USS *Yorktown* Immediate Repairs Report
Final

Submitted to:

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632 Rosewood Drive, Columbia, South Carolina 29201

Tank A-62 prior to cleaning

Tank A-62 after cleaning

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Table of Contents

List of Figures

List of Tables

1. Background and Summary

The South Carolina Office of Resilience (SCOR) contracted with Research Planning, Inc. (RPI) for an environmental assessment and cost study to identify the legacy contaminants onboard the USS *Yorktown* and develop a Remediation Plan. These contaminants were on the ship when it was delivered by the U.S. Navy in 1975, before there were procedures in place that addressed cleanup of a ship prior to donating it as a museum. The initial assessment identifying and prioritizing contaminants present aboard the ship was completed in July 2023. The RPI team includes T&T Salvage (T&T) and GEL Laboratories (GEL).

In August 2023, the RPI team was engaged to survey, monitor, and make temporary repairs to the external hull and adjacent tanks between frames 26 and 79 on the USS *Yorktown* from 28 August 2023 through 20 December 2023. Immediate repairs were necessary to facilitate the environmental remediation process and to protect the ship's central power system. Loss of the power system could have been a catastrophic event for this asset.

T&T subcontracted with HEPACO for dewatering, cleaning, and disposal services of deep structural tanks within this boundary. Additional targeted areas included the flooded access trunks, machinery spaces and normally occupied spaces between frames 32 and 55. Asbestos abatement was deemed necessary in certain machinery spaces before cleaning operations could be completed. Regulated asbestos-containing materials were removed and disposed of in a safe and compliant manner.

A salvage team with diving capabilities was mobilized on 28 August 2023. The divers performed an assessment of the hull and established locations of the external leaks. Splashzone epoxy was reapplied to multiple existing patch locations on the port side, and new epoxy repairs were installed to several damage locations above the waterline in Elevator Machinery and Catapult Pump Room A-404AE, frames 19 to 39. External leaks forward of frame 26 had to be addressed due to the risk of water migration aft during king tides or storm surges. A total of 22 repairs were made forward of frame 26. Epoxy was applied to small holes or pits in tanks A-8F at frames 33 and 35, and A-32.5J at frame 54. Old patches were reinforced or replaced in tanks A-4F at frames 26-28 and A-3F at frames 27-29.

Internal diving operations were carried out inside the vessel's tanks A-20.5F and A-26.5F to identify leaks into these tanks that were not apparent from the outside. A leak was discovered into A-26.5F at frames 44-45 and sealed with a salvage patch applied from both the inside and outside of the hull. Additionally, divers discovered extensive corrosion in piping systems and isolated several leaking pipes from adjoining tanks with damage control plugs. The flooding of tank A-20.5F was determined to be caused by the damaged piping. After dewatering and cleaning this tank, epoxy was applied to the existing repair at frames 43-44. During the dewatering operations, an external leak was discovered into tank A-62.5F at frame 73. A local diving team was subcontracted on 20 November to patch the leak using a damage control plug and epoxy.

Observations revealed water migration between different tanks and pump rooms throughout the ship's piping systems. This determination became evident when changes in liquid volume due to dewatering or water ingress in specific tanks correlated with volume changes in other non-adjacent tanks. Multiple piping systems are present in each tank, including steam heat and condensate return, fire main, fuel oil and JP-5 transfer, auxiliary steam, bilge, and ballast. Significant corrosion of the piping and valves facilitated unrestrained communication between multiple tanks and spaces, including DC Pump Room

A-713E and Elevator Machinery Pumproom A-9E. This resulted in an unanticipated contamination of previously clean tanks, and subsequently increased the time required for cleaning and dewatering operations.

To control potential ingress of water and prevent the ship's machinery compartments from flooding, T&T began isolating outboard tanks between frames 26 and 79. Piping was cut at the bulkheads in the second from the side shell tanks and all inboard, and outboard bulkhead penetrations were temporarily sealed with pipe plugs, thereby establishing two longitudinal barriers between the hull and the inboard compartments.

A significant internal temporary repair was made on the port side of bulkhead 26 within tank A-4F. A substantial leak was detected into this tank from the flooded compartments forward of frame 26. The dewatering operations were redirected to this tank with the goal of lowering the water level to allow access to the damage location. The pumping process continued for 11 days and gradually overcame the water ingress allowing the T&T crew to apply a temporary patch using shims, wedges, and epoxy. Subsequently, the spaces forward of frame 26 were dewatered and epoxy was applied to the patch from the forward side of the bulkhead. During the flooding of tank A-4F, the water migrated into A-8F through a hole in the bulkhead 32 and into Elevator Machinery Pump Room A-9E through piping.

2. Tank Cleaning and Dewatering

During the initial survey assessment, 42 deep tanks were identified for dewatering and 16 for cleaning. These encompassed tanks contaminated with oil or containing brackish or sea water, as well as outboard tanks that required dewatering for internal repairs. In the course of the project, these numbers increased to 50 tanks or spaces for dewatering and 30 spaces for cleaning. There were multiple causes for the increase of scope. These include, but are not limited to, migration of contaminants through piping, contamination of machinery spaces, and inability to access spaces or perform accurate assessment during the survey due to the liquid levels. A drawing highlighting the original target spaces is included in Appendix A. The spaces that were added to the original scope are as follows:

Dewatering: Tanks A-16V, A-28V, A-29V, A-41V, A-43V, A-45V, A-59V, Elevator Machinery Pump Room A-9E, Aviation Lube Oil Pump Room A-708E, Aircraft Ammunition Room A-709M, and Fuel Oil Transfer and Damage Control Pump Room A-713E. Dewatering was deemed unnecessary for tanks A-3F, A-17V, and A-23V that were included in the original list of target tanks.

