

SAFETY EVALUATION
OFFICE OF FEDERAL AND STATE MATERIALS &
ENVIRONMENTAL PROTECTION PROGRAMS
RELATED TO AMENDMENT NO. 14 TO FACILITY OPERATING LICENSE NO. NS-1
U.S. DEPARTMENT OF TRANSPORTATION, MARITIME ADMINISTRATION
N.S. SAVANNAH
DOCKET NO. 50-238

1.0 INTRODUCTION

By letter, dated October 9, 2007, and supplemented on January 25, 2008, the U.S. Department of Transportation, Maritime Administration (MARAD) requested that the U. S. Nuclear Regulatory Commission (NRC) amend Facility Operating License No. NS-1. The amendment consists of the following general changes to the Technical Specifications (TSs):

- Deleting discussion that is more appropriate in the Final Safety Analysis Report;
- Invoking consistent titles and phrases;
- Deleting duplicate requirements;
- Combining similar requirements into single locations;
- Removing requirements that are more appropriately implemented by invoking current regulations;
- Deleting out of date requirements;
- Invoking requirements consistent with the current ship status and decommissioning schedule;
- Formatting and renumbering as appropriate to implement these changes;
- Revising the requirements to reflect the historical practices;
- Eliminating potential conflicts with the approved Decommissioning Quality Assurance Plan; and,
- Correcting errors introduced in Amendment 13.

2.0 BACKGROUND

MARAD is the owner and licensee of the Nuclear Ship Savannah (NSS), the world's first nuclear powered merchant ship. Conceived in the 1950's as part of President Eisenhower's "Atoms for Peace" program, the NSS was designed, constructed and operated as a joint research and development project of the MARAD and the Atomic Energy Commission (AEC). MARAD's contribution was the ship while the AEC's was the reactor and related nuclear systems. The reactor was first brought to power in 1961. Seagoing trials followed in 1962.

The AEC ended its participation in the project in about 1965, transferring liability and title of the reactor to MARAD. NSS was operated in experimental and commercial demonstration service throughout the 1960's. The ship was removed from service in 1970. In 1971, when alternative uses for the ship failed to materialize, its nuclear power plant was defueled, partially decommissioned and prepared for long-term lay-up under contemporary best practices. By April 1976, additional decommissioning activities such as removing the three primary purification system ion-exchangers, their resins and dewatering the primary, auxiliary and secondary systems had been performed. The NSS possession-only license was issued on May 19, 1976. The NSS is a registered National Historic Landmark.

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TS as part of the license. The Commission's regulatory requirements related to the content of TS are set forth in 10 CFR 50.36. The regulation, however, does not specify particular items to be included in TS.

Section 50.36(c)(2)(ii) provides four criteria to be used in determining whether particular items are required to be included in the TS. While the four criteria apply specifically to Limiting Conditions for Operation (LCOs), in adopting the July 1995 revision to 50.36, the Commission indicated that the intent of these criteria can be used to identify the optimum set of TS administrative controls. Addressing administrative controls, 10 CFR 50.36(c)(5) states that they "are the provisions relating to organization and management, procedures, record keeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner." The particular administrative controls to be included in the TS, therefore, are the provisions that the Commission deems essential for the safe operation of the facility that are not already covered by other regulations.

Accordingly, the staff has determined that administrative control requirements that are not specifically required under 10 CFR 50.36(c)(5), and that are not otherwise necessary to obviate the possibility of abnormal situation or event giving rise to an immediate threat to the public health and safety, may be relocated to more appropriate documents (e.g., Quality assurance Plan (QAP), Security Plan, or Emergency Plan), which are subject to regulatory controls. Similarly, while the required content of TS administrative controls is specified in 10 CFR 50.36(c)(5), particular details may be relocated to licensee-controlled documents, where other regulations provide adequate regulatory control.

The QAP is a logical candidate for relocations of administrative controls due to the controls imposed by such regulations as Appendix B to 10 CFR Part 50, the existing NRC-approved QAP and commitments to industry QA standards, and the established QA program change control process of 10 CFR 50.54(a).

NRC Administrative Letter (AL) 95-06, "Relocation of Technical Specification Administrative Controls Related to Quality Assurance," provides guidance to licensees requesting amendments that relocate administrative controls to NRC-approved QAP descriptions, where subsequent changes are controlled pursuant to 10 CFR 50.54(a). AL 95-06 provides specific guidance in the areas of: (1) independent safety engineering group, (2) reviews and audits, (3) procedure review process, and (4) records and record retention.

Some relocations are specifically discussed in AL 95-06, while others are similar in nature. Relocations not specifically discussed in AL 95-06 are evaluated with respect to the appropriateness of the relocation. Editorial changes are allowed without basis by 10 CFR 50.54(a)(3) and are not explicitly evaluated.

3.0 EVALUATION

MARAD has determined that its licensed activities could be substantially improved if the TS is brought up to contemporary standards. As a result, MARAD is proposing 39 changes to the TS. Each of the proposed changes is evaluated below.

3.1 Technical Specification Changes

Proposed Change 1

MARAD proposes revising TS 1.0 to state that NSS has been in a state of protective storage since 1976 when the possession-only license was issued. Further, the discussion describing administrative procedures that protect public health and safety will be removed from TS 1.0 to eliminate any possibility of conflict with the Decommissioning Quality Assurance Plan (QAP). In addition, MARAD proposes deleting the last sentence in TS 2.1 Radioactive Liquid Waste Release, Applicability.

MARAD has determined that it is no longer appropriate that any TS should describe plant status. The discussion of the current plant status is described in the Final Safety Analysis Report (FSAR), Revision IV and any change in plant status will be documented in FSAR updates as required by 10 CFR 50.71(e).

