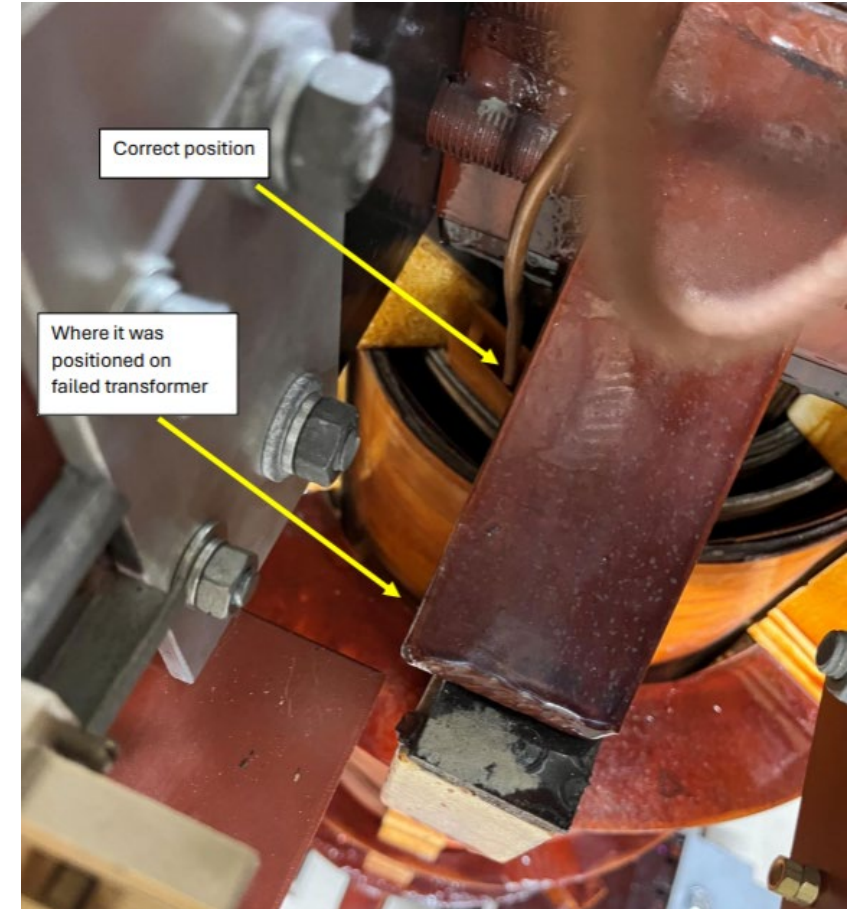


### What Happened?

The Unit Auxiliary Transformers supply 415V power to the auxiliary systems (pumps, compressors etc.) on the main generating units at Clyde. They step down power generated from the Unit at 15.4 kV to 415V. As part of the local monitoring a capillary tube temperature gauge is fitted to monitor internal transformer temperature.

This gauge was suspected of reading incorrectly and was removed as part of for calibration/fault finding. Note: the work order this job was done under did not include this UAT, but the tech thought that as they had the calibration hot box out and the Major Unit was under permit that they would check this probe. During this testing the Probe found to have failed and was replaced with a spare. The spare was inserted in a slightly different position in the transformer to the original location which was placed between two insulated barrier boards (Fig 1). The different position had the probe fitted between the HV winding stack and the internal coil insulation. This allowed contact between the capillary tube and transformer coils.



### What Happened cont.

Shortly after unit 2 start up the transformer was energized, the capillary tube contacted a phase winding and subsequently caused a phase-to-phase short, activating the designed electrical protection which de-energized the unit. In addition, the event generated smoke, initiating a smoke alarm resulting in the local fire service attending the station.

This event has been categorised as a Tier 2 event because it resulted in a electrical failure and caused damage of more than \$4k NZD and less than \$160k NZD.

### What was Learnt.

Work was conducted outside the approved work order and permit. Had this work been included on the permit, electrical checks on the UAT would have been included as a QA check prior to returning the unit to service. These checks would have likely identified the defect before the UAT was energized.

The need to maintain permitting and work order compliance has been reinforced.

**In this case good intentions, bypassed due process**



**Capillary Tube contacting Tx Windings**