Bureau of Safety and Environmental Enforcement

SAFETY ALERT

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Arc Flash Incident Highlights Critical Need for Voltage Verification During Offshore Electrical Maintenance

Fig 1. Second-degree burn to technician's hand

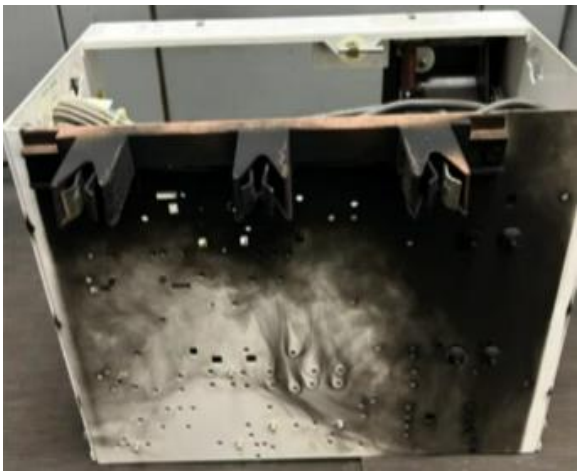

Fig 2. Charred MCC Panel

Incident: On March 21, 2025, a contract electrical crew was installing a three-conductor cable from a transformer to a motor control center (MCC) during a platform upgrade. The job required coordination among crew members at the MCC, below the MCC, and at the cable spool.

During the first attempt, the crew found the cable was too short. They withdrew it, stripped more insulation, and prepared to try again. On the second attempt, the electrician below the MCC pushed the cable into the penetration before making contact with the receiving team inside the energized MCC cabinet. The cable end was routed behind a protective barrier near a live bus bar.

An electrician inside the MCC tried to reposition the cable using non-insulated pliers. That action caused an arc flash between the exposed ground wire and the energized bus bar. The electrician received a minor thermal burn (Figure 1), and the MCC panel showed charring and damage (Figure 2).

An “all stop” was called, and the MCC was safely de-energized to remove the damaged cable.

Findings: An investigation found that a procedural gap and communication failures were the primary causes. The Job Safety and Environmental Analysis (JSEA) did not recognize, or control energized electrical hazards. It did not call for electrically rated personal protective equipment (PPE) or insulated tools. Work proceeded on energized equipment without effective, documented communication between the separated work locations.

Contributing Factors:

- The JSEA described routing the cable into the panel but did not identify arc flash hazards, required PPE, or the need for insulated hand tools.
- Personnel below the MCC pushed the cable before those inside the MCC were ready to receive it — there was no enforced readback “ready/clear” confirmation or reliable radio backup.
- The electrician inside the MCC was not wearing arc-rated PPE appropriate to the task and used non-insulated pliers; the tool in use was not electrically rated for exposure to energized conductors.
- The cable was pushed too far into the penetration and migrated behind the protective barrier, bringing exposed conductor(s) into proximity with the live bus bar.
- Limited visibility/line-of-sight between operators, premature action by the cable-puller, and insufficient situational awareness during cable manipulation.

To prevent similar incidents, BSEE recommends that operators and contractors, where appropriate, take the following actions:

- Perform electrical work on de-energized equipment whenever technically feasible. Only perform energized work with documented risk justification and management approval.
- Require JSEAs to identify electrical hazards, arc-flash categories, required PPE, and the use of insulated tools. JSEAs should explicitly cover multi-location tasks and communication protocols.
- Require arc-rated PPE suited to the calculated incident energy. Prohibit non-insulated tools near live parts.
- Mandate verbal confirmation, read-back, and “ready/clear” signals before advancing cables or components into energized spaces. Provide radio backup when line of sight is not possible.

CATEGORY: Electrical Safety, Arc Flash, Personnel Safety

- Provide refresher training on electrical hazards, arc-flash awareness, and Safety and Environmental Management Systems (SEMS). Verify contractor qualifications and set competency standards for energized work.

- Audit permits, JSEAs, and field work to confirm compliance with API RP 14F or API 14FZ, SEMS, and company electrical safety procedures.

- Reinforce Stop Work Authority when conditions deviate from approved procedures or when hazards are not fully controlled.

– BSEE –

A **Safety Alert** is a tool used by BSEE 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.

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