**Primary Presenter:** Nathaniel Mucke, nathanielmuc.11@sunymaritime.edu, 845-667-6053, SUNY Maritime College, Mechanical Engineering
**Faculty Mentor:** Dr. Joseph Levert, jlevert@sunymaritime.edu
**Secondary Presenters:** Bruce O'Connor, bruceoco.11@sunymaritime.edu
Phillip Velazquez, philipvel.11@sunymaritime.edu

# Design To Reduce Corrosion Of A Marine Winch Brake

Military Sealift Command (MSC) ships are responsible for resupplying the U.S. NAVY's ships with fuel and supplies while sailing in mid ocean. This is accomplished with a system of cables that are connected between the ships. Each of these cables are connected to their respective winch and all winches have their own brake system. The salt water in the marine environment poses a constant threat to the integrity of all metal components by corrosion including winch brakes. Over a short amount of time, the metal in the brake corrodes and either seizes the brake in the locked or unlocked position leading to time-consuming maintenance. With the understanding that all brakes will eventually fail due to corrosion, the goal is to find a solution that prolongs the time that a brake can be in service without maintenance. The methodology included a failure analysis that led to two findings that are expected to lead to a redesign. The failure analysis found a clogged drain, which resulted from sailors painting over the drain fixture. The failure analysis also found corroded and seized linkages where water had collected. The seized linkages caused brake failure. It is expected that redesign of linkages considering galvanic couples and tolerances will reduce the chance of seizure. It is also expected that a redesigned drain fixture will prevent collection of standing water, thereby reducing corrosion and seizure. It is expected that these design changes will reduce maintenance and improve readiness for MSC.

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