



Bodensee-Wasserversorgung covers demand for emergency power with new MTU genset

Words: Silke Rockenstein | Pictures: Robert Hack

Lake Constance Water Supply Authority

On 23 June 2015, the Lake Constance Water Supply Authority started up the new emergency standby genset from MTU Onsite Energy. It will extend the capacity of the existing emergency power supply system and ensure that the supply of drinking water to four million people in Baden-Württemberg is safeguarded, even in the event of a power outage. With a mechanical output of 6,500 kW, the new generator is the most powerful MTU emergency backup genset Rolls-Royce has ever built. The MTU and MTU Onsite Energy brands are part of Rolls-Royce Power Systems within the Land & Sea Division of Rolls-Royce.

The power package was built and tested in MTU's Plant 2 in Friedrichshafen-Manzell, where two test benches were required to put the new nine-metre long genset through its paces. The 67-ton genset travelled the short distance from Friedrichshafen to the waterworks in Sipplingen some 35 km away by heavy haulage truck in March 2015. With around 1,700 kilometres of pipeline and a water delivery of 125 million cubic metres to consumers each year, The Lake Constance Water Supply Authority is the largest in Germany.

The new emergency backup genset purchased by the Lake Constance Water Supply Authority is based on a high-speed 20-cylinder Series 956 diesel engine from MTU. MTU engines of this series are also used to drive large locomotives, ferries and other sea-going vessels. The power output of this new "TB34" type genset, which has gone into service with the Lake Constance Water Supply Authority for the first time, is almost five percent higher than that of the preceding "TB33" generation. The engine has a mechanical output of 6,500 kW (50Hz/1,500 rpm), which is converted by the generator into a rated output of 7,800 kVA. MTU is scheduled to deliver the next ten gensets of this type in 2016 and 2017 to Ostrovets 1&2, the Belarusian nuclear power plant, for the emergency power supply system there.

Besides the engine and the generator, MTU has also supplied numerous components for the emergency power supply system, which fill three stories of a new building at the Lake Constance Water Supply Authority and include the ventilation and flue gas system, air intake system, fuel supply, engine cooling system, compressed air chamber and switchgear. The charge air and engine of the new genset are cooled using water taken from Lake Constance. The water is pumped from a depth of 60 metres and has a maximum temperature of 8 degrees Celsius – which is ideal for cooling purposes.

To provide a reliable supply of drinking water to the 320 towns and villages throughout Baden-Württemberg in the event of a power outage, the Lake Constance Water Supply Authority has operated an emergency power supply system consisting of two MTU gensets on Sipplinger Berg, a hill above the town, since 1986. The new genset will now increase the power output from 8.8 to 15.3 MW. In emergency operation, this output is enough to pump, purify and deliver as much as 75 per cent of the

average water requirement. Dr. Marcel Meggeneder, technical director of the Lake Constance Water Supply Authority: “The new emergency power supply system represents a significant gain in terms of the reliable supply of water for four million people in Baden-Württemberg. As a result of the current restructuring of the electricity grid following the energy turnaround, the risk of power outage has increased. We can counter this risk with what we have achieved today.“

The extension to the emergency power supply system will now make it possible to carry out a general overhaul of the two existing MTU gensets in stages. Following the completion of the general overhaul, there will then be the additional possibility, in the event of a power outage in the network, of operating an 11.5 MW delivery pump via the three replacement gensets. This will make it possible to increase the delivery volume of untreated water to 3,000 litres/second.

In the event that a power outage occurs, the Lake Constance Water Supply Authority initially has a large reservoir, from which it can continue to supply its customers with drinking water. Only when power from the electricity grid remains interrupted for an extended period of time will the genset be started up. In order to reduce the impact on the environment and on wearing parts, it has been intentionally set to ensure that it does not start to produce electricity within seconds, but only after three to five minutes.

EnBW AG was responsible for the overall design and planning of the new system on Sipplinger Berg. As a result of the size of this genset alone, the design and planning, construction management and project support were anything but an everyday affair for Kurt Weber, project manager from EnBW AG. The special appeal was the structural and electrical connection of the new genset to the existing emergency power supply system so as to produce a high-performance and, above all, reliable overall system, that can now cope with higher ambient temperatures.

