


INTER PLANT STANDARD – STEEL INDUSTRY		
 IPSS	GENERAL PARAMETERS FOR MAINTENANCE FACILITIES IN CONVEYOR SYSTEM	IPSS:2-03-009-20 (Third Revision)
	Corresponding IS does not exist	Formerly: IPSS:2-03-009-11 (Second Revision)

0. FOREWORD

- 0.1 This Interplant Standard has been prepared by the Standards Committee on Conveyors, IPSS 2:3, with the active participation of the representatives of all the steel plants, reputed consultants and established manufacturers of conveyors and conveyor equipment and was adopted in was adopted with Third revision in **September, 2020**.
- 0.2 The maintenance of belt conveyor system covers primarily the provision of adequate space at appropriate locations for carrying out different maintenance functions. These functions include the use of hoisting mechanism; provision for adequate lighting, compressed air lines and water lines; electrical power points; lubrication system and replacement of belts. This standard was originally published in 1987, revised with first revision in 1997 and with second revision in 2011. In the light of the experience gained in the usage of this standard since then and after extensive discussions with the executives in the steel plants and captive mines, consultancy organizations and the experts from the conveyor system fabricating organizations through IPSS Committee Meeting on Conveyors held in August, 2020, this second revision has been finalized.

1. SCOPE

- 1.1 This Inter Plant Standard covers the important parameters which are required to be built into the overall design of the conveyor system for ensuring ease of maintenance and operation.

2. SPACE REQUIREMENTS

- 2.1 Sufficient space should be provided at the following locations:
- a) Provision shall be made for replacement of drive pulley by lifting it vertically above its mounting. In case of constraint of head room, sufficient space shall be provided on the non-driving side of the

pulley so that the replacement can be done from that side. In such case minimum clear space shall be equal in the length of the pulley over its shaft plus 500 mm;

- b) A minimum 1000 mm clear space around the drive and the tail end drum mechanisms (see 2.4 of IPSS:2-03-003-20 `General design features of junction houses for belt conveyors);
- c) A suitable platform near expansion joint of gallery for inspection and maintenance of supporting rollers and connected parts
- d) Sufficient space for replacement of belt at the locations indicated in clause 8 of this document.

3. HOISTING MECHANISM

- 3.1 Depending upon the site condition, the monorail provided for hoisting mechanism may extend upto 2 m from the edge of the platform floor so that material can be loaded or unloaded from this platform for onward transport or vice versa.
- 3.2 At the tail end of the conveyor, a suitable lifting beam shall be provided.
- 3.3 Lifting beam shall be provided above the take-up pulley of vertical gravity take-up unit.
- 3.4 The take-up weights shall be smaller in mass so that adjustment can be made easily by shifting / lifting the weights. A minimum of 15 percent of total take-up weights shall consist of smaller weights of up to 25 kg in mass and the remaining shall be in accordance with the manufacturer's design.
- 3.5 Suitable provision shall be made for lifting of the counterweight by chain pulley block/ electric hoist during changing / repair of conveyor belt.

4. LIGHTING

- 4.1 Adequate provision, as specified in IPSS:2-03-005-20 `Design considerations for lighting of junction houses, conveyor galleries and tunnels' shall be provided in galleries and junction houses. In addition, electric points with 24 V supply shall be provided in the galleries as per requirement at each floor of the junction house for connection of hand lamps.

5. WATER LINES

- 5.1 Suitable water lines shall be provided, for hydro-flushing of junction house and galleries and also for cooling of hot materials wherever, required.

6. ELECTRIC POWER POINTS

- 6.1 Power points for the following supplies shall be provided at suitable locations for connecting welding transformers, electric winches, etc.:
- a) 415 V /440 V, 3 phase supply; and
 - b) 220 V, single phase supply
 - c) 24 V, power socket
 - d) Earthing strip shall be provided all along the conveyor.

7. LUBRICATION

- 7.1 Suitable provision shall be made for lubrication of all moving parts, for example, pulleys, idlers and gearboxes.