NRC agrees that 10 CFR 50.71(e) requires that the FSAR include a description of the current plant status. Therefore, the discussion of plant status can be removed from Sections 1.0 and 2.1 of the TS. The staff also agrees that the discussion of administrative procedures that protect public health and safety can be removed from TS 1.0 without decreasing MARAD's commitments because the same procedural requirements are contained in Section 3.0 of the Decommissioning QAP. Therefore, the staff has determined that the proposed changes are administrative changes that do not decrease MARAD's commitments.

Proposed Change 2

MARAD proposes revising the format for Applicability, Objective and Specification in Section 2.0 of the TSs.

The staff has determined that revising the format of Section 2.0 is an administrative change that does not decrease MARAD's commitments.

Proposed Change 3

MARAD proposes revising TSs 2.1 Applicability, 2.4 Applicability, 3.1.4(new), 3.1.5(new), 3.3.1, 3.3.1.1(new), 3.3.1.2(new), 3.4.2.g, 3.6.3.c(new), 3.7 Objective, 3.7.1.2, 3.7.1.3 and 3.7.2.1 to use the title, “Radiological Controlled Area(s)” in place of the following titles:

- Controlled areas;
- Radiation areas;
- Radiation control areas; and,
- Controlled radiation area.

Section 3.3 of the TS defines the term radiation control area but does not provide definitions for controlled areas, radiation areas, or controlled radiation area. MARAD has determined that a single consistent title should be used to describe “restricted areas” of the ship.

The staff has determined that replacing the terms “Controlled areas,” “Radiation areas,” “Radiation control areas,” and, “Controlled radiation area” with “Radiological Controlled Area(s),” will clarify the TSs without reducing control to “restricted areas” as defined by 10 CFR Part 20 and MARAD’s radiation protection program. The staff believes this is an administrative change that does not decrease MARAD’s commitments.

Proposed Change 4

MARAD proposes to revise sentence 2 of “Specification” of TS 2.3, Radioactive Liquid Waste Release Surveillance, to state:

Concentrations of radioactive liquid waste shall not exceed 10% of the applicable limits of 10 CFR 20 or other applicable Federal regulations.

MARAD has determined that revising sentence 2 of “Specification” of TS 2.3, Radioactive Liquid Waste Release Surveillance, by deleting the phrase “prescribed by” will make this phrase consistent with similar phrases in “Specifications” TSs 2.1, 2.2 and 2.4.

The staff has determined that deleting “prescribed by” from sentence 2 of “Specification” of TS 2.3, Radioactive Liquid Waste Release Surveillance, will not change the meaning of the sentence but will clarify the sentence and make it consistent with the wording in TSs 2.1, 2.2, and 2.4. The staff believes this is an administrative change that does not decrease MARAD’s commitments.

Proposed Change 5

MARAD proposes to number the individual paragraphs in TS 3.1 as 3.1.1, 3.1.2, 3.1.3, 3.1.4 and create new 3.1.5 as described in Proposed Changes 9 and 10.

MARAD has determined that TS 3.1 is clarified by renumbering its paragraphs as individual Technical Specifications.

The staff has determined that numbering the individual paragraphs in TS 3.1 is an administrative change that does not decrease MARAD's commitments. The staff's evaluation of the new TS 3.1.5 is presented under Proposed Change 9.

Proposed Change 6

MARAD proposes deleting TS 3.7.2.2 in its entirety and renumbering paragraph three of TS 3.1 as 3.1.3. The new text of TS 3.1.3 is shown in Proposed Change 10.

MARAD has determined that paragraph three of TS 3.1 is duplicated in TS 3.7.2.2. Both state that surveys are performed by "an individual who meets or exceeds the qualifications of ANSI N18.1-1971, paragraphs 4.3.2 or 4.5.2." TS 3.7.2.2 also states that radiation surveys will be performed annually and environmental surveys will be performed semi-annually.

The staff agrees with MARAD that the qualification requirements for individuals performing surveys are duplicated in paragraph 3 of TS 3.1 and TS 3.7.2.2. Therefore, consolidating the qualification requirements for individuals performing radiation and environmental surveys in TS 3.1.3 is acceptable. TS 3.7.2.2 also states that radiation surveys will be performed annually and environmental surveys will be performed semi-annually. As described in Proposed Change 8, new TSs 3.7.2.2 and 3.7.2.4 include requirements to perform annual radiation surveys and semi-annual environmental surveys. The staff has determined that all requirements in TS 3.7.2.2 are duplicated in other requirements, and therefore, eliminating TS 3.7.2.2 is an administrative change that does not decrease MARAD's commitments.

Proposed Change 7

MARAD proposes revising TSs 3.1.3, 3.4.1.b and 3.6.3.d (new) to use the title, "radiological survey(s)" (as appropriate).

MARAD has determined that a single, consistent title, "radiological survey(s)," should be used to replace the title "radiation survey."

The staff has determined that replacing the term "radiation surveys" with the term "radiological surveys" in TSs 3.1.3, 3.4.1b, and 3.6.3d, will not change the meaning of the TSs but will make it consistent throughout the entire TS. The staff has determined that this is an administrative change that does not decrease MARAD's commitments.

Proposed Change 8

MARAD proposes revising TSs 3.1 paragraph three to state, "3.1.3 Radiological surveys, environmental sampling and surveillance, and laboratory analyses will be the responsibility of MARAD and performed by an individual who meets or exceeds the qualifications of ANSI N18.1-1971, paragraphs 4.3.2 or 4.5.2. Laboratory analyses of environmental samples will be the responsibility of MARAD and reviewed in accordance with the Decommissioning Quality Assurance Plan." In addition, MARAD proposes revising TS 3.7.2.5 to delete the phrase "by a qualified laboratory." Further, MARAD proposes to add new TSs 3.7.2.2, 3.7.2.3 and 3.7.2.4 that state:

3.7.2.2 Radiological surveys of the ship will be performed at least annually and as necessary to support ship activities in accordance with 10 CFR 20.

3.7.2.3 Thermoluminescent dosimeters (TLDs) or equivalent monitoring devices shall be placed at strategic locations throughout the vessel to monitor the radiation from reactor generated materials. MARAD shall determine these locations on the vessel and shall require dosimeter readings at least semi-annually.