Cleaning: Tanks A-4F, A-16V, A-20F, A-20.5F, A-22V, A-26.5F, A-27F, A-28V, A-29V, A-59V, and spaces A-9E, A-708E, A-709M, and A-713E.

Tank A-4F flooded from tidal compartments forward through damaged bulkhead 26. Subsequently, the water migrated through piping into contaminated Elevator Machinery Pump Room A-9E. In order to apply repairs to the damage location, A-4F had to be dewatered, resulting in migration of oily water from A-9E back into the tank and causing contamination. During cleaning operations in A-4F, a substantial amount of solid waste, such as grit sand, mud and rust scale was discovered in the tank. This contaminated solid waste could not be pumped out and had to be collected into waste bags by hand, extending the duration of cleaning operations.

Tank A-16V was only accessible through the sounding tube during the initial survey, and its contents were observed as oily water. Flooding in the wiring trunk A-512T located atop of A-16V obstructed access to the manhole for this tank. It was only after A-512T was dewatered and cleaned, and access to A-16V established, that the tank was found to contain heavy fuel oil with the potential of migrating elsewhere through the multiple deteriorating pipe system running through the tank.

After completing repairs to the side shell in tanks A-20.5F and A-26.5F, allowing for the dewatering of the tanks, a significant volume of mud was discovered on the bottom. The accumulation of mud in these tanks was a result of the prolonged existence of external leaks. A more powerful vacuum truck was mobilized for the mud removal, and the cleaning team made entry into the tanks and assisted the removal process through pressure washing.

Tanks A-28V and A-29V are void spaces directly adjacent to the Fuel Oil Transfer and DC Pump Room A-713E on the port and starboard sides, respectively. The majority of the piping systems servicing tanks between frames 39 and 67 traverse through these tanks. The deteriorated condition of the piping has led to the formation of multiple leaks into these tanks from various other tanks, both clean and contaminated. Consequently, oil migrated into A-28V and A-29V necessitating cleaning. Similarly, tanks A-22V and A-59V have also become contaminated due to communication through piping with oily tanks. Figure 1 was taken inside tank A-28V and shows the numerous piping systems as well as an active leak from one of them.

Figure 1. Leaking piping in tank A-28V.

Starboard tanks A-41V, A-43V and A-45V initially contained fresh water and were not included in the list of target tanks for dewatering. A change in water levels in these tanks prompted a reassessment, and new

salinity measurements revealed the contents to be brackish water. Saltwater ingress into these tanks was determined to originate from the external leaks on the port side, migrating through pump room A-713E and void space A-29V. Following this discovery, these tanks were identified for dewatering and disposal.

Pump room A-713E contains piping systems for all deep tanks between frames 39 and 67, predominantly fuel oil, ballast, JP5, and steam systems. Large volume of water and oil have migrated into this space through numerous leaks in the piping. Pump room A-708E and aircraft ammunition room A-709M are adjacent to A-713E and share the same access trunk, which allowed for water migration between the spaces. Additionally, many of the piping systems in these spaces contained asbestos insulation that had to be abated prior to completion of cleaning operations. An asbestos abatement team was subcontracted on 6 November and completed the abatement on 1 December 2023. Several aspects impacted the abatement progress, such as poor accessibility, deterioration of the piping and formation of leaks previously contained by the insulation. Figures 2 and 3 show photographs of pump rooms A-713E and A-708E.

Figure 2. Photographs of pump room A-713E.

