



NSW DEPARTMENT OF  
PRIMARY INDUSTRIES

Partners in the **profitable** and **sustainable development**  
of our State's **agriculture, fisheries, forests** and **minerals**



Mine Safety

Longwall Pump Station Audit & "4 P"



# Purpose

- This audit was conducted after a fatality on a Longwall Pump Station.
- The initial investigation on the fatality did not reveal clear causal factors.
- To have a critical look at the safety aspects of Longwall Pump Stations in Operation.



# Participants in the Pump Station Audit

- Department of Primary Industries Mechanical Personnel
- Mine Mechanical Engineering Managers
- Mine Longwall Engineers
- Mine Mechanical Technicians / Fitters
- Local Check Inspectors
- Mine OH&S / Training Managers
- District Check Inspectors
- Pump Station Manufacturers
- Longwall Manufacturers



# Before Audit

- Pump Stations built to general industry standards set by mine specification and OEM pump manufacturers standard.
- The industry standard has developed through continuous improvement with each new pump station.
- This standard generally included but not limited to:-
  - lockable isolation valves,
  - bleed valves, gauges,
  - hoses to Australian Standards and
  - SAE 62 couplings etc.



# Pump Station Audit Criteria

The audit consisted of:-

- Isolation components and systems
- Depressurisation
- Documentation
- Training
- Specific maintenance and monitoring tasks

# Isolation Components

- Isolation valves should be lockable. The valve handle indicate flow OPEN or CLOSED.
- Bleed valves and pressure gauges should be accessible and clearly labelled indicating description and function.
- The bleed valve and pressure gauge should be located close to each other and the system to reduce any confusion



# Component Labelling

- Labelling should indicate component description and function of the component.



- Labels should be clear and concise.
- Larger labels on main components was recommended.

# Pump Site Information

- Pump station information should be available on the pump station. (or close by i.e. in the crib room)
- The hydraulic schematics did not represent the hydraulic circuit “As Built”
  - Wrong information is a latent condition (one barrier down).





# Operational Risk Assessment

- The operational risk assessment did not cover all maintenance operations.
- Some contracted maintenance not covered
  - i.e. the condition monitoring schedule.
- Generally the regular inspections and relocations were covered.



# Knowledge

- Mine Mechanical employees understood the hydraulics control operation i.e.
  - Unloader valve (limiting pressure)
  - Main Relief's
  
- Mine Mechanical employees had limited understanding of the electrical pump station controls and the hydraulic / electric interface.
  - Pressure switches
  - Unloader valve set points
  - Dump Valve electrical interface

# Good Points

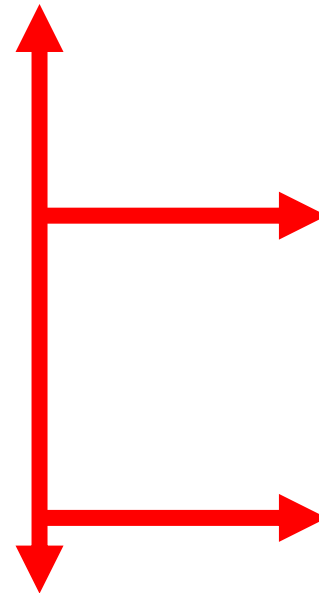
- Co-operative approach
- Danger sign at the cut through entrance.
- Emergency stop / lanyard at the entrance and along the length of the cut through.
- Pump Station well maintained and loved.
- Discharge hoses secured and supported off the ground.
- Hydraulic Pipes sited and supported appropriately.





# "4 P"

- Philosophy
- Policy
- Procedures
- Practice



- E Wiener "Aviation Psychology in Practice"
- Management Model
- The 4 P should be aligned
- Guiding principle



# Thank You

- The pump station report will be available in the near future located on the
- Department of Primary Industries Website at [www.dpi.nsw.gov.au/safety/resources/mechanical/topical-issues](http://www.dpi.nsw.gov.au/safety/resources/mechanical/topical-issues)
- Continuous Improvement never stops