboard forward floor	4.0	mda	mda
CARGO HOLD 4D			
Floor at stern bulkhead	3.0	mda	mda
Floor starboard side	3.0	mda	mda
Under barrier rope	3.5	mda	mda
Floor starboard side forward	2.0	mda	mda
Floor port side forward	4.0	mda	mda
Floor port side center	3.5	mda	mda
Floor port side aft	3.0	mda	mda
4 TANK TOP			
At ladder entering hold forward	3.5	mda	mda
Cylindrical equipment on floor forward	3.0	mda	mda

SAVANNAH Technical Staff
Annual Report 2006, Revision 0
March 23, 2007

Location	$\mu\text{REM/hr}$	Alpha dpm/100cm ²	Beta dpm/100cm ²
Cylindrical equipment-center of hold	2.5	X	X
Average background	3.0	X	X
At wall port side aft	2.5	X	X
Platform center aft	3.0	X	X
Platform starboard side aft	3.0	X	X
At wall starboard side aft	3.0	X	X
Cylindrical equipment on floor forward	3.5	mda	mda
Floor starboard side forward	3.0	mda	mda
Floor starboard side center	3.5	mda	mda
Floor starboard side aft	3.5	mda	mda
Wall center aft	3.5	mda	mda
Floor port side aft	3.0	mda	mda
Floor port side center	3.0	mda	mda
Floor port side forward	3.5	mda	mda



U.S. Department
of Transportation

**Maritime
Administration**

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

Enclosure 2 to Submittal of Annual Report for CY 2006, Revision 01

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License NS-1
Docket No. 50-238

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March 23, 2007

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