

SAFETY

Plant and Equipment Guarding and Safety Interlocking

What you should know for compliance with the Victorian Safety Legislation.

ROBERT Floyd is the founder and Director of Floyd Industries. He has seen many changes over the past 50 years that he has been involved in providing professional and qualified electrical services to the quarrying industry. These changes include the automation of equipment and the introduction and enforcement by authorities of regulations around plant and equipment safety. As plant and equipment becomes 'smarter' through the use of automation and controls, so does the need for guarding and safety interlocking to ensure safe access. Floyd Industries as long term contractors in this industry, would like to share our experiences in working in the quarrying and manufacturing industries, in relation to guarding and safety interlocking, in addition to the recent CMPA Guarding workshop and their subsequent article.

What is Safety (Electrical) Interlocking?

One of the most important types of protective devices available is a safety interlock, which interlocks an access door, activation area or device with a control system and the power source of the potential mechanical/electrical hazard.

When the guard door is opened, the power is isolated immediately, ensuring that the machine is safe when the operator requires access e.g. for cleaning, clearing obstructions or general maintenance. There are many variations of interlocking devices, each with their own characteristics and specific functional protective roles. It is important to ensure the type, location, fitting and robustness of the device/s chosen are correct for their chosen operational application.

Safety Interlocking devices and systems, when are they required?

Neil Riches from Hypersafe Safety Consultant's advises safety interlocking devices, need to be assessed via risk assessment, to ensure safety compliance and to meet productivity and maintenance requirements prior to installation or be totally reassessed if upgrading plant and equipment.

Under the Occupational Health and Safety Act 2004, any person or Organisation who is, or may be associated with, or may come into contact with plant and equipment, has a statutory duty of care to have compliant guarding in place. The OHS Act expects designers, manufacturers, suppliers, re sellers, importers, Installers, servicing organizations, Contractors and Employers to comply to ensure employees and the public are protected.

Determining the level and type of Safety Interlocking

There are four categories that designate which level of safety interlocking system requirement is to be used, when installing or upgrading plant and equipment. These categories should always be determined by a risk assessment in consultation with employees and are based on the Health and Safety Legislative Framework. In Victoria, the Victorian WorkCover Authority has the responsibility for the administration of the OHS Act which

is underpinned by regulations, compliance codes, codes of practice and Australian Standards.



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An Example Project:

During a recent Secondary Plant upgrade we had a safety consultant conduct an assessment and then Floyd Industries completed the installation. We have outlined some more details on the process below:

1. Plant and Equipment Risk Assessment process

Before commencing the project we consulted a safety consultant to determine the design of the safety system to meet the requirements of current Health and Safety legislation. This also determines the category level (1 to 4) of Safety Interlocking required, based on a risk assessment and the standards.

Ramesh Menon – Safety Consultant for Rockwell Automation refers to the following standards when conducting risk assessments, selection of the category and design of the safety system.

- AS4024 (Safety of Machinery standard) provides guidelines to meet the obligation of the OHS Act, AS4024 covers all aspects of the safety system development life cycle beginning with the risk assessment,
- AS4024.1201 and AS4024.1202 details the risk assessment process and selection of the risk reduction method.
- Based on the risk assessment and the risk reduction method, the next step of safety system design is the selection of the appropriate safety category and type required for the risk reduction method identified (risk reduction method e.g. interlocked guard, light curtain scanner etc.

- AS4024.1501 provides the details to selection of the category and design of the safety system to the required category level.

Employers Ensure!

Neil Riches from Hypersafe Safety Consultant's advises, if you are in a high risk - high consequence type industry, such as mining, quarrying, construction etc, then your outcomes to poor, inadequate or no guarding in the event of a Statutory Reportable event could be catastrophic.

High risk assessment outcomes by law, demand the highest possible 'Category' of safety interlocking e.g.; OHS Act states - 'The highest level of protection must be afforded to all at all times'.

2. Installation Conducted by Floyd Industries

- Manufacture and install Control and Distribution switchboard, install supply cables, control system and CCTV. Automate plant and equipment with PLC and install touch screen control with graphic display.
- Install a Captive Key System on the guarding infrastructure & surge pile tunnel entrance, lanyards on conveyors and emergency stops on all inter connected equipment to a level four safety PLC as determined by the safety assessment.
- The safety PLC was installed to covert the safety system from control circuits to power isolation through shunt trip mechanisms, isolating power to crushers by locking out the supply circuit breakers and dual safety contactors lock out supply to conveyors, shakers and other equipment leaving the system safe.

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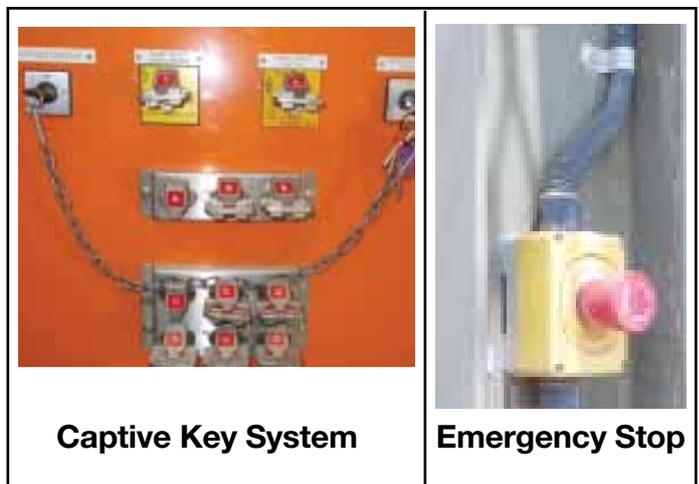
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Key Messages

- A risk assessment of your plant should be conducted prior to carrying out a new installation or an upgrade of existing plant and equipment. Risk assessments should be conducted by a qualified and competent person/organisation. This will also assist in the project outcomes meeting the relevant statutory required standards.
- From Floyd's experience, investing in some professional and qualified advice prior to any works will ensure that the installation meets standards and is often the most cost effective.

- One of the important lessons that Floyd Industries has learnt over the years, when you alter an item of plant the safety assessment needs to take into account all associated equipment. For example, if you change the crusher, then you need to elevate the 'feed in' and 'out' conveyers to the same safety compliance standard requirements.
- Neil Riches from Hypersafe Safety Consultant's advises the above will assist in the legislative compliance requirements also, that is demanded of Executive Management and the organisations 'Officers' with respect to the OHS Act.

Please note the information provided within relates to a specific installation and that each installation or upgrade must be individually assessed.

Contributors to the article:

- Neil Riches - Founder and Principal Consultant – Hypersafe Safety Consultants
- Ramesh Menon – Safety Consultant for Rockwell Automation
- Robert Floyd – Director of Floyd Industries Pty Ltd

References used:

- NHP - Safety Solutions on Tour – Presentation May, 2014
- Safety Interlock Switches and Monitoring Relays – Scientific Technologies Inc.

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