



Naval Safety Command

SAFETY AWARENESS DISPATCH



SA 22-12

LOSS OF REMOTELY OPERATED VEHICLE

This Safety Awareness Dispatch recounts the U.S. Navy's loss of a Remotely Operated Vehicle (ROV) while operating onboard a Dynamic Positioning (DP) vessel. The Navy Expeditionary Combat Command (NECC) began using the DP vessel within the last five years. It is crucial to understand how to operate an ROV onboard to prevent potential loss of life and equipment. The takeaways from this mishap could apply to any operational mission, so even if you're not a member of the Dive / ROV community, read on and consider how [fill in your mission here] could benefit from the lessons learned here.



Event Narrative. A Mobile Diving and Salvage Unit (MDSU) mobile dive company conducted unit-level training onboard a contracted civilian ship approximately 13 nautical miles off the coast as part of Basic Phase training. The ship had a transponder deployed in 110 feet of water, which was used to pinpoint its exact location over a selected geographic point on the seafloor. The dive team on the DPV could not use Surface Supplied Diving (SSD), as initially planned, due to malfunctioning equipment. Self-Contained Underwater Breathing Apparatus (SCUBA) could not be used due to the elevated sea state. The only remaining option was using an ROV (or canceling the mission, which was not considered at the time). Since the ship was able to track and locate the transponder at a later date, this unplanned use of the ROV could have waited until the weather cleared. There was no "emergent tasking." During the attempted recovery, the ROV was deployed directly from the moon pool to the bottom, but soon lost power and was sucked into the ship's Z-drive propulsion unit and destroyed.

An Expensive Decision. The total property damage was \$450,000. Yes, for an ROV! The damage could have been much more extensive if the ROV had damaged the DP vessel's propulsion system. Not only did the loss of the ROV cost nearly half a million dollars, but it also cost the Navy two days of lost training time for 16 personnel plus \$42,000 per day to lease the DP vessel. Training days built into a diving company are finite. Commands cannot afford to lose days of diving due to avoidable mistakes.

The Right Way To Do It. When using diving equipment below the waterline from a DP vessel, either from the moon pool or over the side, each operation should be treated as if a diver is on the end of the umbilical or tether. The equipment shall have a shortened tether, not allowing it to become within 10 feet of the nearest propulsion or underwater hazard. If you fail to do so, the equipment or diver could get sucked into the propulsion system, as demonstrated in this mishap. The proper procedures to complete this operation are described in the U.S. Navy Dive Manual, Appendix 2D. The umbilical/tether is secured to the wet bell, stage, or clump so that it is no less than 10 feet shorter than the distance to the closest underwater hazard. This procedure will prevent the ROV from coming any closer than 10 feet to the nearest hazard. The manual also recommends that you mark the umbilical or tether every 25 feet before the first marker to identify the distance to the closest hazard. We won't get into the math here, but that doesn't mean it isn't important. There are figures in Appendix 2D of the U.S. Navy Dive Manual to help determine the maximum umbilical distance. When properly calculated, an ROV or a diver at the end of the umbilical will not reach any hazardous suction or drive unit on the ship while tethered. Get it wrong, and the consequences could be much more tragic than losing a piece of expensive equipment.

Use your resources. All too often, usually due to funding or asset availability, dive teams are rushed and do not have time to plan correctly. That lack of training opportunities prevents properly building a solid knowledge

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base to plan a training evolution. Commands should involve their Training Department, when possible, to capitalize on their experience. If anything isn't going the way it should, an "all stop" should be called. The officer in charge should review risk management with the team, especially if the mission has changed.

This Just In. A Standard Operating Procedure (SOP) for remotely operated vehicle operations from a DP vessel is in the works as of May 2022. The SOP will establish ROV-specific guidelines for their use on DP vessels. In the meantime, follow the U.S. Navy Dive Manual for diving operations on DP vessels.



Key Takeaways

Consideration of these takeaways before your next dive or ROV operations on a DP vessel could help you avoid a half-million dollar mistake.

- 1. Are we authorized to conduct this mission?** The command in this mishap did not have standardized operating procedures in place to conduct operations from a DP vessel. Until the new SOP is promulgated, use Appendix D for dive operations on DP vessels.
- 2. Do we need to contact anyone?** The dive team should have contacted Naval Sea Systems Command (NAVSEA) 00C3 before conducting any in-water operations from a DP Vessel to obtain specific guidance and authorization. There's no need to go it alone. Ensure that risk is assumed at the appropriate level within the chain of command.
- 3. Does a procedure already exist for this?** The dive team should have followed the procedure written in Appendix 2D of the most current U.S. Navy Diving Manual.
- 4. Plan ahead.** Use a line to attach the in-water transponder to a buoy. This buoy enables the DP vessel to maneuver close to the buoy and pick it up with a boat hook to be recovered with the crane or deckhands, eliminating the need for dive operations altogether.
- 5. Always apply proper Risk Management (RM).** If you didn't plan for this type of operation, have an "all stop" and review the procedure. During the RM process, whether it's deliberate planning or time-critical risk management, one main question you should ask yourself is, "what are the consequences of **not** doing the mission?" Don't dismiss canceling or postponing the mission as an option.

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