


INTER PLANT STANDARD – STEEL INDUSTRY		
 IPSS	SAFETY GUIDELINES FOR WORK ON EOT CRANES	IPSS: 1-11-015-12
	Corresponding IS does not exist	

0. FOREWORD

0.1 This Inter Plant Standard, prepared by the Standards Committee on Personnel Safety Appliances & Procedures, IPSS 1:11; with the active participation of the representatives of all member steel plants and associated organizations in the field, was adopted in February 2012.

1. OBJECTIVE

1.1 Statistics say that accidents, incidents are very common on cranes. It may be during shifting of material or during maintenance work. Considering the hazards and associated risks involved, it has been felt necessary to formulate some basic guidelines for safe working on EOT cranes (are formulated & specified in this standard for compliance).

2. SCOPE

2.2 This standard will be applicable to all EOT cranes in operation or during maintenance. The subject has been addressed from the following three different aspects and adherence to the requirements evolving thereof shall ensure better control of and protection from foreseeable hazards:

- Relevant Statutory Provisions
- Engineering Controls to Ensure Safety
- Standard Work Practices

2.2.1 RELEVANT STATUTORY PROVISIONS

2.2.1.1 **Fencing of Machinery (Sec 21)** - Unless they are in such position or of such construction as to be safe to every person employed in the factory as they would be if they have securely fenced the following namely

- a) Every part of an electric generator or rotary convertor
- b) Every part of a transmission machinery and
- c) Every dangerous part of any other machinery

Shall be securely fenced by safe guards of substantial construction which shall be constantly maintained and kept in position while the parts of machinery they are fencing are in motion or in use.

2.2.1.2 **Work on or near machinery in motion** (Sec 22) – Where in any factory, it becomes necessary to examine any part of machinery referred to in Sec (21) while the machinery is in motion, such examination or operation shall be made or carried out only by a specially trained adult male worker wearing tight fitting clothing whose name has been recorded in the register prescribed in this behalf.

No woman or young person shall be allowed to clear, lubricate or adjust any part of any machine if the cleaning, lubrication or adjustment thereof would expose the woman or young person to risk of injury from any moving part either of that machine or any other adjacent machinery.

2.2.1.3 **Self-acting machines** (Sec 25) – No traversing part of a self-acting machine in any factory and no material carried there on, shall, if the space over which it runs is a space over which any person is liable to pass whether in the course of employment or otherwise be allowed to run on its outward or inward traverse within a distance of 50 cm from any fixed structure which is not part of the machine.

2.2.1.4 **Lifting machines, chains, ropes and lifting tackles** (Sec 29) – In any factory, the following provisions shall be complied with in respect of every lifting machine (other than a hoist and lift) and every chain rope and lifting tackle for the purpose of hoisting or lowering persons, goods or materials.

- a) All parts including the working gear, whether fixed or moveable of every lifting machine and every chain rope or lifting tackle shall be:
 - i) of good construction, sound material and adequate strength and free from defects.
 - ii) Properly maintained and
 - iii) Thoroughly examined by a competent person at least once in every period of 12 months or at such interval as the Chief Inspector may specify in writing and a register shall be kept containing the prescribed particulars of every such examination.
- b) No lifting machine and no chain rope or lifting tackle shall, except for the purpose of test, be loaded beyond the safe working load (SWL) which shall be plainly marked thereon together with an identification mark and duly entered in the prescribed register and where this is not practicable, a table showing the safe working loads of every kind and size of lifting machine or chain rope or lifting tackle shall be displayed in prominent positions in the premises.
- c) While any person is employed or working on or near the wheel track of a travelling crane in any place, where he would be liable to be struck by the crane, effective measures shall be taken to ensure that the crane does not approach within six meters of that place.

- 2.2.1.5 **Floors, stairs and means of access** (Sec 32) – In every factory, all floors, steps, stairs, passages and gang-ways shall be of sound construction and properly maintained and shall be kept free from obstructions and substances likely to cause persons to slip and where it is necessary to ensure safety, steps, stairs, passages and gangways shall be provided with substantial handrails.

There shall, so far reasonably practicable, be provided and maintained safe means of access to every place at which any person is at any time required to work.

When any person has to work at a height from where he is likely to fall, provision shall be made, so far as reasonably practicable, by fencing or otherwise to ensure the safety of the person so working.

