



Guide to fixed plant HIF audit 2008

Contents

1. Conveyors.....	3
2. Crushers	5
3. Rotating mills	6
4. Walkways and platforms.....	7
5. Access ladders and stairways	8
6. Electrical installations	10
7. Cleaning arrangements	11
8. Plant under pressure	12

1. Conveyors

Point	Standard	Guideline
1.1	Guards are installed to prevent a trapping hazard at the nip points of conveyor head and tail pulleys.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of conveyor head and tail pulleys. Refer to MSIR 4.4(3).</p>
1.2	Guards are installed to prevent a trapping hazard at the nip points of conveyor impact idler rollers.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of conveyor impact idlers. Refer to MSIR 4.4(3).</p>
1.3	Guards are installed to prevent a trapping hazard at the nip points of accessible conveyor return idler rollers.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of conveyor return idlers. Accessible is where the idler roller is between 0.5 and 2.4 metres of a floor level. Refer to MSIR 4.4(3).</p>
1.4	An emergency stop device is provided along the accessible length of a conveyor.	<p>Intent: To provide an effective mechanism for stopping the conveyor in the event of an emergency.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of conveyor installations.</p>
1.5	A means of access is provided for the inspection and maintenance of all sections of a conveyor.	<p>Intent: To ensure that access is provided for routine inspection and maintenance of a conveyor system.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: Inspect a sample of conveyor installations. Interview personnel.</p>
1.6	Conveyor belt take-up devices are guarded.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of conveyor installations. Refer to MSIR 4.4(3).</p>

Point	Standard	Guideline
1.7	Conveyor drives are guarded.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of conveyor installations. Refer to MSIR 4.4(3).</p>
1.8	The accesses to lubrication points are remote from the moving parts of a conveyor.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: Inspect the access to lubrication points on a sample of conveyors. Interview personnel.</p>
1.9	Lighting is provided along the access walkways, at transfer points and at the drive and return heads of conveyors.	<p>Intent: To verify that moving machinery is illuminated at all times.</p> <p>Personnel: N/A.</p> <p>Method: Inspect conveyor lighting installations. Refer to MSIR 13.6(1).</p>
1.10	Anti - runaway devices are fitted on inclined conveyors.	<p>Intent: To prevent the uncontrolled movement of an inclined conveyor after the power is cut off for whatever reason.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: Inspect a sample of inclined conveyor installations. Interview personnel.</p>
1.11	Pre-start warnings are provided prior to the starting up of conveyors.	<p>Intent: To alert employees when moving machinery is about to start up.</p> <p>Personnel: Plant employees.</p> <p>Method: Where possible observe the start up of conveyor systems. Interview personnel.</p>

2. Crushers

Point	Standard	Guideline
2.1	Signs requiring the wearing of eye and hearing protection are located at all the entrances to crusher areas.	<p>Intent: To verify that persons entering crusher areas are warned as to the hazards present.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the signage at crushing plant entrances. Refer to MSIR 4.10(1)(b).</p>
2.2	Guards are installed at crusher drives.	<p>Intent: To protect employees from inadvertent contact with moving machinery parts.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the drive guards at crushing plants. Refer to MSIR 4.4(3).</p>
2.3	Personnel who operate crushers have been advised as to the hazards of tramp metal and other items being expelled from crusher jaws.	<p>Intent: To ensure that personnel working in and around crushing plants are aware of the tramp material hazards associated with crushing operations.</p> <p>Personnel: Plant operators.</p> <p>Method: Interview personnel.</p>
2.4	Documented safe work procedures are provided for the removal of material that has become jammed in a crusher.	<p>Intent: To ensure that safe work procedures are in place for the release of crusher blockages.</p> <p>Personnel: Plant operators.</p> <p>Method: View procedures. Interview personnel.</p>
2.5	Personnel have been trained in the safe procedures for removing jammed materials from a crusher.	<p>Intent: To ensure that personnel who are required to free crusher blockages have been trained.</p> <p>Personnel: Plant operators.</p> <p>Method: Sight training records. Interview personnel.</p>
2.6	Documented safe work procedures are provided for crusher maintenance.	<p>Intent: To ensure that there are safe work procedures for carrying out regular crusher maintenance.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: View procedures. Interview personnel.</p>

3. Rotating mills

Point	Standard	Guideline
3.1	Mill drives and other rotating elements are guarded.	Intent: To protect employees from inadvertent contact with moving machinery parts. Personnel: N/A. Method: Inspect the mill drives. Refer to MSIR 4.4(3).
3.2	Documented safe work procedures are provided for mill maintenance.	Intent: To ensure that there are safe work procedures for carrying out regular mill maintenance. Personnel: Maintenance personnel. Method: View procedures. Interview personnel.

