



## Space-saving PHEs chosen for turbine cooling

Medupi Power Station, Limpopo Province, South Africa

Case Story



The first of the six 800 MW turbines at the new Medupi Power Station is expected to be commissioned in 2012. Gasketed plate heat exchangers from Alfa Laval are being installed for turbine cooling.

The Medupi Power Station is a new dry-cooled coal fired power station being built by Eskom, the South African public electricity utility. Destined to be the largest of its type in the world, the plant will have six boilers, each powering an 800 MW Alstom turbine, producing 4,800 MW of power. Alfa Laval gasketed plate heat exchangers (PHEs) are installed in the turbine systems as distillate coolers, air seal oil coolers and hydrogen seal oil coolers.

The turbine systems have been supplied by Rockfin Sp. z o.o., a long-term customer of Alfa Laval Poland which, in turn, supplied the PHEs for cooling applica-

tions. With space at a premium, the flexibility and compactness of the PHEs, combined with Alfa Laval's capability to supply an innovative, non-standard installation design were major advantages for Rockfin.

### Request for distillate coolers

The original request to Alfa Laval from Rockfin was for distillate coolers. The challenge with using PHEs for this application was that the cooling water flow was almost four times greater than the hot distillate flow. It was also a much bigger flow than was required by the PHE to achieve the desired cooling result.

Rockfin wanted to simplify the system as much as possible and was not prepared to accept any reduction in cold water flow or a controlled bypass system on the heat exchanger's cold water side. The entire cold water flow must pass through the heat exchanger. Also, since space at the front of the

**Rockfin Sp. z o.o.** Established in 1991 and located in Chwaszczyno, Rockfin Sp. z o.o. is a Polish company dedicated to designing, manufacturing and servicing hydraulic oil systems. A partner to the world's major power generation players, Rockfin's product range includes lubrication systems, drive and control systems, industrial oil filtration and maintenance systems.



**Product facts:**

Alfa Laval gasketed plate heat exchangers use heat transfer plates fitted with gaskets that seal off each channel from the next, and direct the fluids into alternate channels.

**Benefits include:**

- High thermal efficiency for effective heat transfer
- Compact design resulting in small quantities of materials used for heat transfer surfaces
- Low installation cost
- Easy dismantling and easy, rapid cleaning
- High performance with low hold-up volume
- Versatile, modular design
- Environmentally efficient



Alfa Laval plate heat exchangers installed for turbine cooling at the Medupi Power Station.

PHE was limited, no valves could be situated there.

**An innovative solution**

Working with Rockfin, a sales engineer from Alfa Laval Poland suggested a typical PHE with a non-standard installation design. A bypass pipe was mounted between extra cooling water connections on the pressure plate at the back of the unit. As continuous water flow through the exchangers was expected during operation, a regulation valve on the bypass pipe was not required. It was simply a case of installing an orifice there to ensure the correct flow proportions between the PHE and the bypass.

Service of the PHE unit with a bypass mounted on the pressure plate is as easy as servicing a standard PHE. The plates can be cleaned without

detaching the bypass pipe from the pressure plate. If it becomes necessary some time in the future to change the flow proportions between the PHE and the bypass, it can be achieved easily by changing the size of the orifice.

**Alfa Laval PHEs chosen for all three applications**

Based on the success of Alfa Laval's distillate cooler solution, Rockfin also chose PHEs for the air seal oil coolers and the hydrogen seal oil coolers, a total of 10 sets. A spokesman for Rockfin said: "We see Alfa Laval as a reliable supplier with a wide portfolio, fast response, and deep technical knowledge and experience."

The Medupi Power Station is still under construction. The first 800 MW turbine is expected to be commissioned in 2012.

**Fast facts:**

**Customer:** Rockfin Sp. z o.o. , a Polish manufacturer of hydraulic oil systems.

**Location:** Medupi Power Station, near Lephalalle, Limpopo Province, South Africa.

**The initial task:** To supply distillate coolers for the steam turbines.

**The challenge:** The cooling water flow was almost four times greater than the hot distillate flow. It was also a much bigger flow than required by the PHE to achieve the desired cooling result. Space around the system was very limited.

**The solution:** A typical PHE with a non-standard installation design. The PHE was fitted with a bypass pipe between extra cooling water connections on the pressure plate at the back. An orifice was installed on the bypass to ensure continuous flow equalization between the PHE and the bypass. The serviceability of the PHE is not affected.

**How to contact Alfa Laval**

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com).