Weekly Maintenance
Exhaust Gas Temperature Safety

Exhaust gas temperature, coolant water temperature, and water level sensors are required on 30 CFR part 36, permissible equipment. These sensors shutdown the engine before a fire or explosion hazard arises from the release of hot exhaust gas or high engine surface temperatures.

Permissible machines with either wet exhaust gas conditioners or dry exhaust gas conditioners and DPM exhaust filters are required to have exhaust gas sensors that meet the requirements of §7.98(s)(4)(i) (185°F maximum exhaust gas temperature) and §7.98(s)(4)(ii) (302°F maximum exhaust gas temperature), respectively. These sensors are in addition to the water level (float) sensor §7.98(i)(3) and the coolant water temperature sensor §7.98(i)(1). If the wet exhaust gas conditioner, (scrubber) loses water and the water level sensor fails or if the dry exhaust gas conditioner loses cooling water and the coolant water temperature sensors fails, the temperature of the exhaust gas can rise to over 1000°F. This temperature is high enough to ignite most combustible materials, including hydraulic fluid, coal dust, and DPM exhaust filters. This can lead to a fire or explosion.

A filter fire is a significant enough hazard for the use of redundant sensors to limit the exhaust gas temperature. MSHA regulations, therefore, require an exhaust gas temperature sensor, in conjunction with the coolant water temperature or water level sensors, to activate the safety system shutdown. These redundant sensors combined with the general fail safe nature of safety systems- loss of safety system air pressure results in the shut off of the fuel rack, greatly reduces the risk that the hot exhaust gas will create a fire or explosion hazard.

However, the benefit of redundant safety sensors is only realized if both sensors are maintained. The sensors are intended to address unforeseen developments and not normal machine wear. Maintenance of the sensors on a weekly basis is necessary to avoid fire and explosion hazards. This has become a greater concern since DPM filters have been required on permissible equipment under the new DPM Rule. Hot exhaust gas may ignite either the filter material or the DPM, engine oil, unburned fuel, etc. deposited on the filter. Accordingly, checks of the sensors must be performed on a weekly basis following the procedures in the Permissibility Checklists for the specific machine.

Mine operators must follow the current instructions in the Permissibility Checklists and perform the checks of the exhaust gas temperature, coolant water temperature, and water level (float) sensors on a weekly basis.