Case story

Reliability at the core

Alfa Laval delivers reliable and efficient sea water filtration for Heysham II, British Energy

Heysham II is a nuclear power station owned and operated by British Energy, and located just outside the port of Heysham. The plant's two advanced gas-cooled reactors (AGRs) provide steam to two 660 MW steam turbines.

Prior to privatization, British Energy was part of the Central Electricity Generating Board (CEGB), an organization with a worldwide reputation for excellence. The power station provides electricity to the high-voltage electricity transmission network for distribution throughout the UK.

A new stable sea filter alternative

After many years of power generation, the conventional screening and filtering systems installed during the construction phase of Heysham II needed replacing due to their deteriorating performance. To improve reliability and availability, British Energy sought alternative solutions to the seawater filtration system used in the reactor cooling process.

The original seawater filters at Heysham II were susceptible to clogging, and the service life of the original plant was coming to an end. Recognizing the need for increased availability and reliability, as well as reduced maintenance, the station staff investigated replacing the conventional basket filters with alternative filter types.

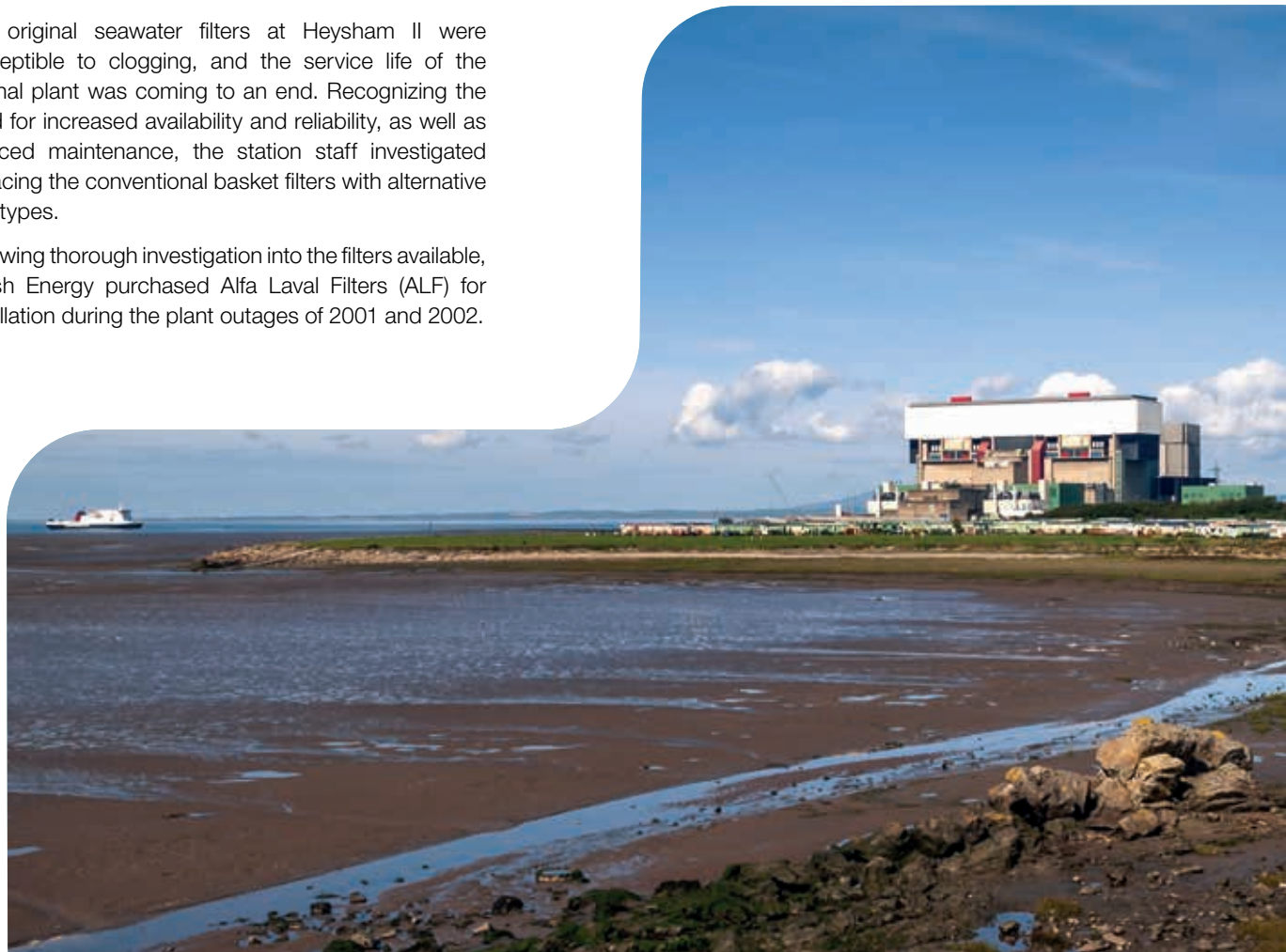
Following thorough investigation into the filters available, British Energy purchased Alfa Laval Filters (ALF) for installation during the plant outages of 2001 and 2002.