3.7.2.4 Semi-annually, water samples and bottom sediment will be taken adjacent to the ship and analyzed by a qualified laboratory for radioactivity.

MARAD has determined that TSs 3.1 (paragraph three), 3.7.2.2, 3.7.2.4 and 3.7.2.5 duplicate the periodicity requirements for performing radiological surveys and environmental sampling/surveillance, and that the periodicity for performing surveillances should be listed in one section of the TS.

The staff agrees that the periodicity requirements for performing radiological surveys and environmental sampling/surveillance are duplicated in TSs 3.1 (paragraph three), 3.7.2.2, 3.7.2.4 and 3.7.2.5. The staff has determined that removing the periodicity requirements from TS 3.1 will clarify the TSs without reducing MARAD's commitments to perform annual radiation and semi-annual environmental surveys. The staff has also determined that new TSs 3.7.2.2, 3.7.2.3, and 3.7.2.4 will clarify the overall TS without reducing MARAD's commitments. New TSs 3.7.2.2 and 3.7.2.4 include commitments to perform radiological surveys at least annually and collect environmental samples semi-annually, respectively. Proposed Change 37 provides the basis for revising TS 3.7.2.3 which defines the ship spaces requiring Radiological Surveys. New TSs 3.7.2.3 and 3.7.2.4 are essentially renumbered TSs 3.7.2.4 and 3.7.2.5. The staff has determined that these revisions are administrative changes that do not decrease MARAD's commitments.

Proposed Change 9

MARAD proposes to add TS 3.1.4 that states, "MARAD shall have a health physicist on duty or on call to provide health physics support and direction for all entries into Radiological Controlled Areas."

The intent of TS 3.1.4 is to combine similar requirements regarding normal entries into a Radiological Controlled Area from TSs 3.1 and 3.3, into one section of the TS. MARAD has determined that paragraph four of TS 3.1 is clarified by creating separate TSs for normal and emergency requirements for entering a Radiological Controlled Area (RCA). The emergency requirements for entering a RCA are found in TS 3.1.5. In addition, MARAD noted that the health physicist requirements in TS 3.1 conflict with requirements in paragraph one of TS 3.3 for entering an RCA.

Paragraph four of TS 3.1 states "MARAD shall have a health physicist on duty or on call within two hours *to provide health physics support* [emphasis added] for radiological emergencies or entry into radiation control areas. In addition to the services of a health physicist, MARAD shall provide an Emergency Radiological Assistance Team in the event of radiological emergencies."

Paragraph one of TS 3.3 states "All entries into radiation control areas by visitors or employees shall be *under the direction of a health physicist* [emphasis added] ..."

The staff agrees that the TSs are clarified by combining similar requirements regarding normal entries into a new TS 3.1.4. With this TS revision, MARAD is eliminating the requirement to have a health physicist on duty or on call within two hours for entries into a RCA. The staff has determined that the elimination of the two hour criterion will not result a reduction in safety. The two hour criterion was established in the Possession-only License, when the only RCA entries anticipated were those associated with annual surveys. Prior to October 2006, all staff entering RCAs received Radiation Worker training on an "As-Needed and Just in Time" basis. Since October 2006, increased staffing has resulted in numerous staff members being trained as radiation workers. Improvements to the Radiation Protection Program have resulted in the establishment of routine Radiation Work Permits for supervisory tours and inspections of RCAs. Routine surveys ensure Radiation Workers are aware of expected dose rates and contamination levels to be encountered in these areas. Improved planning and scheduling of activities has resulted in coordinated entries into RCAs with Health Physics support. The net effect of these improvements to NSS administrative processes and the Radiation Protection Program is the two hour criterion for providing health physics support and direction for normal entries is no longer necessary.

Proposed Change 10 discusses emergency RCA entry requirements.

Based on the above discussion, the staff has determined that adding TS 3.1.4 is an administrative change that does not decrease MARAD's commitments.

Proposed Change 10

MARAD proposes to add TS 3.1.5 that states, "MARAD shall have a health physicist on duty or on call within two hours to provide health physics support and direction for radiological emergencies. MARAD shall provide an Emergency Radiological Assistance Team which will provide health physics direction and support in the event of an on-board emergency such as fire, flooding or intrusion. In the event of fire, entry may be made into the effected Radiological Controlled Areas except the reactor containment vessel, without the support and direction of a health physicist."

The staff agrees with MARAD's assessment that TS 3.1 is clarified by separating out the normal and emergency requirements for entering a radiological controlled area (RCA). The staff also agrees that the TS is clarified by explicitly stating that the purpose of the Emergency Radiological Assistance Team is to provide health physics direction and support in the event of an on-board emergency such as fire, flooding or intrusion.

The staff has determined that adding TS 3.1.5 will clarify the TS, and that the addition is an administrative change that does not decrease MARAD's commitments.

Proposed Change 11

MARAD proposes revising the format for TS 3.2, Records, to establish a consistent format.

The staff has determined that revising the format of TS 3.2, Records, is an administrative change that does not decrease MARAD's commitments.

Proposed Change 12

MARAD proposes revising the title of TS 3.3 to “Radiological Criteria, Access Control and Security,” and adding the following new TSs:

3.3.1 Radiological Controlled Areas

3.3.1.1 Radiological Controlled Areas are “Restricted areas” as defined in 10 CFR 20 and in the radiation protection program developed in accordance with 10 CFR 20.

MARAD has determined that the definition of “radiation control area” (i.e., Radiological Controlled Area) contained in TSs 3.3, paragraph 2 and 3.3.1 is no longer needed or appropriate. TSs 3.3, paragraph 2 and 3.3.1 define a “radiation control area” as an area of the ship with radiation levels from reactor generated radioactive materials in excess of 0.25mR/hr above natural background as measured at one meter from any surface, and/or surface contamination in excess of those limits prescribed in Table I of NRC Reg. Guide 1.86. These extremely low limits were first required with the issuance of License Amendment 9 which granted conditional unescorted access to the ship and opened the ship to the public as a museum, hotel and restaurant. These low levels were intended to minimize exposure to unescorted members of the public (i.e., visitors). The ship is no longer open as a museum and TS3.3.2 requires that all visitors be escorted by MARAD personnel.

