INCIDENT: A crane accident took place on the road near a project site involving a 250 T crawler crane. The mast of the crane descended suddenly and fell on three contract workers resulting in injuries to them. One of the injured workers later on succumbed to his injury.

OBSERVATIONS: (1) A Kobelco make 250 Ton crawler crane was engaged by contractor to dismantle and erection of breechlock heat exchangers and associated piping in DHDT unit. (2) After completion of above job, it was decided to move the crane to other unit. Booms & counter weight of the crane were dismantled. (3) After incident, the mast of the crane was found lying down with one end resting on a saddle support of a heat exchanger. (4) A lifting belt was found wound on exchanger saddle support with other end attached to hook of the mast. D-shackles were also found lying at the site. (5) Wire rope connecting Mast and the drum was found intact. (6) Crane gantry was kept flat at rear side of the crane which should be in lifted condition during operation of the crane except during transportation. (7) From the functionality test carried out after incident, fault in the machine was ruled out (8) No work permit and Job Safety Analysis (JSA) was available for saddle lifting job. (9) It is evident from the above facts that Non-standard and unauthorised operation of crane was done to lift the saddle support in partially dismantled condition. (10) The radius of the mast was found > 11.0 meters at site.

ROOT CAUSE: Failure of crane operator / foreman to adhere to safety norms and SOP of crane operation.

- Maximum radius under which the mast should have been used for lifting load is 7.3 meters whereas the radius of the mast was measured > 11.0 meters. Such deviation from operating manual should not have been permitted by crane operator/ foreman.
- Non-standard operation of crane in partial dismantled condition i.e. keeping the mast in front of the crane while moving the crane and keeping the gantry in flat position at rear end during crane operation.
Unauthorized operation of crane i.e. permit to work was not taken/issued and Job Safety Analysis was not carried out.

Noncompliance of Standard Operating Procedure i.e. keeping people away from crane during operation.

RECOMMENDATIONS: (1) OISD-GDN-192 (Safety Practices During Construction) and OISD-GDN-207 (Contractor Safety) to be strictly implemented during project/major maintenance activity. (2) Crane should be operated with proper permit to work and in accordance with safety norms & Standard Operating Procedure (SOP) only. (3) The crane crew should be trained on safe operation of crane. (4) Deployment of dedicated and qualified construction site safety officer for regular monitoring of project site.

WORTH MENTION: Safety must always be the operator's most important concern. He must refuse to operate the crane when he feels it is unsafe and consult his supervisor when safety is in doubt. He must read and understand the Operator's Manual and see that the machine is in proper order before operating.

Some Basic steps for Safe Operation of Crane

- **Proper use of Cranes**: e.g. Not to use for side loading instead of vertical lifting.
- **Have a certified operator**: A crane in the hands of an unqualified operator can be a deadly weapon.
- **Inspection of Crane**: Over and above the annual inspection and load test of cranes, it's important to check the operating functions daily.
- **Know what's below**: The most powerful, carefully rigged crane is only as strong and stable as the surface upon which it stands.
- **Start with a plan**: Each lift is different from another, plan for each lift. The operator, riggers, and other workers involved with the lift should be part of that planning process.
- **Plan for swing**: To ensure that the area within swing radius is barricaded off,
- **Proper Communication**: Needs clear communication between the operator and the other workers

This safety alert is based on the Investigation report submitted by industry and published for information purpose only.

Industry members are requested to post ‘Safety alerts’ in above format to Devendra Mahajan, Joint Director, OISD at mahajandm.oisd@gov.in to share across the Industry.