



Naval Safety Center

LESSONS LEARNED



LL 21-17

SHIPBOARD STEERING CASUALTIES?

This lesson learned focuses on casualties (real and perceived) to ship's steering systems and the responses of those who operate them. Losing control of thousands of tons of ship is gut wrenching in any situation, and even more so during special evolutions like underway replenishment (UNREP) or special sea detail. If you're a Sailor and haven't already read the **2017 U.S. Fleet Forces Comprehensive Review of Recent Surface Force Incidents**, you should (especially if you're a bridge watchstander).¹ In one of the four Class A mishaps in the review, the USS JOHN S. MCCAIN, confusion about "who had control of what" between the helmsman and lee helmsman led to an unintended and uncontrolled turn to port, resulting in a collision and the tragic loss of 10 Sailors.



USS MCCAIN collision - 2017

Considering the principles of the Naval Safety Center study "The Half-Life of Scared"² (we tend to 'forget' and revert to old bad habits six months after a major mishap or 'scare'), we've collected a few reminders of such scary moments where ships' crews were fortunate enough to regain control quickly and avert tragedy. Please read and share among your watch teams to reinforce the need to train to proficiency and know the actions to take in the event of a loss of steering.

- Follow the Underway Checklist. A ship got underway from the pier with a pilot embarked. With assistance from tugs, the ship backed away from the pier, pivoted to the outbound heading, and ordered all engines ahead 1/3. After casting off the tugs, the ship continued at all ahead 1/3, and the conning officer ordered left standard rudder to align the ship's bow with the first outbound course leg. The helmsman attempted the ordered input, but received no answer from the rudders. The helmsman reported the loss of steering and shifted steering gear pumps (*the correct action*), while the conning officer ordered engines to all stop, and the tugs returned to hold the ship in place. Upon receiving no rudder response from switching pumps, the helmsman sounded the steering casualty alarm, and the after steering helmsman actuated the control switches on the steering gear units. Since steering control was already in after steering from the previous day's rudder checks, the after steering helmsman actually shifted steering control back to the bridge (*instead of taking it*). Within 20 minutes of the casualty report, the crew identified and corrected the error. — *This perceived loss of steering was a result of not conducting proper steering checks immediately before getting underway. This crew was fortunate that skipping one step in the underway checklist didn't lead to a much worse outcome.*

- Conduct a Proper Watch Turnover. During normal underway operations and before watch officer turnover, the helmsmen conducted an improper watch turnover. The oncoming helmsmen assumed the ship was in auto-pilot, when it was actually in hand-steering mode. This incorrect assumption led to the ship gradually veering off the intended track line by approximately 40 degrees to starboard ... toward the path of an oncoming tug and tow. The tug and tow was approximately 1,400 yards away before the navigator realized the mistake and took corrective action. The resulting action by the navigator was a hard left rudder order, which resulted in a closest point of approach range of approximately 800 yards with the tug and tow. — *We all know what happens when we 'assume.'* *The helmsmen in this near miss were a case in point for verifying engine and steering control status **before** relieving the watch.*

¹For a copy of the full Comprehensive Review of Surface Force Incidents or the USS MCCAIN investigation, contact us at NAVSAFECEN_CODE522_LESSONS_LEARNED@navy.mil.

²Visit our public website at <https://www.navalsafetycenter.mil> for LL 19-13 The Half-life of Scared.

- **Know the Alarms.** During an UNREP with a USS ship alongside, a civilian mariner mistook the sound of his phone ringing for the steering casualty alarm, and took steering control in aft steering without permission from the bridge, while also failing to establish comms (*in the interest of brevity, we'll omit the chaos that ensued at this point; just close your eyes and imagine*). However, within one minute of the bridge discovering they lost steering (*and sounding the actual alarm*), the chief engineer established comms, discovered the error, and shifted steering control back to the bridge. — *No one wants this to happen at any time, let alone during UNREP. Whatever your watch position, your shipmates depend on you to know your alarms and the appropriate actions to take.*



- **Identify the Real Casualty.** During UNREP, the master helmsman observed abnormal indications on the primary and alternate gyrocompass repeaters and corrected with up to 20 degrees left rudder to counter a perceived turn to starboard (toward the other ship). When the master helmsman and helm safety officer noticed the gyro discrepancy, both thought it could be a loss of steering. As the ship's stern rapidly swung towards the UNREP ship, the commanding officer called "loss of steering" and the ship executed an emergency breakaway. While the master helmsman and helm safety officer both reported the abnormal indications of the vital gyrocompass repeaters, no watchstanders checked the magnetic heading to validate the course, and they didn't recognize that the real casualty was a gyro error. Of note, the ship had previous abnormalities with steering, which caused their bias toward a steering casualty. — *The good news is that the ship executed the perceived loss of steering and emergency breakaway correctly and safely. However, their misdiagnosis of a gyro error led to an unnecessary breakaway, which as any bridge watchstanders would attest, is a high risk operation (hence it being called an "emergency" breakaway).*

Key Takeaways / Lessons Learned

Nothing will get a bridge watchstander's heart pumping like a loss of steering, except perhaps a man overboard. And they seem to happen more often when you really don't want them to, like during restricted maneuvering situations in close quarters. That's why your bridge teams need to know how to quickly identify the problem, determine if it is real or "perceived" (like all four examples were; none involved an actual steering hardware failure) and execute the proper response. Here are a few things to work on to increase your teams' confidence and lower the stress level when a casualty occurs.

1. **Know your console.** Navy ships use more than 20 different ship's control consoles, so being a master helmsman on one ship (even the same class!) doesn't automatically make you a master helmsman on another. Learning all the features and controls is a must and should not merely be a 'demonstrate and sign off' type of qualification. The better you know and can quickly identify the status of steering and engine control, the better prepared you will be to correctly identify a problem. You don't want to be the one who treats the phone ringing like a steering casualty.

2. **Know the casualty procedures by heart.** Once you've mastered #1, learn and memorize the steering, gyro, and propulsion casualty response checklists by heart. Leaders; make sure the checklists align with current Engineering Operations Sequencing Systems and other applicable manuals. Yes, there will be checklists on the bridge, and you will have help from others on the bridge team, but the better you know the initial actions to take, the better off the team will be. There's a lot going on already and knowing your part could save the day ... and the ship. All helmsmen should repeat their procedures for loss of steering from memory during Sea and Anchoring and special evolution briefings.

3. **Become proficient, not just sufficient.** Time spent improving your skills and knowledge is never wasted. Bridge teams should rehearse and discuss possible casualties often, and ensure that **all** watchstanders know their roles. Your learning doesn't end – in fact, it is just beginning – when you get your helmsman qualification letter.