

# Safety Notice

## Notice to Powerco Contractors

Issue 10 | Rev. 1 | June | 2025

## Safe Bypassing of Voltage Regulators

Powerco has identified a concerning trend of improper operations related to the bypassing of voltage regulators, having documented three incidents in the past eight weeks that resulted in the failure of high-voltage (HV) fuses. The common operational issues observed include:

- Failure to set voltage regulators into manual and neutral tap modes correctly,
- Failure to close/engage all solid links correctly
- Neglecting to place all three voltage regulators into manual mode for three-phase type voltage regulators.

It is imperative that a live regulator set is bypassed only while set to the neutral tap position, and it must remain in this position for the entire duration of the bypass. If a live regulator is off neutral tap while bypassed, large circulating currents can flow through the regulator and bypass circuit. Such a situation may cause substantial equipment damage and create a hazardous condition that poses a significant risk of injury to the operator executing the switching. When a voltage regulator is bypassed while correctly set to the neutral tap and in manual mode, no large circulating currents will occur.

Powerco's network comprises both two-phase and three-phase regulator arrangements (where three single-phase voltage regulators are banked together to regulate a three-phase distribution network) and this distinction must be considered prior to any switching operations. The two major types of approved voltage regulators are Copper Power CL6B and Cooper Power CL7 Regulator controllers. These controllers have a toggle switch for onsite manual selection and a raise and lower toggle switch to select to neutral tap and for remote operations they can be selected and operated via SCADA.



Fig1: 3 Phase/ 3 Tank Voltage Regulator



Fig 2: 2 Phase/ 2 Tank Voltage Regulator

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Fig 3: Shows a Cooper Power CL6 controller



Fig 4: Shows a Cooper Power CL7 controller.

### Controller standard operating procedures:

The copper power CL6 are configured for individual regulator controls (one controller to one tank) and normally three of these CL6 controller are installed per site as shown in figure 3, whereas the cooper power CL7 controllers are configured to control all three regulators from the same panel as shown in figure 4.

### Manual Selection of voltage regulators:

- CL6 controllers: these operations have to be done and checked on each of the control panels for all three regulators.
  - o Find the "Control function" toggle switches.
  - o Select the auto/remote toggle switch to off and then onto Manual.
- CL7 controllers: these operations are done and checked on the singular panel for all three VR1, VR2, VR3 regulators.
  - o Find the "Control function" toggle switches.
  - o Select the auto/remote toggle switch to off and then onto Local/Manual

### Neutral Tap Selection of voltage regulators:

- CL6 controllers: these operations have to be done and checked on each of the control panels for all three regulators.
  - o Find the "Control function" toggle switches.
  - o Ensure the auto/remote toggle switch has been selected onto Manual.
  - o Use the Raise/Lower toggle switch to position the regulator to the neutral tap position.
  - o The three places you can check to confirm neutral positioning (to be done on each of the controllers/regulators)
    - Panel neutral light
    - Panel display, press #4 (Tap position) and confirm Tap 0
    - Check regulator external dial (top of regulator) to ensure black dial is on tap 0. (This is the most important)
- CL7 controller: these operations are done and checked on the singular panel for all three VR1, VR2, VR3 regulators.
  - o Find the "Control function" toggle switches.
  - o Select the auto/remote toggle switch has been selected onto Local/Manual

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- Each individual panel for "VR1, VR2, VR3" neutral light
- Panel display, select each regulator (1 or 2 or 3 on LHS next to display), then press #4 (Tap position) and confirm Tap 0
- Check regulator external dial (top of regulator) to ensure black dial on tap 0. (This is the most important)

## Recommendations and Safety actions:

- All switching operations undertaken shall be within the limits of that Field Switcher's competency class certification and authorised switching instructions from the NOC.
- To maximise safety and minimise the risk of switching errors, the Field Switcher shall comply with the 'Stop – Think – Check - Test' rule and PUSH PAUSE if unsure prior to undertaking each individual switching operation.
- The Select to Manual and Neutral Tap routines shall both be performed prior to bypassing a Voltage Regulator and the following switching items on a Switching Instruction Sheet shall be used to indicate this requirement:
  - Regulator – Select to Manual
  - Regulator – Select to Neutral Tap
  - Reverse Switching
  - Regulator – Select to Auto
- Switching operations for bypassing Voltage Regulators shall be in accordance with 393S092 Distribution Voltage Regulators – Installation and Operation, Section 3 Operation.
- Paralleling feeders with two phase and three phase regulators shall be in accordance with 220S004 Network Switching – Operate AEN, Section 15 Paralleling.
- The following notice shall be placed on voltage regulator on SCADA tiles.

### NOTES ON BYPASSING REGULATOR

All regulators must be switched to **MANUAL** and selected to the neutral tap **BEFORE** closing the bypass switch.

**CAUTION:** For 2 phase structures, centre phase could be wired straight through, bypass ABS cannot be used as an isolation point.

- If the voltage regulator is in an area with low to no cell coverage, then a competent field switcher should be dispatched to carry out the switching as per the written SIS (switching instruction sheet).
- If you are unsure of any switching steps or if you are unfamiliar with the specific voltage regulator, PUSH PAUSE and contact NOC for guidance and clarification.

**Questions?** Please contact [techservicesupport@powerco.co.nz](mailto:techservicesupport@powerco.co.nz)