Increased production

Efficiency improvements with Alfa Laval seawater filters

"Basically, we had experienced a lot of problems with the original strainers. So when we looked at replacements, we were mainly interested in reliability. We were looking for very tight delivery times and these were actually specified in the contract. Alfa Laval reacted to the urgency of the situation and came up with the goods when we needed them."

Mike Craddock of British Energy



Specifications

Pressure Vessel Code: BS5500

Body: carbon steel (rubber lined)

Filter basket: AISI316

Filter mesh: Ø 1.5 mm (0.06 inch) - Δ 2.33 mm (0.092 inch)

Seawater flow: 1260 m^3/hr/filter (5,548 GPM)

Design pressure: 10 barg

Design temperature: 65°C / 149°F

Horizontal mounting

Pneumatic control

The The Alfa Laval Filters (ALF) are mounted horizontally in the seawater piping system.

The Heysham plant's seawater filtration system uses water from Morecambe Bay. However, the bay is relatively shallow and sandy, which means the filtration system has to remove sand as well as marine life and shell debris.

Alfa Laval Filters (ALF) are located in the reactor containment building, mounted horizontally in the seawater piping system, after the coarse drum screen and ahead of the cooling water pumps. The filters effectively remove particulate down to 1.5 mm in size.

Reliable efficiency improvements

The Alfa Laval Filters (ALF) have improved both reliability and efficiency. The automatic flushing, based on a timer and pressure differential, ensures the filters are kept free of debris.

"There is little doubt that we have seen a great improvement in efficiency since installing the Alfa Laval seawater filters."

Mike Craddock of British Energy

Equipment supplied

Alfa Laval equipment

4 x ALF40-R – May 2001

4 x ALF40-R – April 2002

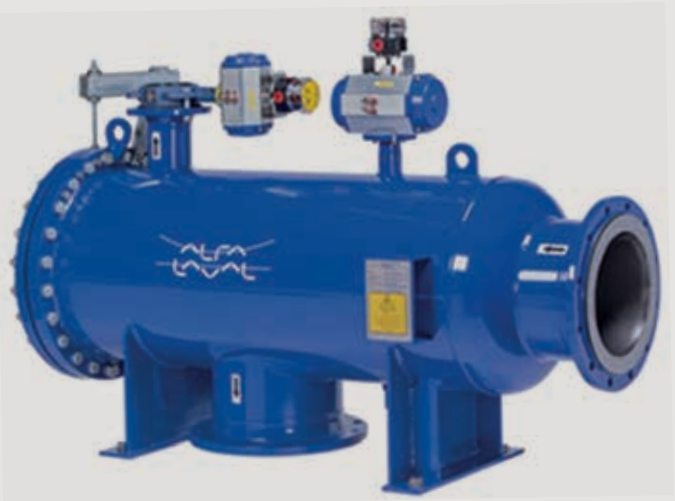
The Alfa Laval Filters (ALF)

The Alfa Laval Filter is a pressure filter with an automatic flushing arrangement. The design features a pressure vessel casing made of stainless steel (ALF-S), fibreglass reinforced polyester (ALF-P) or rubber-lined carbon steel (ALF-R and ALF-B). Along with other wetted parts, the internal cylindrical filter basket is usually made of stainless steel, super stainless steel (SMO) or titanium.

ALF-B is a standardized model aimed at tasks where special options are not required. Just as the other models it offers reliable protection for your heat exchangers and fully automatic operation (backflushing). The filter system is available with connections ranging from DN100/4" to DN800 mm/32" and is designed to be placed directly in the pipe system. ALF filters can be installed in almost any position, horizontally or vertically thanks to the flexible nozzle orientation and because the automatic regeneration process is run by the inlet pressure.

The inlet is placed at one end and the main outlet at a 90° angle, making it suitable for installation on any 90° pipe bend close to the equipment to be protected. The inspection/service opening is placed on the opposite side of the inlet, providing easy service access with no need to remove the pipe connection.

Backflushing is carried out automatically at regular intervals without interrupting the filtering process. The flushing valve and a flow diverter valve are controlled by a PLC in the control panel, which can be installed close to the filter. The filter is divided into two sections by the flow diverter valve, the inlet section, and the outlet section. A flushing valve for discharging the debris is located at the end of the outlet section.



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.

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