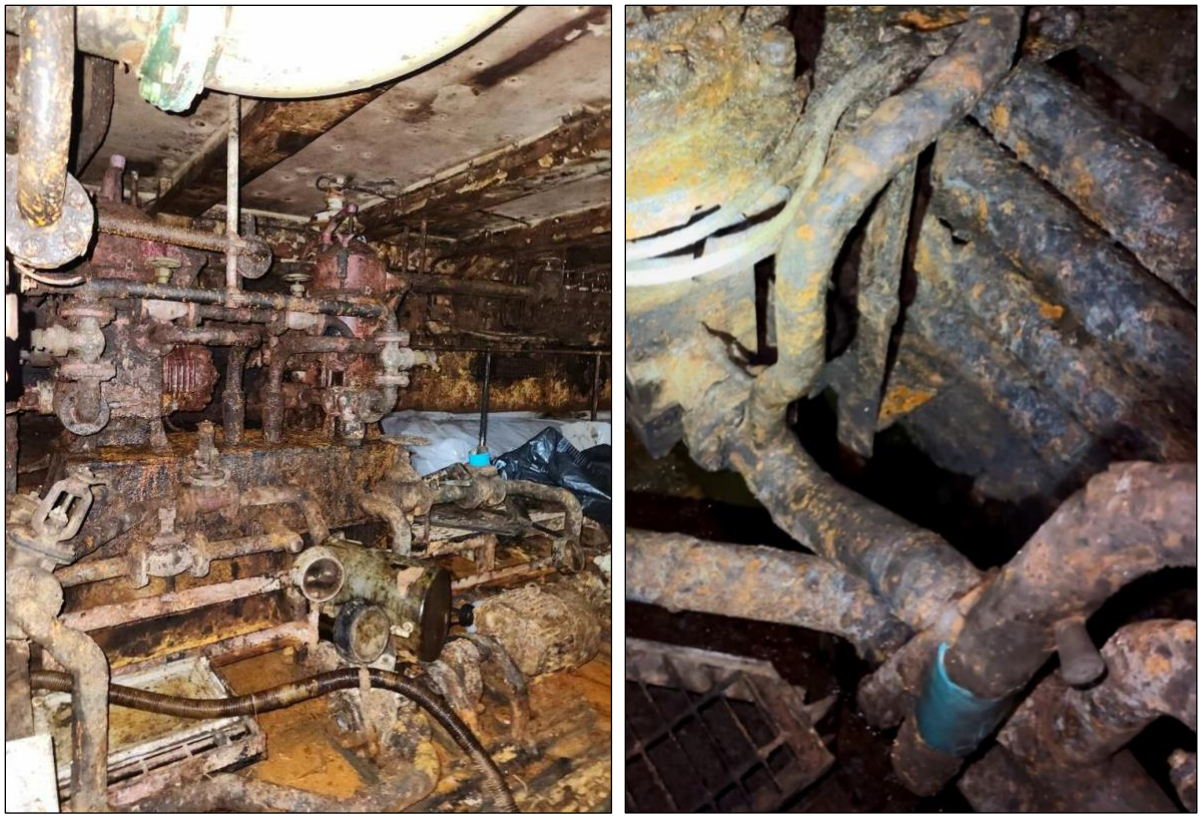


Figure 3. Examples of deteriorated condition of the piping in the pump rooms, A-713E.

While conducting dewatering operations in tank A-62.5F, a leak was discovered, leading to an overnight increase in the tank's volume. Salinity measurements confirmed this leak to be external. Consequently, all operations in this tank were suspended and a local diving company was engaged to patch the side shell penetration. After the necessary repairs were completed, the tank was dewatered again. A significant accumulation of grit sand, mud, and rust scale was discovered on the bottom of the tank, attributed to prolonged existence of the external leak and exposure to salt water. Although liquid oil coating the tank walls was cleaned, the remaining project timeline proved insufficient for the removal of the contaminated solid waste. The unfinished work identified here will be part of the scope for Phase 2 of this Remediation Project

In summary, dewatering was completed for 47 out of 50 tanks, while cleaning was completed for 22 out of 30 tanks. On average, five and a half days were required for dewatering and cleaning of a single tank. A total of 568,800 gallons of oily water and sludge and 8.88 tons of solid waste were removed from the ship and disposed of. To optimize disposal costs and expedite the dewatering process, fresh water from the clean tanks was internally transferred into isolated tanks. After extremely high tides in December 2022, Patriots Point staff added approximately 250,000 gallons (930 LT) of freshwater ballast. Summary tables for the completion of cleaning and dewatering are presented in Table 1. Additionally, a detailed drawing highlighting updated targeted tanks and the completed work is included in Appendix B.

Table 1. Summary of completion of cleaning and dewatering during the immediate repair works.

Tanks or spaces required dewatering or transfer of contents	
Completed Total - 47	<u>Contents disposed of:</u> A-4F, A-5F, A-6F, A-7F, A-8F, A-16V, A-18F, A-19F, A-20F, A-20.5F, A-21F, A-21.5F, A-22V, A-24F, A-25F, A-26F, A-26.5F, A-27F, A-27.5F, A-28V, A-29V, A-43V, A-45V, A-47F, A-54F, A-59V, A-62F, A-62.5F, A-63F, A-63.5F, A-72F, A-73F, A-512T, A-713E (DC Pump Room), A-9E (Elevator Mach. Pump Room), A-708E (Aviation Pump Room), A-709M (Aircraft Ammunition Room)
	<u>Contents transferred internally:</u> A-32F, A-32.5J, A-33F, A-33.5J, A-46F, A-46.5F, A-54.5F, A-47.5F, A-55F, A-55.5F
Remaining Total - 3	A-41V, A-70F, A-71F

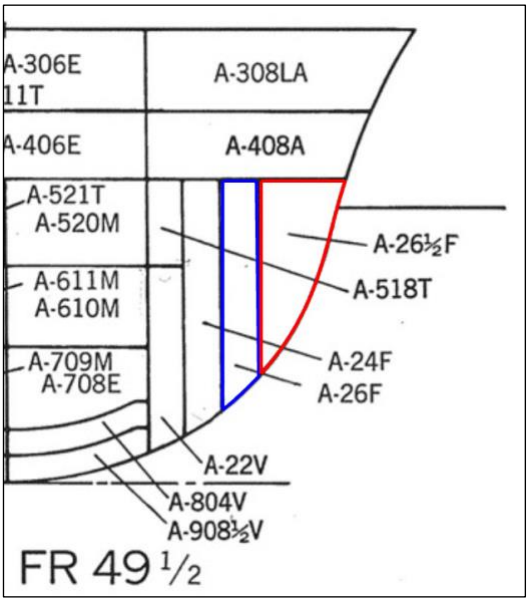
Tanks or spaces required cleaning	
Completed Total - 22	A-4F, A-5F, A-16V, A-18F, A-20F, A-21F, A-20.5F, A-21.5F, A-22V, A-24F, A-25F, A-26F, A-26.5F, A-27F, A-27.5F, A-28V, A-29V, A-62F, A-512T, A-713E (DC Pump Room), A-708E (Aviation Pump Room), A-709M (Aircraft Ammunition Room)
Remaining Total - 8	A-19F, A-59V, A-62.5F, A-63F, A-63.5F, A-72F, A-73F, A-9E (Elevator Mach. Pump Room)

