



Retro Fitting Solution Fact Sheet

Practical Solutions to Interlocking and Isolation devices on Farming Equipment

Interlocking and Isolation devices, when installed, maintained and used in the correct way, can prevent injury (including deformity, amputation of limbs, or loss of life) arising from an incident when performing tasks such as maintenance, clearing blockages, restarting equipment after power outages etc.

This Fact Sheet highlights the importance of Interlocking and Isolation devices such as permanently fixed physical barriers, interlocked physical barriers, physical barriers that can only be altered or removed by use of tools or presence-sensing safeguarding systems on farming equipment when performing inspections and maintenance work. These farming equipment may include grain and fertilizer auger / elevator systems in fixed and mobile situations. This fact sheet places particular emphasis on hazards associated with the auger systems installed in grain feed-mills and multi use silo systems where various augers, elevators and conveyers are part of grain, fertilizer and/or other agricultural produce delivery systems.

The purpose of correct interlocking and isolation of machinery is to address the risk of exposure to hazards, incidents or accidents involving workers, contractors/visitors and suppliers (Workplace Participants) as set out in legislation including the Work Health and Safety Act and Regs, Codes of practices and Australian Standards (AS1755, AS4024).

Identifying workplace plant/equipment requiring retro fitting devices

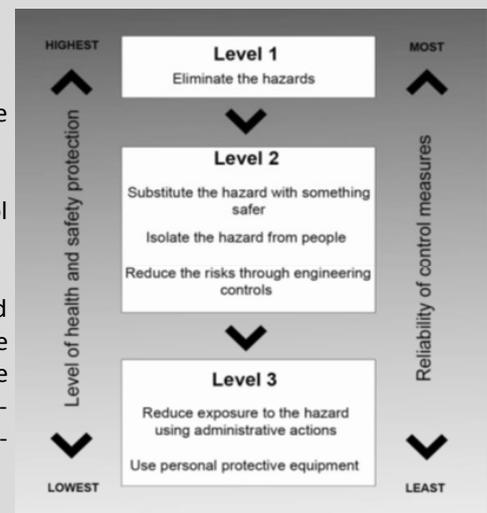
The hazards associated with performing tasks on plant and equipment can be identified by using the risk management approach, this will help make a judgement about the risks associated with these hazards and implement appropriate control measures using the hierarchy of controls.

Risk Management Process

- Identifying hazards
- Assessing risks that may result because of the hazards
- Deciding on appropriate control measures to prevent or minimise the level of the risks
- Implementing the chosen control measures
- Monitoring and reviewing the effectiveness of the chosen control measures

The risk Management Process and the Hierarchy of controls are outlined comprehensively on the *Risk Management Advisory Standard 2000* and the *How to Manage Work Health and Safety Risks Cod of Practice 2011*. These standards and codes of practices will help systematically identify all workplace plant and the associated hazards and any retro fitting that maybe required to ensure they are safe and comply to applicable legislation.

Hierarchy of controls



Controls measures

ELIMINATION is the most effective method of control and should always be attempted first. Discontinue dangerous practices, if the equipment is no longer used remove or dispose of the dangerous equipment. Thou elimination is not always practicable, other control measures must be put in place. When considering the hierarchy of controls always follow in order from level 1 (Highest control measure) to level 3 (Lowest control measure).

SUBSTITUTION is the process of replacing a material or process associated with plant with a less hazardous one that will reduce the risk. eg. Replace standard screw nuts and bolts or hinged openings that are able to be removed or opened by fingers with nuts and bolts that can only be removed using a tool.

Control measures (continued)

ISOLATION is the process of isolating (separating) a process or machine from workers. This can be achieved by either distancing the process from the workers or by inserting a physical barrier between the process or machine and workers, commonly known as guarding.

Section 208 of the Work Health and Safety Regulations states the following:

The person with management or control of the plant must ensure that-

If access to the area of the plant requiring guarding is not necessary during operating, maintenance or cleaning of the plant, the guarding is a permanently fixed physical barrier; or

If access to the area of the plant requiring guarding is necessary during operation, maintenance or cleaning of the plant, the guarding is an interlocked physical barrier that allows access to the area being guarded at times when that area does not present a risk and prevents access to that area at any other time; or

If it is not reasonably practicable to use guarding mentioned in paragraph (a) or (b), the guarding used is a physical barrier that can only be altered or removed by use of tools; or

If it is not reasonably practical to use guarding include mentioned in paragraph (a), (b) or (c), the guarding includes a presence-sensing safeguarding system that eliminates any risk arising from the area of the plant requiring guarding while a person or any part of a person is in the area being guarded.



