

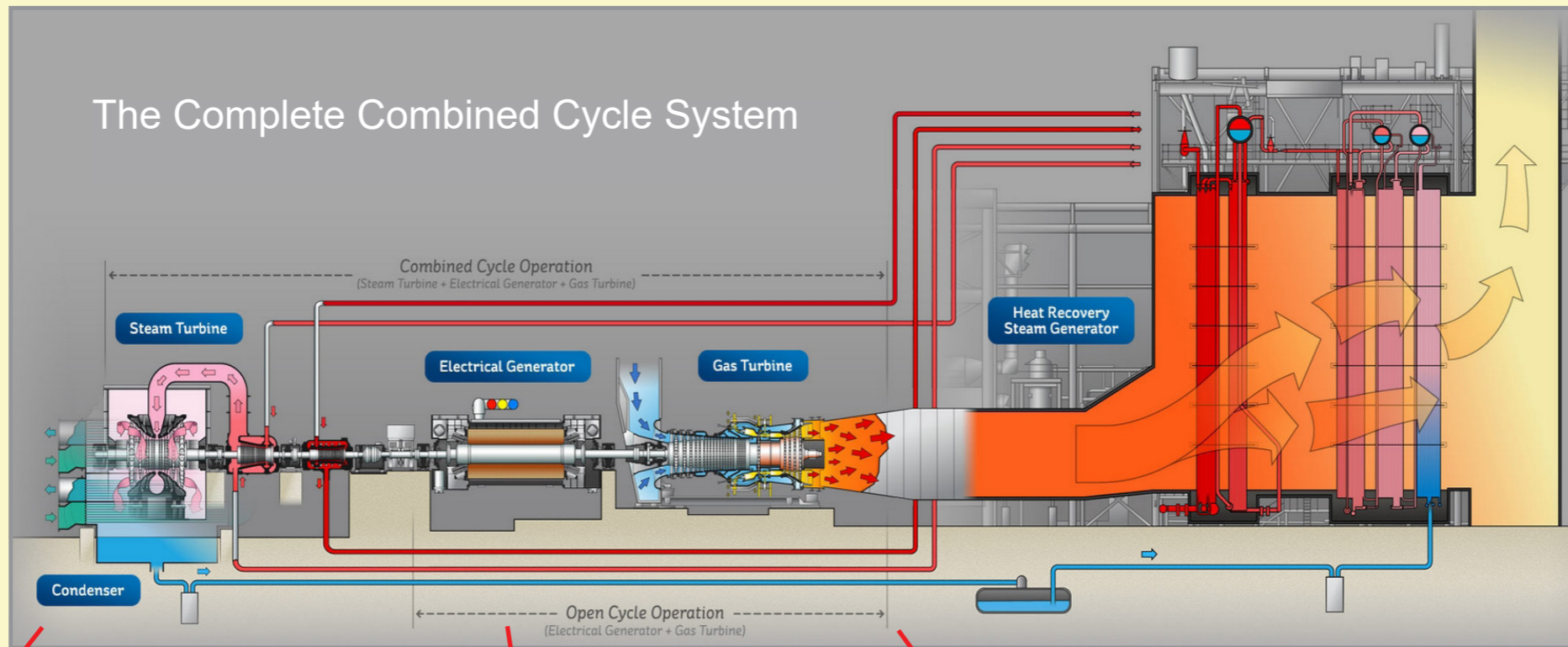


Aghada Combined Cycle Power Station, Whitegate, Co. Cork

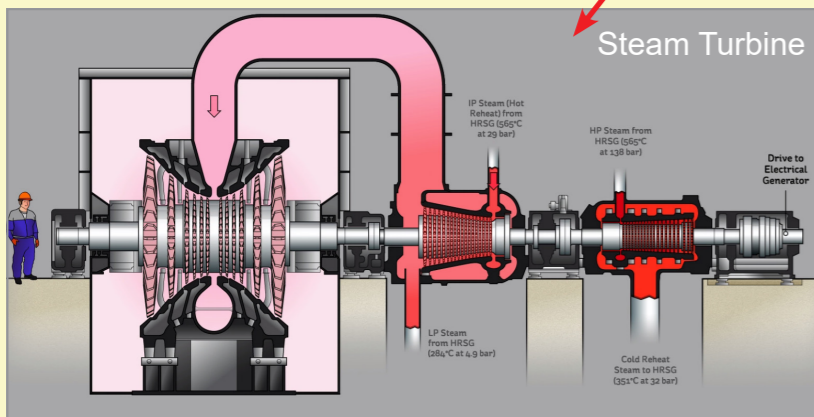
Aghada Power Station was built close to the entrance of Cork Harbour to use gas from the nearby Kinsale Gas Field.

