NOPSA

NATIONAL OFFSHORE PETROLEUM SAFETY AUTHORITY

SAFETY ALERT 33

Hazardous Area Electrical Equipment

What happened?

An emerging trend identified during NOPSA's planned inspections of facilities is the range of safety issues relating to electrical equipment in hazardous areas. Typical safety issues identified include:

- Fixed electrical equipment not suitable for the hazardous zone (i.e. not correctly rated).
- Corrosion of electrical equipment (e.g. motors, instruments, junction boxes, etc.) potentially compromising the hazardous area rating.
- Non-rated portable electrical equipment (e.g. hand drills, non-EX rated lighting, etc.) used in hazardous areas.
- Poorly maintained hazardous area equipment e.g. damaged glands and seals, broken conduit, missing labelling, mismatched colour-coding, exposed wiring, etc.
- Electrical wiring not appropriately terminated and, in some cases, still 'live'.
- Poorly maintained hazardous area electrical equipment dossiers or registers and expired certification.

Photo 1 – Damaged Conduit and Exposed Wiring

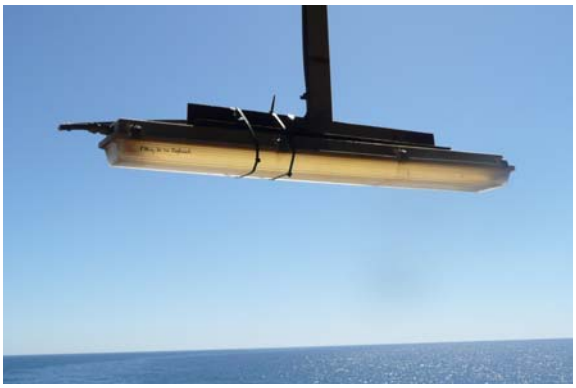

Photo 2 – Poorly Maintained Light Fitting in Process Area

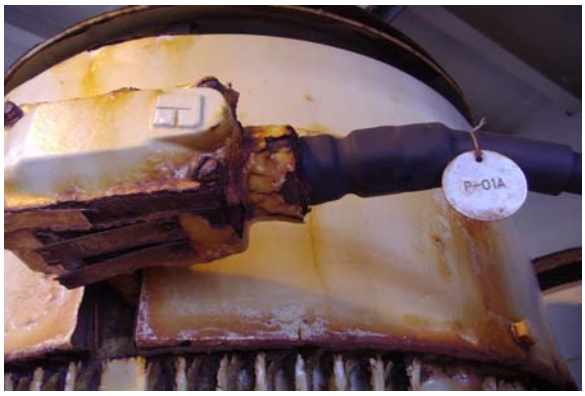

Photo 3 – Corroded Junction Box on Pump Motor

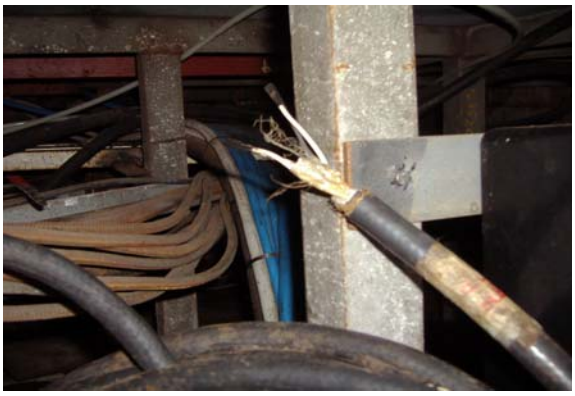

Photo 4 – Loose Wiring (Not Appropriately Terminated)