The staff has determined that revising the title of TS 3.3 to “Radiological Criteria, Access Control and Security” clarifies the TSs by removing the unnecessary term “radiation control area” from the TS. Further, the new title more accurately describes the content of the section. The staff has determined that the title revision is an administrative change which does not result in a reduction in MARAD’s commitments.

As provided in the staff’s evaluation of Proposed Revision 3, replacing the term “Radiation control areas,” with “Radiological Controlled Area(s),” will clarify the TSs without reducing control to “restricted areas” as defined by 10 CFR Part 20 and MARAD’s radiation protection program. Therefore, the staff believes that defining “Radiological Controlled Areas” as “Restricted Areas”, as defined in 10 CFR 20, is an acceptable administrative change that does not decrease MARAD’s commitments.

Proposed Change 13

MARAD proposes to add TS 3.3.1.2 that states “All entries into Radiological Controlled Areas shall be in accordance with the licensee’s radiation protection program.”

The staff agrees with MARAD’s assessment that sentence one of paragraph one of TS 3.3 is clarified by replacing the title “health physics procedures manual” with “radiation protection program” and renumbering the Technical Specification. The staff has determined that replacing the title “health physics procedures manual” with “radiation protection program” and renumbering the Technical Specification is an administrative change that does not decrease MARAD’s commitments.

Proposed Change 14

MARAD proposes deleting the phrase “by visitors or employers” as shown in the new TS 3.3.1.2, adding a new TS 3.4.2.1g that deletes the phrase “by visitors or employers” and states “Any unauthorized entry into Radiological Controlled Areas and corrective action taken to improve access control.” and revising TS 3.5, by removing the phrase “visitors, employees, or maintenance personnel.”

Four TSs identify specific groups of individuals who may have access to the ship. These TSs are the following:

- 3.3 - uses the phrase visitors or employees;
- 3.3.1 - which uses the phrase “employees, contractor personnel, escorted guests and official visitors”;
- 3.4.1.g - uses the phrase “visitors or employees”; and,
- 3.5 - uses the phrase “visitors, employees, or maintenance personnel.”

These types of phrases first appeared with the issuance of License Amendment 9 which approved unescorted access to the ship and opened the ship to the public as a museum, hotel and restaurant. When the Possession-only license was issued, all visitors were accompanied “by representatives of the licensee” and were therefore under the same controls as the “representative”.

MARAD has implemented procedural controls to ensure visitors are escorted, and therefore has concluded it is no longer necessary to distinguish between any groups of individuals that may access the ship.

The staff agrees that it is no longer necessary to distinguish between any groups of individuals that may access the ship because the new TS 3.3.2.2 requires that all visitors be escorted by MARAD’s designated personnel. Therefore, the staff has determined that deleting the phrase “by visitors or employers” in the new TS 3.3.1.2, adding a new TS 3.4.2.1g that deletes the phrase “by visitors or employers” and states “Any unauthorized entry into Radiological Controlled Areas and corrective action taken to improve access control.” and revising TS 3.5, by removing the phrase “visitors, employees, or maintenance personnel,” are acceptable administrative changes that do not decrease MARAD’s commitments.

Proposed Change 15

MARAD proposes numbering sentence one of TS 3.3.2 to create a new TS 3.3.2.1 that states, “The license holder shall control all access to the vessel through assignment of designated personnel with appropriate administrative procedures and physical security provisions.”

The staff has determined that numbering sentence one of TS 3.3.2 to create a new TS 3.3.2.1, is an administrative change that does not decrease MARAD’s commitments.

Proposed Change 16

MARAD proposes to add TS 3.3.2.2 that states, "Visitors shall be escorted by MARAD's designated personnel."

MARAD has determined that a TS requirement to escort visitors should be established. In anticipation of activities where Radiological Controlled Areas will routinely be opened, MARAD has implemented procedural controls to ensure visitors are escorted to prevent them from inadvertently entering these areas.

The staff agrees with MARAD's establishment of TS 3.3.2.2 to control access to the ship. With increased decommissioning activities aboard the ship, RCAs will be routinely opened, and increased access control to the ship will be beneficial. Therefore, the staff has determined that adding TS 3.3.2.2 is an acceptable administrative change that results in an increase in MARAD's commitments.

Proposed Change 17

MARAD proposes to number the third sentence to create a new TS 3.3.2.3 that states "Security for the vessel shall be provided by the license holder at all times."

The staff has determined that numbering sentence three of TS 3.3.2 to create a new TS 3.3.2.3, is an administrative change that does not decrease MARAD's commitments.

Proposed Change 18

MARAD proposes revising the title of TS 3.4 title to "Reports and Notice of Ship Movement."

The staff agrees that placing all TS requirements related to communicating with the NRC in one section clarifies the TS. Revising the title of TS 3.4 is an administrative change that does not decrease MARAD's commitments.

Proposed Change 19

MARAD proposes numbering sentence one of TS 3.4 as TS 3.4.1 and TSs 3.4.1 and 3.4.2 as TSs 3.4.1 and 3.4.2, respectively.

The staff has determined that numbering sentence one of TS 3.4 as TS 3.4.1, and renumbering TSs 3.4.1 and 3.4.2 as TSs 3.4.2 and 3.4.3, respectively, are administrative changes that do not decrease MARAD's commitments.

