

# Plant Safety – Examples

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# Overview

**Plant issues**

**Hierarchy of risk controls and the hazard reduction precedence - examples**

**Applying plant safety legislation**

**DPI expectations**

# Plant issues

**Plant and equipment can easily kill and maim**

**Put plant and equipment in a mine and the risks increase**

**Plant is getting bigger**

**Plant is getting more complex**

**Risks are easily transferred**

**Risk profiles can be subtly changed**

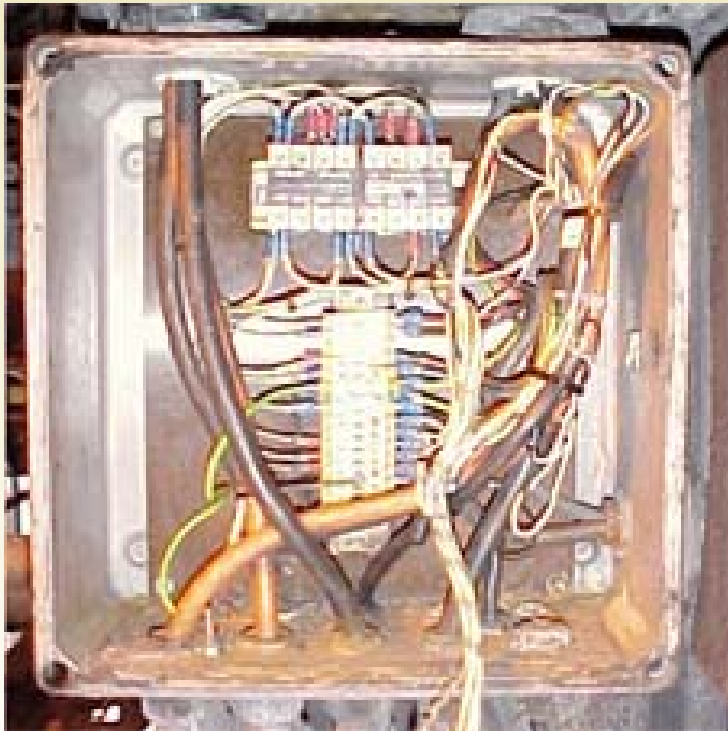
**As power and size increase old design practices and risk control methods may be insufficient**



# Eliminate the hazard



# Substitute with safer options



# Isolate the hazard from people



# Engineering controls



# Engineering controls



# Engineering controls



# Engineering controls



# Combinations of risk controls

## Risks

**240V**

**Regularly hosed during cleanup**

**High risk of impact during under belt cleaning (close to the ground)**

**IP53**

## Risk controls

**Reduce voltage to 24V supply  
(substitute)**

**Relocate (modify - location)**

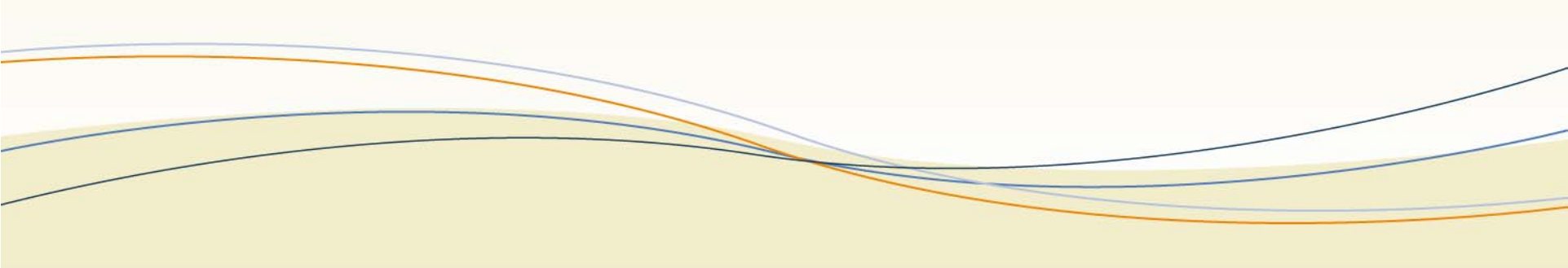
**IP66 (engineering control)**



# Comment on the examples

- **Hierarchy is often not difficult to apply from an engineering sense**
- **Have often been adopted as a result of intervention by the regulator**
- **Not applied at the original design stage**
- **Application of the hierarchy of risk controls and the hazard reduction precedence as a way of doing business has a long way to go.**

# Plant safety legislation

- **Purpose for which the plant was designed**
  - **Foreseeable hazards over the life-cycle**
  - **Risks from the foreseeable hazards**
    - **impact on the work environment**
    - **range of environmental & operational conditions**
    - **ergonomic, access and egress needs**
    - **specific legislative risk controls**
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# Plant safety legislation

## – Risk controls

- ergonomics, access and egress
- build up of materials
- guarding
  - permanently fixed, or
  - interlocked or presence sensing,
  - must consider ejection of material
- work procedures & devices for unblocking moving parts
- operational controls
  - suitably identified
  - conveniently located
  - prevent unintentional activation
  - lockable in the off position (or equivalent)
- emergency stops

# Applying plant safety legislation

## Foreseeable hazards & risk controls

- range of environmental & operational conditions
- ergonomic, access and egress needs



# Applying plant safety legislation

## Foreseeable hazards & risk controls

- specific legislative risk controls
- operational controls
  - suitably identified
  - conveniently located
  - lockable in the off position (or equivalent)



# Applying plant safety legislation

## Foreseeable life-cycle hazards

### Risks from those hazards

- range of environmental & operational conditions
- specific legislative risk controls
- guarding
  - permanently fixed, or
  - interlocked or presence sensing,
  - must consider ejection of material



# Applying plant safety legislation



**Foreseeable hazards over the life-cycle**

**Risks from the foreseeable hazards**

- range of environmental & operational conditions
- specific legislative risk controls

# Applying plant safety legislation

**Purpose of the plant**

**Foreseeable life-cycle hazards**

**Risks from those hazards**

**Risk controls**

- ergonomics, access and egress
- guarding
  - must consider ejection of material
- build up of materials & work procedures & devices for unblocking moving parts
- operational controls
  - suitably identified
  - conveniently located
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- emergency stops



# DPI Expectations

- A SYSTEMATIC, RIGOROUS & AUDITABLE APPROACH TO SAFETY.
- Compromising electrical engineering practices because of environmental constraints is not an option
- Reducing the practical ability to apply risk controls because of environmental constraints is not an option
- Transferring risk from one group of workers to another is not an option.