ABB generation protection and control systems

ABB OEM protection solution upgrade

As the owner/operator of a gas turbine combined cycle power plant delivered by ABB Power Generation prior to 2005, your generator protection system was designed and built with technologies that remain a core of the ABB portfolio. As the original protection system provider, ABB is well equipped to engineer and deliver your next generation upgrade.

Challenges
Your unit was delivered more than 10 years ago and is approaching its first, or perhaps second, protection upgrade. Regulatory requirements, grid modernization phenomena such as subsynchronous oscillations, operational and footprint challenges are all driving the requirements for your next upgrade decision. Your current system has served you well, but aspects of its design will become increasingly problematic:

• It is based on electromechanical or first generation microprocessor generator protection relays deploying antiquated protection philosophies, exposing generation assets to greater risk.
• It shuts down when the frequency is less than 55 Hz, leaving your unit unprotected.
• It does not offer protection against stator or rotor winding earth faults.
• NERC/PRC regulations have significantly increased your disturbance reporting obligations and maintenance efforts.
• It cannot detect and respond to subsynchronous oscillations and subsynchronous resonance coming from your grid connection.
• It is not compatible with the latest protection and control technologies available in the digital world.

Situational analysis/background
As the owner/operator of plants with gas turbine technology from any of the following families, ABB continues to be your OEM provider of the protection and control systems:
• GT24
• 11N2
• 11N1
• GT10
• GT8

As the original provider of your generator protection and control system, ABB can deliver the power of one solution for protection and control with the necessary expertise and a portfolio of products including:
• Generator protection
• Generator step-up & unit auxiliary transformer protection
• Generator excitation
• Synchronization
• Static starting devices
Points to consider
• What components of your generator protection and control system are original equipment?
• Which components have previously been upgraded? When were the upgrades performed?
• When is your next planned generator outage? Upgrade outage?
• Do you operate as a base load unit or as a peaking unit? If peaking, roughly how many starts per year?
• Do your existing generation assets utilize advanced protection solutions capable of protecting 100% of the stator and rotor windings from earth faults?
• Have you been impacted by subsynchronous oscillations or subsynchronous resonance?
• Are you in proximity to:
  - HVDC devices
  - Series capacitance, STATCOM, SVC or other active devices
  - Wind farms
• Are you able to comply with all the requirements of NERC/PRC as it pertains to generators?

The solution
ABB protection and control solutions allow for increased capability at a significantly smaller footprint while providing self-supervision, measurements, metering and integration to the electrical SCADA and DCS.

Advanced applications
• Generator and unit transformer protection in one protection device.
• ABB’s patented turn-to-turn winding detection for ultrafast fault detection and clearance.
• ABB’s patented frequency tracking algorithm to protect the asset during generator startup and shutdown.
• Smaller footprint, reduced control system wiring and integrated control for flexible automation.
• NERC/PRC compliant trending, reporting and display.
• Synchronizing and excitation systems for automatic voltage regulations for synchronous generators.

Next steps
ABB will be happy to arrange a visit from our technical team to collaboratively discuss the requirements for your next generator protection and control system. A technical session will provide further background on the latest technological advances in generator protection and control. These sessions will help you to develop a budgetary estimate for an ABB solutions upgrade.

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