



Safety Alert

From the International Association of Drilling Contractors

ALERT 09 – 10

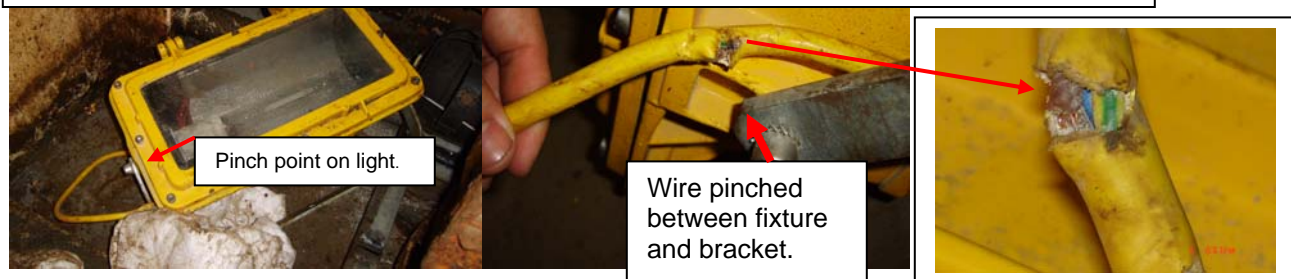
DAMAGED ELECTRIC CORD RESULTS IN WELDER ELECTROCUTION

WHAT HAPPENED

Two contract welders were working side by side in the hole of the bilge pump room in the column of a semi submersible. Welder 1 (Injured Person [IP]) finished his side of the job and welder 2 asked welder 1 to pass the welding lead so welder 2 could weld. Welder 2 got no response from welder 1 and noticed that welder 1 was in contact with the floodlight being used for additional lighting. Welder 2 thought welder 1 might have received an electric shock so welder 2 climbed out of the bilge and disconnected the floodlight and welding cable. Welder 2 immediately called for help. Response team arrived but was unable to revive the IP.

Background Note: A Permit To Work (PTW) and a Job Safety Analysis (JSA) were completed for the task. The 220 V floodlight was taken to the work location, but was deemed improper for the job and was moved to the side with the cord wrapped around it, but it was **not** removed from the work area. At some point in time, the floodlight was put in the bilge hole.

Fig. 1. 220 Volt floodlight with cord that had been pinched between the lamp fixture and the mounting bracket while it was being positioned by welder 1 for the job.



WHAT CAUSED IT:

1. During the investigation it was discovered that the power cord was pinched and partially cut between the light fixture and the bracket. (See Figure 1 above.)
2. Based on the observation of Welder 2 that Welder 1 was leaning against the floodlight, it was concluded that Welder 1 made contact with the exposed wires and / or the fixture's metal frame.
3. The deceased contacted electrical current from the 220 V power cord of the floodlight.
4. The floodlight was designed for a fixed installation and not suitable for use as a portable light.
5. The rig has a floating 220 V system ("delta based" - 2 conductors and no common "ground" system); if only one conductor is cut, the other conductor remains "hot" and will not trip the 10 amp breaker. More guidance will be published by Asset Manager and Engineering on Ground Fault Circuit Interrupters and related electrical safety issues.
6. The heat index (temp + humidity) at the time of incident is estimated at 97 deg F. There was no mechanized ventilation (air movement) in the confined / constrained area.
7. The coveralls worn by the IP were wet from perspiration.
8. Safety Systems failed to recognize the potential hazard electrical shock from the portable light being used. The PTW system was used but did not capture all elements (confined space; electrical hazard; ventilation; communications and rescue team alert; etc). A JSA was conducted with welding crew and supervisor, but was not specific to the job.

The Corrective Actions stated in this alert are one company's attempts to address the incident, and do not necessarily reflect the position of IADC or the IADC HSE Committee.

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9. Personnel (including the supervisor) were aware of the potential hazard of the floodlight and although it was put aside with cord wrapped around it, the light was not removed from the work area or rendered inoperative. Although both welders were short-service contractors (less than 3 hitches on the rig), they were not accompanied by a supervisor / mentor because the welders were considered highly experienced and qualified.

CORRECTIVE ACTIONS: To address this incident, this company did the following:

1. Instructed rig personnel to conduct "Hazard Hunt" of entire rig fleet with emphasis on portable lights / electric cords / power tools. Ensure all portable electric equipment is registered and inspected, looking at the entire "system", not only the electrical parts. Chief Electrician to schedule periodic Hazard Hunt of portable electric equipment, using other Heads-Of-the Departments (HOD) to assist
2. All rig supervisors were instructed to attend JSA / PTW / Safety Leadership training sessions.
3. Rig supervisors are to enforce increased participation in **STOP** (TM) method by mandating 1 STOP card per day per person on board (company and sub contractors; client and other client contractor personnel).
4. Procure low-voltage / pneumatic lights for portable requirements.
5. Investigate use of Ground Fault Interrupter (GFI) devices to work with portable electric equipment.
6. Ensure that all Permit to Work and Job Safety Analysis documents and reviews include inspection and assessment of all possible electrical hazards **prior to the job**.
7. Before work begins, make a final worksite check to ensure all safety provisions / systems are in place with all hazards controlled and risks are reduced to ALARP—as low as reasonably possible.
8. Use only low voltage lighting—especially in confined spaces.
9. All tools (Company's, contractors and third party) are to be inspected and tested prior to use.
10. **Instructed operations personnel that all the below lights have metallic cases or enclosures and are prohibited as Portable Lighting**



Permanent fixed light not to be used as portable.



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12. Use only Portable Lighting as prescribed by Asset Manager and Engineering.

ACCEPTABLE *PORTABLE* LIGHTING

All have plastic enclosure (except air-powered unit)

Air Powered – 24 Volt.



Battery Powered



Double insulated in-line transformer.

1. **Primary Preferred Method: Air-driven**
2. **Secondary Preferred Method: Battery-operated**
3. **Approved (NOT preferred): Low-voltage (50 Volt AC and below) with in-line transformer**
4. **LAST RESORT (must be approved by Rig Manager / Electrical Supervisor prior to use): High-voltage (above 50Vac) must be rated for portable service as well as double insulated**

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