3. Internal Repairs

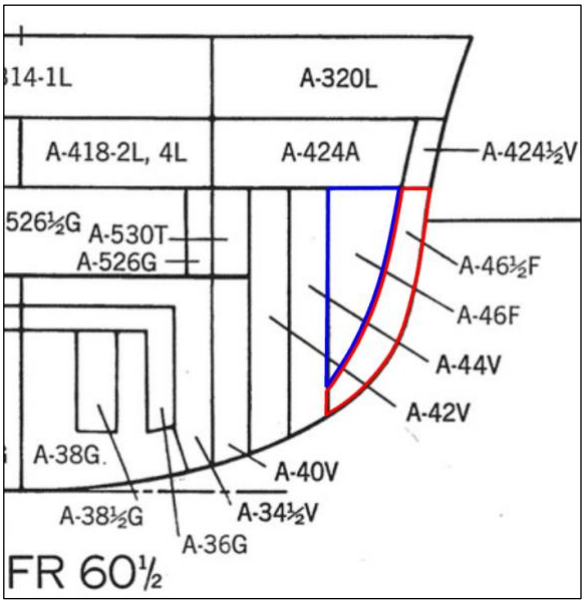
Summary

To limit communication through piping between tanks and restrict migration of water from potential external leaks into the inboard tanks and compartments, the T&T team entered the tanks second from the side shell and cut the piping at the inboard and outboard bulkheads. All bulkhead penetrations were then sealed with temporary patches, effectively isolating the two outboard-most tanks.

In some cases, the outboard tanks shared a portion of the inboard bulkhead with the second from the side shell tanks and contained pipes that ran directly from the third from the side shell tanks. In these cases, entry was made into both second and third from the side shell tanks to ensure that all bulkhead penetrations are sealed. The schematics in Figure 4 illustrate two different geometries of the outboard tanks.



Case 1 – All piping into the outboard tank A-26.5F penetrates the inboard bulkhead directly from the second from side shell tank A-26F.



Case 2 – Some or all piping into the outboard tank A 46.5F penetrates the inboard bulkhead from the third from side shell tank A-44V, below the second from side shell tank A 46F.

Figure 4. Schematics of different geometries of the outboard tanks.

All tanks that were entered had to first be dewatered as well as cleaned, if contaminated. Figure 5 shows the boundaries that have been established through the previously described proccess with the bulkheads that have been sealed highlighted in red. The list of isolated tanks is included in Table 2. Further details about repairs conducted in each tank along with photos of the repairs are provided in the subsequent sections. Additional noteworthy internal repair encompassed work on bulkhead 26 in tank A-4F, which has been previously described in this report.

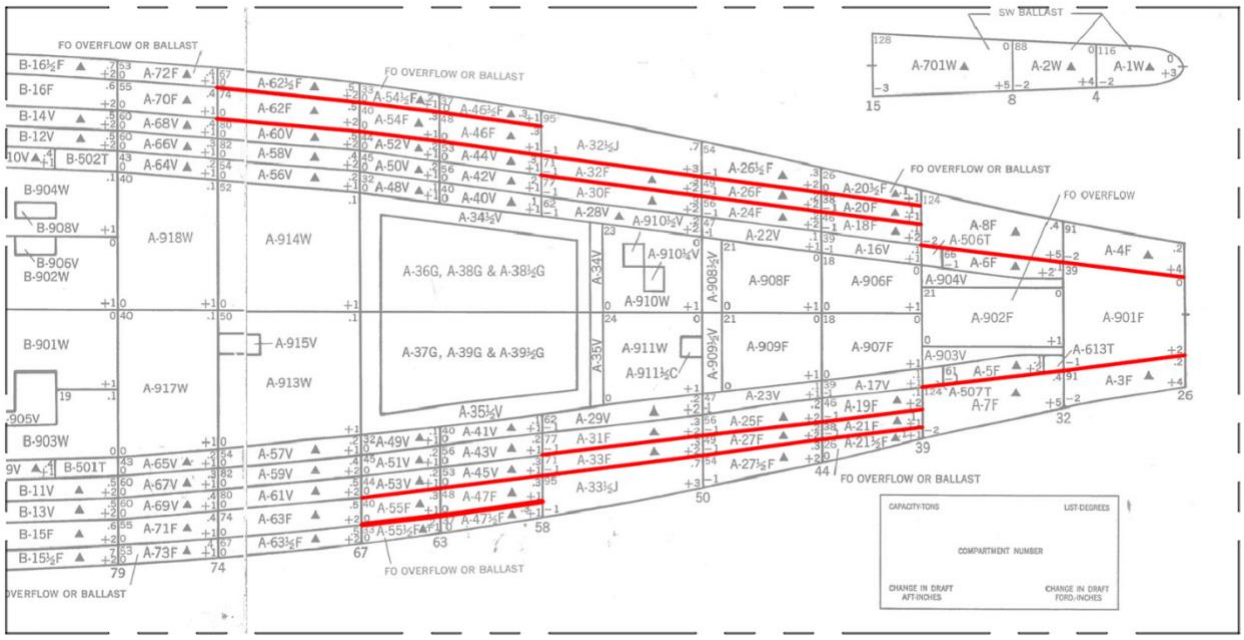


Figure 5. Boundaries (in red) created by removing sections of pipe at the bulkheads and sealing the bulkhead penetrations, consequently isolating the outboard tanks and restricting water migration through piping.

Table 2. Tanks isolated during the immediate repairs.

