



Guidelines To Prevent Wet Stacking Caused By Operations At Light Loads

- ◆ Wet-Stacking is a common problem with diesel engines which are operated for extended periods with little or no loads applied. When a diesel engine operates without sufficient load it will not operate at its optimum temperature. In order for a diesel engine to operate at peak efficiency it must be able to provide fuel and air in the proper ratio and at a high enough engine temperature for the engine to completely burn all of the fuel.
- ◆ The proper load can be achieved by adding additional building load or by providing supplemental load through the use of a resistive load bank. Providing additional load from the building load may not be practical with critical computer, life safety or communication equipment. Any interruption of power to these loads may cause a loss of data, operations or jeopardize personal safety.
- ◆ Several guidelines have been issued for controlling the effects of wet stacking in generators. They require exercising the unit at least monthly for 30 minutes under either of two methods:
 - ◆ Under operating temperature conditions and not less than 30 percent of the name plate kW rating, or
 - ◆ Loading to maintain the minimum exhaust gas temperature as recommended by the manufacturer.
- ◆ **Additional Guidelines**
 - ◆ For mission critical applications like health care institutions, the requirement is even more stringent. They require testing of 12 times per year with testing intervals between 20-40 days. Testing generators for at least 30 minutes under a dynamic load of 30% or greater of the name plate rating.
 - ◆ Systems that do not meet the 30% load capacity have three options.
 - ◆ Increase the load to meet or exceed 30% of the name plate rating,
 - ◆ Maintain the minimum exhaust temperature as recommended by the engine manufacturer, or
 - ◆ Undertake load bank testing for a total of 2 hours continuous loading as follows:
 - ◆ Load at 25% of name plate for 30 minutes
 - ◆ 50% for 30 minutes
 - ◆ 75% for 60 minutes.
- ◆ **What are the recommendations for ATS?**
 - ◆ It is also recommended that all automatic transfer switches (ATS) are tested 12 times per year at 20 and 40 day intervals. The provider of the power system through planned maintenance programs can undertake load testing when testing the ATS.
- ◆ **Solutions to wet stacking:**
 - ◆ The obvious solution is to always run the generator set with an electrical load that reaches the designed operational temperature of the diesel, or approximately 75% of full load. Built-up fuel deposits and carbon can be removed by running the diesel engine at the required operational temperature for several hours if wet stacking has not yet reached the level where carbon buildup can only be removed by a major engine overhaul.
 - ◆ The following load bank solutions should prevent a reoccurrence of wet stacking.
 - ◆ **Automatic auxiliary loading** - This solution is usually used only when the diesel generator set is the primary source of power. The “auxiliary load bank” will be switched into the system when only the lighter loads are present and switched out when the larger load is connected.
 - ◆ **Facility manual load bank** - Operated as described for the automatic load bank, but a manually operated system for use with light loads and when the larger load is also manually initiated. The load bank can also be used for load testing a system primarily used for standby power.
 - ◆ **Portable load bank** - The authorized distributor for the diesel generator set is often the best qualified outfit to undertake the maintenance of the system. Today it is very common for the owner of a standby generator system to outsource complete maintenance of the system and have a planned maintenance (PM) contract with a qualified distributor. During a regularly scheduled planned maintenance call, the distributor may bring in a portable load bank to run the generator at a load that maintains the designed operational temperature and cure previously existing condition of wet stacking. The cost of this portable load bank to the owner is a pittance in comparison with the benefits he can reap by removing an undesirable engine condition.

Please don't allow your expensive equipment to suffer on account of light loads.

For more advice, please contact ESL at customercare@eslpk.com