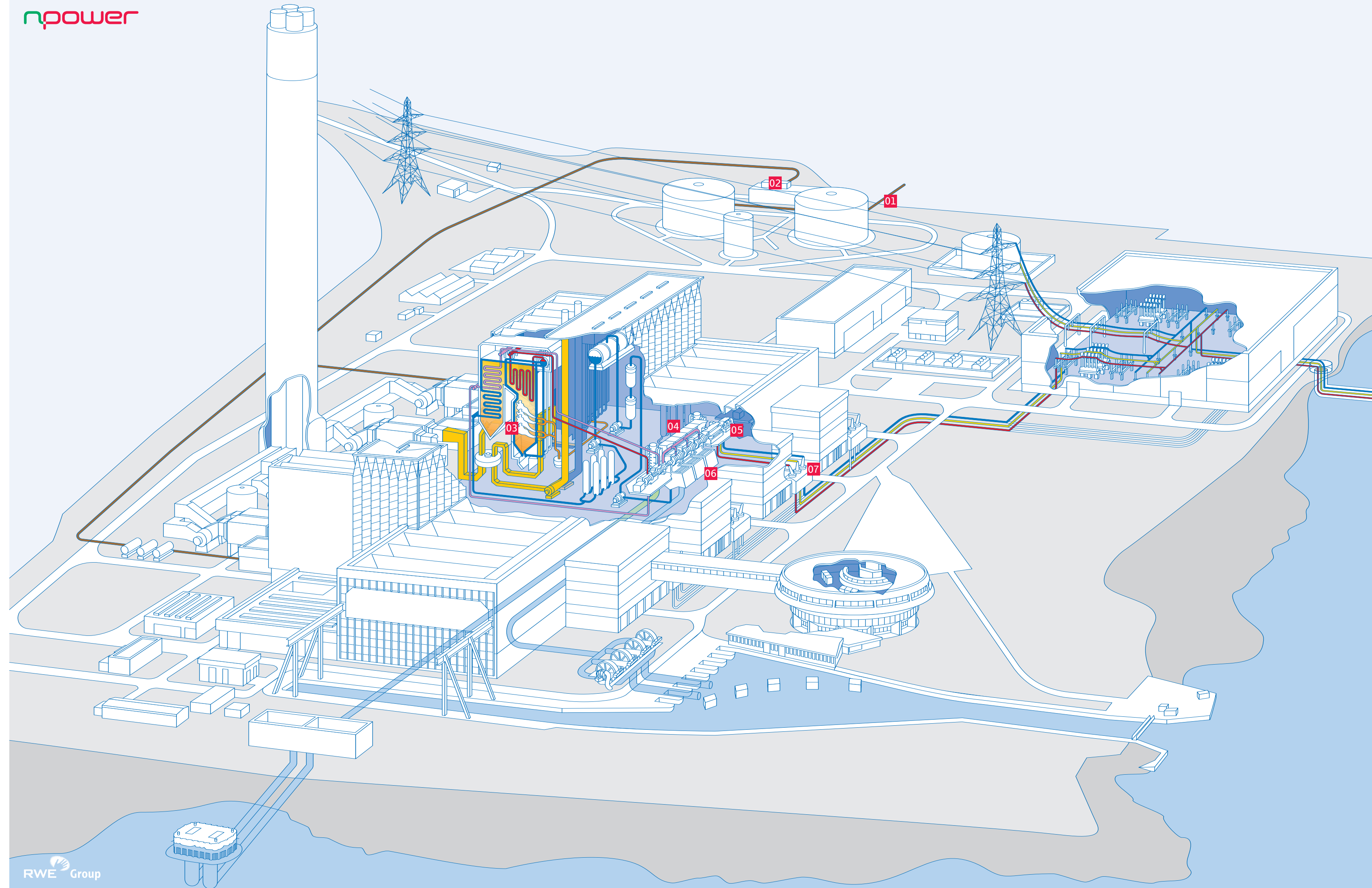


Fawley has four generating units, two are closed, one mothballed and one operational. Each unit consists of a boiler, supplying steam to a turbine that powers an associated generator. In addition, the station has two operational gas turbines for emergency generation.

npower



01 Oil supply

Oil is supplied to the power station by pipeline from the nearby Esso refinery and is stored in two main oil tanks, each holding up to 15,000 tonnes.

02 Oil preparation

When it is about to be used, the oil is filtered, heated to 130°C and pressurised up to 80 bar. It is then atomised as it is sprayed into the boiler when it burns like a gas.

03 Boiler

Each boiler, which can burn up to 2,600 tonnes of heavy fuel oil per day, is lined with over 400 kilometres of steel tubing. The heat produced in the boiler furnace converts ultra pure water within the tubes to superheated steam, which leaves the boiler at up to 165 times atmospheric pressure and at a temperature of 541°C. The steam passes through the boiler twice to maximise the electricity produced from each tonne of oil.

04 Turbine

The steam from the boiler passes through the high pressure section of the steam turbine, turning the blades and shaft at 3,000 revolutions per minute. The steam returns to the boiler for reheating, and then to the turbine intermediate pressure stage, and then passes to the three low pressure stages. The turbine, which can produce more than 670,000 horse power, is connected to the electrical generator.

05 Generator

Inside the generator, the rotor (an electromagnet) turns inside the stator (made up of copper bars) and creates an electric current. Each generator has an output of 500MW of electricity.

06 Condenser

The water used in the boilers is extremely pure and too valuable to be lost. Therefore, as the steam leaves the turbine, it is cooled back to water by large condensers before passing back to the boiler. The condensers are cooled by sea water, pumped from Southampton Water, which is then returned to the Solent through tunnels 1,540 metres long and 4.3 metres in diameter. The returned water is a few degrees warmer but otherwise unchanged.

07 Generator transformer

Electricity from the generator is produced at a voltage of 22,000 volts. For transmission along the National Grid system, the voltage is increased to 400,000 volts in the generator transformer.