CASE STUDY

OISD/CS/2024-25/P&E/08 Dt.:20.08.2024

INTRODUCTION

Title: Fatal accident due to fall from height.

Location: Construction Site at Refinery Expansion Project.

Loss/ Outcome: One fatality.

BRIEF OF INCIDENT:

A contract worker (hereinafter called Injured Person (IP)), employed by a subcontractor of a Lump Sum Turnkey (LSTK) contractor suffered a fatal injury after falling from 23 m to 17 m level of an under-construction pipe rack (fig 1). He was engaged in paint marking of tightened bolts of the beam of the structure of the Main Pipe Rack.

OBSERVATIONS/ SHORTCOMINGS

1. Structural work was under progress in a section of the Main Pipe Rack (fig 2), including torquing, bolting, and yellow paint marking of tightened bolts. Blanket Work Permits had been issued by the company. On the day of the incident, IP was assigned to carry out paint marking of tightened bolts.
2. As observed, at the location where IP was working, beam bolts were marked with yellow paint. Hence, probably after performing the paint-marking job, IP did not hook-up the lanyard of the 'Full Body Safety Harness (FBH)' with the anchor point. He deviated from the guidance provided in Toolbox Talk (TBT), Job Safety Analysis (JSA), Work Permit (WP) etc.
3. Check-listing/ verification of control measures mentioned in the JSA (which was a standard one for bolting) for the incident site location was not evident, implying that job specific compliance was not being ascertained on a day-wise/ location-wise basis
4. It was evident that for the bolt torquing of the beam at incident location, no scaffolding platform had been provided for torquing and painting of the bolts on the lower side of the beam. Workers had carried out torque bolting by sitting over the beam and working bending downwards. IP had also stepped on the beam to carry out the paint-marking job. This digress possibility had not been considered in the JSA.
5. Injured Person was imparted induction training. However, subsequent plant/project-work specific safety training/ task specific safety training was not evident.
6. The IP had involved in other unsafe acts in the past, as noted in the master list of UA-UC (Contractor), with violations and counseling recorded.
7. Repeated unsafe acts by other workers, such as improper use of tools, lanyards and FBH lanyard knots, were also reported. Scaffold-related unsafe conditions were also reported on the Company's portal.
8. Toolbox talks were conducted daily, with "hook at height, FBH anchoring" discussed as a topic. No special training for the subcontractor's supervisor was evident.
9. Contractor maintained a register of safety violations with records of punitive actions. Not anchoring the FBH while working at height was recorded with penalties ranging from warnings to suspension.
10. The LSTK contractor was aware that there were inaccessible areas where a crane with a basket could not approach, but no alternative rescue arrangements were planned.
11. The owner's Fire & Safety (F&S) group received communication about the accident after about 13 minutes through safety supervisor under contract of owner who cycled to F&S station in absence

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of communication facility available at the project site. Reportedly, due to apprehension of labor unrest/ mob agitation at the site, the F&S personnel did not respond quick enough to aid in the rescue/ evacuation activities or to control the mob. The rescue operation was entirely carried out by contract workers who were not trained for the task. After about 25 mins the injured person was brought to ground level and shifted into the ambulance.

12. Previous mock drills did not include rescue scenarios from height, and there was no evidence of contractor personnel being trained for such rescues. A recommendation for height rescue drills was mentioned in a project safety meeting records, but no drills were conducted before the incident.

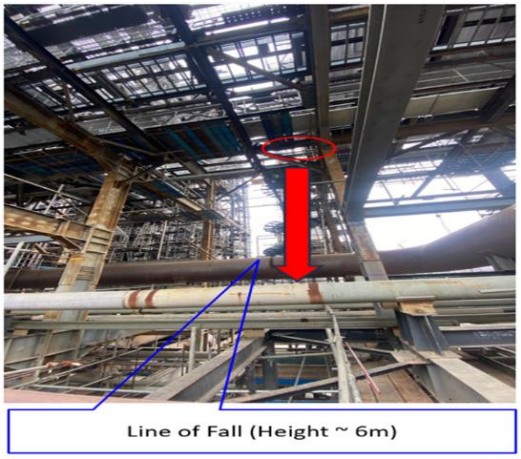

Fig-1 Fall of height



Fig-2 Main Pipe rack

CONCLUSION / ROOT CAUSE

The root-cause of the incident was the unsafe act by IP of not anchoring the double lanyard. Further, a mechanism to prevent the unsafe act/condition (inadequate scaffold working platform and not anchoring the double lanyard while working at height) was also missing.

RECOMMENDATIONS

1. Robust mechanism shall be developed to prevent unsafe acts/ unsafe conditions. This shall include adequate/ repeated awareness sessions in line with OISD-GDN-192 clause 11. Monitoring of project activities through CCTV with adequate recording facility should be reviewed and scrutiny of the footages, manually or through AI techniques, should be explored to identify unsafe acts/ conditions and take rectification measures thereof.
   Team responsibility amongst team members for each other should be encouraged and promoted so that they point out and rectify unsafe acts, even of fellow workmen, in their own interest and of their fellow workmen.
2. JSA should be work and job location specific in line with clause 6.3.1 (v) of OISD-STD-105. In case of template developed for a specific kind of job, verification of control measures identified shall be ensured by means of checklist workwise/ location-wise. For any abnormality, the JSA should be revisited/ redone.
3. Safety awareness training shall be ensured in line with OISD-STD-154.
   Further, since day-to-day supervision of contract workforce is done by the supervisor of contractor, special emphasis must be given to the minimum competency criteria and mandatory

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training/ certification required for the contractor supervisors in the tender document in line with clause 7.3.2.4 of 'Report of the Working Group on Safety in Indian Petroleum Sector'.

4. Scaffoldings with adequate platforms, handrails and all stipulated appurtenances should be available at work locations at height in line with OISD-GDN-192.
5. The provision of adequate communication means like walkie-talkies should be reviewed at the project site.
6. Alternative rescue arrangements should be developed and implemented for inaccessible areas where cranes with baskets cannot approach. The Provision for evacuating Injured person from elevations using devices like Rope Access Device and Lift Rescue along with suitable stretchers from elevations shall be reviewed.

   Training/ mock drills including Company, Contractor and subcontractor should be conducted to ensure the effectiveness and readiness of these rescue arrangements.
7. A zero-tolerance policy for operational lapses should be developed and responsibility fixed on all persons responsible for the lapses. Similarly, responsibility should be fixed on the contractor's company for its functional lapses and action taken against it for the acts of omission and commission contributing to the incident.

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