

CRN Air-Cooled Top solves shaft seal problem at dairy

With a turnover of some EUR 400 million, the Milk Union Hocheifel (MUH) in Germany, is Europe's largest UHT milk producer (Ultra Heat Temperature) and supplies milk for more than 170 well-known companies.

Every year 460 employees produce approximately 740 million litres of milk - 1 billion cartons. MUH is well equipped to deal with large volumes, and the 16 UHT milk machines have a throughput of around 120,000 litres per hour.

The Situation

MUH uses large heat exchange systems in the UHT process in order to obtain a constant temperature that ensures the high milk quality that MUH is known for. With time, milk residue is deposited on the heat exchange system. Consequently, the heat exchange coefficient decreases little by little and so does the system's efficiency.

The mechanical shaft seal in the conventional horizontal pumps can only withstand high temperatures for a short period of time. Changing the mechanical shaft seal every second month has until now been part of MUH's production planning. The calculated downtime per pump for changing the shaft seal is 4 hours, obviously a time and money-consuming affair. If the planned downtime is expensive, then unplanned shutdowns during production are even more critical.

The Grundfos Solution

The shaft seal is the weak part of a pump. The lifespan and efficiency of a shaft seal depend on the nature of the pumped liquid as well as the pressure and temperature to which it is

TOPIC:

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LOCATION:

Germany

COMPANY:

Hocheifel

subjected. The Grundfos shaft seal solutions are designed to withstand excessive wear and to provide long life under adverse or extreme operating conditions.

The Grundfos CRN Air-Cooled Top pump has a shaft seal that is specially designed for applications, which have to handle very hot liquids, that is 120°C to 180°C. In order to ensure that the liquid temperature around the shaft seal does not exceed the level that it can withstand, the pump is fitted with a special air-cooled shaft seal chamber. A pipe interconnects the pump and the air-cooled chamber. Through a narrow passage in the pipe, a small amount of water seeps into the air-cooled chamber with the shaft seal. On its way past the pipe, the water temperature is reduced, making it possible to keep the shaft seal at a safe temperature without any additional external cooling.

The air-cooled pump head separating the pumped liquid from the shaft seal chamber prevents the shaft seal from overheating. However, should the shaft seal need to be replaced, it is possible to change the CR cartridge seal within only a few minutes - obviously an important reduction in the downtime for MUH.

The Outcome

Out of a numerous of pumps that MUH decided to test, Grundfos turned out to be the only pump supplier that can deliver a convincing and economically viable solution. Thus, the dairy decided to replace all their 16 old horizontal pumps in the UHT process with 16 Grundfos CRN Air-Cooled Top pumps.

According to MUH, the classical shaft seal does not need any external cooling and is able to deal with high temperatures. Without any doubt this will result in a longer average lifetime. Likewise, the number of downtimes per pump will diminish and so will the operating costs.

Additionally, MUH noticed that it was easy to replace their old horizontal pumps with the Grundfos CRN 64 pumps in the existing UHT production system.