

# Appendix I: Maintenance Discussions with Navy Crews



## Navy Crewmembers Identified Challenges Affecting Ship Maintenance

We met with crews representing 16 various submarines, surface ships, and aircraft carriers to discuss challenges affecting the completion of organizational-level maintenance, whether pier-side or underway, including organizational-level maintenance performed during intermediate maintenance periods. Specifically, we met with 107 junior and senior enlisted sailors from the following types and classes of ships:

- three *Los Angeles*-class and one *Virginia*-class fast attack submarines
- three *Ohio*-class ballistic missile submarines
- two *Arleigh Burke*-class guided missile destroyers
- one *Ticonderoga*-class guided missile cruiser
- one *Whidbey Island*-class and one *Harpers Ferry*-class dock landing ship
- one *Wasp*-class amphibious assault ship
- one *San Antonio*-class amphibious transport dock
- two *Nimitz*-class aircraft carriers

These crews represented ships from a variety of the Navy's homeports around the world. These homeports included the following:

- Naval Submarine Base New London (Groton, Connecticut)
- Naval Station Norfolk (Norfolk, Virginia)/(Joint Expeditionary Base Little Creek-Fort Story (Virginia Beach, Virginia)
- Naval Station Mayport (Mayport, Florida)
- Naval Base Coronado (San Diego, California)
- Naval Station Kitsap-Bangor (Bangor, Washington)
- Joint Base Pearl Harbor-Hickam (Pearl Harbor, Hawaii)
- Naval Station Rota (Rota, Spain)
- Commander Fleet Activities, Yokosuka (Yokosuka, Japan)

### Four Main Challenges and Two Additional Challenges to Performing Maintenance

We identified four main challenges to the performance of maintenance from our discussions with ship's crews including crew shortages, high operational tempo/scheduling, limited maintenance/repair training, and parts and material shortages. These challenges were identified in every discussion we held with ships' crews. We also identified two other challenges in 10 of the 12 discussions we had with ships' crews associated with the performance of maintenance and the low prioritization of maintenance.

We engaged ships' crews in collaborative discussions about challenges to ship maintenance and efforts to address those challenges. The perspectives provided by the ships' crews regarding challenges to maintenance may not be generalizable across the fleet of Navy warships, but the examples provided below from the discussions with the ships' crews provide important insights into actual conditions in the fleet at the

time of the discussions. The following ships' crews' perspectives were edited for clarity and length.

## MAIN CHALLENGE: Crew Shortages

### What Sailors Had to Say



#### Crew Shortages

Includes a lack of capacity (not having enough people), capability (not having people with the right skills), and experience among ships' crews. All ships' crew meetings identified workforce shortages as a critical challenge affecting the crews' abilities to complete maintenance. This challenge affects the completion of maintenance. There are not enough qualified, available crew assigned to vessels to complete maintenance. Crew shortages are exacerbated by medical/mental health absences, and can have a negative impact on the operational tempo and scheduling as well as upon training.

Source: GAO analysis of discussions with Navy personnel. | GAO-22-104510

- Normal staffing for a ship's sonar maintenance crew is 16 to 21. The crew is essentially operating with 13 people. The crew does not have the personnel to teach the new sailors and do maintenance and assessments.
- The ship's biggest problem is being understaffed resulting in maintenance taking longer than it should.
- Ship crews are overwhelmed with maintenance work. On one surface ship, a large work center that required many crew had only three sailors available to complete weekly maintenance checks.
- A surface ship's maintenance division is at 40 percent of its optimal crewing levels. Thus, ship's maintenance is often delayed.
- Crew shortages of sailors with the right skills resulted in deferring preventative maintenance until the crew arrived in port.
- A submarine may borrow 10 to 12 personnel from other ships for deployment. Afterward, a huge vacuum occurs when qualified maintenance personnel leave to support a deploying submarine.

## MAIN CHALLENGE: High Operational Tempo/Scheduling

### What Sailors Had to Say



#### High Operational Tempo/Scheduling

Includes "overspending" the force in terms of unit and individual activity; reduction in time available for training and maintenance; and potential adverse impacts on readiness, force structure, and quality of life, amongst other things. Ships' crews described working long hours both while in port and underway to perform maintenance.

Source: GAO analysis of discussions with Navy personnel. | GAO-22-104510

- The operational tempo has increased over the last 2 years. Because of this, junior personnel do not receive proper training, which in turn leads to junior personnel gaining senior status and still not knowing what they are doing.
- The Navy at times shortens maintenance periods and doubles the workload for submarines, resulting in submarines "breaking" as they start deployment because equipment was not properly fixed and/or it was fixed in a rushed manner.
- Workforce shortages at sea result in work days that regularly exceed 16 hours. Further, additional demands to perform maintenance in port can result in longer workdays than at sea.
- The operational tempo adds to the stress levels among the crew because it affects how they actually accomplish their work. It is really hard and causes high levels of stress. There is no down time; the work seems to be non-stop.
- Ships' crews are really only working with a handful of personnel to accomplish everything they are responsible for. The hours of required maintenance exceed the hours in a day.

## MAIN CHALLENGE: Limited Maintenance/Repair Training

### What Sailors Had to Say



#### Limited Maintenance/Repair Training

Ships' crews described sailors arriving from A-school training with little to no practical maintenance training and sometimes relying on internet videos to help them solve maintenance problems aboard their respective ships. Further, ships' crews described limitations in the number of seats available for formal training, poor quality of formal training, or schools, and the heavy reliance upon on-the-job training to teach new sailors maintenance and repair.

