NAVAL SAFETY COMMAND
SAFETY AWARENESS DISPATCH SA 26-29

Underway Replenishment Mishaps


File photo, not associated with mishap

For safety in the civilian maritime world, safe navigation generally dictates two vessels must maintain a slow, no-wake or idle speed when within 100 feet of each other. Conversely, the U.S. Navy routinely conducts underway replenishment (UNREP) operations maintaining 12 to 16 knots, while connected, usually positioned a mere 80-200 feet apart. This complex evolution comes with inherent risks, especially during the close-proximity transfer of parts, stores, munitions, provisions and, in some cases, personnel.

For our Navy to remain as effective as possible, fleet units must be capable of remaining at sea for prolonged periods, always ready to carry out the mission and assigned tasks. While UNREPs provide critical logistic support to sustain our ships at sea, they can be detrimental to mission readiness if not performed safely and aligned to established doctrine.

Separation Anxiety.

While actively engaged in both a connected underway replenishment and vertical replenishment (VERTREP) from its starboard side, the receiving ship began opening distance to port. The delivery ship informed them they were opening and asked if they were coming back to starboard. While they responded yes, the ship kept opening distance to port and sounded an emergency breakaway signal. Two stations on the delivery ship were connected and started emergency breakaway procedures. The crew was able to detension the outhaul wires, but due to how fast the two ships were separating, they could not detension the highlines. They kept paying out the highlines until the wires were eventually lost. Outhaul wires were cut at the stations with wire rope cutters, and surf blocks were lost to the sea from the connection at the receiving ship. Several Sailors suffered minor injuries from the incident. — *The investigation concluded the receiving ship needed more rudder input to arrest their turn rate. So why not just add rudder? Typically, mishaps are not the result of just one factor. The benign conditions earlier in the day and leading up to the UNREP induced complacency and led the bridge team to expect that smaller rudder inputs would be adequate to control heading. The master helmsmen believed they were limited to a specified degree of rudder input when alongside and therefore didn't apply enough when it was needed. The misunderstanding was found to be the difference between word-of-mouth technique and published limits. Compounding the issue, there was no forceful backup by senior bridge team members to correct the inadequate rudder inputs. Driving a ship closely alongside another requires constant vigilance as seemingly benign situations can deteriorate very rapidly if incorrect decisions are made.*

Blocked.

During line-handling operations, a crew member attempted to free a line caught on a block, placing their hand in a known hazard zone, when a sudden and unexpected tensioning of the line occurred. The abrupt increase in line tension caused a chain reaction through the rig, causing the probe and messenger line to move rapidly outboard. The resulting stored-line energy caused the crew member's hand to be pulled forward into the block pinch point. The evolution was immediately halted and the crew member was able to pull their hand free with minimal injury. Once all personnel were verified clear of hazards, a re-brief was conducted emphasizing the need for personnel to remain clear of blocks, saddles, and snapback zones, before the UNREP (*safely*) resumed. — *Fortunately this crewman walked away with only minor bruising and with all their appendages still intact. Placing a hand in a known pinch point hazard zone during a period of unstable line tension could have ended much worse – don't do that. Focusing on the task at hand, like freeing the fouled line is good, but not at the expense of losing situational awareness of the danger zones. Changes in tension can occur throughout the entire UNREP rig causing unexpected and abrupt movements while under load. Never place hands near blocks or lines unless slack has been positively verified.*

Burn Notice.

During an UNREP, a service member was assigned a line-handling position. As a novice line handler, he performed his duties with no gloves on and sleeves rolled up throughout the UNREP. He was not proficient with proper line-handling procedures and didn't know what to do when the line became uncontrollable *(i.e., use of "hand-over-hand" technique)*. The team lead, who was also serving as the safety observer, failed to identify and correct the unsafe actions as they occurred. Following the evolution, the service member reported to medical where he received treatment for burns to his hands and arms. — *While it's easy to point*

to a lack of training and experience as the reason for this incident, it also reflects a breakdown in supervision and oversight, and a weak pre-evolution brief. The unsafe conditions were visible from the start and should have been identified and corrected immediately before, or at the very least during, the evolution. A more situationally aware team lead/safety observer could have coached and corrected the service member before it ever became a problem. Know your team's weaknesses and head off issues early. Your teammates won't know what they've never had an opportunity to learn.


