



Biodiesel for Electrical Generation

The 6 megawatt biofueled backup power system pictured here was installed for the University of California, Riverside's 2001 pilot program and represented a significant milestone in the effort to reduce emissions from standby emergency generators. As the power crisis in California in 2001 unfolded and forced many facilities to deploy portable diesel generators to protect critical operations against blackouts, Southern States Power Company helped the state reduce harmful emissions that normally are associated with this type of equipment.



Temporary backup petroleum diesel-fueled generators typically operate in emergencies without the benefit of exhaust after-treatment to reduce emissions. Using alternative fuels for these necessary backup power sources is a cost effective method of protecting the environment. Fueled on 100% biodiesel (B100), these generators help reduce emissions compared to petroleum diesel in several key areas. Hydrocarbons, a contributing factor in the localized formation of smog and ozone, and sulfur emissions, a major component of acid rain, are essentially eliminated with the use of B100. The exhaust emissions of carbon monoxide, a poisonous gas, are about 50% lower in biodiesel than carbon monoxide emissions from petroleum diesel. Particulate matter, a human health hazard, is reduced by a third, with the smaller particulates reduced by over two thirds.

The demonstration run of the generators, held in August 2001, clearly showed few signs of the telltale smoke associated with diesel fuel. The operation of the generators was part of the weekly scheduled test run by Riverside Public Utilities to ensure readiness in the case of a blackout.

The three Cummins generators represent the state of the art in compression ignition engine technology, as well as digitally controlled electrical interconnection equipment. Each 16 cylinder, 3,673 cubic inch, 2,922 HP Turbocharged/Low Temperature After-Cooled computer controlled four cycle industrial engine drives a heavy duty brushless four pole permanent magnet type generator capable of outputting up to two million watts of power at 480 volts. Separate transformers for each generator to increase reliability steps up the voltage to match the 12,470 volt electrical grid operated and maintained by Riverside Public Utilities. The three generators, operating at full output, consume almost 450 gallons of fuel per hour. A 55-gallon drum of fuel is consumed in approximately seven minutes. That is the equivalent of half a quart for every second of operation. A Southern States Power Company 5,000 gallon onsite tanker trailer provided enough fuel for over 11 hours of operation. SSPC maintained a local tanker truck with biodiesel ready to roll and replenish emergency generator needs on a 24-hour basis.