4. Walkways and platforms

Point	Standard	Guideline
4.1	Fixed plant has platforms and walkways installed for everyday operational purposes.	<p>Intent: To verify that all sections of the plant are easily accessible for normal operational purposes.</p> <p>Personnel: Plant operators.</p> <p>Method: Inspect the plant accesses. Interview personnel. Refer to MSIR 6.2(2)(c).</p>
4.2	Fixed plant has platforms and walkways provided for maintenance and/or cleaning purposes.	<p>Intent: To verify that all sections of the plant are easily accessible for maintenance and/or cleaning purposes.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: Inspect the plant accesses. Interview personnel. Refer to MSIR 6.2(2)(c).</p>
4.3	Platforms and walkways are no less than 600mm in width.	<p>Intent: To verify that there is sufficient space for walking.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the plant platforms and walkways. Refer to AS1657 section 3.</p>
4.4	Guards and handrails are provided for platforms and walkways.	<p>Intent: To protect employees from the risks of falling from a height.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the plant platform and walkways. Refer to MSIR 4.4(1). Refer to AS1657 section 3.</p>
4.5	Platforms and walkway have kick boards fitted.	<p>Intent: To prevent objects from inadvertently falling from an upper level.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the plant platforms and walkways. Refer to AS1657 section 3.</p>
4.6	Platforms and walkways are free from trip hazards.	<p>Intent: To ensure that the risks of tripping and falling are minimised.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the plant platforms and walkways.</p>
4.7	Inclined walkways have cleats installed or are fitted with a non - slip type material.	<p>Intent: To ensure that the risks of slipping and falling are minimised.</p> <p>Personnel: N/A.</p> <p>Method: Inspect any inclined walkways.</p>

5. Access ladders and stairways

Point	Standard	Guideline
5.1	Stairway width is not less than 600 mm.	<p>Intent: To verify that there is sufficient foot space when climbing a stairway.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant stairways. Refer to AS1657 section 4.</p>
5.2	Step rises on stairways are between 150 and 215 mm and are of a uniform dimension.	<p>Intent: To verify that the height of stairway steps is regular and not excessive.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant stairways. Refer to AS1657 section 4.</p>
5.3	Step goings on stairways are between 215 and 305 mm and are of a uniform dimension.	<p>Intent: To verify that the depth of stairway steps is regular and not restrictive.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant stairways. Refer to AS1657 section 4.</p>
5.4	The vertical clearance between the tread nosing on stairways and overhead obstructions is not less than 2000 mm.	<p>Intent: To verify that the risk of injury to the head when climbing a stairway is minimised.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant stairways. Refer to AS1657 section 4.</p>
5.5	At least one side of a stairway is provided with a handrail which is located on the exposed side.	<p>Intent: To verify that three point contact is available when climbing a stairway.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant stairways. Refer to AS1657 section 4.</p>
5.6	Where there is a fall hazard associated with a rung type ladder cages or guards have been installed.	<p>Intent: To verify that the risk of falling from a height when climbing a ladder is minimised.</p> <p>Personnel: N/A.</p> <p>Method: Inspect plant rung type ladder installations. Note: AS 1657 only requires installation of ladder cages when a height of 6000 mm is exceeded. This is still considered to be a significant hazard and it is suggested that a cage or other fall arrest device is installed where it is possible to install one. This will require a cage on any ladder in excess of about 2.4 metres. Refer to MSIR 4.4(2)(a).</p>

Point	Standard	Guideline
5.7	The stiles of a step through ladder extend at least 900 mm above the landing.	<p>Intent: To verify that three point contact is available at all positions on the ladder.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant ladders. Refer to AS1657 section 5.</p>
5.8	The spacing of ladder rungs is between 250 and 300 mm and is uniform, with rungs no less than 20mm in diameter and preferably not vertical.	<p>Intent: To verify that the space between ladder rungs is regular and not excessive and the rungs will not sag with use.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of plant ladders. Refer to AS1657 section 5.</p>

6. Electrical installations

Point	Standard	Guideline
6.1	Individual items of fixed plant have an electrical isolating device.	<p>Intent: To verify that individual items of plant can be isolated by a dedicated isolator.</p> <p>Personnel: Electrical supervisor, plant operators.</p> <p>Method: Inspect the MCC's related to a sample of key items of plant and identify the isolators. Refer to MSIR 5.29.</p>
6.2	Isolation switches are clearly labelled.	<p>Intent: To clearly identify which isolator controls an individual item of plant.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of isolator labels.</p>
6.3	Isolation switches have a provision for being locked in the isolated position.	<p>Intent: To provide the means of preventing an item of plant from being inadvertently placed in operation.</p> <p>Personnel: Plant operators, maintenance personnel.</p> <p>Method: Inspect a sample of isolators. Interview personnel.</p>
6.4	Isolation switches have a provision for the attachment of tags.	<p>Intent: To provide the means of identifying an isolated item of plant by the attachment of personal and other danger tags.</p> <p>Personnel: Plant operators, maintenance personnel.</p> <p>Method: Inspect a sample of isolators. Interview personnel.</p>
6.5	Electrical cables are adequately supported.	<p>Intent: To ensure that live electrical cables are not subject to external forces capable of causing damage.</p> <p>Personnel: Electrical supervisor.</p> <p>Method: Inspect a sample of electrical cable installations.</p>
6.6	Electrical cables and equipment are not damaged.	<p>Intent: To ensure that the risks of fire or danger to personnel are minimised.</p> <p>Personnel: Electrical supervisor.</p> <p>Method: Interview personnel.</p>