Hazardous Area Electrical Equipment

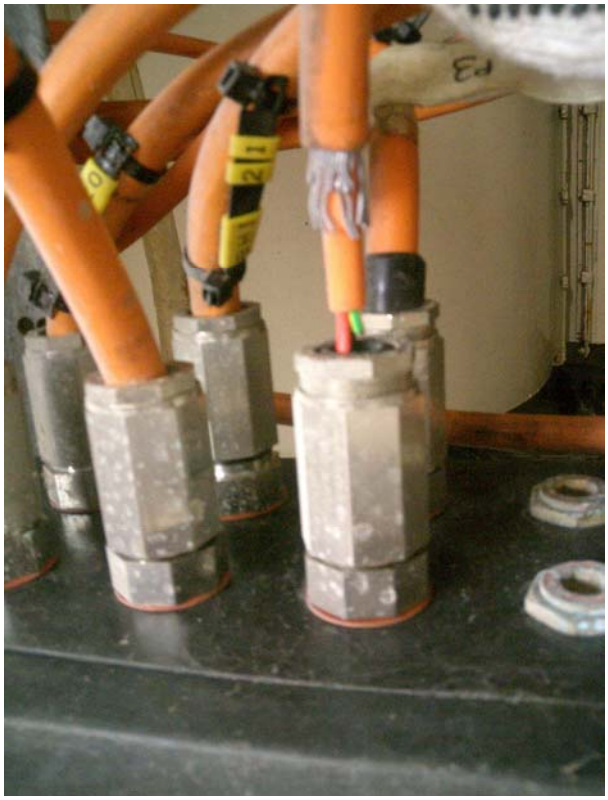

Photo 5 – Exposed Wiring (pulled out of gland)

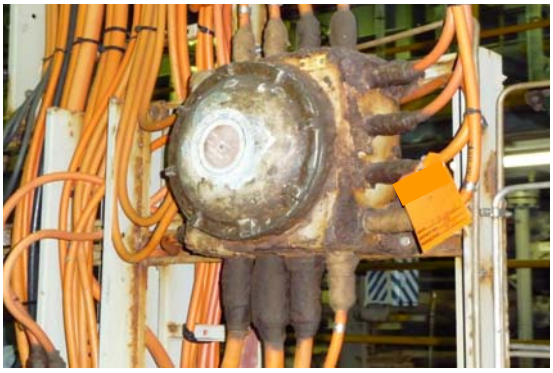

Photo 6 – Corroded Junction Box

Photo 7 – Poor Dressing of Cables

Note: Photographs taken either with an intrinsically safe rated camera or under control of hot work permit.

Most of the safety issues identified with electrical equipment occur on aging facilities where maintenance is lacking. However, there have been instances of incorrectly rated hazardous area electrical equipment being installed in hazardous zones on newer facilities.

What could go wrong?

Inappropriate or poorly maintained electrical equipment could become an ignition source, posing a fire and explosion risk in the event of a release of hydrocarbons or other flammable materials (e.g. hydrogen evolved from UPS batteries, diesel aerosols, vapours from solvents and paints, etc).

Key Lessons:

The Australian and international standards applied in relation to selection and installation of electrical equipment for use in hazardous areas must be specified in the safety case for the facility [MoSOF 11]. Once the safety case has been accepted, there is an obligation to comply with the safety case in force [MoSOF 49].

The legislation also imposes duties of care on a range of parties, including the operator of the facility, to take all reasonably practicable steps to ensure that the facility is safe and without risk to the health of any person at or near the facility [OPGGSA 2006 Sch. 3, Clause 9]. This includes the requirement to properly maintain electrical equipment for use in hazardous areas.

Hazardous Area Electrical Equipment

Failures in the selection, installation and maintenance of electrical equipment in hazardous areas have resulted in numerous inspection recommendations. A range of enforcement actions has also been taken by NOPSA, including improvement notices and in some cases prohibition notices, where the identified defects could lead to an immediate threat to health or safety.

It is important to ensure that electrical equipment used in hazardous areas is suitable and appropriately certified for the relevant hazardous zone. Hazardous area-rated electrical equipment is often used as safety-critical equipment in the prevention of fire and explosion and, like all other safety-critical equipment, should be subjected to regular specialist inspection, maintenance and recertification. In addition, it is essential to properly manage the documentation necessary to ensure hazardous area electrical equipment is maintained in a safe state.

Contact

For further information email alerts@nopsa.gov.au and quote Alert 33.