

ENVIRONMENTAL REPORT ON THE DECOMMISSIONING WORK PLAN FOR THE SURFACE SHIP SUPPORT BARGE

1.0 Introduction

The U.S Nuclear Regulatory Commission (NRC) has entered into an agreement with Naval Sea Systems Command (NAVSEA) to provide technical expertise regarding decommissioning of a barge used for nuclear refueling; the Surface Ship Support Barge (SSSB) (Agencywide Document Access and Management System [ADAMS] Accession No. Main Library [ML] ML20177A172). Under the terms of the agreement, NRC will provide an environmental report and recommendation on the contractor's decommissioning work plan (DWP). NAVSEA awarded a contract for completing decommissioning of the SSSB to Aptim Federal Services, LLC (Aptim) in 2020.

The Aptim team that will disassemble the SSSB is required by their contract with NAVSEA to employ trained personnel and observe radiological controls during the dismantlement and disposal work to protect the workers, the public, and the environment in a manner consistent with NRC requirements.

In a September 2, 2020 letter from NAVSEA, Aptim has proposed a DWP (ADAMS Accession No. ML20269A446), which was supplemented by letter on January 21, 2021 (ADAMS Accession No. ML21055A034) that outlines the planned work. The NRC is currently evaluating this plan to confirm its consistency with analogous NRC requirements pursuant to its agreement with NAVSEA. NAVSEA will decide whether to approve Aptim's DWP based upon the NRC's final recommendation. The Navy contract requires the work to be conducted consistent with NRC requirements that mitigate the potential for release of radioactivity and ensure no adverse impact to the environment or the public through required environmental monitoring.

The NRC staff prepared this environmental report (ER) in support of its technical evaluation of NAVSEA's proposed DWP and supplement. While similar to the technical and environmental reviews that the NRC performs as a regulator, the NRC's role here is in support of NAVSEA, which maintains regulatory and contractual authority over the SSSB and Aptim. A positive recommendation from NRC staff, based on successful review of the DWP and supporting documents would meet Aptim's contractual requirements for NAVSEA to approve the DWP, and the start of decommissioning activities on the SSSB. The primary decommissioning activity is dismantling and appropriate waste disposal of the SSSB. Upon successful completion of decommissioning activities, Aptim's DWP describes how they will implement effluent controls at the work site and conduct a final radiological survey on the SSSB work area footprint.

For the purpose of environmental hazard evaluation, NRC staff considers the SSSB size, project scope and identified radiological inventory, and concludes that the project to decommission the SSSB would be similar to a research reactor decommissioning project. Environmental evaluations for research reactor Decommissioning Plans are evaluated under the requirements for the categorical exclusion provisions in Title 10 of the Code of Federal Regulation (CFR), Part 51, Section 22(9). NRC staff evaluate these decommissioning projects to determine if they involve no significant hazards, no significant increase in the types or amounts of effluents that may be released offsite, and no significant increase in individual or cumulative occupational radiation exposure. If the licensee proposed decommissioning plan and implementing license amendment meets these eligibility criteria for categorical exclusion set

forth in 10 CFR 51.22(c)(9), pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment is prepared.

Alternatively, other NRC licensed facilities in decommissioning, including power reactors, are evaluated by utilizing a generic environmental impact statement, NUREG 0586, "General Environmental Impact Statement (GEIS) on the Decommissioning of Nuclear Facilities," Supplement 1, 2002. (<https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0586/s1/v1/index.html>). NRC staff notes that the US Army Corps of Engineers referenced NRC's NUREG-0586 Supplement 1 for their environmental evaluation of the MA-1A *Sturgis* decommissioning project. (<https://www.nab.usace.army.mil/Missions/Environmental/Sturgis.aspx>).

2.0 Facility Description/Operating History

The SSSB operated exclusively at Newport News Shipbuilding for over 50 years supporting defueling operations of the Navy's nuclear-powered aircraft carriers and cruisers. Spent naval nuclear fuel modules from these ships were placed in a pool of water in the SSSB, then subsequently packaged into shipping containers for eventual shipment to a special-purpose facility in Idaho.

