OMCSI NEWS LETTER

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Diesel Generators Failures
Lesson Taught But We Don't Listen

During several power outages, weather emergencies diesel generators failed to start why?

The most common culprits are:

- Fuel contamination by sludge, water or asphaltines
- Dead or weak starting batteries.
- No starting air.
- Failed engine-cooling systems.

Sludge contaminating the fuel tank will clog fuel Ines, filters, strainer baskets and fuel injectors and lead to corrosion of essential engine parts. The key to maintaining good fuel quality is in understanding the process that causes fuel degradation. Diesel fuel is organic, refined product. It begins to decay as soon as it is refined. Sludge formation is an organic process caused by bacteria, fungus and other biological agents especially in the presence of water. That's why the sludge in a diesel tank sometimes is referred to as "biofilm."

The first step to presenting biofilm buildup in the fuel tank is proper tank design to restrict the entrance of water through vents, leaks and fill boxes. Sidewalk fill boxes and in-wall fill boxes must be designed so that rainwater (and potentially seawater) is prevented from entering the fuel tank. Fill caps must he watertight, especial in underground fill boxes where water could accumulate. Interstitial leak detectors should be installed in the annular area of doubled walled tanks. These can discriminate between water and oil and oil and activate an alarm to notify facility personnel of a problem.

Even with proper fuel-system) design, it is possible to get water in the fuel tank as part of the delivered fuel and by condensation through fuel vent lines. Condensation is an especially serious problem on the Gulf Coast or, where the relative humidity tends to be high and ambient temperature changes are frequent. Most fuel-filtration systems include a coalescing filter to remove water from fuel. Fuel-filter systems can range from portable units that can be rolled from tank to tank, to permanently installed, multi-tank filtration systems that automatically filter, dewater and continuously add a chemical stabilizer to the fuel. Services also exist that will bring truck-mounted fuel-filtration equipment to a site to periodically clean and dewater the fuel. The cost usually is assessed on a per-gallon basis. The best scenario, from a fuel-quality standpoint, would be to turn over the fuel supply by using the fuel on a regular basis through exercising the generators and/or boilers. In practice, however, this scenario has several flaws. First, the weekly exercising of generators consumes very little fuel, so there would still be a large amount of potentially contaminated stored fuel even in small systems. Second, facilities a store large volume of fuel on-site and there is often no practical way to consume enough fuel to maintain a fresh fuel supplies. Third, with the rising cost of fuel and a potentially unstable oil market, consuming fuel just to keep a fresh supply can be quite costly.

Failed coolant systems are the third most common culprit when a generator fails to start. A hospital in Lorigwood, Fla., lost power in 2007 and its emergency generator failed to start. This prompted local authorities to go into "mass casualty mode," according to local news reports. Several of the 180 patients at the hospital had to be evacuated. Facility engineers

determined that the diesel generators failed to start because of a coolant leak. The local electric provider restored power two hours later.

Coolant systems need to be part of a regularly scheduled maintenance and inspection procedure. A typical inspection regimen consists of visually inspecting the coolant system for leaks, drips, puddles or crusty areas that indicate evaporated engine coolant. A visual inspection of cooling hoses should be conducted as well. Worn, cracked or loose hoses should be repaired or replaced.

Cummins Power Generation, a leading supplier of diesel generators, recommends a regular inspection regimen covering the exhaust system, fuel system, DC electrical system and the engine itself.

Detroit Diesels reminds customer's installation manuals for its engines that regulatory codes that require backup power often specify minimum on-site fuel supply. These include NFPA 70 National Electric Code and NFPA 99 Standard for Health Care Facilities.

O&M Consulting Inc has seminars that cover all types of Emergency Back-up Diesel Generators; these seminars can be geared towards Health Care Facilities to meet the NFPA 99 and 110. OMCSI will meet your needs from A to Z lets know don't wait till it's too late, Call 1-812-926-0187 ask for Larry or Garry.