



APPLICATION REPORT Power

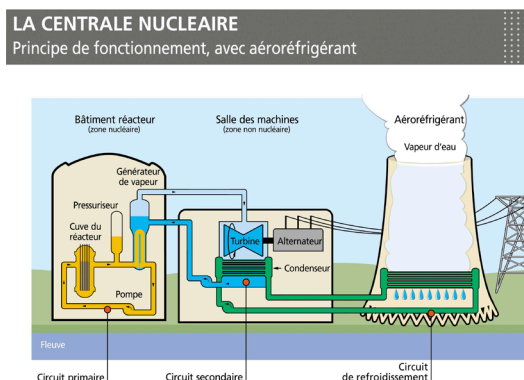
Differential pressure flow measurement of raw water

- Flow measurement of make-up water for cooling towers
- Robust and immersible measurement solution for reliable operation
- Reduced maintenance costs



1. Background

The Nuclear Power Production Center (CNPE) is a French nuclear power plant located on the Loire in the municipality of Dampierre-en-Burly, in the Loiret department. The plant produces an average of 24 billion kWh per year, which represents 5% of the French electricity production and seven times the consumption of the Loiret region. The facility includes four 910 megawatt power generation units of which each is cooled by a natural draft wet cooling tower. River water from the Loire is treated as cooling water. It is used for the cooling of the main condenser in the secondary steam circuit of the plant. This type of cooling enables the highest cooling efficiency.



2. Measurement requirements

The amount of the filtered raw water intake from the river needs to be measured. This is done so as to control the make-up water preparation, the chemical treatment of the cooling water and the blowdown. Since the intake pipes are buried in the ground, the application is located in an underground pit.

According to the CNPE standard the measurement is designed as DP measurement with an orifice plate as primary element. The temperature of the intake water may vary seasonally between 0...+25°C / +32...+77°F. In case of heavy rain or thunderstorms, a flooding of the measuring pit may occur. Even in this case the measurement must reliably continue its operation. Because of the specific situation and location of the pits, personal access to the measuring pit is complicated, time consuming and requires special permission, the closing of a road and hatches to be opened.



3. KROHNE solution

Since relocation of the installation points was not possible, EDF decided on the OPTIBAR DP 7060 differential pressure transmitter to solve this application. All four KROHNE devices feature ingress protection IP68 for long-term and trouble-free operation. The DP transmitter is available with hermetically sealed compartments for the transmitter electronics and terminals for a maximum ingress protection.

The KROHNE DP transmitter provides its readings via 4...20 mA/HART. It is additionally equipped with the SJB 200 junction box, allowing the operator to communicate remotely with the transmitter.

Once installed into the horizontal concrete pipes, the units were configured via the junction box. Thus, setting up the devices in the wet, dark and difficult-to-access pit was avoided.



OPTIBAR DP 7060 C differential pressure transmitter

4. Customer benefits

The utility company wanted to improve the reliability of its instrumentation for the raw water intake. Using the new DP transmitters eliminates insulation faults and other problems which have occurred in the past due to the ingress of moisture at the installation point in the pit. The KROHNE device allows continuous, uninterrupted operation, even in the event of unintended immersion.

This way, it complies with the company's safety regulations and standards. Thanks to the KROHNE SJB 200 junction box, which is positioned locally outside the flood zone, the technicians can easily connect to the transmitter if necessary. This considerably eased the intervention procedure for the EDF technicians who, in order to gain access to the pit, had to take many time-consuming steps. It was mainly due to the new communication interface that EDF was able to reduce their intervention costs.

After two years of operation the customer confirms the reliable operation and is fully satisfied with the improvement of the situation. The maintenance costs for these measuring points have been cut off significantly since personal access to the pits can now be refrained from.



OPTIBAR DP 7060 C IP 68 measuring raw water intake



Junction box SJB 200

5. Product used

OPTIBAR DP 7060

- Differential pressure transmitter
- Level, flow, differential pressure, interface and density measurement
- High accuracy and measurement stability under all process conditions

Contact

Would you like more information about this application or others?
Do you require technical advice for your application?
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