# Monitoring Control Systems forNuclear and Fossil-Fueled Power Generation Facilities

by CMR Group

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Power generation facilities such as nuclear and fossil-fueled plants have some of the strictest safety regulations due to their massive size and intrinsic dangers. Itâ€™s a huge undertaking to manage the energy produced at the facilities. In order to do this specialized equipment is utilized to safely harness and distribute the electricity to designate areas. Unfortunately, power generation plants are not a one size fits all when it comes to design and production of the industrial components. There are many variables such as size of the plant, and capacity that adds to the complication of the daily operations. The truth is designers and manufacturers of the engines, electrical generators and other capital equipment are constantly looking for ways to enhance make their industrial products. Facility and plants owners are employing power management technologies and equipment of which include many specialized alarm monitors, industrial sensors and safety systems.

Many of these engine generators systems run with the assistance of software that helps improve the operation and reliability of the system. The software helps reduce energy consumption, optimize energy usage and predict electrical performance.These systems are often referred to as alarm monitoring and safety systems (AMS). Alarm monitors and safety systems prepare engine instrumentation for primary, standby, emergency and peak trimming as well as offer the capabilities of load flow management, short circuit and harmonic distortion analysis.The load flow management computes calculation of voltages,currents, spin reserves, configuration and distribution of power throughout the electrical system. The power management system permits for unregulated voltage sources to travel through unobstructed power grids and generator connections.Custom controls are designed to help and protect and coordinate devices used to clear a fault, without widespread damage to the electrical components of the circuit system.Harmonic distortion is typically produced by chopping electric flow sources such as frequency converters.

All equipment responds differently to electrical harmonics. For example residential lighting and stoves are might not affected, but induction motors often overheat causing internal damage, operating malfunctions and possibly fire. In the past it was common that harmonic distortion was untreated unless the equipment temperature and voltage was continuously monitored. Plant engineers have since then, installed proper equipment and software will help absorb most of the harmonic current and prevent it from spreading into the supply source. This dramatically increases the equipmentâ€™s shelve life. IT networks with no grounding require earth outflow direction. This management system will trip if the drives used are not suitable for insulated networks. In addition, to the alarm monitoring and safety system itâ€™s important to temperature and pressure sensors for nuclear applications offer high performance solutions for monitoring engine-driven generators.

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