7. Cleaning arrangements

Point	Standard	Guideline
7.1	The hazards associated with the manual cleaning of fixed plant have been determined.	<p>Intent: To verify that safe work procedures for cleaning can be developed in confidence.</p> <p>Personnel: Senior manager, maintenance personnel.</p> <p>Method: View hazard analysis and safe work procedures. Interview personnel. Refer to MSIR 6.17 and 6.27.</p>
7.2	The hazards associated with the mechanical cleaning of fixed plant have been determined.	<p>Intent: To verify that safe work procedures for cleaning can be developed in confidence.</p> <p>Personnel: Senior manager, maintenance personnel.</p> <p>Method: View hazard analysis and safe work procedures. Interview personnel. Refer to MSIR 6.17 and 6.27.</p>
7.3	The hazards associated with cleaning down fixed plant with a water hose have been determined.	<p>Intent: To verify that safe work procedures for cleaning can be developed in confidence.</p> <p>Personnel: Senior manager, maintenance personnel.</p> <p>Method: View hazard analysis and safe work procedures. Interview personnel. Refer to MSIR 6.17 and 6.27.</p>
7.4	The hazards associated with cleaning fixed plant whilst it is in operation have been determined.	<p>Intent: To verify that safe work procedures for cleaning can be developed in confidence.</p> <p>Personnel: Senior manager, maintenance personnel.</p> <p>Method: View hazard analysis and safe work procedures. Interview personnel. Refer to MSIR 6.21.</p>
7.5	Spillage around fixed plant does not present a hazard.	<p>Intent: To ensure that spillage is controlled and not allowed to accumulate such as to present a hazard.</p> <p>Personnel: N/A.</p> <p>Method: Inspect the plant for spillage.</p>

8. Plant under pressure

Point	Standard	Guideline
8.1	Pressure vessels comply with a recognised standard.	<p>Intent: To verify that the hazards of pressure vessel usage are minimised.</p> <p>Personnel: Maintenance manager.</p> <p>Method: Inspect a sample of vessel design and registration documentation. Refer to MSIR 6.26 and 6.33.</p>
8.2	Pressure vessels are inspected and maintained.	<p>Intent: To verify that the hazards of pressure vessel usage are minimised.</p> <p>Personnel: Maintenance manager.</p> <p>Method: Inspect a sample of vessel inspection and maintenance records. Refer to MSIR 6.26 and 6.33.</p>
8.3	Pressure piping is adequately supported.	<p>Intent: To ensure that pressure piping is sufficiently supported such that additional stresses are not applied.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of installed pressure pipes. Are the pipes subject to excessive flexing due to a lack of support?</p>
8.4	Pressure piping is labelled in order to identify the contents, direction of flow and line pressure.	<p>Intent: To ensure that the contents and usual flow direction in pressure piping can be identified without having to break the line.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of pressure piping. The pipe contents may be identified by labels or colour coding and flow direction should also be indicated at strategic positions along the route.</p>
8.5	Flexible hose is rated for the maximum available operating pressure.	<p>Intent: To ensure that the hoses in use are compatible with the available pressures.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: View the hoses in use and cross reference the hose pressure ratings with the available pressure in the pipe work.</p>
8.6	Flexible hose is rated for the temperatures and types of fluid to be conveyed.	<p>Intent: To ensure that the hoses in use are compatible with the chemical and physical properties of their contents.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: View the hoses in use and cross reference the hose ratings with the fluids and temperatures.</p>

Point	Standard	Guideline
8.7	Flexible hose connections are designed such that they are incapable of being unintentionally disconnected.	<p>Intent: To ensure that hose connectors facilitate the installation of safety clips or other such locking devices.</p> <p>Personnel: N/A.</p> <p>Method: Inspect a sample of flexible hose connections.</p>
8.8	The specifications of the flexible hose fitting manufacturer are compatible with those of the flexible hose manufacturer and any assembly is done in accordance with the manufacturer's instructions.	<p>Intent: To ensure that all flexible hose and fitting assemblies are compatible.</p> <p>Personnel: Maintenance personnel.</p> <p>Method: View the hoses in use and cross reference the specifications of hose and fittings.</p>