



SAFETY AWARENESS DISPATCH SA 26-03



Electrical Mishaps

A 'shocking' number of electrical mishaps are reported every year. A review of the rough data shows there were about five incidents reported every week on average over the last three years (communities combined). Despite established safety procedures and periodic training requirements, the regularity in which incidents are reported highlights the ever-present risks associated with electrical equipment and reinforces the need for mitigation strategies to prevent electrical shock injuries and fatalities. The mishap examples below differ in circumstance but share common themes including, lapses in proper electrical handling procedures, failure to verify the state of electrical components before work and inadequate follow-through on safety checks. This dispatch discusses factors that contributed to mishaps and underscores lessons needed to strengthen electrical safety practices.



File photo, not associated with a mishap

Troubleshooting Gone Wrong

A power grid was set up involving two generators arranged in a parallel configuration to support a field training exercise. During the exercise, one of the generators failed and required troubleshooting. A Marine, who was qualified to troubleshoot the failed generator, attempted to remove the wiring from the load studs and was shocked instantly because the unit was still energized. He was medically evaluated and placed on light-limited duty for a week following the incident. — *According to the report, excitement of the rehearsal (exercise) led to a lack of focus on the equipment. The Marine immediately tried to fix the problem before scanning the environment and ensuring the equipment was in the proper state (de-energized) before starting maintenance procedures. Rushing to fix an issue without following proper procedures can be deadly. Checklists and sequential maintenance procedures are established to mitigate the risk of doing this very thing.*

Unforeseen Dangers

A Sailor was assigned to clear out foul weather gear from a compartment to facilitate the troubleshooting of a high voltage motor controller located within that space. The space was very confined, forcing the Sailor to crawl under and around various piping to move about. The motor controller panel was positioned around a corner, roughly 12 inches from the bulkhead, and wasn't immediately visible upon entry into the space. The Sailor entered the space through a small opening, and while maneuvering to remove the gear, reached blindly around the corner and accidentally contacted the motor controller panel. Unfortunately, the panel cover was improperly installed, leaving the controller's energized components exposed which, upon contact, shocked and killed the Sailor. The investigation revealed failures in both procedural safety and communication. It's likely the panel cover was installed incorrectly following earlier maintenance on the controller and no one verified it was installed properly. — *Aside from clarifying and codifying specific procedures and having leadership in place to ensure compliance, constant awareness of the potentially dangerous work environment is crucial to minimizing risk. Inconsistent inspections combined with the lack of explicit sign-off for critical safety actions led directly to this tragedy. Preventive measures, such as requiring verified completion of critical steps, reliable safety oversight, and thorough training, are crucial to preventing such incidents in the future.*

Caution: Random Dangling Cables From Overhead May be Live

A worker was on a rolling scaffolding platform and wrapping equipment with aluminum foil and plastic containment in preparation for spray painting in a passageway aboard a ship. During the process of wrapping the equipment, the rolling platform contacted a 110-volt energized cable hanging from the overhead. The worker began yelling and shaking while his hands were affixed to the scaffolding rail. His hands broke free, and he fell off the platform onto the deck. Nearby personnel took immediate actions to assist the worker, secure the area, call for medical assistance and notify the quarterdeck. The worker was able to walk off the ship to an ambulance for transport and treatment at the ER. While the injuries were not permanent, the report lacked additional details other than noting the loss

of one or more workdays. — *With this incident, there was no work request for the specific action of spray-painting preparation; had there been, the overhead lighting (where the energized cable originated) would have been tagged out. Proper work documentation puts safeguards in place, BUT the worker failed to notice the uninsulated cable hanging down. A vigilant visual scan and alert situational awareness are risk management steps for any maintenance action and may have prevented this shock.*

Just Unplug it Already

While underway, a Sailor was tasked to remove a faulty circuit card from a chassis assembly. During the process of removing the leads to the chassis, the Sailor neglected to unplug the power input from the power distribution unit, so the circuit remained charged. When he removed the circuit card, he received a shock to his hand that traveled up the arm to the shoulder. The Sailor immediately stopped, assessed his condition and reported to medical. After evaluation, he was cleared for full duty with no follow-up needed. — *This incident highlights the importance of following standard operating procedures (SOPs). Failure to de-energize the power distribution unit before removing the circuit card led to this preventable shock. Using appropriate personal protective equipment (PPE), such as gloves, would have provided another layer of protection (risk mitigation) and may have prevented the shock even though the procedures were not followed correctly.*

A Shocking Experience ... Times Two

A worker was on a portable ladder and routing new cable into a shared space with other cables in the ship's overhead. Using a ball-hammer, he tapped the end of a metal marlin spike to create space for the cable in the hardened cableway putty. In the process, the spike punctured an energized wire, delivering a 440-volt electrical shock to the worker. To prevent falling off the ladder, the worker instinctively grabbed the marlin spike still positioned in the overhead and was shocked a second time before falling about four feet to the deck. The worker spent the next few days in the hospital and returned to full duty shortly after. — *Lockout/tagout was not considered a viable safety measure due to the various equipment powered and perceived operational constraints, yet no alternative risk controls were effectively implemented. A subject matter expert electrician was assigned to oversee the cable pulling team; however, the worker performed the task without adequate supervision and required training per command SOPs. His unsafe tool selection and actions went unchecked. Inadequate task assessment, improper tool use, absence of job-specific training and lack of proper oversight combined to create a high-risk environment. When de-energization is not feasible, deliberate risk management, appropriate PPE, qualified supervision and strict adherence to training requirements are essential to prevent serious injury or worse.*

Key Takeaways

Proper procedures, clear communication, and vigilance are key in mitigating risks associated with electrical hazards (or any hazard really). A team that's trained and risk aware is much more effective than not.

1. Prioritize risk communication. In one of the examples, the worker had poor situational awareness and encountered a live uninsulated cable. Had deliberate risk management taken place before starting the job, the risks would have been identified, assessed and managed (*supervisors – take note*) ahead of time. Had the situation changed during the job, the worker would likely have been more situationally aware and keyed in to recognize the changing hazard potential. Time Critical Risk Management could then be used by individuals to formulate mitigation strategies or elevate risks on-the-run.

2. Discuss the job before starting it. Conducting a risk management (RM) brief before the work begins should be part of the process. A RM brief gets the team on the same game plan and enables them to identify areas of risk and a plan of action to mitigate those issues.

3. Follow your procedures. Lack of procedural compliance is a contributing factor in most mishaps. Review the procedure before starting the job and pay attention to cautions and warnings. Don't get in a rush and skip steps (*especially lockout/tagout!*), they are designed to get the work done and prevent unsafe action. Following the procedures includes using the right tools and wearing the appropriate PPE. Stay focused or electricity will get your attention quickly.

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