Bureau of Safety and Environmental Enforcement

SAFETY ALERT

Safety Alert No. 515

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Prevent Fires by Inspecting Cords, Plugs and Welding Leads Before Use

Figure 2-Welding lead contacted a wood plank on the deck, causing charring.

Figure 1-Small Flames on Left Side of Plug during Welding Operations

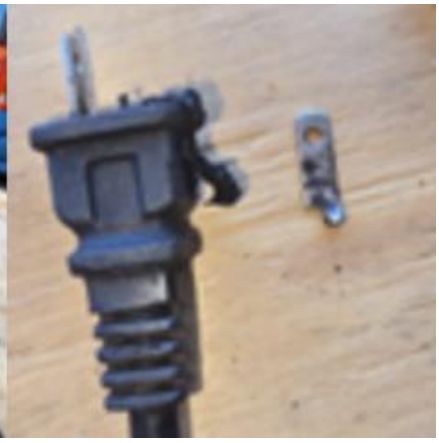

Figure 3-Melted Plug to Tubing Bender

Background:

The Bureau of Safety and Environmental Enforcement's Gulf of America Region has identified recent fire incidents involving damaged extension cords, plugs and welding leads. Reviews found contributing factors including inadequate inspections and equipment failure.

Incident 1: While walking past a welding machine, a health, environmental and safety technician saw the ground wire and plastic insulation on the welding lead melting. He immediately activated the machine's emergency shutdown to prevent further damage and reduce the risk of injury. During the follow-up inspection, he found an extension cord plugged into the machine that ran into the well bay area, along with the welding lead. A safety team member then doused the affected wires with water. The crew remained on standby and monitored the ground wire and welding lead to ensure the situation was stable and no further problems developed.

Note: Applying water to potentially energized conductors create a serious electrocution hazard and may spread a fire if the conductors remain energized.

Incident 2: During routine construction operations, personnel noticed flickering at an electrical cord connection. At first, it appeared the light inside the clear head connection was flickering. Small flames then appeared at the side of the plug. Personnel told the welder to stop working, and as he turned to inspect the cord, it began to smoke. Personnel quickly unplugged the cord from the welding machine. They red-tagged the cord and removed it from service. They also inspected all other cords for visible damage and found no other problems.

Incident 3: Instrumentation and electrical crews connected their "Rothenberger Tubing Bender" to bend one-inch tubing for two sample sinks. When they plugged it in, they saw the plug begin to melt. They quickly unplugged the equipment and notified platform management. An investigation found that the platform receptacle and extension cord were not the source of the problem. Instead, the tubing bender plug had a loose prong that was not detected during the pre-job inspection. The prong fell onto the workbench when the plug was removed. The tubing bender was taken out of service. This incident underscores the need to verify plug integrity and prong security during equipment inspections, not just the condition of the cord and receptacle.

To help prevent similar incidents, the Bureau of Safety and Environmental Enforcement recommends that operators and their contractors, as appropriate, consider the following:

- Ensure extension cords, plugs, and welding leads comply with American Petroleum Institute Recommended Practices 14F (§12.3 Electrical Tools, §6.10.3 Equipment Grounding, §12.5 Extension Cords), Occupational Safety and Health Administration, and National Fire Protection Association 70 requirements.
- Use only UL-, FM- or CSA-listed extension cords, plugs, and welding leads rated for hard or extra-hard usage.
- Ensure all cords are three-wire types with intact grounding conductors and secure terminations. Inspect cords, plug prongs, strain reliefs, and terminations before each use.
- Limit extension cord length and regularly inspect, tag, and replace cords used to transmit power in accordance with company procedures and industry best practices.
- Provide ground-fault circuit interrupter protection for all temporary cord-and-plug electrical equipment, either through cords with integral ground-fault circuit indicators or by connecting to ground-fault circuit indicator protected receptacles, consistent with American Petroleum Institute Recommended Practices 14F, Occupational Safety and Health Administration, and National Fire Protection Association 70 requirements.
- Conduct regular hazard hunts that include a check for proper use of extension cords, plugs, and welding leads.
- Confirm proper separation of extension cords, plugs and welding leads before work begins to prevent abrasion and abnormal wear of their protective sheathes/coatings.

- Follow permit-to-work and job safety analysis requirements to identify and assess electrical hazards before work begins.
- Ensure personnel performing electrical work or operating welding equipment are trained and competent in recognizing electrical hazards, including hazards involving temporary equipment.
- Review Bureau of Safety and Environmental Enforcement Safety Alert 410-Damaged Electric Cord Results in Arc and Safety Alert 314-Operator Electrocuted Trying to Charge a Battery. These alerts show how damaged cords and improper use of temporary wiring can lead to arcing, fire, and electrocution, even when equipment appears functional.
- Incorporate these alerts into toolbox talks, electrical safety training, and periodic refresher briefings for welders, instrumentation and electrical technicians, and supervisors.

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A **Safety Alert** is a tool used by the Bureau of Safety and Environmental Enforcement to inform the offshore oil and gas industry of the circumstances surrounding a potential safety issue. It also contains recommendations that could assist avoiding potential incidents on the Outer Continental Shelf.

CATEGORY: Fire, Electrical