Cooling water directly from the Baltic Sea

Turbidity measurement with the CUS52D plastic version

Monitoring cooling water after use

Baltic Sea water used as cooling water in the power station

The Rostock power plant is a coal-fired power station operated by Kraftwerks- und Netzgesellschaft mbH (KNG), which was founded in 1990 directly after the fall of the Berlin Wall. The power plant's gross electrical output is 553 MW (net output 509 MW). In addition, a maximum district heating output of 300 MW can be supplied from cogeneration of which 150 MW are currently utilized. With this output, the Rostock plant currently produces more than half of the electricity generated in the federal state of Mecklenburg-Western Pomerania, one fifth of Rostock's district heating requirement and feeds almost 3 TWh per year into the power grid. Its current efficiency is 42.3 %.

The Rostock power plant uses cooling water from the Baltic Sea and pumps it back into the sea after use in order to maintain the water cycle. A turbidity measurement must take place with the required supporting documentation to protect the environment and ensure that the water returned to the cycle does not contain any impurities.

Customer Challenge

The power plant draws cooling water from the Baltic Sea and uses it almost untreated. It is pumped back into the Baltic sea after it has been used as cooling water. This process is monitored by means of the turbidity measurement as this parameter can be used to detect possible impurities and thus identify leaks in the cooling water cycle. Given that the flow rate of the cooling water is several thousand cubic meters per hour, an online measurement is imperative for a quick response. Turbidity is approximately 1-2 FNU normally. A value that increases to in excess of 8 FNU indicates impurity. In this process, the sensor is exposed to the high salt concentration of the Baltic Sea water creating a very harsh environment for the material.
The Turbimax CUS31 turbidity sensor has been used successfully in the Rostock plant until now. Following the discontinuation of this model, an alternative was required that could match the reliability of the previous version in monitoring the process described.

Our solution

The CUS52D stainless steel turbidity sensor was used initially. However, the new version made from robust plastic is even better suited to the application. The high salt concentration of the Baltic Sea water creates a very harsh environment for the material and regular maintenance is thus avoided. The plastic version of the new CUS52D turbidity sensor was used as an alternative in order to increase the

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operating times of the turbidity sensor and prevent possible breakdowns due to corrosion. The resilient plastic of this sensor prevents material changes and any functional restrictions. The plastic sensor measures reliably even at low turbidity values.

Results

The customer enjoys highly accurate measurements thanks to the Endress+Hauser solution, which also remains stable in the saltwater over a longer period. This reduces maintenance costs. Furthermore, the measuring sensor technology guarantees high availability and is perfect to ensure compliance with turbidity limit values and as documentary proof of the parameter for supervisory authorities.

Measuring sensor technology used

- Turbidity sensor CUS52D-AA1HA3
- Transmitter Liquiline CM442-AAM2A2F210AA

Turbimax CUS52D turbidity sensor in the plastic version, suitable for saltwater applications

Measuring station with Liquiline CM442 transmitter and Turbimax CUS52D turbidity sensor

Advantages of the Turbimax CUS52D

- The plastic version of the sensor can be used in saltwater without any problems.
- Accurate and reliable monitoring even at very low turbidity values.
- Memosens technology guarantees high process and data integrity.
- Easy to use and predictive maintenance.

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