Proposed Change 20

MARAD is proposing to renumber TS 3.4.1 as 3.4.2, Annual Report, and number the first sentence as 3.4.2.1. MARAD proposes new TS 3.4.2 that states:

3.4.2 Annual Report

- 3.4.2.1 Prior to March 1 of each year, a written annual report shall be submitted to the NRC in accordance with 10 CFR 50.4. The report shall include the following:
- a. The status of the facility;
 - b. The summary of the results of the radiological radiation surveys and monitoring station dosimeter readings;
 - c. The summary of 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 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 Radiological Controlled 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 N.S. SAVANNAH; and
 - i. Results of occupational exposure indicated by personal dosimetry.

The staff has determined that renumbering TS 3.4.1 as 3.4.2, and numbering sentence one of TS 3.4.1 as TS 3.4.2.1, are administrative changes that do not decrease MARAD's commitments.

Proposed Change 21

MARAD proposes renumbering each of these sentences as TSs 3.4.3.1, 3.4.3.2 and 3.4.3.3, respectively.

NRC agrees that TS 3.4.2 is clarified by renumbering its three sentences as individual TSs. Further, the staff has determined that numbering each sentence as TS 3.4.3.1, 3.4.3.2 and 3.4.3.3 are administrative changes that do not decrease MARAD's commitments.

Proposed Change 22

MARAD proposes deleting TS 3.4.2.a – c and renumbering TSs 3.4.2.d and 3.4.2e, as TSs 3.4.3.1.a and 3.4.3.1.b, respectively.

The intent of Proposed Change 22 is to eliminate the reporting requirements in TS 3.4.2 that are contained in existing regulations 10 CFR Part 20 and 10 CFR 50.73. MARAD has determined that the first three items of TS 3.4.2, Reportable Events can be removed and more appropriately implemented by invoking existing regulations 10 CFR Part 20 and 10 CFR 50.73, which require reports for similar situations.

Currently, TS 3.4.2 includes the following Reportable Events:

- a. The entrance of an unauthorized person or persons into any controlled radiation area;

- b. A significant change in the radiation or contamination levels in the vessel;
- c. Any release of radioactive material to the environment in excess of 10% of the limits of applicable sections of 10 CFR 20.

The threshold for 10 CFR 20.2202 which most closely corresponds to TS 3.4.2.a is not concerned with an unauthorized person entering a controlled area. As stated in Health Physics Positions (HPPOS) 236, the NRC understands the intent of this reporting requirement is to notify the NRC when an event "probably is about to cause" or "likely will soon cause" harm to the unauthorized individual. The TS 3.4.2.(a) requirement was established with the issuance of the Possession-only license (POL) in 1976. At that time, the general area dose rates were such that the licensee staff felt the "likely will soon cause" criterion was met. In 1976, the General Area (GA) dose rates were 100mR/hr in the containment vessel (CV) and a maximum of 45 mR/hr in other spaces. At that level, an unauthorized individual member of public entering the CV would have exceeded their dose limit in an hour. Using the most recent survey results to measure general area dose rates of approximately 4 mR/hr in the CV, an unauthorized individual member of the public would have to gain entry to and remain in the CV undetected for 25 hours.

The Safety Evaluation for the POL includes no discussion of the "new" reportability criteria. During the ship's operating period, the reportability threshold was significantly higher. For example, the criteria for reportability related to plant operations were the following:

6.9.B. Any substantial variance disclosed by operation of the facility from performance specifications contained in the Safety Analysis Report or the Technical Specifications shall be reported ...

6.9.D. FAST shall inform the AEC of:

1. any failures of the engineered safety systems or of the components of such systems which render or could threaten to render the systems incapable of performing their intended safety function, or
2. any degradation of one of the several boundaries which are designed to contain the radioactive materials resulting from the fission process.

In comparison to TS 3.4.2 (a), radiological event reporting threshold for the NSS, the reporting threshold in 10 CFR 20.2202 is immediate notification if the event may have caused or threatens to cause an individual to receive a total effective dose equivalent (TEDE) of 25 rems or more, or 24-hour notification if the event may have caused or threatens to cause an individual to receive a TEDE of 5 rems. Therefore, based on current radiological conditions, MARAD proposes that the reporting criterion of TS 3.4.2.(a) can be eliminated and more appropriately implemented by invoking current regulation 10 CFR 20.2202. The reporting criteria of TS 3.4.2(b) to report significant changes in radiation or contamination levels has a corresponding reporting requirement in 10 CFR 20.2203(a)(3)(i) and (ii). These require a report when either of the following conditions is met:

- (3) Levels of radiation or concentrations of radioactive material in--
 - (i) A restricted area [are found] in excess of any applicable limit in the license; or

- (ii) An unrestricted area [are found] in excess of 10 times any applicable limit set forth in this part or in the license (whether or not involving exposure of any individual in excess of the limits in § 20.1301).

In both cases, there must have been significant changes in radiation or contamination levels to meet the reporting criteria. Therefore, MARAD proposes that the reporting criterion of TS 3.4.2(b) can be eliminated and more appropriately implemented by invoking current regulations 10 CFR 20.2203(a)(3)(i) and (ii).

The reporting criteria of TS 3.4.2(c) to report any release of radioactive material to the environment in excess of 10% of the limits of applicable sections of 10 CFR 20 is essentially a requirement to report a condition prohibited by TS 2.0. The reporting criterion 10 CFR 50.73(a)(2)(i)(B) requires the licensee to report any condition prohibited by the TS.

Changes to TS 3.4.2 were also approved in License Amendment Request (LAR) 13. In LAR 13, MARAD requested changes to TS 3.4.2 to make it consistent with the reporting requirements contained in 10 CFR 50.4, 50.72 and 50.73. The revisions to TS 3.4.2 should also have included deleting the first three items of TS 3.4.2. As a result of the above discussion, the staff has determined that the reporting requirements in TS 3.4.2 (a), (b), and (c) are contained in existing regulations 10 CFR Part 20 and 10 CFR 50.73. Therefore, deleting the requirements from TS 3.4.2 is an acceptable administrative change that does not decrease MARAD's commitments.