The last of the spent naval nuclear fuel in the SSSB was shipped out in 2016, removing over 99.9% of the radioactivity. The remaining radioactivity in the SSSB exists within the SSSB cooling water pool (which was used to store the fuel upon removal from a ship), cooling water piping systems, and support equipment. The remaining percentage of low-level radioactivity is primarily activated corrosion and wear products, predominately Cobalt-60 (Co-60). This small percentage of radioactivity remaining is captured within the SSSB steel structure and support systems of the SSSB that, by contract, will be disposed of in accordance with state, federal, and local requirements.

3.0 Affected Environment

Lists of the structural areas of the SSSB that are considered radiologically impacted or potentially radiologically impacted are provided in Tables 3-1, 3-2 and 5-1 of the DWP. The bulk of the SSSB will be disposed of as low-level radiological waste, including some areas considered to be non-radiologically impacted. Areas and systems considered non-impacted, which are planned for release (i.e., disposal as non-radiological material), includes the controlled pure water storage tanks, pure water systems and freshwater systems. the exterior upper deck, and the exterior hull; but specific disposition has not yet been determined.

According to the DWP, approximately 85% of the SSSB will be disposed as low-level radiological waste, and approximately 15% will be surveyed for unrestricted release, and disposed of as non-radiological material, as appropriate.

3.1 Radiological Status

Chapter 4 of the DWP provides an evaluation of the radionuclides of concern in the SSSB, utilizing waste stream characterization data from NAVSEA reports completed in 2006. Decay corrected radioisotope inventories indicate that radionuclides of concern are Co-60, Iron-55, Nickel-63, Carbon-14, and Cesium-137 (Co-60, Fe-55, Ni-63, C-14, and Cs-137, respectively).

Table 9.2 in the DWP provides an estimated inventory of radiological contaminants of potential concern, based on a review of historical SSSB characterization and operating records. The total estimated radiological inventory is 0.12 curies, after accounting for radiological decay. Pages 5-4 to 5-8 of the DWP estimate that over 99% of the radiological inventory is located in of the wet pit water and other metal and solids inside the wet pit, wet pit storage racks and stands, dry pit equipment, clean house equipment, and pump room system and equipment.

4.0 Proposed Action

The proposed action includes the following:

1. Physical preparation for transfer of the SSSB from Huntington Ingalls Industries shipyard in Newport News, VA, to Aptim at the Colonna's Shipyard in Norfolk, VA
2. Preparations at the Colonna's Shipyard for SSSB transport via ocean-going heavy lift transport barge to Alabama Shipyard in Mobile, AL
3. Preparations at Alabama Shipyard, to include establishing a security perimeter, installation of environmental monitoring stations, conducting a baseline radiological survey, installing a liner system, and preparing two stair towers for personnel access
4. Ocean transport to the Port of Mobile, AL
5. Transfer of SSSB from heavy lift barge to land at Alabama Shipyard using self-propelled modular transporters
6. Survey, identification, physical separation, and segregation of radiologically contaminated SSSB structures, systems and components (SSCs) from non-contaminated SSSB SSCs during the ship-breaking process
7. Packaging, transport and disposal of radiologically contaminated material at the Waste Controls Specialists, LLC federal facility in Andrews, Texas
8. Final radiological survey of the SSSB footprint at the Alabama Shipyards.

4.1 Alternative 1: No Action

The no-action alternative would be to not decommission the SSSB, and the residual contamination would remain as it currently exists. The SSSB would remain in Newport News, presumably until another disposal option is identified. While in applicable here, the staff notes that the failure to pursue decommissioning of the SSSB would not be consistent with NRC regulations governing decommissioning timeliness, such as 10 CFR 40.42. The purpose of the Decommissioning Timeliness Rule is to reduce the potential risk to the public and environment that may result from delayed decommissioning of inactive facilities and sites. Specific concerns addressed by the Decommissioning Timeliness Rule include the potential risk of safety practices becoming lax because of the attrition of key personnel and the lack of management interest at facilities after operations cease, as well as other unforeseen changes that may complicate or delay decommissioning. All these considerations counsel strongly in favor of

prompt decommissioning, and for the same reasons that it is impermissible for NRC regulated material, it is not considered a reasonable alternative here, and is not evaluated further.

