

Siemens 3AP2 Type CB – Catastrophic Failure

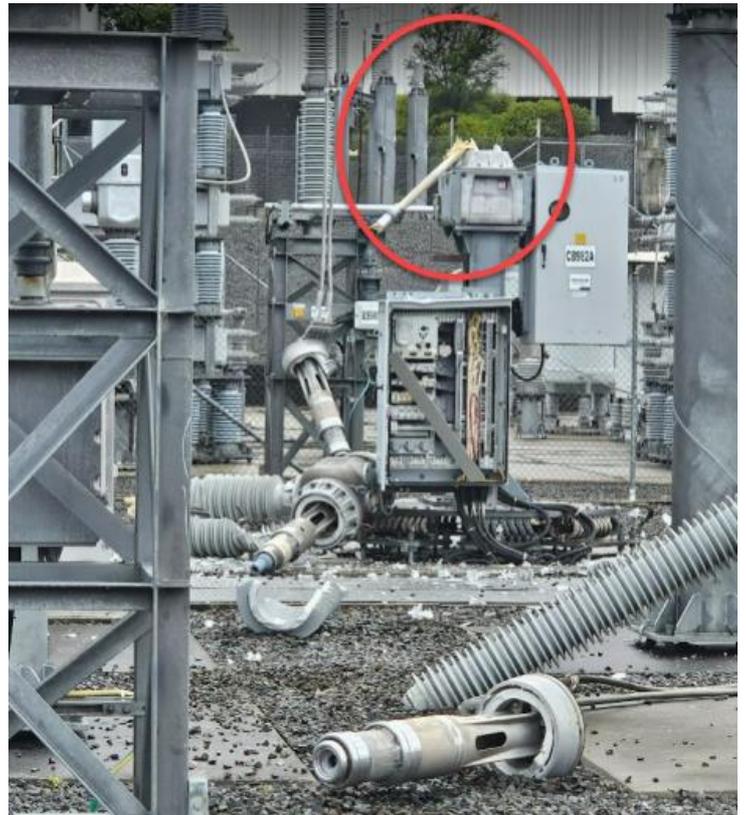
WHAT HAPPENED?

On 31.01.2025 at 06:08am, Haywards Filter bank 5 tripped via protection operation. This occurred immediately following a close operation.

When staff arrived on site, they discovered HAY-CB-982A Y phase had suffered a catastrophic failure resulting in the loss of SF6, with porcelain and mechanical components dispersed across the filter bank switchyard.

The failed circuit breaker is a Siemens type 3AP2. These circuit breakers are associated with HVDC assets and are only installed at Haywards and Benmore Substations. The 3AP2 circuit breaker is a SF6 circuit breaker with double head/interrupter arrangement.

- No injuries to any personnel.
- This happened early in the morning when no staff were on site.



LEARNINGS & OUTCOMES:

- Latent mechanical defects, such as a loose locating collar, can lead to catastrophic failure during normal operation.
- The failure sequence suggests a mechanical breakdown occurred upon closing, leading to other system responses like SF6 loss and protection trips, rather than being initiated by an electrical fault current
- Safety measures have been put in place to mitigate the safety risk of the remaining operational fleet of 3AP2 breakers
- Overhauls are being planned on other 3AP2 breakers to identify if this fault is present elsewhere in the fleet

Name	Stephen Butler
Position	HVDC and Power Electronics Service Performance Manager
Mobile	021 224 0736
Email	Stephen.butler@transpower.co.nz
Maximo Ref	177212