

Hazard Alert

Control of integrated plant and equipment



Government
of South Australia

SafeWork SA

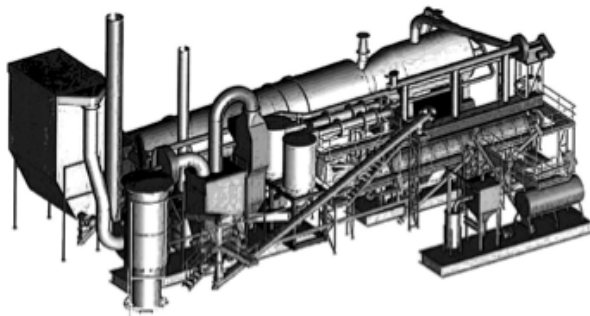
Summary of incident

A mill hand was fatally injured when he was crushed by a moving component of the machine he was working on.

The worker was performing a maintenance task through a hatch door which was activated via a solenoid operated pneumatic control valve. The emergency stop (E-Stop) had been activated but did not isolate the compressed air supply.

Background

Many manufacturing facilities integrate multiple items of plant and equipment to create a production line. These items of plant may be sourced from different manufacturers or different countries of origin, and may use programmable logic controllers (PLCs) with a code written specifically for the equipment rather than the integrated unit.

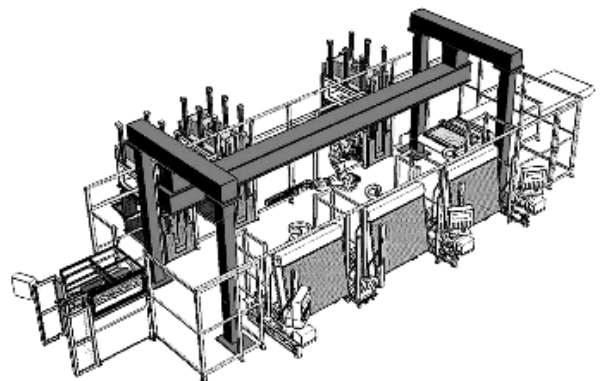


Example of a multiple plant and equipment facility

The power sources for this type of plant and equipment may vary with a combination of electrical (mains, battery, solar) and mechanical means (internal combustion engine, wind, wave action) and it is necessary to consider the effects of stored or potential energy, particularly when an E-Stop sequence is initiated. These can include pneumatic, hydraulic (hydrostatic) and gravity.

Possible causes

- All energy sources were not isolated prior to the start of maintenance work.
- System residual air pressure was not released prior to the start of maintenance work.
- Hatch door not mechanically secured / pinned in the open position prior to the start of maintenance work to avoid unintentional movement.
- Alternate more suitable maintenance access point was not used.
- Plant operational controls by-passed allowing unintentional hatch door activation.
- Plant did not revert to a safe state when E-Stop sequence was initiated.
- Maintenance work performed without supervision.



Example of a multi-workstation automation cell

Action required

- Identify and consider controls for all sources of power and motion to the plant.
- Ensure that a hazard identification and risk assessment is conducted on all plant during the commissioning phase. Where the risk cannot be eliminated, the risk must be minimised so far as is reasonably practicable.

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- Where possible, arrange an independent inspection of the plant by a competent person in your industry.
- Ensure that the activation of an E-Stop isolates and / or releases all energy sources (where appropriate) and does not introduce new hazards, such as unintended or uncontrolled movement.
- Consider the effects of an E-Stop initiation on all work stations and plant and equipment that is integrated into the whole production line.
- Prior to performing maintenance activity on plant, inspect and confirm that the plant is in a safe state.
- Some fast moving or rotational components of plant require an extended lock-out period to allow for a run-down time before it is safe to enter or access.
- Where access is required through vertical moving gates, doors or openings, ensure that these are mechanically pinned or locked in position prior to entering.
- Before releasing an activated E-Stop and initiating a reset sequence, ensure that all workers are outside of the plant and that guarding is correctly and securely fitted.
- Develop and implement safe work procedures for entering / accessing plant and ensure that all workers are informed and trained in these procedures.
- Ensure that all E-Stop and safety interlock circuits are tested regularly for correct operation.

Further information

Managing Risks of Plant in the Workplace – National Code of Practice
AS4024 – Safety of Machinery

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