Temporarily isolated tanks	
Total - 26	A-3F, A-4F, A-7F, A-8F, A-20F, A-20.5F, A-21F, A-21.5F, A-26F, A-26.5F, A-27F, A-27.5F, A-32F, A-32.5J, A-33F, A-33.5J, A-46F, A-46.5F, A-47F, A-47.5F A-54F, A-54.5F, A-55F, A-55.5F, A-62F, A-62.5F **Tanks A-47F and A-47.5F isolated only partially. Previously cut sections of longitudinal bulkheads will allow for water migration if the outboard tank becomes tidal.*

Tanks A-3F and A-4F

Bulkheads to tanks A-3F and A-4F are each penetrated by a 1.0” steam supply pipe, a 0.75“ condensate return pipe, a 3.5” ballast pipe and a 4.0” fuel oil pipe, all located between FR (frames) 32 and 33. The ballast pipe to tank A-4F was sealed in the tank itself. All remaining piping to these tanks was cut and sealed in the Belt Links and Drill Rocket Stowage Room A-704A. Damage control plugs were used for sealing all bulkhead penetrations. Notably, the fuel oil pipe to A-3F had previously been sealed with a welded-on doubler plate and steam lines to A-4F had previously been sealed with bolted-on flanges. Excluding the previous repairs, three pipes were cut and sealed for tank A-3F and two for A-4F. See photographs in Figures 6-8.

Figure 6. Piping to tank A-3F prior to removal. Photograph captured in A-704A.

Figure 7. Sealed bulkhead penetrations to tank A-3F. Photographs captured in A-704A.

Figure 8. Sealed fuel and steam lines to A-4F (left) – photograph captured in A-704A. Sealed ballast line at the inboard bulkhead in A-4F (right) – photograph captured in A-4F.

Tank A-7F

Four pipes were cut and penetrations sealed inside tank A-7F: a 0.75” condensate return pipe at FR 33-34; a 1.0” steam supply pipe at FR 32-33; a 3.5” ballast pipe at FR 32; and a 4.0” fuel oil pipe at FR 33-34. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figure 9 and 10.

Figure 9. Condensate return (left) and steam supply (right) pipes cut and sealed in A-7F.

Figure 10. Fuel oil (left) and ballast (right) pipes cut and sealed in A-7F.

Tank A-8F

Four pipes were cut and penetrations sealed inside tank A-8F. Pipe sizes and frame locations are identical to those in A-7F. Damage control plugs were used to seal bulkhead penetrations for steam pipes and mechanical plugs were used for ballast and fuel oil pipes. See photographs in Figures 11-13.

Figure 11. Piping in A-8F prior to removal.

Figure 12. Steam supply (left) and condensate return (right) pipes cut and sealed in A-8F.

Figure 13. Ballast (left) and fuel oil (right) pipes cut and sealed in A-8F.

Tanks A-20F and A-20.5F

Eight pipes were cut and twelve bulkhead penetrations were sealed in tank A-20F. Four pipes servicing tank A-20F were cut and sealed at the inboard bulkhead. The other four pipes were cross-over pipes to tank A-20.5F, which were cut and sealed at both the inboard and the outboard bulkheads. Both of the tanks contains one condensate return, one steam supply, one ballast and one fuel oil pipes of the same diameters as mentioned previously. All of the bulkhead penetrations are located at FR 43-44. Damage control plugs were used to seal bulkhead penetrations for steam pipes and mechanical plugs were used for ballast and fuel oil pipes. See photographs in Figures 14-16.

Figure 14. Piping in A-20F prior to removal.

Figure 15. Penetrations sealed at the inboard bulkhead in A-20F.

Figure 16. Penetrations sealed at the outboard bulkhead in A-20F.

Tanks A-21F and A-21.5F

Following the same procedure as applied to tanks A-20F and A20.5F, eight pipes were cut and twelve bulkhead penetrations were sealed in tank A-21F – four pipes servicing A-21F and four cross-over pipes servicing A-21.5F. Fluid service, sizes and frame location of pipes in A-21F are identical to those in A-20F. Damage control plugs were used to seal all bulkhead. See photographs in Figures 17-18.

Figure 17. Penetrations sealed at the inboard bulkhead in A-21F.

Figure 18. Penetrations sealed at the outboard bulkhead in A-21F.

Tanks A-26F and A-26.5F

Eight pipes were cut and eleven bulkhead penetrations were sealed in tank A-26F and one bulkhead penetration in tank A-26.5F. Four pipes servicing tank A-26F were cut and sealed at the inboard bulkhead of A-26F: condensate return, steam supply, ballast and fuel oil. Three cross-over pipes to tank A-26.5F were cut and sealed at both the inboard and the outboard bulkheads in A-26F: condensate return, steam supply, and fuel oil. The ballast pipe to A-26.5F was sealed at the inboard bulkhead in tank A-26.5F and at the inboard bulkhead in A-26F. All pipes are of the same diameter as mentioned previously. All of the bulkhead penetrations are located at FR 49-50. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figures 19-22.

Figure 19. Piping in A-26F at the inboard bulkhead (left) and outboard bulkhead (right) prior to removal.

Figure 20. Sealed ballast line at the inboard bulkhead in A-26.5F – photograph captured in A-26.5F.

Figure 21. Penetrations sealed at the inboard bulkhead in A-26F.

Figure 22. Penetrations sealed at the outboard bulkhead in A-26F.

Tanks A-27F and A-27.5F

Eight pipes were cut and twelve bulkhead penetrations were sealed in tank A-27F. Four pipes servicing tank A-27F were cut and sealed at the inboard bulkhead. Four cross-over pipes to tank A-27.5F were cut and sealed at both the inboard and the outboard bulkheads. Each of the tanks had one condensate return, one steam supply, one ballast and one fuel oil pipes of the same diameter as mentioned previously. All of the bulkhead penetrations are located at FR 49-50. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figures 23-24.