8. REPLACEMENT OF BELTS

- 8.1 The methodology of replacement of belts in conveyor system shall vary for different layouts. Some of the methods are illustrated in Fig. 1 to 4. Sufficient space behind the tail end shall be provided so that the new belt can be spread there suitably. In place where spreading of belt would not be necessary, provision for anchoring the stand (for keeping the roll of the belt) shall be made. The roll stand shall be designed taking into consideration the width of the belt, the maximum diameter of the roll and the maximum weight of the roll.
- 8.1.1 Opening shall be provided in side sheeting / wall of the junction house to facilitate belt changing from tail pulley side. Width of opening shall be about 250 mm more than width of belt and height shall be about 500 mm from top of belt level (see Fig 4).
- 8.2 Idlers and guide rollers shall be provided behind tail pulley, counter weights structure and opening through which the new belt would enter the gallery as illustrated in Fig 5 to ensure smooth mounting and minimizing the possibility of damage to the new belt.
- 8.3 The suspenders of the counter weights of the take-up units shall be located at a distance not less than belt width plus 100 mm (see Fig 6).
- 8.4 In case of underground and other conveyors, wherever required, suitable opening matching with the centre line of the conveyor shall be provided for introducing the new belt and removal of used belt.

9. GENERAL PROVISIONS

9.1 The following general provisions may also be incorporated in the conveyor system for facilitating maintenance:

- a) Suitable provision for suppression and extraction of dust
- b) The design of the bearing blocks and the side cover permitting visual inspection of the bearings
- c) Depending upon the particular conveyor system, suitable inspection schedule for preventive maintenance should be devised by the designer
- d) Provision of sump pump for de-watering of underground locations
- e) Suitable sweep-chutes for disposal of fine dust from the floors
- f) Location of the walkway shall preferably be on both sides
- g) In case of outdoor installation of vertical take-ups, platform with excess stairs / ladders shall be provided at every 3 m to 3.5 m intervals in the travel length to enable inspection / maintenance of take up pulleys or any other maintenance
- h) Portable electric blowers

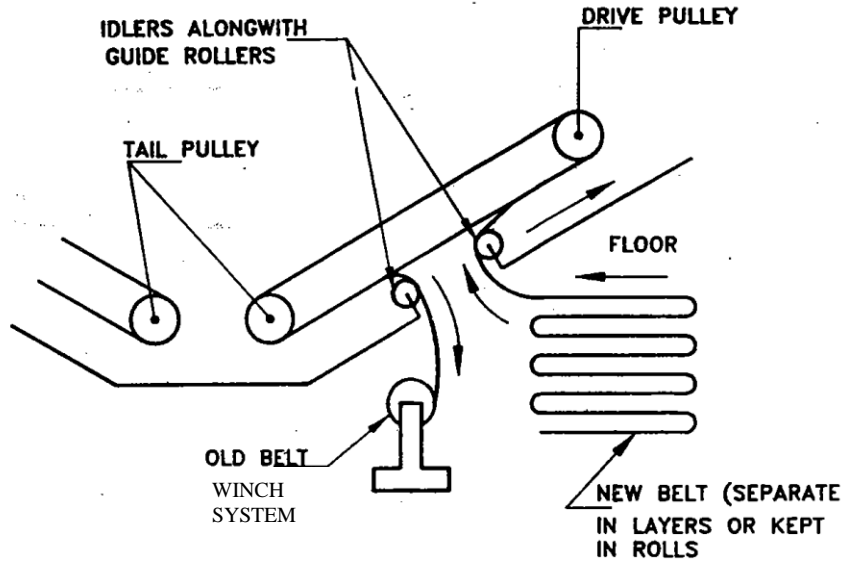
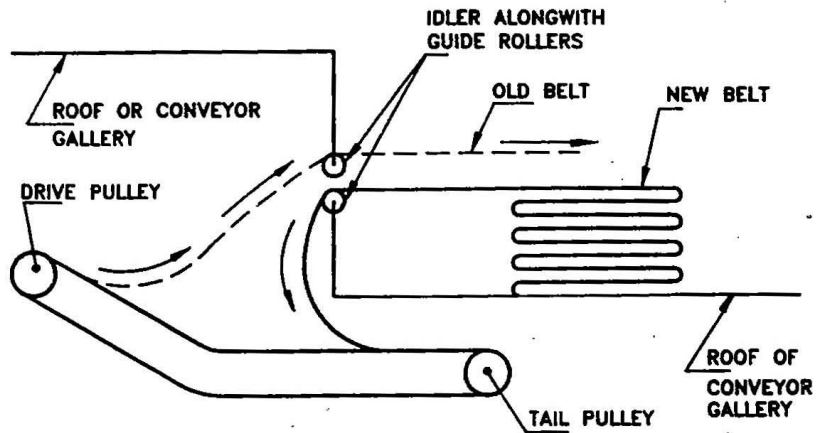