Proposed Change 23

MARAD proposes to add TS 3.4.4 that states:

3.4.4 Notice of Ship Movement

- 3.4.4.1 Following 30 days written notice to the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 50.4, the vessel can be towed, berthed, moored or drydocked in any U.S. domestic location having a U.S. Maritime Administration approved Port Operating Plan.

The NRC agrees that the TSs is clarified if the requirement to provide a written notice of ship movement is relocated from TS 3.3.2 to TS 3.4. Further, the staff has determined that numbering the TS requirement is an administrative change that does not decrease MARAD's commitments.

Proposed Change 24

MARAD proposes to revise TS 3.5 to state:

3.5 Procedures and Operating Instructions

- 3.5.1 Activities which are designated as within the scope of the Decommissioning Quality Assurance Plan shall be prescribed by written, reviewed and approved procedures of a type appropriate to the circumstances.

3.5.2 Procedures and any subsequent revisions shall be reviewed and approved as required by the Decommissioning Quality Assurance Plan.

MARAD's proposed change eliminates the list of procedures requiring approval, and instead requires review and approval of procedures and their revisions as required by the Quality Assurance Plan (QAP). Each procedure listed in TS 3.5 is also listed in Sections 3.2.2 or 4.3.1 of the QAP. MARAD submitted a QAP on February 28, 2007, as required by 10 CFR 50.54(a)(2). 10 CFR 50.54(a)(4) requires MARAD to submit all changes to the QAP that reduce MARAD's commitments, to the NRC for review and approval. Since MARAD cannot reduce its commitments under the QAP without NRC approval, the staff has determined that the proposed change is an acceptable administrative revision.

Proposed Change 25

MARAD proposes that TSs 3.2.6, 3.6 and 3.6.1 be revised by renaming the Review and Audit Committee as the Safety Review Committee. To be consistent with the revised TS, MARAD also proposes to revise the QAP by replacing the title "Review and Audit Committee" with "Safety Review Committee."

MARAD submitted a QAP on February 28, 2007, as required by 10 CFR 50.54(a)(2). With implementation of the QAP, a committee named the "Review and Audit Committee" is no longer appropriate. Section 19 of the Decommissioning Quality Assurance Plan, "Audits" describes the audit process. While members of the Review and Audit Committee can be assigned audit duties by the Quality Assurance Manager, the committee is no longer exclusively assigned the responsibility to conduct audits. Further, Section 2.0 of the QAP states that the Review and Audit Committee is responsible for advising the Senior Technical Advisor on issues regarding public health and safety. Since the QAP requires MARAD to have an audit function, and MARAD cannot reduce its commitments under the QAP without NRC approval, the staff has determined that the proposed change is an acceptable administrative revision.

Proposed Change 26

MARAD proposes revising the format of the list of permanent members of the Safety Review Committee in TS 3.6.1.

Since the proposed change does not change the make-up of the committee, the staff has determined that reformatting the TS requirement is an administrative change that does not decrease MARAD's commitments.

Proposed Change 27

MARAD proposes revising TS 3.6.1 and 3.6.2 to add the Quality Assurance (QA) Manager as a permanent member to the Safety Review Committee (RAC).

MARAD has determined that with the approval of the Decommissioning Quality Assurance Plan, the Quality Assurance Manager should be added as a TS-required member of the RAC in TSs 3.6.1 (permanent member list) and 3.6.2 (the quorum requirement).

The staff agrees that the QA Manger should be a permanent member of the RAC. The addition of the QA Manager to the RAC will strengthen the review and oversight function of the RAC. The staff has determined that adding the QA Manger as a permanent member of the RAC is an acceptable administrative change that increases MARAD's commitments.

Proposed Change 28

MARAD proposes to revise TS 3.6.3 to state, "Members of the Committee shall review the following items: ... j. Annual reports to the NRC" (see proposed Change 29).

MARAD has determined that with the approval of the Decommissioning Quality Assurance Plan, the requirement in TS 3.6.3 should be revised to eliminate any potential conflict between the TSs and the Decommissioning Quality Assurance Plan. The TS states: "Members of the Committee shall conduct audits, on-the-spot checks, and evaluations to assure that all work is being done safely and in accordance with established procedures. If a deficiency is discovered, the Senior Technical Advisor, U.S. Maritime Administration, Washington, D.C., is to be notified immediately. The license holder is to take the necessary immediate corrective action, and a written report of the deficiency is to be prepared for review by the Committee."

The Decommissioning Quality Assurance Plan describes the minimum requirements for the corrective action process in Section 17 and the minimum requirements of the audit process in Section 19. (see Proposed Change 29).

The staff agrees that revising TS 3.6.3 by eliminating the requirements for implementing corrective actions will clarify the TS, and insure that consistency between the TS and the approved QA Plan. The staff has determined that the corrective action process described in the QA Plan is adequate and therefore, revising TS 3.6.3 is an acceptable administrative change that does not reduce MARAD's commitments.

Proposed Change 29

MARAD proposes to revise TS 3.6.3 such that it states:

Members of the Committee shall review all of the following items:

- a. Proposed changes to Technical Specifications;
- b. Evaluations required by 10 CFR 50.59;
- c. Proposed changes or modifications to a Radiological Controlled Area entry alarm system or the reactor containment vessel system;
- d. Evaluations of substantive changes to the results of radiological surveys;
- e. Procedures and revisions per Technical Specification 3.5;
- f. Evaluations of reported violations of Technical Specifications;

- g. Evaluations of reportable events per Technical Specification 3.4.3.1;
- h. Evaluations of deviations allowed by Technical Specification 3.7.1.7;
- i. Audits and self assessments to verify the effectiveness of the Decommissioning Quality Assurance Plan; and,
- j. Annual reports to the NRC.

