



केस स्टडी / CASE STUDY

OISD/CS/2025-26/LPG/12

Dt.: 03/11/2025

INTRODUCTION

Title: Fatal accident due to electrical shock

Location: LPG Bottling Plant

Result/ outcome: One Fatality.

BRIEF OF INCIDENT

During maintenance activity at the plant, one contract worker (IP), helper to electrician, suffered an apparent electrical shock from damaged electric cable connected to motor push button station near purging unit in the filling shed.

On Sunday afternoon (plant was not operating), one electrician provided temporary power connection from PTDU (Motor push button station near purging unit) to a temporary extension board for carrying out job of fixing the stand of proximity sensor in filling shed. In the evening, electrician left the plant to get the drill bit after switching on the supply to PTDU and instructed IP to go to the filling shed and wait till he comes back. However, during handling of cable, IP got electric shock and collapsed.

First responder, upon hearing a hitting sound on the floor, rushed to the incident site and saw the victim shivering by holding a damaged flexible electric cable in his hand and hitting the floor with his feet. Immediately he pressed the emergency push button of the PTDU.

He was promptly shifted to nearby hospital, where hospital emergency medical staff advised to take IP to multi-specialty hospital. IP was then shifted to multi-specialty hospital for further treatment; however, doctor declared him brought dead.

OBSERVATIONS/ SHORTCOMINGS

The observations are as follows: -

1. Usage of Substandard Equipment and Unsafe Electrical Practices:

- 1.1** The electrician used a non-standard extension box with damaged cable and connected it to an incorrect and unauthorized power source (PTDU: Motor push button station) inspite of having dedicated single-phase and three-phase connection sockets located at distance of 24 meters approx.
- 1.2** The temporary extension box was not fit for use. It was a makeshift arrangement where two different cables were joined together using insulation tape, and the cable was found damaged at multiple places. Sockets were not of industrial type (metal clad) and did not have any human protection like ELCB, RCCB.
- 1.3** Though plant was having industrial type of plug and junction box suitable for temporary power connection; however, it was not kept ready connected to an armoured cable. Non availability of this arrangement would have prompted electrician to use nonstandard extension board.

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1.4 IP was probably not wearing Electrical gloves. During last External Safety Audit, conducted by OISD, it was observed that electrician was not wearing LT/ HT gloves while checking electrical aspects. Usage of gloves does not seem to be regular practice.

2. Bypassed Work Permit System:

2.1 The Work Permit System including LOTO (Lock out/ Tag out) as per OISD-STD-105 was violated in this case.

2.2 LOTO provision was not available for the PTDU panel. Furthermore, a review of the LOTO register showed that it was not being regularly updated. It appears that use of LOTO system is not in regular practice as per requirement of clause 6.3.2 of OISD-STD-105.

3. **Lack of Management control:** As per the statements, Electrician has performed this job without the knowledge or approval of the Plant Officer.

4. **Lack of Qualified Personnel:** On the day of incident, two class "B" certified electrician and two other persons were available in the plant. However, both the certified electricians, were not present in the plant between the hours when the incident occurred. Moreover, it is observed that one person was regularly deployed to work as a shift electrician even though he does not possess the class "B" or class "C" certification required as per Regulation 3 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

5. **Training:** Training to electricians were provided on topic covering work permit system, electrical isolation procedure, importance of earthing and bonding, emergency procedure in case electrical shock etc. Despite the training, violation in implementation is observed.

6. Absence of periodical mock drills (involving electrical incidents and medical emergencies) is observed.

7. **Reporting of unsafe condition and act:** It is observed that during year 2024-2025, only 1 no. unsafe act and 3 no. unsafe condition is observed and FY 2025-26 (up to July 2025), no unsafe act and unsafe condition is reported. In this incident itself multiple unsafe act and condition is observed e.g. taking power connection from unauthorised source, usage of non-standard extension board, usage of damaged cable, handling cable without wearing electrical gloves. This indicates that reporting of unsafe act, unsafe condition is lacking in this plant.