File photo, not associated with mishap

A Classic "Who Done It?"

A dry cargo ship was conducting UNREP with two Navy vessels. Both ships were starboard of the supplying vessel. Ship-one was receiving fuel via connected replenishment; while ship-two was conducting a VERTREP and passenger transfer. After ship-one was complete with fueling, they initiated their breakaway, then cleared to starboard, while ship-two continued their operations. After ship-one cleared and several minutes passed, the supplying ship contacted ships one and two via VHF radio, confirming whether they had their air search radars secured. Both ships confirmed their radars were secured or sectored — just as they did when they initially came alongside. During the simultaneous UNREP evolution, the dry cargo ship experienced electronic magnetic interference (EMI), resulting in the loss of internal comms and temporary malfunctions to the fire detection system, computer screens and a personal laptop. — *At first, it was unclear which ship caused the issue, but it was determined ship-one was responsible for radiating the supplying vessel. Their radar was inhibited sectored based on relative bearing to the supplying vessel, but no adjustments were made as the ship began to pass ahead during breakaway, resulting in their radar pointing in the direction of the supplying ship. This very point has been documented multiple times over the past several years, yet here we are re-learning the same lesson. This mishap should serve as a reminder of the importance of strict procedural compliance, forceful watch team backup and multiple person verification of critical settings - every time. Several watchstanders missed opportunities to break the error chain by providing forceful backup to others on the team. Let's make sure we aren't frying our friend's systems.*

Doing Right When Things Go Wrong.

During an UNREP, crew members aboard the supplying vessel noticed a small but steady fuel leak. The leak was coming from the junction of the seven-inch hose and saddle while pumping at minimum pressure. As soon as the fuel leak was spotted, all pumping stopped until the hose was replaced. Once the hose was replaced, pumping resumed and the UNREP was completed without any other issues. — *The fuel leak was ultimately caused by normal wear-and-tear on the hose assembly, which ended up failing under pressure. While pre-UNREP procedures and checks were followed, the leak was not evident until pumping first commenced at minimum pressure. The crew's immediate decision to cease pumping and fix the rig was a critical and wise choice. They prioritized safety over speed, which ultimately led to a more efficient and safer operation. The crew's clear communication, including relaying information to the receiving ship and coordinating the expeditious repairs, allowed for a coordinated and efficient response to the problem. Their pre-evolution brief, use of the Safety Management System checklists and recurring training were all key factors to ensure they were prepared to respond correctly. Prompt action, effective communication and strict adherence to safety protocols kept this mishap from becoming a bigger problem. Well done to the crew!*

Key Takeaways

The potential risks of two ships traveling alongside while attached or in close proximity cannot be emphasized enough. These evolutions require the most knowledgeable and professional people to execute without incident.

Do effective training. If our crew members are not yet trained experts, they need to be paired with seasoned mentors who teach not only the duties of the job but also risks associated with those roles. What we perceive as common sense is not always obvious to someone else. Training and briefings must be thorough to eliminate assumptions and prevent mishaps. While it is tempting to keep unpracticed personnel clear of risk-involved evolutions, we must actively train them to sustain the next generation of warfighters.

Keep your mind "awake". UNREPs can be repetitive, lengthy and frequent. It becomes increasingly likely that crew members may enter a state of "autopilot." Chances are if someone is injured during an UNREP, it's because someone is on autopilot and not paying full attention. We need to realize what we're doing while we're doing it. Focus on the task at hand and stay situationally aware. When conditions change, so must your perception of reality. Be present and in the moment.

And remember, "Let's be careful out there"