Review responsibilities of the Safety Review Committee are currently identified in TSs 3.6.3 and 3.6.4. MARAD proposed to combine all of the responsibilities of the Safety Review Committee into TS 3.6.3 to replace the current TS 3.6.4. Items a, b, c, d, e, f, g, and j above, are essentially the current review responsibilities of the Safety Review Committee. In addition, proposed TS 3.6.3 also contains two new review responsibilities for the Safety Review Committee, as identified in Items h and i, above.

Item a: Proposed changes to Technical Specifications. This requirement replaces TS 3.6.4.a. with no changes.

Item b: Evaluations required by 10 CFR 50.59. This requirement replaces TS 3.6.4 with revisions. TS 3.6.4 includes the phrase “unreviewed safety question,” which is no longer used in 10 CFR 50.59. Therefore, in Item b this phrase has been removed.

Item c: Proposed changes or modifications to a Radiological Controlled Area entry alarm system or the reactor containment vessel system. This requirement replaces TS 3.6.4.b with revisions. Item c was revised to eliminate potential misinterpretation of “containment system” in TS 3.6.4.b. “Containment system” was replaced with “reactor containment vessel system” to focus on controlling access to the containment vessel.

Item d: Evaluations of substantive changes to the results of radiological surveys. This requirement replaces TS 3.6.4.c with revisions. This item was revised by replacing the first half of TS 3.6.4.c “substantive changes to radiological surveys” with “evaluations of substantive changes to the results of radiological surveys” since it is more appropriate to review an evaluation of the substantive change than to simply review the substantive change itself.

Item e: Procedures and revisions per Technical Specification 3.5. This requirement replaces the second half of TS 3.6.4.c “substantive changes to security surveillance procedures with “procedures and revisions per Technical Specification 3.5” to list all procedure review items in one TS requirement.

Item f: Evaluations of reported violations of Technical Specifications. This requirement replaces TS 3.6.4.d with revision. The revision includes replacing “reported violations of Technical Specifications” with “evaluations of reported violations of Technical Specifications” since it is more appropriate to review an evaluation of the violation than to simply review that the violation was discovered.

Item g: Licensee Event Reports. This requirement replaces TS 3.6.4.e. with no changes.

Item h: Evaluations of deviations allowed by Technical Specification 3.7.1.7. TS 3.6.3.i is a new review requirement for the Committee.

Item i: Audits and self assessments to verify the effectiveness of the Decommissioning Quality Assurance Plan. TS 3.6.3.j is a new requirement.

Item j: Annual reports to the NRC. This requirement replaces TS 3.6.4.f. with no changes.

The proposed changes discussed above do not reduce the responsibilities of the Safety Review Committee, but instead, serve to clarify the TS and the role of the Committee. Therefore, the staff has determined that the proposed changes are acceptable administrative changes.

The staff has determined that the revised review responsibilities of the Safety Review Committee, as identified in TSs 3.6.3 contain essentially the current review responsibilities of the Safety Review Committee plus two new review items. Therefore, the revisions TS 3.6.3 are acceptable administrative changes that do not reduce MARAD's commitments.

Proposed Change 30

MARAD proposes a new TS 3.6.4 that states: These reviews may be accomplished and concurred with by members of the Committee without a formal meeting.

MARAD's is proposing to take sentence two from TS 3.6.4 to make a new TS 3.6.4. Since the proposed change does not remove a requirement, the staff has determined that reformatting the TS requirement is an administrative change that does not decrease MARAD's commitments.

Proposed Change 31

MARAD proposes to revise TS 3.6.5 to state, "The Committee shall be convened by the Chairman and shall meet annually to review and discuss events of the preceding period. The Committee will meet when necessary to review evaluations of reportable events of Technical Specification 3.4.3.1."

The TS was revised to require the Committee to meet "to review evaluations of reportable events" instead of meeting "in the event of grounding or sinking of the vessel." In accordance with TS 3.4.3.1, reportable events include (1) reportable events as described in the regulations of the NRC; (2) any major damage to the vessel due to severe weather conditions or other causes; and (3) major flooding or sinking of the vessel (see Proposed Change 22 for other revisions to TS 3.4.3.2). To avoid inconsistency in the TS, MARAD is proposing to revise the wording in TS 3.6.5 to require the Committee to review evaluations of reportable events as described in TS 3.6.3.

Since the proposed change does not reduce the scope of "reportable events" and does not reduce MARAD's commitment to have the Committee review the evaluations of reportable events, the staff has determined that the proposed change is an acceptable administrative change.

Proposed Change 32

MARAD proposes to add TS 3.6.6 that states: "Written minutes of all meetings shall be prepared and distributed to all Committee members."

MARAD determined that the TSs are clarified if the third sentence of TS 3.6.5 is removed to form TS 3.6.6. Since the proposed change does not remove a requirement, the staff has determined that reformatting the TS requirement is an acceptable administrative change that does not decrease MARAD's commitments.

Proposed Change 33

MARAD proposes revising TS 3.7.1.3 by changing areas to area such that the TS now states: "All Radiological Controlled Area entrances will be posted with appropriate caution and warning signs."

The staff has determined that changing "areas" to "area" is an acceptable administrative change that does not decrease MARAD's commitments.

Proposed Change 34

MARAD proposes revising TS 3.7.1.4 to state, "All entrances to the ship not in use will be secured after normal working hours."

The current TS 3.7.1.4 states, "All entrances to the ship not in use will be secured at all times." In anticipation of personnel more routinely working on board, MARAD would like the flexibility of having the entrances to the ship not in use, to be secured "after normal working hours" rather than "secured at all times."

In accordance with its January 25, 2008, submittal, MARAD has withdrawn its request for Proposed Change 34.

Proposed Change 35

MARAD proposes revising TS 3.7.1.6 to state, "MARAD designated personnel will patrol the vessel at least once during a twenty-four (24) hour period."

The current requirement in TS 3.7.1.6 states, "Security personnel will patrol the vessel once during a twenty-four (24) hour period."

