STAY LIVE
Electrical Industry Health & Safety Group

Shared Learning

Stored Energy (Water) | Vulnerability of a Safety Critical Element | Hydro Power Station

What happened?

A refurbished headgate failed a test during recommissioning. The headgate failed to close during priming of the penstock.

Further tests confirmed that the headgate *does trip* after the penstocks are fully primed, including successful trips at full flow.

Engineers believe pressure imbalance on the headgate during priming increases friction which prevents the gate from dropping under its own weight.

The unit was cleared for return to service while investigations continue into the root cause of the problem.

What did we learn?

- Under specific operating conditions (priming of the penstock) we lose redundancy of Safety Critical Elements. Temporary operating rules have been put in place that represent a formal operational variation for that generating unit.
- This operational variation was formally communicated to affected parties by email, and changes were made to the generation control software.
- No updates were made to Station Manuals and the business has no common repository to log temporary operational variations or long-term vulnerabilities.
- Our people are highly competent in understanding and assessing risk and determining the need for operational variations when returning units to service.
- However, we rely on highly competent individuals to remember the state of our plant, and to know where (and how) to look for relevant information.
- We are now investigating ways to better communicate operational variations and system vulnerabilities. We will build a formal process to manage the recording and sharing of critical knowledge relating to Process Safety.

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