

## **Presentation # 21**

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**Title:** BC Hydro Perspective on Distribution Islanding for Customer Reliability Improvement

### **Abstract**

BC Hydro, one of the largest electrical utilities in Canada, has experienced a substantial growth in distributed generating sources that are connected to its distribution system (12 kV, 25 kV and 34.5 kV). These Power Generators (PGs) are mostly run-of-river hydraulic generating plants with capacities ranging from 1.0 to 15.0 MW. This increment in the number of independent power producers (IPPs) is the result of an aggressive energy acquisition plan to meet provincial renewable energy targets. Introducing small PGs into the distribution system, however, is changing the way how the distribution system is planned, operated and protected. New technical, economical, and environmental challenges are coming up and they must be properly addressed to avoid jeopardizing system operation and customer reliability.

BC Hydro has developed technical interconnection requirements guideline for various types of PGs connecting to its distribution system. BC Hydro's current practice is to avoid non-intentional islanding operation by de-energizing all distributed generators without islanding capabilities whenever the feeder circuit breaker opens to avoid a potential detriment in power quality. This can be achieved by implementing a transfer trip signal or by means of power quality (voltage and frequency) protection relays. Improving reliability in locations where reliability is below the customer expectations is one of the top objectives BC Hydro constantly endeavours to achieve, and was the main driver for BC Hydro to explore distribution generation islanding as one of the feasible solutions to improve power supply reliability. Given the amount of technical considerations to be taken into account when a generator operates islanded from the system, BC Hydro decided to take the lead on this issue and release a Distribution Power Generator Islanding Guideline intended to provide existing and new generators with the technical requirements, considerations, and procedures to implement a planned islanded operation.

This presentation outlines the BC Hydro's perspective on distribution islanding and assesses its impact on customer reliability performance. It describes the major technical considerations according to the BC Hydro generator guideline for distribution planned islanding, which covers equipment islanding capability of voltage and frequency regulation, generator black start, dead load pick-up, protection coordination, transient overvoltages, and operational and safety issues. It provides an insight on the impact of planned islanding on customer based reliability, which is the approach BC Hydro utilizes to assess reliability to its customers. The strategies followed by BC Hydro for planned islanding are also outlined and a recent successful experience on planned distribution islanding implemented in one of the BC Hydro's substations is presented.