8. IP was taken to nearby Hospital (not listed in external emergency number in ERDMP), located 1.5 km from LPG bottling plant, where hospital emergency medical staff examined the IP inside the vehicle and detected with pulse. As this hospital was having only basic medical facilities, hospital team advised to shift the IP to multi-speciality hospital. Victim was then shifted to multi-specialty hospital (listed in the list of external emergency numbers in ERDMP) for further treatment. Also, as per ERDMP, mentioned nearest hospital is located at 0.3 Km where IP was not taken. Direct visit to multi-specialty hospital could have saved the time.

9. IP was shifted in contractor's vehicle. Emergency vehicle to transport the IP in supine position on stretcher was not available at the plant.

PROBABLE REASON OF FAILURE/ROOT CAUSE:

The findings indicate the incident was caused by a combination of the following factors:

1. Non-adherence to the work permit system.
2. Usage of substandard equipment without any protection.
3. Unauthorized handling of electrical work by uncertified personnel.

RECOMMENDATIONS:

The recommendations are as follows: -

1. Ensure usage of standard equipment:

- 1.1. Ensure that the dedicated single-phase and three-phase sockets are used for temporary electrical connection.
- 1.2. Temporary electric power connection with Human body protection devices such as ELCB, RCCB etc shall only be used.
- 1.3. The correct plugs and suitable armoured cables must be kept readily available at all times.
- 1.4. Entity to review the current provision of sockets in the LPG shed and install additional connections wherever necessary to eliminate the need for temporary or unsafe wiring.
- 1.5. Defective cables/ equipment should be identified and removed from the system.

2. Adherence to Work permit system: Strict adherence to the Work Permit System as mandated by OISD-STD-105 for all maintenance jobs shall be ensured. The plant must ensure LOTO provisions are available on all panels within the Motor Control Center (MCC) room, in strict compliance with OISD-STD-105. Adherence to LOTO procedures is mandatory, and the practice must be properly recorded and maintained in the logbook.

3. Adequate Management control: There were lapses from both management as well as contractor which has resulted in loss of life. Hence appropriate corrective action shall be taken so that recurrence of such negligence can be avoided in the organisation.

4. Mandate Qualified Personnel: All electrical work must be performed exclusively by certified electricians in line with Regulation 3 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

5. Training:

5.1 Training on Work permit system OISD-STD-105 to be strengthened.

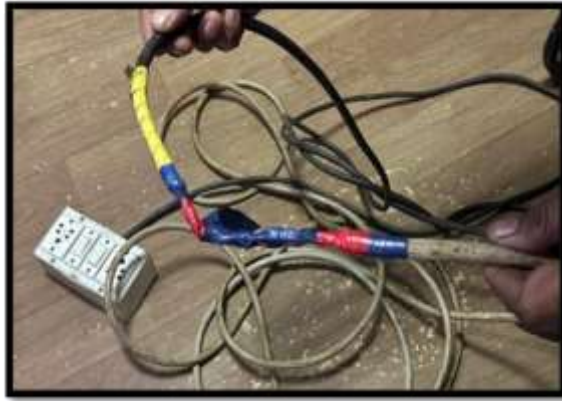
5.2 Training on identification of unsafe condition and unsafe act to be strengthened and reporting to be improved.

6. Periodic mock drills to be conducted on electrical incident involving shock, burns, arc flash hazards etc.

7. Reporting and monitoring of unsafe act, unsafe condition also needs further strengthening during inspections and audits.

8. Location may review handling of medical exigencies such as electrical shock, snake bite, cases of trauma etc. and suitably identify hospitals so as to save time in case of emergency.

9. Availability of Emergency vehicle which can carry patient in supine condition on stretcher to be ensured in line with OISD-STD-227.



Temporary extension Box and cable

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