TRANSPOWER

Egdgecumbe-Owhata Overload Protection Scheme Overview

Purpose of the Document	This document provides information on the operation and procedures related to the Edgecumbe-Owhata (EDG-OWH) Overload Protection Scheme.
System need	The scheme trips the EDG-OWH-2 110 kV circuit if it becomes overloaded.
Purpose of the Scheme	This scheme provides overload protection on the EDG–OWH-2 110 kV circuit to minimise generation constraints.
When to Enable the Scheme	The scheme is normally enabled.
When to Disable the Scheme	The scheme does not need to be disabled for any outages. However, the scheme maybe be disabled when there is no 110kV through transmission from the KAW 110kV bus through OWH, i.e. if any of the following circuits are out of service: • EDG-KAW 1 & 2 • EDG-OWH 2 • TRK-OWH-TMI The load through EDG-OWH-2 will need to be manually managed to within the circuit's rating while the scheme is disabled.
Overview of the Scheme	This scheme is used to maximise the power flow through the 110kV EDG-OWH-2 circuit by providing overload protection as close as the protection allows to the summer/shoulder/winter rating of the conductor. Generation injected into the KAW 110kV bus that is in excess of the local load is exported to the rest of the grid through the 220kV EDG-KAW-3 and KAW-OHK-1 circuits, with some generation also exported through the 110 kV EDG-KAW-1 & 2 and EDG-OWH-2 circuits.

An outage of the 220kV EDG-KAW-3 circuit may overload the 110kV EDG-OWH-2 circuit. The scheme prevents the overload by opening the EDG-OWH-2 circuit.

The scheme will also operate if EDG-OWH-2 overloads for other contingencies.

The scheme is implemented in the SEL411L-1 line protection relays at each line end (EDG and OWH), which provides duplicated overload protection. If the relay is not available for service at EDG or OWH, then the scheme remains in service until the second relay is returned to service. That is, either relay will protect the circuit from overloading.

The 110kV EDG-OWH-2 circuit is monitored by two SEL411L-1 line protection relays, installed at either end of the circuit. These relays provide overload functionality and initiate a trip and block auto-reclose when an overload is detected.

The relays on the EDG-OWH-2 circuit are connected to circuit breakers EDG 252 and OWH 92.

If the current through the circuit exceeds the nominal trip setting of the relay for longer than 7 seconds, the relays will trip the corresponding circuit breakers.

The relays are automatically selected by SCADA to summer/shoulder/winter ratings.

Circuit	Season	Nominal Trip Setting (Amps)	Recommended Operational Limits (Amps)	Line Rating (Amps)
EDG-OWH-2	Winter	364	349	364
	Shoulder	332	319	332
	Summer	300	288	298

Other Supporting Information

Two special protection schemes are available to maximise the generation injection into the KAW 110 kV bus. These are:

- This scheme Edgecumbe-Owhata Overload Protection Scheme, and
- Edgecumbe Kawerau 1 and 2 Overload Protection Scheme

The EDG-OWH-2 110kV Overload Protection Scheme is offered to the System Operator to be used on an *as and when required basis* subject to use being as per the conditions set out in this document.