

A management review, by a major gas production company, of two separate fire incidents directed engineering to design a high reliability fire & gas detection system to be installed on all compressors company wide. The system would be required to monitor gas leaks and provide control outputs appropriate to worsening conditions and, detect and respond to fire. The system had to be modular so the same components could be used on remote, single compressor stations, as well as large multi-compressor stations. Months of review by their Corporate engineering led to Sierra Monitor being the specified system. A plant in southern Texas was the first installation of the system.

Engine Room #1 at the Gas Plant has 18 compressors situated in a tandem layout. The design called for one Sentry controller for each two compressors. Each controller would manage three infra-red combustible gas detectors and one flame detector per compressor. Combustible gas sensors, set for Methane, are mounted above compressing cylinders. Combustible gas sensors, set for Ethane, are mounted below compressing cylinders. A combustible gas sensor, set for Methane, is mounted at the roof peak above each unit. One flame detector is mounted on the building wall so that its cone of vision encompasses the entire engine. The zone relay logic option, available in Sentry, was utilized to provide control outputs to shut down the engine releasing gas, turn on a local strobe and, provide audible annunciation differentiating between fire or gas alarm. The Sentry controllers are mounted near the compressors in purged NEMA4X enclosures. The controllers are on an RS-485 MODBUS RTU network serving redundant FieldServers located in the engine room control shelter. Due to the area classification, the enclosure containing the FieldServers is purged. This enclosure also contains two Sentry Commanders operating as clients to the FieldServers. The Commanders operate in parallel to provide redundancy.

The Commanders are used to shut down compressors adjacent to the unit leaking gas so they will not provide a source of ignition if the gas concentration continues to escalate. The Commanders also provide control outputs to activate strobes & horns located outside the building warning workers of conditions in the building.

In addition to functioning as a client to the Sentry Controllers and a server to the Sentry Commanders, the FieldServers function as a server to the Honeywell TDC 3000 distributed control system. The fire & gas data is served to the ELPCG of the TDC 3000.

The main factors influencing the owner to specify Sierra Monitor as the exclusive supplier were the system level integration capability of the SENTRY system and the ability to achieve the target Safety Instrumentation Level (SIL) by utilizing the options available in the SENTRY system. It was also critical that the system could be expandable, in modular fashion, from very simple implementations to complex systems as described above.