2.2.2 ENGINEERING CONTROL

- 2.2.2.1 Identification number and SWL to be painted in bold letters on the crane itself in such size and clarity that it is easily visible, readable from Floor Level.
- 2.2.2.2 One **portable** CO₂ fire extinguisher **of suitable capacity** is to be kept in the crane operator's cabin.
- 2.2.2.3 Safety switches, preferably of lockable push button type shall be provided on four corners of the crane near the ladder so that it can be operated either from Gantry or from the bridge platform. In addition, one such switch shall be provided in the operator's cabin also.
- 2.2.2.4 An audible warning device shall be provided in the operator's cabin to warn people working below, while operating the crane.
- 2.2.2.5 All drive couplings and protruded extended shafts etc are to be securely guarded (refer 2.2.1.1 of the above).
- 2.2.2.6 Sufficient light shall be hung from the girder of the crane so that the working area under the crane is properly illuminated.
- 2.2.2.7 There shall be at least two plug points of voltage **220 AC** and 24 volts ac respectively fitted in the crane girder to facilitate during maintenance work.
- 2.2.2.8 Panel nomenclature to be painted on the outer side of individual panel doors and all circuit components to be adequately labeled and all **control cables** properly ferruled to facilitate correct identification.

2.2.3 STANDARD WORK PRACTICES

- 2.2.3.1 Only the designated crane operator or a specially trained and authorized person having sufficient knowledge and skill regarding safe operation of various mechanisms of the crane shall be allowed to operate a crane.
- 2.2.3.2 The crane which is to be shut down for maintenance and repair, shall be brought to the repair bay or to the repair platform or to any other suitable place where the crane may be shut down for maintenance with least interference to other cranes.
- 2.2.3.3 Before the maintenance work on a crane is taken up, the group incharge shall inform the operation shift incharge regarding the nature and duration of work.
- 2.2.3.4 When the crane is brought to the required place, the group incharge of maintenance shall arrange for necessary power shut down in relation to the nature of repair work and place of repair work on the crane.
- 2.2.3.5 When power has been shut down as required, the isolation switch/switches shall be locked and tagged and the keys are to be kept with the group incharge for maintenance. The power rails in the repair bay shall be adequately earthed.
- 2.2.3.6 In case of end crane rail, stops (scotch blocks) shall be placed on the runway rails on the required side at a distance of 6 meters from the crane. In case of a middle crane, rail stops shall be fixed on both sides 6 meter away from the crane.
- 2.2.3.7 Crane operators on the adjacent cranes shall be notified by the group incharge about the work to be done on the crane under shutdown and about the places of the rail stops.
- 2.2.3.8 A red flag during day time and a red lamp during night shall be hung from the centre of the crane on the required side (both sides if it is a middle crane) to draw attention of the adjacent crane operator. The ground area below the crane shall be cordoned off and red flags during the day and red lamps during nights shall be exhibited to warn men on the floor.
- 2.2.3.9 Use of scaffolding on the crane for repair maintenance work shall be prohibited except for location not otherwise possible.
- 2.2.3.10 Persons deployed on the crane during maintenance or supervision should have secured foothold while at work and must guard themselves against tripping, slipping or getting unbalanced. They must make use of **full body harness with double lanyard** wherever necessary. The group incharge shall brief this to all persons before start of work.

- 2.2.3.11 Before any work is commenced and men are sent over the crane the group incharge shall make sure that all necessary safety precautions have been taken.
- 2.2.3.12 If the crane under repair is to be shunted then the supervisor wanting such an operation must inform the group incharge of the maintenance so that he can arrange to remove the rail stocks and his men from dangerous positions and move to a safe and secure place before the shunting is done.
- 2.2.3.13 Care shall be taken to ensure that no tools or loose parts fall down. The material from above shall not be thrown down or it shall be lowered down to selected place.
- 2.2.3.14 On completion of the maintenance of an EOT crane, all loose items, tools and equipment shall be removed from the crane or securely fixed or stored in a secured container.
- 2.2.3.15 The work shall not be considered complete unless all the safety guards and other safety devices are back in position and spillage of oil or grease, oily rags and other refuse removed from the crane.
- 2.2.3.16 Before the job is declared complete, the incharge of the repairmen must inspect the crane thoroughly and satisfy himself that everything is all right.
- 2.2.3.17 When the work is completed, the red flags and the lamps on the crane and on the ground and the rail stops shall be removed and all men must leave the crane. Then the group incharge of maintenance shall remove the danger boards from the isolating switches, unlock them and ask the operator to take over the crane. The crane operators of the adjacent cranes and shop foremen shall also be informed of the completion of the work.
- 2.2.3.18 When taking over the crane, the crane operator shall ensure that all local safety rules relating to the use of cranes are being observed. The following inspection / operational checks shall be carried out by the crane operator to ensure that the crane is in safe working condition:
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| a) Is hoist brake in order? | f) Are all guards fitted? |
| b) Is the hoist mechanism working? | g) Is warning device in order? |
| c) Is emergency stop operable? | h) Are crane lights in order? |
| d) Are ropes free from damage? | i) Is fire extinguisher fitted? |
| e) Are walkways free from loose objects? | j) Condition of the cabin? |