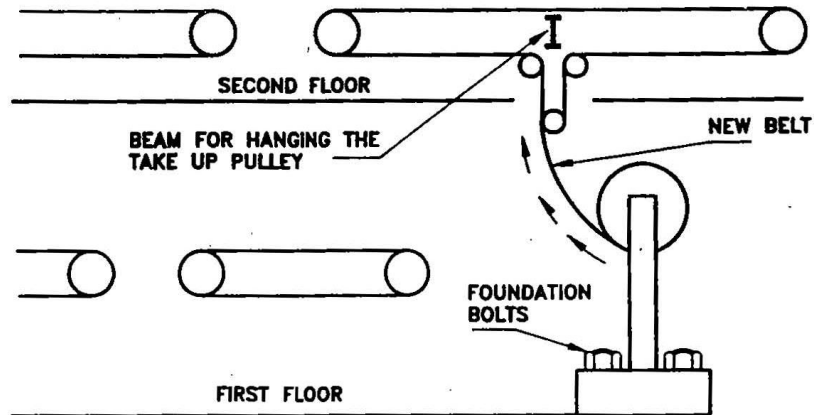
FIG. 1 METHOD OF CHANGING BELT



Location : In underground conveyor where feeding of new belt either from drive end or tail end is not possible.

Provision : Opening with idlers and guide rollers width of opening shall be more than the belt width.

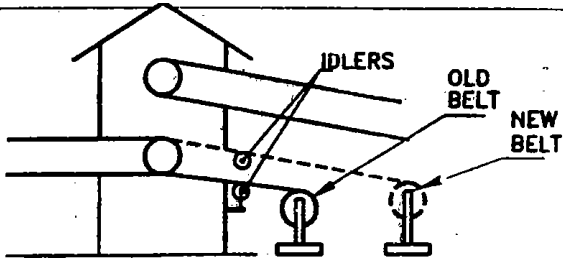
FIG. 2 METHOD OF CHANGING BELT



Location : A number of belt conveyors are in the proximity and at different levels so that feeding of new belt is not possible either from tail end or drive end and spreading of belt is also not possible, the belt has to be taken directly from the roll.

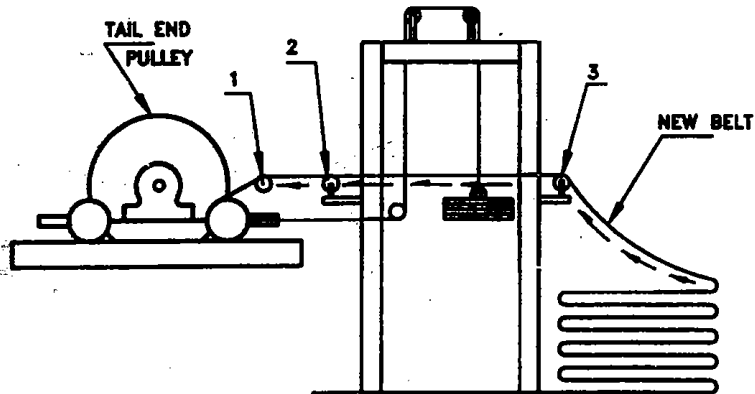
Provision : Stand with suitable anchorage.

FIG. 3 METHOD OF CHANGING BELT



Location : Junction house.

FIG. 4 METHOD OF CHANGING BELT



1, 2 & 3 IDLERS ALONGWITH GUIDE ROLLERS

FIG. 5 PROVISION OF IDLERS & GUIDE ROLLERS FOR SMOOTH FEEDING ON NEW BELT

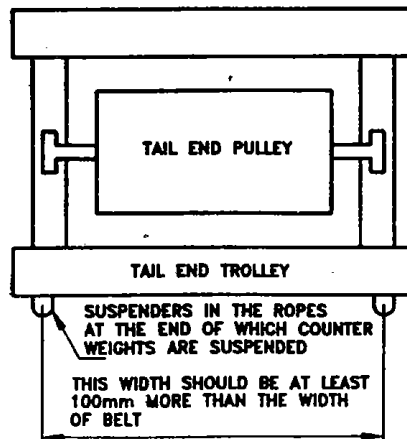


FIG. 6 LOCATION OF HOOKS FOR ROPES FOR COUNTER WEIGHTS IN TAIL END TROLLEY