


INTER PLANT STANDARD – STEEL INDUSTRY		
	<p align="center">SAFETY PROCEDURE FOR ROOF SHEET CHANGING <i>(FIRST REVISION)</i></p>	<p align="center">IPSS: 1-11-003-12</p>
	<p align="center">Corresponding IS does not exist</p>	<p align="center">Formerly : IPSS: 1-11-003-98</p>

0. FOREWORD

- 0.1 This Inter Plant Standard prepared by the Standards Committee on Safety Appliances and Procedures IPSS 1:11, with the active participation of the representatives of all steel plants and associated organizations in the field, was adopted in March 2012.
- 0.2 This is one in the series of Inter Plant Standards in the area of safety in steel plants with a view to providing guidance to all concerned in accident prevention.

1. SCOPE

- 1.1 This Inter Plant Standard provides guidance in carrying out roof sheet changing at height more than 2.0 m from ground level at site, involving the following activities, in a safe way to avoid accidents:
- a) Climbing and movement of persons for working on roof.
 - b) Dismantling of existing sheets on roof.
 - c) Lowering of dismantled sheets from roof.
 - d) Lifting of new sheets from ground to roof top.
 - e) Laying and fixing of new sheets on roof.

NOTE 1: The provision of the following standards shall be fully applicable in roof sheet changing:

- i) IPSS:1-11-005-98 Procedure for working at heights by contractor's workers (with Amendment No. 1), and
- ii) IPSS:1-11-008-98 Procedure for working at heights by regular employees of plants/mines.

NOTE 2: Roof sheet could be galvanized corrugated (GC), galvanized plain (GP), corrugated asbestos cement (AC) or a sheet made of any similar material.

2. NECESSARY DOCUMENTATION

- 2.1 **Height Pass** - Height passes shall be issued to contractor's workers, as per clause 3.1 of IPSS:1-11-005-98.
- 2.2 **Safety Requirements/Precautions** - Checklist of requirements/precautions for working shall be as per :
- i) Clause 3.2 of IPSS:1-11-005-98, for contractor's workers and
 - ii) Clause 3.1 of IPSS:1-11-008-98, for regular employees of plants/mines
- 2.3 **Safety Talk** - Before commencement of work in each shift, all workers shall be given a Safety Talk by Executing Officer or his representative and this shall be recorded by that person in a register.
- 2.4 **Shut Down of Moving Equipment** - Before commencement, all moving equipment under the roof sheet where work is to be carried out shall be shut down and shall be recorded by the executing officer or his representative.
- 2.5 **Warning Signs** - Sign boards in Hindi, English and local language shall be placed at conspicuous places indicating the following appropriately :
- a) Fragile roof
 - b) Do not walk on roof without proper precautions.

3. REQUIREMENTS OF WORKERS FOR ROOF SHEET CHANGING

- 3.1 Training and physical fitness standards shall be as per :
- a) Clauses 4.1 to 4.3 of IPSS:1-11-005-98, for contractor's workers &
 - b) Clause 4.1 of IPSS:1-11-008-98, for regular employees of plants/mines

4. EXECUTION OF WORK OF ROOF SHEET CHANGING

- 4.1 The provisions as stated in the following shall be applicable :
- a) Clauses 5.1 to 5.6 of IPSS:1-11-005-98, for contractor's workers &
 - b) Clauses 5.1 to 5.6 of IPSS:1-11-008-98, for regular employees of plants/mines
- 4.2 Area under the sheet roof where the work is to be conducted shall be cordoned off with ropes and flags.

- 4.3 The executing officer, departmental safety officer and the in-charge of the shop where the roof sheet is being changed, shall visually inspect the site, identify the potential hazards (like weak purlins, exposure to heat or chemicals and thick layer of dust), chalk out the appropriate strategies and inform all concerned about the work plan details including a safe means of access to the sheet roof top.
- 4.4 In addition, the following shall be followed :
- a) No person shall be allowed to stand, walk or do any work or go for any purpose on a GC, GP or AC sheet roof, where there may be danger of the sheet giving way (breaking) due to the weight of the person.
 - b) No person shall be allowed to walk on the centre of the sheets. He shall walk only on purlins (i.e. the line of the protruding hook tops)
 - c) Movement of persons shall be restricted from the point of climbing to the roof top via the shortest safe approach to the point of work.
 - d) Suitable and sufficient safety devices and safe means of access like ladders, which must have length to project at least one meter above the lower end of the roof, duck ladders, access boards and crawling boards securely supported and fixed, shall be provided.
 - e) The workman shall work on suitable movable frames or ladders made of bamboo, wood, aluminium or similar material, which shall span at least between two purlins (so that his weight is not on the sheet) and this frame/ladder shall be anchored to a purlin or other fixed structure. The **full body harness with double lanyard** of the worker shall be tied to the frame/ladder suitably and securely. Use of crawling boards and/or bamboo chalis shall be encouraged.
 - f) If any damaged or cracked sheet is found, then the same shall be reported to the EA / In-charge and the sheet shall be changed under supervision of his representative.
 - g) Wherever possible, suitable and sufficient parapet wall or railing, **toe guards** or any other equally effective device to prevent the person from falling shall be provided. Where railings cannot be provided, holding nets shall be provided.
 - h) Safety **full body harness with double lanyard** having ISI mark shall be used.
 - i) Normally use of a drilling machine shall not be allowed on a sheet roof. In exceptional cases where their use is unavoidable, the drilling shall be carried

out under supervision of a competent person with specific permission of the Executing Officer.

- j) **It is advisable not to allow the workers to carry their mobile sets to the roof.**
- k) **Where transparent sheets are fixed there should be guard fencing around the same or suitable netting should be provided below the sheets spreading from purlins to purlins.**
- l) **Life line or fixed fall protection system (angles) should be provided for fixing lanyards.**
- m) In respect of electrical lines, the following precautions shall be taken :
 - i) Three core flexible cable conforming to appropriate Indian Standard shall be used.
 - ii) Connection shall be provided by a competent person, with proper earthing.
 - iii) All plugs, sockets, etc, shall conform to appropriate Indian Standard and earthing shall remain continuous.
 - iv) The switch board shall conform to the provisions of the Indian Electricity Rules.
 - v) Care shall be taken to see that the cables are not damaged by sharp edges of the sheets and shall be kept in such a way that nobody stumble upon or get entangled with them.
- n) Loose materials like nuts, bolts, hooks and tools shall be kept in a box which shall be kept safely away from the edges of the roof. Care shall be taken to prevent fall of objects like old/new hooks, nuts and bolts.
- o) Not more than two new sheets shall be lifted at a time from ground. The lifting shall be done by means of manila ropes and pulleys. The persons receiving the sheets at roof top shall essentially wear **full body harness with double lanyard** suitably tied to a firm structure. Till the sheets are fixed, they shall be tied down for avoiding any accidental fall. No loose sheet shall be left on the roof top at the end of the shift.
- p) Dismantled sheets shall not be thrown down from top. They shall be lowered to the ground by means of manila ropes and pulleys, and shall be stacked on ground properly before the workmen leave the site.

- q) Dismantling of old sheets shall start from ridge downwards while laying of new sheets shall start from bottom end to the ridge, unless otherwise required as per site conditions. Both dismantling of old sheets and fixing of new sheets shall be done row by row.
 - r) The contractor shall deploy a supervisor, experienced in the job, to be present at site 100% of the time to ensure compliance to the rules and safety procedures by the workers **from the time of mobilization for work to the time last worker leaves the workplace.**
 - s) **Workers should not be allowed on the roof at the time of high wind, rain and when lightning striking, inclement weather or insufficient light.**
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