SAFETY FEEDBACK NOTICE
ELECTRICAL FATALITY

DGEP / HSE	Ref: 21 - 2006	Issued: 15/12/06

THINK SAFETY FIRST

A: Accident description

A fatal accident, probably due to electrocution, occurred again this year after the last electrical fatality on 2000.

Two fitters were working in a new building under construction. They worked together in the Air Handling Unit (AHU) room.

The victim (fitter) was at the top of a metal stepladder (1.8 metres high) with a colleague working opposite him (about 30 cm away). He was sitting on the ladder when suddenly he began to shake. His co-worker panicked, ran out of the room and raised the alarm. The victim was later found lying unconscious, with his head and body outside the room on the corridor floor.

Co-workers immediately carried him to the site nurse, after which the victim was moved to different hospitals with better facilities for treating his critical condition. Despite the emergency resuscitation attempted, the victim was declared dead one hour after the accident.

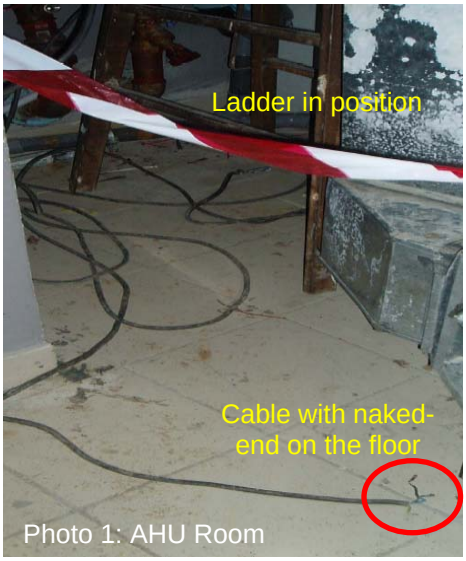

Photo 1: AHU Room

B : Accident causes from site investigation

The accident causes were as follows:

(1) **Fall from the ladder.** There were two possible causes of his fall: **fatal electrical shock** or **medical pre-condition.**

(2) **Live wire** in the room and **unauthorised electrical connections. A naked-end cable** which probably had been used for other purposes **lay on the floor** *(see photo 1)*. It **had been connected into the same strip connector** as the temporary lighting used by the workers to light the room. The unauthorised connections were possible because of **unrestricted access to the power supply.**


Photo 2: Lighting connection

(3) **Poor handling of cable extensions.** Arriving through an opening in the wall, there was one cable to power the temporary lighting *(see photo 2)* and another lying on the floor.

(4) **No differential circuit breaker** to protect against direct exposure to the live voltage. All temporary distributions passed thru only **1 breaker with no differential protection. The temporary/site distribution box,** which has differential protection, **was removed.**

(5) **Metal ladder without isolation.** The victim worked on an A-shape movable metal stepladder with no isolation.

➡ So, most probably, **one of the ladder legs came in contact with the naked-end cable** lying on the floor. **No protection system cut off the power supply** because no real short-circuit occurred; there was just **electrical potential at the metal ladder.**

(6) **Substandard housekeeping.** Half the room space was occupied by technical equipment such as steel ducting and pieces of scrap cables, and off-cut wires lay on the floor.

(7) **Inadequate emergency response.** Co-workers **did not apply immediate first aid** to the victim and **no ambulance** was available.

(8) **Medical pre-condition.** The victim had been ill 2 weeks before the accident but the cause and nature of his illness were not known, as there was **no documented sick report.**

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C: DGEP/HSE summary

The accident causes as per CR EP HSE 102 and GM EP HSE 102 definitions are:

Immediate Causes

- Inadequate equipment, tool (3,4,5)
- Inadequate isolation system (4)
- Failing to warn, inform (2)
- Poor housekeeping, disorder (6)

Root Causes

Human factors:

- Physical condition: *illness, injury* (8)
- Mental condition: *lack of safety awareness* (2,3)

Job factors:

- Equipment management failure: *failing inspection* (2,3,4)
- Inadequate supervision: *supervisory level not suitable for the risk level* (2,3,4), *insufficient risk assessment* (2,3)

Management System dysfunctions

- Management responsibilities (2,4,6)
- Operational responsibilities (2,3,4,6)
- Risk evaluation & management (2,3,4)
- Safeguarding of health (8)
- Emergency preparedness (7)

D: DGEP/HSE Actions follow-up

The following actions should be carried out in each E&P affiliate:

1. Facilities/buildings not involving hydrocarbon. All installations including those not involving hydrocarbon (e.g. offices, warehouses and buildings owned/constructed by affiliate) must be controlled under the affiliate's HSE Management System.

   Action: Appoint a dedicated RSES for each offices/warehouses/other buildings construction site or extension project. The RSES is to be a member of the project team and may be a RSES Delegate who reports to the designated RSES for Company Offices (action: all affiliates).

2. Management and supervision of contractors that include civil engineering and service contractors for works related to onshore administrative and support facilities/buildings.

   Action: Appoint contract managers, assess contractor's capabilities and adapt supervision (including HSE advisors and officers) of contractor's activities to the conclusion of the assessment (action: all affiliates).

3. Temporary electrical installations. Any modification in an accepted situation must be considered as a downgraded situation (e.g. in this accident, the accepted temporary distribution box, which has differential protection, was removed). Temporary electrical installations shall be risk assessed. Based on this assessment, the appropriate work planning is to be defined by or/and with contractor. Both risk assessment and work planning must be communicated to all personnel involved.

   Action: Verification of the temporary electrical installations to be implemented (action: all affiliates).

4. Emergency response. Onshore facilities emergency response plan(s) to be developed, made known and tested in accordance with CR EP HSE 091.

   Action: Verify whether or not adequate emergency response plans and bridging documents with contractors exist (action all affiliates).

Note: See SFN 4 – 2005 Electrical Incidents for another reference and useful recommendation.

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