5.0 Radiation Protection Program

As described in Chapter 7 of the DWP, Aptim will control and monitor radiation exposures to workers and the public during decommissioning of the SSSB by exercising project managerial control and by establishing a radiation protection program, including workplace air sampling, respiratory protection (if needed), work area monitoring, external exposure monitoring and a contamination control program. Chapter 8 of the DWP describes Aptim's Environmental Monitoring and Control Program, which includes an environmental As Low As is Reasonably Achievable (ALARA) program, an effluent monitoring program, and an effluent control program.

6.0 Evaluation of Proposed Action's Environmental Impacts

6.1 Licensee's Proposed Action

6.1.1 Radiological Impacts to Workers and the Public

Chapter 5 of the DWP's Radiation Protection Plan (RPP) for the SSSB discusses radiological impacts to workers. The RPP indicates that the primary gamma-emitting radionuclide contributing to gamma exposure rates will be Co-60. Occupational dose estimates will be performed as more radiological survey data are accumulated from characterization surveys on receipt of the vessel prior to performing dismantlement work.

Internal and/or external dose monitoring will be required for individuals expected to receive a dose greater than 10 percent of the maximum permissible dose. Aptim will require external dose monitoring for occupationally exposed individuals as deemed necessary to demonstrate compliance with Aptim administrative limits and federal limits specified in 10 CFR 20, including ALARA. Once the wet pit and associated equipment and systems have been dispositioned, occupational dose is anticipated to be minimal.

A dose assessment for members of the public will be conducted and documented on an annual basis to demonstrate compliance with the regulatory limits. This assessment shall be based on results of radiological surveys, site perimeter air monitoring data, and any environmental dosimeter readings. Additionally, Aptim is imposing these additional restrictions for SSSB decommissioning:

- Individuals under 18 years of age shall not be occupationally exposed.
- To ensure that doses to the public do not exceed 2 millirem in any one hour, surveys will be performed in applicable unrestricted areas, physical barriers will be established as necessary, and appropriate postings will be displayed.
- Members of the public shall not receive a total effective dose equivalent in excess of 10 mrem per year from air emissions of radioactive material to the environment, excluding Radon-222 and its daughters.

- Planned Special Exposures are not permitted.
- Visitors shall not be allowed to receive a whole body dose greater than 10 millirem per visit.

6.1.2 Nonradiological Environmental Impacts

Controls being put in place to control radiological impacts will minimize potential release for non-radiological contaminants as well.

The Alabama Shipyard is located on Pinto Island, which is zoned exclusively for heavy industry, with the exception of the Battleship Alabama historical site, which is zoned as parks and open space, and a few sites along the water's edge on the other side of the island zoned as water dependent. Impacts to the ground water are not expected because the work controls previously discussed being put in place to control effluents at the Alabama Shipyard.

The truck shipments of low-level radiological waste and non-radiological material from Alabama Shipyard will impact the local area during dismantlement and disposal of the SSSB. However, given the heavy industry zoning of Pinto Island, the impacts are expected to be minimal. The truck shipments will occur over several weeks, given the project schedule. Therefore, impacts to local traffic should be small and of limited duration.

6.1.3 Cumulative Impacts

The Alabama Shipyard has been used for industrial purposes for 70 years and was utilized to build and maintain U.S. Navy ships during World War I and World War II. On project completion, a final survey will be performed to demonstrate that the SSSB dismantlement area was not impacted by project operations and release the site for unrestricted use.

Therefore, there are no foreseeable cumulative impacts due to past, present, or reasonably foreseeable future actions from the proposed action.

7.0 Conclusion

The NRC staff has determined that this action, if under its regulatory purview, would involve no significant hazards consideration, no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site, and no significant increase in individual or cumulative occupational radiation exposure. Based upon the review above, the NRC staff recommends that a simple environmental assessment (or categorical exclusion, as applicable) would appropriately capture the potential environmental impacts of this decommissioning action.