

ABB Power Conditioning Systems

Old Dominion Electric Cooperative, Parksley, Virginia USA

Project Reference Sheet



MINICOMP – Statcom - Static VAR Control



Overview

ABB Inc, Power Electronics Systems received an order from Old Dominion Electric Cooperative for a Statcom system to be used on the Eastern Shore of Virginia. The customer needed to support a long radial transmission feed. With summer approaching the need would be more prevalent, thus time was of the essence. ABB delivered a complete system within three months of an order. ABB's scope of supply was system study, design, manufacture, delivery, civil, installation, and commissioning of a Statcom system. The complete system was placed inside an existing substation without the need for expansion or major upgrade, the reduced footprint of the Statcom allowed this to happen.

Mechanical

The Statcom system is mounted in outdoor walk-in buildings. The buildings are equipped with high efficiency air conditioners, as an option, for cooling. The capacitor equipment is mounted outdoor in the substation yard.

Capacitor Banks

The voltage support system has one 69kV switched capacitor bank rated 11 MVar. The bank is switched using a SF6 – Independent Pole Operated breaker. The capacitors are internally segmented and have an inrush reactor in each phase.

Transformer

The Statcom unit operates at 600 VAC and so requires a step-down transformers. Liquid filled power transformers are provided for this purpose. The units are rated 4 MVA, 13.8-600 V, 3 phase, 60 Hz.



Picture shows 69kV Modular Capacitor Bank and Circuit Breaker.

Inverter

The dynamic voltage control is performed by a standard IGBT-based inverter unit. This unit is capable of controlling VAR's from -8000 to +8000 kVAR at 600 VAC. The modules utilize forced air cooling with a fan for each phase. Three air-cooled sinus filters connected to the inverter input provides an output compliant with IEEE 519 standards.



Picture shows inverter modules in one section of building.

Control

The complete control of the voltage support system is done digitally including the capacitor switching, inverter charging sequence and operation, sequence control, protection and monitoring. ABB's standard control provides the top level control of the Statcom. Automatic control and advanced self-diagnostics enable the system to operate fully automatically. Remote diagnostics enable the customer to operate the system via their SCADA and for ABB to check the system status from our home office.

Main Technical Data

Plant:	BelleHaven Substation
Statcom Installation:	Outdoor
Transformer Installation:	Outdoor
Environmental Conditions:	-20°C +40°C
Primary Supply:	69 kV and 13.8 kV / 60 Hz
Step-down Voltage:	600 VAC
Capacitor Bank:	1 x 11.0 MVar @ 69 kV
Static Compensation:	+/- 8 MVar
Inverter Module:	MINICOMP
Inverter Cooling:	Forced Air
Inverter Control:	AC 800/ AMC
System Rating:	-8 to + 19 MVar



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