Inspection hatch on a feed mill cross auger. This hatch is not secure and can be lifted off while the auger system is energized.

Corrective Action: Secure all lids and hatches with key locks or a scroll nut and bolt security fastening that requires a specific tool to undo the nut and bolt.

The types of guards can include (but not limited to);

- Fixed Guards
- Interlocking Guards
- Automatic Guards
- Distance Guards
- Trip Guards

Some systems may have guards that are fitted with electronic interlock systems that will automatically de-energize the system if the guard, door or hatch is opened. Always ensure that these systems are locked out at the main power source and tested for dead before performing work. switches must be repaired as soon as practicable from when you become aware of them.

Never interfere with or prevent an interlock safety switch from functioning. Any malfunctioning safety switches must be repaired as soon as practicable from when you become aware of them.

ENGINEERING is the design or redesign and installation of equipment to counteract hazards. Installation of Emergency Stop buttons within easy reach of operators is considered as an engineering control. If this control measure is applied ensure that any changes or redesigns made are compliant to any applicable legislation. Under the Work Health and Safety Act 2011 the PCBU (person conducting a business or undertaking) may become the designer and/or the manufacturer and therefore further duties apply and must be adhered too. Note: Any interlocking systems must be tested on a regular basis by an approved competent person.



ADMINISTRATION controls includes implementing procedures and instructions into the process. The use of a safe lock-out/tag out systems including key security, isolation locks, lock boxes for multiple person lock outs, master keys, and danger tags will ensure a safe system of work whilst work is being undertaken on plant and machinery such as cleaning, maintaining or servicing. Isolation of electrical equipment must utilise full current isolation e.g. Line fuses or line circuit breakers. You must ensure that only trained and competent workers perform this task specific work on plant and machinery, you can do so by supervision of new workers, contractors and other persons until deemed competent by trainer, buddy, or other worker deemed competent and in a senior position. Other control measures may include Danger signs. Every auger must clearly display pictorial and written signs warning against the serious safety risks. See example of a sign below.



PERSONAL PROTECTIVE EQUIPMENT (PPE) is clothing, equipment or substances which when worn correctly, protect part or all of the body from risks of injury or disease. The control of exposure from machinery or plant risks should be secured by one or more measures other than the provision of PPE. PPE can include protective eyewear, protective hearing devices, or gloves etc. Personal Protective Equipment is the least effective method of controlling risk and should be utilised in conjunction with more effective control measures or as a short term strategy.

Example of safe isolation procedure for blockages, jams and clearing of auger type plant and equipment

Identify work to be completed (Clearing of blockages or jams etc)



Before work is to commence on any machine or equipment, ensure that all hazards are correctly identified, controlled and isolated. This can be done so by completing a Risk Assessment.



Isolate all control points including circuit breakers isolated and/or fuses removed.



All workers to place a 'Danger' tag and personnel isolation lock on all points.



Drain or dissipate all residual or stored energy.



Test isolation prior to commencing work. The worker testing the isolation must have sufficient knowledge of the equipment to ensure the test is correctly performed.



Commence work to be completed.

When work has been completed, Tags and locks must be removed. All Isolation points must be returned to their original state prior to isolation if this does not create additional hazards (called De-Isolation)



For Further information see:

Work Health and Safety Act 2011

Work Health and Safety Regulation 2011

Australian Standards

AS 1755-2000 Conveyor—Safety Requirements

AS 4024:1601-2006 Design of controls, interlocks and guarding—Guards—General requirements for the design and construction of fixed and movable guards

AS 4024:1604-2006 Design of controls, interlocks and guarding—Emergency stop—Principles and design

Managing Risks of Plant in the Workplace Code of Practice

https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0006/58173/managing-risks-plant-cop-2013.pdf

How to Manage Work Health and Safety Risks Code of Practice

https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0003/58170/how-to-manage-whs-risks-cop-2011.pdf

Rural Plant Code of Practice

https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0007/58192/rural-plant-cop-2004.pdf