Load Bank Testing and Unit-Mounted Load Banks

New Load Banks Improve Genset Installation Testing

New load bank technology allows off-line genset installation tests to more closely emulate characteristics of the intended load. This helps verify proper operation of the entire system - from fuel line through transfer switch - before connecting to the main distribution bus. Consulting engineers can now specify tests that include reactive loads, computer-controlled load sequencing and online data recording.

Basic Tests

While brine tanks and older heater-socket-style load banks are perfectly capable of basic genset installation testing, newer models offer more precise control. Older load banks are usually limited to resistive load tests in the 100 kW to 750 kW range.

Now load banks are being built to handle any voltage at power levels up to several megawatts. Special reactive load banks test kVA load effects of low power factor loads on generator current and voltage capabilities.

Of course, the advantage of relatively basic installation tests is cost. Many installations don't need more elaborate, expensive testing. Basic load banks are perfectly capable of testing kW, voltage, frequency, and current capacity. In some cases, it might be sufficient to simply ensure that the genset will start up and accept a specified load. A variety of other client concerns, such as air flow, proper cooling, transient response, noise, vibration, and fuel-use rates, can be reviewed during the test.

Precision Tests

For some large, sophisticated or critical installations, the added cost of new testing technology is dwarfed by the consequences of a system that doesn't operate as designed. Reactive load banks and programmable, computer-controlled load banks let you specify tests that will mimic real-life operating conditions. Some units can continuously record power quality and other factors to provide baseline operation data.

The best test simulates the intended load. There's little point in proving a genset can handle a 100% block load or run continuously for 24 hours unless these are characteristics of the anticipated load. While some government and military specifications require 18- to 24- hour duration tests, four-hour tests are sufficient for most standby installations. Large installations with multiple transfer switches should be step-loaded to accurately reflect system demands and ensure proper transfer switch sequencing.

Where possible, we recommend a reactive load test. These are done with special resistive-reactive load banks. The load bank controller regulates the percentage of reactive load, to give a much more accurate test for distribution systems with high-kVA/low-power-factor loads. This testing brings the machine to its maximum kW and kVA levels. Why is this important? Adding 20% more kVA to the generator end creates more heat being dissipated from it. This adds to room temperature rise. Testing this way ensures that your radiator performance is adequate under worst-case conditions. Cashman Power Solutions can test up to a 2,500kW generator set up to a 0.8pf with our own load banks.

Permanently Mounted Load Banks

Many customers specify permanent or duct mount load banks for new generator sets. While the concept is excellent, the actual practice can create unforeseen issues. For example, this creates a new source of substantial heat from the machine which could possibly recirculate back into the genset causing an overheat condition. They also restrict radiator airflow which can also contribute to an overheat condition. This is exacerbated when noise abatement equipment or sound attenuated enclosures are specified. When the cost of a permanently installed load bank is compared with the cost of provisions for a temporary load bank and periodic testing via temporary load bank, it is likely a substantial cost saving can be realized. Auto-loading load banks add complexity to the system. If the auto-load feature fails and the building load increases, there's the potential for a genset overload shutdown. Probably the greatest disadvantage of full-time auto-loading load banks is there's not likely to be anyone on the site to be able to completely interpret test results.

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There is no substitute for a factory-trained technician coming to the site to perform this testing. They operate the load bank and monitor the genset performance. They are trained to spot potential trouble areas the untrained eye may miss. A comprehensive maintenance contract which includes periodic (annual or bi-annual) load testing saves on initial cost and system lifetime fuel costs, while keeping the system simpler and therefore more trouble-free.