Figure 23. Penetrations sealed at the inboard bulkhead in A-21F.

Figure 24. Penetrations sealed at the outboard bulkhead in A-21F.

Tanks A-32F and A-32.5J

Six pipes were cut and ten bulkhead penetrations were sealed in tank A-32F. Two pipes servicing tank A-32F were cut and sealed at the inboard bulkhead: one 3.5” ballast pipe at FR 55-56 and one 4.0” fuel oil pipe at FR 52-53. Four cross-over pipes to tank A-32.5J were cut and sealed at both the inboard and the outboard bulkheads: one 2.5” pipe assumed to be JP-5 fuel at FR 58, two 1.5” unidentified pipes at FR 53-56 and one 3.5” ballast pipe at FR 52-53. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figures 25-28.

Figure 25. Two 2.5” penetrations sealed at both bulkheads in A-32F at FR 58.

Figure 26. A 3.5” ballast pipe penetration sealed at the inboard bulkhead in A-32F at FR 55-56.

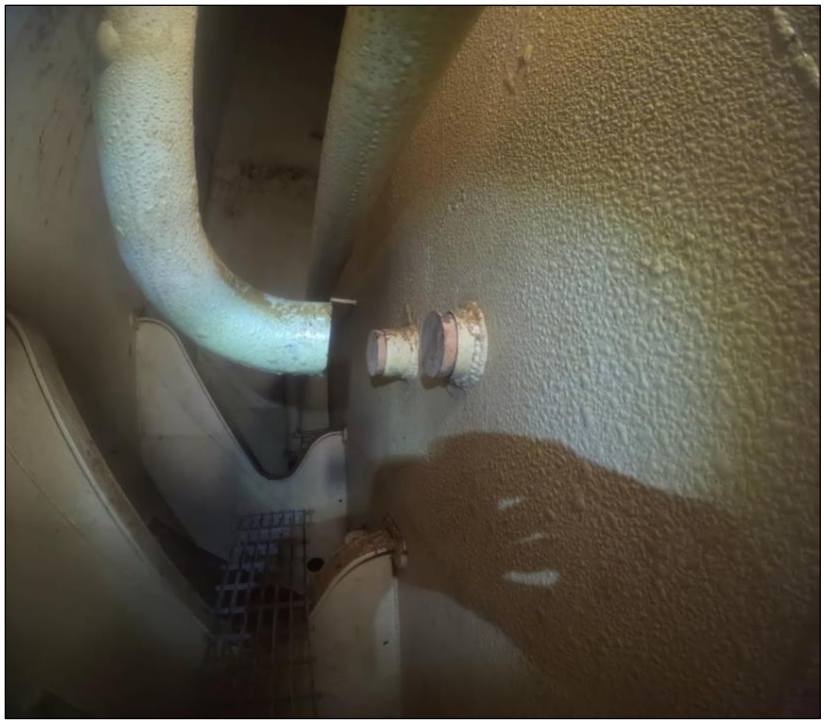


Figure 27. A 3.5” ballast and a 4.0” fuel pipe penetrations sealed at the inboard bulkhead in A-32F at FR 52-53.

Figure 28. A 3.5” ballast pipe penetration sealed at the outboard bulkhead in A-32F at FR 52-53.

Tanks A-33F and A-33.5J

Following the same procedure as applied to A-32F and A32.5J, six pipes were cut and ten bulkhead penetrations were sealed in tank A-33F – two pipes servicing A-33F and four cross-over pipes servicing A-33.5J. Fluid service, sizes and frame location of pipes in A-33F are identical to those in A-32F with the exception of the 1.5” pipes which are both located at FR 53-54 in A-33F. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figures 29-34.

Figure 29. A 2.5” penetration sealed at the outboard bulkhead in A-33F at FR 55-56.

Figure 30. A 2.5” penetration sealed at the inboard bulkhead in A-33F at FR 55-56.

Figure 31. A 3.5” ballast and a 4.0” fuel pipe penetrations sealed at the inboard bulkhead in A-33F at FR 52-53.

Figure 32. A 3.5” ballast pipe penetration sealed at the outboard bulkhead in A-33F at FR 52-53.

Figure 33. Two 1.5” penetrations sealed at the inboard bulkhead in A-33F at FR 53-54.

Figure 34. Two 1.5” penetrations sealed at the outboard bulkhead in A-33F at FR 53-54.

Tanks A-44V, A-46F and A-46.5F

The piping to tank A-46.5F penetrates the inboard bulkhead directly from A-44V underneath A-46F. Two pipes to A-46.5F, one 4.0” fuel oil pipe and one 3.5” ballast pipe both located at FR 62-63 were cut and sealed at the outboard bulkhead in A-44V. Two pipes to A-46F, one 4.0” fuel oil pipe and one 3.5” ballast pipe both located at FR 58-59 were cut and sealed at the inboard bulkhead in A-46F. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figures 35-36.

Figure 35. Ballast pipe and fuel oil pipe penetrations to A-46.5F sealed at the outboard bulkhead in A-44V. Photograph captured in A-44V.

Figure 36. Ballast pipe and fuel oil pipe penetrations sealed at the inboard bulkhead in A-46F. Photograph captured in A-46F.

