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COLLABORATION AND INNOVATION:
ADAPTING TODAY'S GRID FOR
TOMORROW'S FUTURE

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Target base Automatic Load Control

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Audio Frequency Load Control (AFLC) technology was introduced into the QLD grid in the early 80's. The AFLC replaced time clocks, and allowed improved control and management of the controlled load and peak demands. Currently Ergon Energy has approximately 670MW of connected load under AFLC control. Since introduction the AFLC has been used in a fixed time control regime. The world has changed; the distribution and retail companies now operate in a National Electricity Market (NEM). Inverter Energy systems (IES) have taken off and daytime load profile for distribution feeders have significantly changed. The NEM has become more volatile as base plant decommissions with the increase of renewables and push for cleaner energy. The focus on balancing the market is moving to matching the load to generation, rather than the traditional matching of generation to load.

Ergon Energy trialled "Target Control" in a project to demonstrate its Supervisory Control and Data Acquisition (SCADA) system algorithm capability whilst identifying advantages and disadvantages of the dynamic switching operation. In the design phase load available for shedding/restoring for each controllable channel was estimated at each of zone substation and feeder level. SCADA parameters were calculated, programmed and tested. During the trial a number of enhancements were identified and implemented onto the SCADA system. Target control methodology was implemented by setting identified constraints and controllable load was automatically shed and restored to manage the constraint. Operational rules and guidelines for utilising the tariff controlled load along with a stakeholder management plan were developed to facilitate this change.

Load control value is achieved if the load is available for control at the times when it is needed, for the duration needed, at the place where needed. The times that control may be needed could be driven by traditional reasons such as network constraints, or the evolving reasons such as voltage control, network security (generation shortfall / frequency control), market risk (price) management, and potentially other reasons. With fixed time switching of the loads, there is little to no capacity remaining for dynamic control for other non-demand based reasons. Dynamic switching can improve asset utilisation, customer amenity and financial benefits.

The project was analysed for hypothesis, operational control, regulations and customer impact. Target control operation is now fully functional across the Ergon Energy Network to manage load control more effectively. Target load control, which switches the load only as needed, provides spare time capacity within the gazetted rules to control the load when required, thus providing potential to deliver additional value to the business, improve customer amenity, while also containing maximum demand.