It started operating in 1980 as a conventional turbine in open cycle. In 2010 the station capacity was increased to 963 MW with the addition of the combined cycle plant where the generator is powered by both the gas and steam turbine.

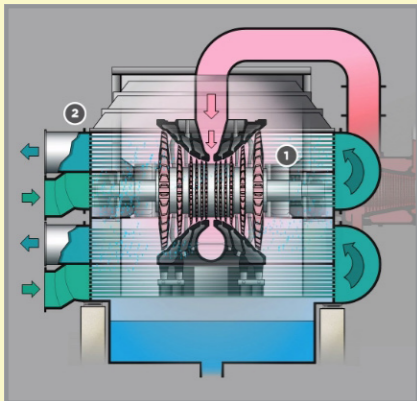
It is one of the most efficient and cleanest plants in Europe.



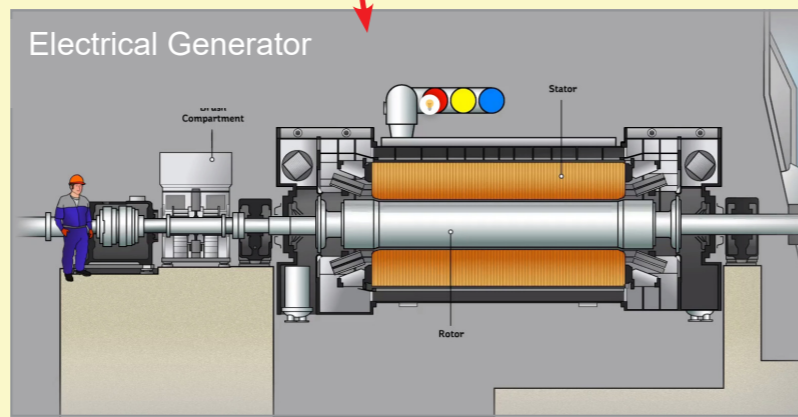
The Heat Recovery Steam Generator (HRSG) is a heat exchanger where liquid water absorbs the thermal energy supplied by the Gas Turbine exhaust. The hot exhaust gases enter from the left and diffuse to fill the space available. The exhaust heat generates steam and feeds the steam turbine, thereby significantly improving the plant efficiency and output.



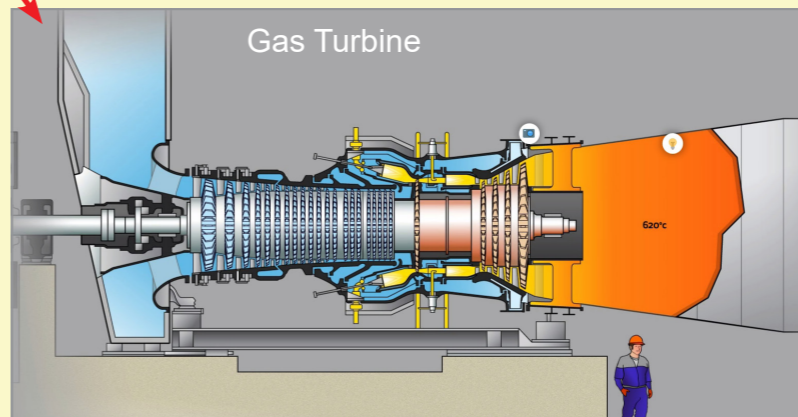
The Steam Turbine has three separate turbine assemblies operating at high, medium and low pressures. Steam produced in the HRSG is piped to the turbines and flows through rows of blades at high velocity causing the shaft to rotate. This drive shaft is connected to the electrical generator via a Self-Shifting & Synchronising (SSS) clutch adding a further 165 MW to the overall station output.



Steam from the Low Pressure Turbine condenses on the outside of water cooled tubes and the condensed steam flows into the hotwell, which provides condensate storage. The steam space of the Condenser during normal operation is under vacuum (at 32 mbar).



The 21 kV, 500 MVA Generator is a hydrogen cooled, two-pole, three-phase synchronous generator. It is rigidly coupled to the Gas Turbine and coupled by a self-shifting and synchronising clutch to the Steam Turbine.



The Gas Turbine compressor draws in ambient air through a two stage filtration system. The air is compressed and mixes with the fuel (methane) in a two stage combustion process to limit emissions. The combustion is an exothermic reaction. The resultant gases expand and drive the turbine shaft. The Gas Turbine output power is 270 MW.



This is the 220 kV Electrical Switchyard Compound from which the electricity is exported onto the ESB Network



The Website
ESB has created an interactive on-line animation to help students understand the science and technology behind the generation of electricity at Aghada: <http://ESBGeneration.esb.ie>
ESB has also developed supplementary bilingual teacher notes which are available from esbwebmaster@esb.ie

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