Tanks A-45V, A-47F and A-47.5F

Following the same procedure as applied to A-44V, A-46F and A46.5F, two pipes to A-47.5F were cut and sealed at the outboard bulkhead in A-45V and two pipes to A-47F, were cut and sealed at the inboard bulkhead in A-47F. Fluid service, sizes and frame location of pipes in A-45V and A-47F are identical to those in A-44V and A-46F. Damage control plugs were used to seal all bulkhead penetrations.

Although the piping penetrations in these tanks were sealed, the tanks cannot be considered isolated as multiple sections of the longitudinal bulkheads separating them were previously cut out at approximately 9 feet below deck 4. See photographs in Figures 37-38.

Figure 37. Ballast pipe and fuel oil pipe penetrations to A-47.5F sealed at the outboard bulkhead in A-45V. Photograph captured in A-45V.

Figure 38. Ballast pipe and fuel oil pipe penetrations sealed at the inboard bulkhead in A-47F. Photograph captured in A-47F.

Tanks A-52V, A-54F and A-54.5F

The piping to tank A-54.5F penetrates the inboard bulkhead directly from A-52V underneath A-54F. Two pipes to A-54.5F, one 4.0” fuel oil pipe and one 3.5” ballast pipe were cut and sealed at the outboard bulkhead in A-52V. Two pipes to A-54F, one 4.0” fuel oil pipe and one 3.5” ballast pipe were cut and sealed at the inboard bulkhead in A-46F. All of the bulkhead penetrations are located at FR 66-67. Damage control plugs were used to seal all bulkhead penetrations. See photographs in Figures 39-40.

Figure 39. Ballast pipe and fuel oil pipe penetrations to A-54.5F sealed at the outboard bulkhead in A-52V. Photograph captured in A-52V.

Figure 40. Ballast pipe and fuel oil pipe penetrations sealed at the inboard bulkhead in A-54F. Photograph captured in A-54F.

Tanks A-53V, A-55F and A-55.5F

Following the same procedure as applied to A-52V, A-54F and A54.5F, two pipes to A-55.5F were cut and sealed at the outboard bulkhead in A-53V and two pipes to A-55F, were cut and sealed at the inboard bulkhead in A-55F. Fluid service, sizes and frame location of pipes in A-53V and A-55F are identical to those in A-52V and A-54F. Damage control plugs were used to seal all bulkhead penetrations. See photograph captured in A-55F (Figure 41). Photographs in A-53V could not be obtained due to the high level of water in the tank.

Figure 41. Ballast pipe and fuel oil pipe penetrations sealed at the inboard bulkhead in A-55F. Photograph captured in A-55F.

Tanks A-60V, A-62F and A-62.5F

The piping to tank A-62.5F penetrates the inboard bulkhead directly from A-60V underneath A-62F. All pipes to A-62.5F, as well as A-62F were cut and sealed at the outboard bulkhead in A-60V. Both A-62F and A-62.5 tanks each contain one 3/4" condensate return, one 1.0" steam supply, one 3.5" ballast and one 4.0" fuel oil pipes. Eight pipes were cut and fourteen bulkhead penetrations were sealed in A-60V – eight at the outboard bulkhead and six at the inboard bulkhead. All bulkhead penetrations are located at FR 72-74. Damage control plugs were used to seal all bulkhead penetrations. Photographs captured in this tank are not included due to poor quality.