MARAD has determined that it is appropriate to allow any MARAD trained personnel, including security personnel, to patrol the vessel at least once during a twenty-four (24) hour period. The current security function is performed by a security contractor organization approved by MARAD. MARAD personnel train the contractor security personnel on the NSS Security requirements. There are no prerequisites or special skill sets required to perform the security function except that of being knowledgeable of the ship and having completed site specific training. MARAD has stated its intentions to train the ship's personnel, in addition to training the security contractor personnel, to perform this security function. This training will be the same training that the security contractor receives. The change allows MARAD the flexibility to perform this function without compromising the effectiveness of the TS security patrol.

The staff has determined that security of the vessel will not be reduced if MARAD trained personnel patrol the vessel at the same frequency as security personnel. Since MARAD personnel provide the training for the security personnel, MARAD trained personnel are capable of providing the same level of security during patrols as security personnel. Therefore, the staff has determined that this is an acceptable administrative change that does not decrease security on the vessel nor MARAD's commitments.

Proposed Change 36

MARAD proposes revising TS 3.7.2.1 by adding "to verify" such that the TS will read, "Periodically and at least once a quarter, MARAD's designated personnel will inspect the Radiological Controlled Area entrances to verify they are properly secured and test the intrusion alarm in Technical Specification 3.7.1.5." In addition, MARAD proposes to revise TS 3.7.2.1 by changing the word "item" to "Technical Specification"

MARAD has determined, and the staff agrees, that the words "to verify" were inadvertently omitted from TS 3.7.2.1 in License Amendment 13. Further, changing "item" to "Technical Specification" clarifies TS 3.7.2.1. Therefore, the staff has determined that these changes are acceptable administrative changes that do not decrease MARAD's commitments.

Proposed Change 37

MARAD proposes to revise TS 3.7.2.2 by combining TSs 3.7.2.2 and 3.7.2.3 such that, in concert with Proposed Changes 8 and 12, will read, "Radiological surveys of the ship will be performed at least annually and as necessary to support ship activities in accordance with 10 CFR 20."

Locations requiring Radiological Surveys are defined by 10 CFR 20, therefore, the list of ship locations requiring Radiological Surveys in TS 3.7.2.3 is no longer necessary. Surveys in these locations will continue to be performed as required by 10 CFR 20.1501(a). In lieu of listing specific areas where surveys are required, MARAD will be required to perform surveys as required by 10 CFR 20.1501(a) which states, surveys shall be performed as:

... necessary for the licensee to comply with the regulations in this part; and (2) Are reasonable under the circumstances to evaluate—

- (i) The magnitude and extent of radiation levels; and
- (ii) Concentrations or quantities of radioactive material; and
- (iii) The potential radiological hazards.

Therefore, any ship space that is currently posted as a Radiologically Controlled Area would continue to be surveyed until that space can be released for unrestricted use. By relying on the 10 CFR 20 requirements to define areas where surveys are required, there will be no need to update a TS list as new areas requiring surveys are created.

The list of survey locations provided in the current TS 3.7.2.3 was apparently derived from the earliest Health Physics Manual where beta-gamma dose rate surveys were required every eight hours while

the reactor was critical. The Possession-only License Amendment listed similar locations as controlled area because they contain radioactive systems and components.

The staff has determined that combining TSs 3.7.2.2 and 3.7.2.3 and replacing the list of ship locations requiring Radiological Surveys in TS 3.7.2.3 by a reference to 10 CFR 20, is an acceptable administrative change that does not decrease MARAD's commitments.

Proposed Change 38

MARAD proposes to revise TS 3.7.6 by adding "auxiliary" systems, such that the TS will read, "An inspection will be conducted at least annually by MARAD's designated personnel to determine any degradation of the primary, auxiliary and secondary systems.

MARAD has determined, and the staff agrees, that the annual inspection to evaluate system degradation should specifically include the auxiliary systems in addition to the primary and secondary systems. Therefore, the staff has determined that adding auxiliary systems to the list of systems that must be inspected, is an acceptable administrative change that does not decrease MARAD's commitments.

Proposed Change 39

MARAD proposes to renumber TSs 3.7.3 through 3.7.6 such that TS 3.7.3 states:

3.7.3 Vessel and System Maintenance

- 3.7.3.1 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. If the lower stripe is not visible, the ship shall be surveyed and the water leakage located. The source of leakage will be determined, the ship pumped out, and repairs made as may be required, including drydocking if determined necessary, in order to assure that the integrity of the hull is maintained.
- 3.7.3.2 A cathodic protection system will be provided and properly maintained to protect the underwater areas of the vessel's hull to minimize corrosion damage to the hull.
- 3.7.3.3 An underwater inspection of the hull will be conducted at least every four (4) years. The vessel will be drydocked if the inspection determines that such action is necessary due to localized severe pitting, underwater plate thinning in excess of 40 percent, or other damage that would require corrective action and/or removal of the vessel to an off-site ship repair facility.

- 3.7.3.4 An inspection will be conducted at least annually by MARAD's designated personnel to determine any degradation of the primary, auxiliary and secondary systems.

MARAD is also proposing to revise TS 3.7.3 by changing the phrase "draft markers" to "draft marks."

MARAD has determined that the TSs 3.7.3 through 3.7.6 are clarified if all of the items regarding vessel and system maintenance are grouped into a single TS renumbered 3.7.3 with the requirements of 3.7.3 through 3.7.6 renumbered as 3.7.3.1 through 3.7.3.4.

The staff has determined that revising TS 3.7.3 and renumbering TS 3.7.3 through 3.7.6 are acceptable administrative changes that do not decrease MARAD's commitments.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Virginia was consulted regarding the proposed issuance of the amendment. Copies of the license amendment request were provided to the State. NRC staff, via email, requested comments on the proposed amendment. The State of Virginia, Departments of Emergency Management and Health, responded that they had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes recordkeeping, reporting, or administrative procedures or requirements. The amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(10)(ii). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (2) such activities will be conducted in compliance with the Commission's regulations; and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: John T. Buckley

Date: April 3, 2008