Ships' crews stated that they received training on equipment that does not match what exists onboard the submarines and ships sailors are assigned, such as obsolete systems and equipment. Also, ships' crews said they received only limited training for essential skills such as soldering, basic troubleshooting, and maintenance.

Source: GAO analysis of discussions with Navy personnel. | GAO-22-104510

- Training and school is obsolete. Ships' crews do not learn how to maintain equipment they are expected to repair. For example, crewmembers are trained on repairing boilers, which only apply to 10 percent of the Navy's ships.
- A surface ship had a camera system installed in 2005; however, personnel expected to repair the camera did not receive training on how to troubleshoot or fix it in school.
- Training at every level for every department involved in organizational level maintenance is substandard. Ships' crews often learn incorrect or incomplete group knowledge that negatively affects their abilities to complete work.
- Crewmembers cannot access needed training because there are not enough seats available at the school.
- Many of the Navy's schools do not teach crewmembers how to service equipment onboard ships because much of that equipment is obsolete.

## MAIN CHALLENGE: Parts and Materials Shortages

### What Sailors Had to Say



#### Parts and Materials Shortages

Every ships' crew meeting identified challenges with parts and materials. For example, ships' crews described waiting for months or even years for parts or materials. More than half of the ships' crews we met with stated that they resorted to cannibalizing parts (taking functional parts from other ships) so that their respective ships could remain operational. According to ships' crews, personnel often keep submarines and surface vessels operational through unorthodox approaches

Source: GAO analysis of discussions with Navy personnel. | GAO-22-104510

- The parts inventory is often insufficient for crewmembers' needs. For example, there are backordered parts that will not be available until 2023. If crewmembers cannot find a part, they may not perform maintenance until that equipment or system is upgraded.
- Crewmembers tend to receive some parts only if their submarine is next in line for deployment.
- A crewmember ordered portable hard drives for migration of data to a new network. It took 7 months to get the parts, when the crewmember could have walked across the street and purchased them from a store the same day.
- Because many of the ship's systems are obsolete, new parts are often unavailable. Crewmembers are told simply to make it work. This leads to swapping parts and improvising.
- Crewmembers have to sift through 1,500 excess parts on the parts list that are no longer even built, all with relatively similar names or identification numbers and with no way to visually identify them. Then crewmembers often get the wrong parts from the supply system.

## ADDITIONAL CHALLENGE: Performance of Maintenance

### What Sailors Had to Say



#### Performance of Maintenance

Ships' crews in 10 out of 12 meetings identified challenges involving the performance of maintenance onboard ships. Sailors described spending an excessive amount of time obtaining supervisory approval to perform the maintenance, maintenance taking significantly longer to perform than allowed, and challenges with tagging out work so that it could be performed in a safe manner and without damaging equipment. Crewmembers, also described challenges with the guidance or instructions used to perform work such as missing technical manuals and maintenance requirements cards that were too generic to inform the sailor on how to perform the maintenance. Lastly, crewmembers describe frequently using workarounds, "duct tape" and "bubblegum" in order to get the ship good enough to get underway.

Source: GAO analysis of discussions with Navy personnel. | GAO-22-104510

- Sometimes a job that takes crewmembers 3 hours on paper requires 9 hours to be completed. When this happens, crewmembers extend the work to the next day or stay late.
- It is hard to complete a tag-out within expected timeframes ("tagging a system or equipment out" is the process of preparing the equipment to be safely maintained or repaired such as ensuring that there is no power flowing through a system). For example, tagging-out a piece of equipment that should take 15 minutes, takes an hour.
- How long a job is supposed to take does not take into account some other associated tasks (e.g. documenting job requirements and approvals; briefing the requirements; retesting; and closing out). A 2-hour preventative maintenance job more accurately takes 5 to 6 hours. With multiple projects, this can add up.
- Ships' crews just fix equipment with Band Aids so that a submarine can get underway. Essentially, a commanding officer does not want the ship to be perceived by superiors as the "boat that cannot get underway."
- Some equipment across the fleet is always broken. For example, high-pressure air compressors have been broken for a long time. When a piston cracked in one of the compressors, management's response to this problem for 3 years was to instruct the ship's crew to use it sparingly.

## ADDITIONAL CHALLENGE: Low Priority of Maintenance

### What Sailors Had to Say



#### Low Priority of Maintenance

Ships' crews in 10 out of 12 meetings described the performance of maintenance as a low priority onboard the ships. These crewmembers described maintenance as being a lower priority at times than obtaining certifications and training. Crewmembers from one ship also noted that any type of evolution onboard a ship curtails the performance of maintenance.

Source: GAO analysis of discussions with Navy personnel. | GAO-22-104510

- Maintenance is usually not a priority for a ship's leadership until leadership wonders why maintenance is incomplete.
- Maintenance is on the backburner during the week. This happens because crewmembers work hard all week on other tasks.
- Crewmembers often work on Saturdays and Sundays to accomplish maintenance because it was pushed to the side given the extra duties they must complete.
- Crewmembers stated that obtaining certifications and training, especially when ships need to get underway, are the highest priority.
- Whenever a ship is undergoing an evolution of any kind performing maintenance is frequently stopped.
- A crewmember stated that the biggest issue facing his crew is the condensed schedule. Under a condensed schedule, work starts to pile up due to other priorities such as training and interactions with outside contractors. There is no time for preventive maintenance.