



ADVANCED GENERATOR PROTECTION

The Advanced Generator Protection (AGP) system was developed jointly by AKA and Transocean, the World's largest offshore drilling contractor.

The first of its kind in the World, AGP is a paradigm shift in the way power plants operate and are protected.

The system relies upon existing performance characteristics inherent in all power plants that depend upon multiple generators feeding a common bus. The individual performance of each generator is monitored against the properties of the common bus to identify deviations from the expected operation. These might be symptoms of serious fault conditions or, alternatively, early warning signals of developing problems. Importantly, the AGP is able to discriminate the root cause of a problem and properly isolate the affected equipment before the fault results in a cascade-type failure of the plant.



The AGP improves on typical protection systems through its ability to carry out the following protective actions:

- Detect a fault condition, or even a minor irregularity in generator performance and take pre-emptive action to bring additional generators online.
- Identify the source of a fault and report detailed information through its touchscreen-based Human Machine Interface (HMI). Clear the fault prior to it affecting the rest of the plant.



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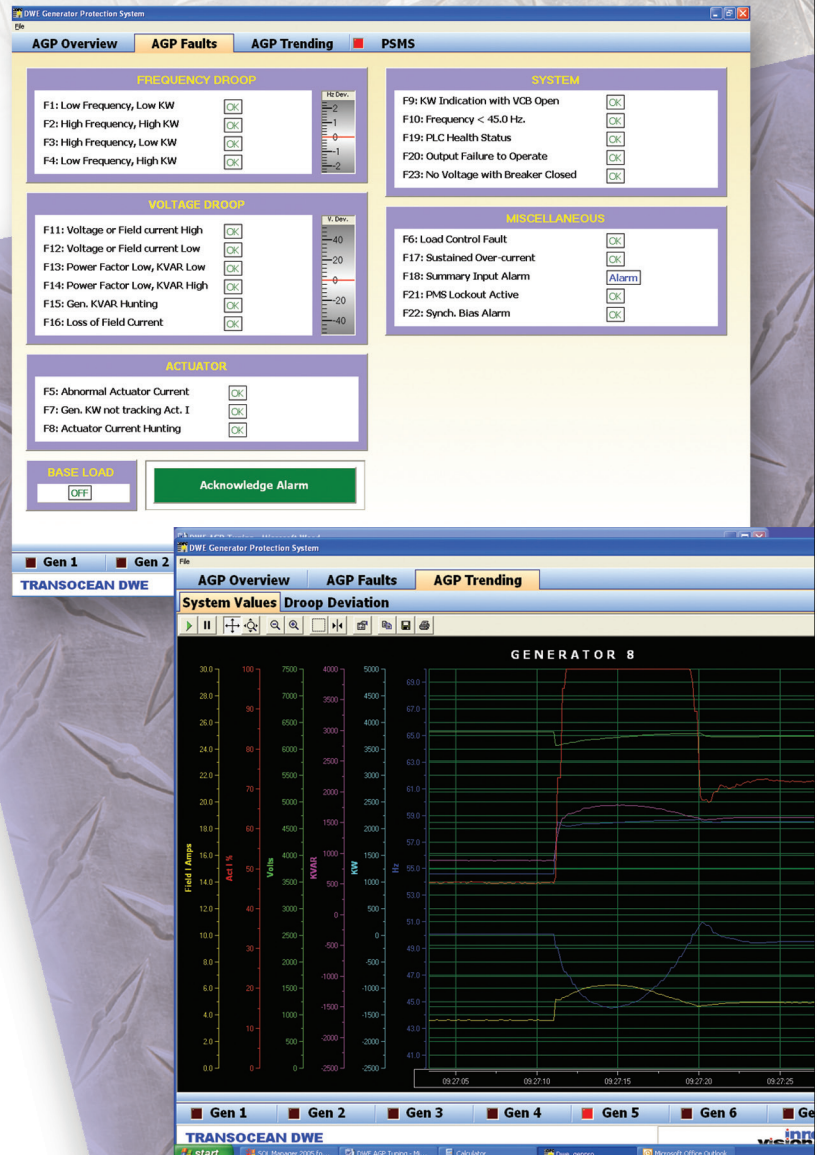
The abilities of the AGP exceed those of ordinary generator protection relays in several key areas. Importantly, generator protection is carried out in the context of the plant as a whole, sometimes even allowing a faulted generator to continue running if it is making a positive power contribution to the bus.

The AGP operates autonomously for each generator being monitored so that protection is never lost due to a single fault in the AGP system itself. Indeed, the protection system for each generator is able to identify faults in other generators on the bus and can take steps to isolate them - by tripping a tie breaker for example. In addition, self monitoring is used by the AGP to issue an alarm when protection is compromised.

The AGP system results in a significant reduction of centralized control, with total independence of each diesel generator's "continuous load sharing", "sync and load-up", and "un-load and open" power management functions.

The AGP provides advanced fault and event logging functions that can be easily accessed at a single location via the user-friendly Human Machine Interface. Historical system data can be viewed to analyze recent system performance or, if preferred, a real time graphical view of system parameters can be displayed on the screen. The information can even be exported for off-site analysis if desired.

The AGP system has been successfully installed on many Transocean Deepwater Drilling vessels including Sedco Energy, Deepwater Discovery, Discoverer Seven Seas, D534 and Sedco 702. It is becoming the default power plant protection system on Dynamically Positioned drilling rigs where continuity of power is absolutely essential.



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