

SMOKE DETECTION FOR ELECTRICAL EQUIPMENT ROOMS

Electric Scientific Company

Electrical Equipment Rooms, MCC and Switch Gear Rooms are difficult environments for standard type spot smoke detectors to sense fires, so various items need to be considered. A typical MCC Room may have an 18-foot ceiling height with air supply and return vents mounted around the 12 to 14-foot level. The supply and return vents may also be located at many locations throughout the room creating varying airflow patterns. The rows of electrical cabinets are typically 8 feet tall and cable tray tiers from elevations of 10 to 16 feet high. Items to consider when looking for smoke detection for electrical rooms are:

- **Smoke dilution** occurs by the high airflow / air change found in these rooms and is the largest hurdle for smoke detection to overcome. The high airflow quickly mixes the smoke and dilutes it to a concentration that is difficult for a standard smoke detector to detect. A typical electrical fire begins as an overcurrent condition that slowly heats up wire insulation or electrical components creating traces of products of combustion (smoke) with minimal heat generated until a fire actually erupts. This negative effect is even more pronounced in rooms that have larger volumes or higher ceilings.
- **Airflow patterns** that direct the migration of smoke, making it difficult to reach the ceiling detectors with enough concentration to alarm within a desirable time frame. Ceiling height and HVAC supply and return air vent locations greatly influence this.
- **Heat interfaces** build-up in a room with heat producing equipment, high ceilings and when climate control is not supplied at the ceiling. The resulting heat interface in the top 3 feet of the room may inhibit the rise of cooler smoke (of developing fires) to reach the ceiling and smoke detectors located on the ceiling.
- **Electrical Cabinets** are generally vented for cooling, but sometimes are built dust-tight with gaskets on doors and no vented panels. The electrical equipment inside these cabinets are the main source for fires, and a fire will need to be quite developed before enough heat and smoke escape the enclosure to alarm detection.
- **Accessibly and serviceability** of the smoke detectors needs to be considered as there will be required annual testing and other possible service requirements. Many electrical rooms have very difficult ceiling access that poses time and safety concerns.

Fenwal AnaLaser Air Sampling Smoke Detection was developed to overcome these obstacles and can give you warning of a developing fire long before standard fire detection. The Fenwal AnaLaser detector is hundreds of times more sensitive than traditional smoke detectors to overcome the smoke dilution issue. The Analaser is an active detector that continually draws air samples from a room with CPVC pipe and special air sampling orifices. Air sampling points are installed at specific elevations, specific locations, into equipment cabinets and other strategic locations in the room to satisfy fire codes and provide optimum detection.

Electrical Equipment Rooms, Switch Gear Rooms, MCC Rooms are typically critical rooms with vital equipment to keep a plant operating. The goal of air sampling detection is to provide smoke detection where standard detection fails, and provide early warning of a fire to reduce personnel risk, equipment damage, downtime and business loss.