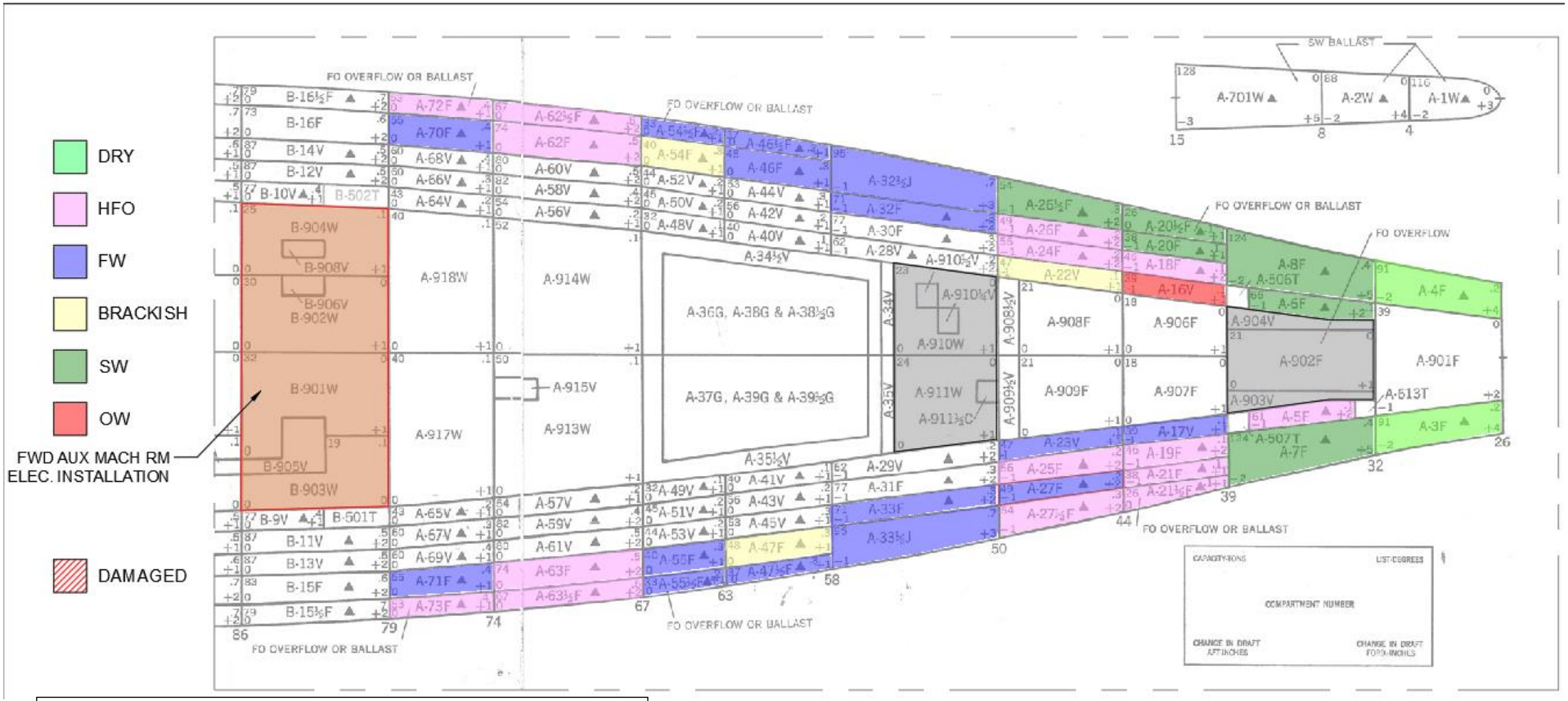
4. Task Completion Summary

Table 3 details the completed tasks, and provides an overview of the progress achieved within the scope of this project.

Table 3. Summary of tanks or spaces cleaned and dewatered during the immediate repairs.

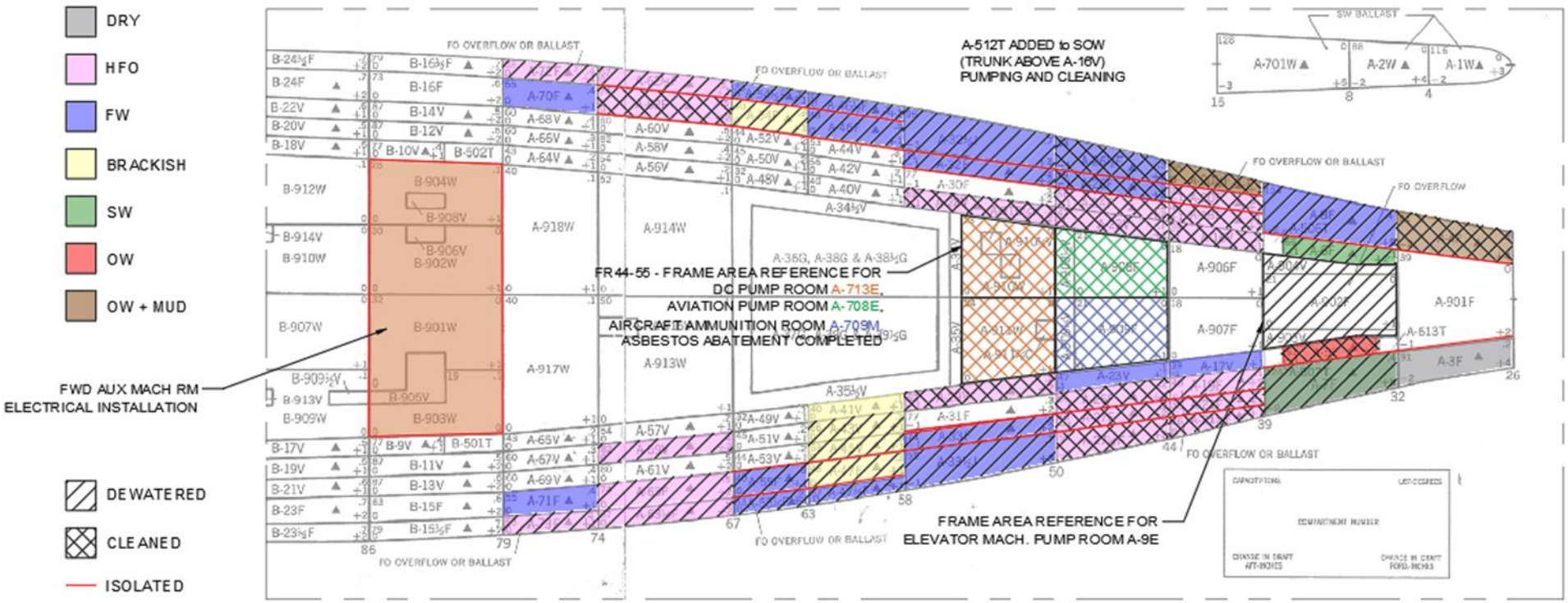
Total tanks or spaces cleaned	22
Tanks cleaned	18
Compartments or machinery spaces cleaned	4
Total tanks or spaces dewatered	47
Tanks dewatered, and contents disposed of	32
Compartments or machinery spaces dewatered, and contents disposed of	5
Tanks dewatered, and contents transferred internally	10
Fresh water transferred internally	90,260 gallons
Oily water disposed of	568,800 gallons
Solid waste disposed of	8.88 tons
Spaces undergone asbestos abatement	3
Asbestos waste disposed of	4.5 tons
Tanks isolated	26
Approximate number of external repairs applied to the hull	35
Repairs applied to the bulkheads	2

APPENDIX A – Original Target Tanks



HFO = Heavy Fuel Oil
FW = Freshwater
Brackish = Brackish Water
SW = Salt Water
OW = Oily Water

APPENDIX B – Updated Target Tanks & Progress Log



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