



Stationary discharge measurement at the location Franken I - E.ON power plant GmbH, Nuremberg

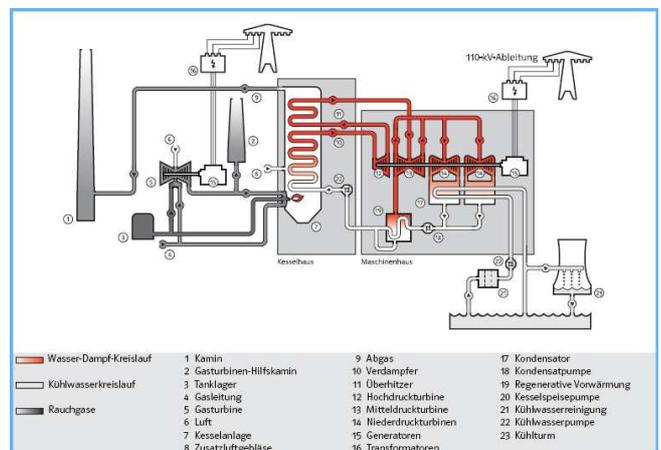
Online discharge measurement with horizontal Doppler-flow sensors OTT SLD



Background

- The power plant Franken I in Nuremberg-Gebersdorf is in operation since 1913. It produces an output of 843 Megawatts to cover the electricity demand of the conurbation area Nürnberg-Fürth-Erlangen. The conventional power plant is fuelled by gas and oil. The high efficiency of the plant allows economical use of fuels and thus contributes to reducing CO₂-emissions.
- E.ON Kraftwerke GmbH is running Franken I in the so-called peak load segment which means, it is used always when the demand for electricity is rising in the short term.
- The peak output is produced by a combined gas and steam turbine. First, natural gas/oil is burning together with the compressed air in the combustion chamber of the gas turbine, the combustion gas which originates from this process drives the gas turbine – exhaust gases are directed through the burner into the steam generator (boiler) where hot combustion gases are generated by combustion of natural gas or oil.
- The combustion gases bring water to boil which is running through pipes in the boiler, the so-called boiler-feed-water. The steam produced is heated to 540°C and directed under high pressure to the blade s of a multistage steam turbine. This turbine is coupled to a generator so that the mechanical energy is converted into electrical energy.

- Due to the advantage in efficiency and the cooling capacity of the Rednitz, the power plant units in Franken I are designed for cooling by freshwater or by cooling tower if water level is too low. The required cooling water is taken from the river Rednitz and after flowing through the condensers it is cleaned mechanically before it is fed back into the Rednitz. Data about quantities and temperatures of the cooling water are monitored continuously and forwarded to the competent authorities.



Functional layout power plant Franken I

Measuring Task

- Online measurement – waterlevel WL1 and WL2, flow velocity v1 and v2 and discharge calculation Q1 and Q2 at the measurement sites at the plant inflows 1 and 2
- Storage and continuous transmission of data to optimize plant operation (reduction of incoming sand)
- Remote maintenance of the measuring system required

Monitoring Solution

- OTT SLD 2.0 – Side Looking – Doppler sensors for measuring local flow velocities (index velocity)
- Stationmanager LogoSens2 for the monitoring, processing, storage and transmission of all measured data
- Power supply 12 V
- Modem for data retrieval and remote maintenance
- Installation done by OTT HydroService and company E.ON Kraftwerke GmbH, Nürnberg



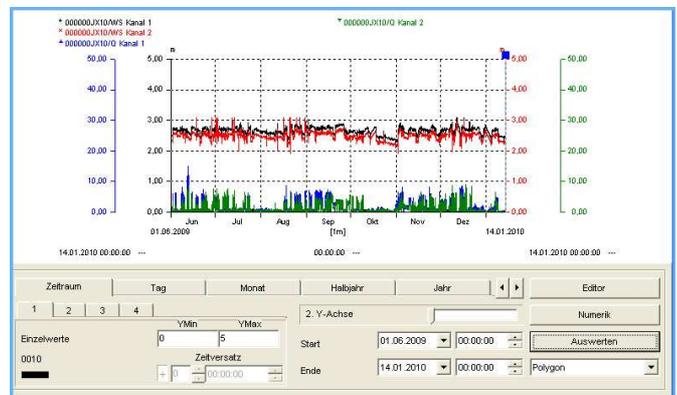
OTT-control cabinet for plant inflows 1 and 2

Advantages:

- Online-of discharge in channels 1 and 2
- Reliable flow speed data thanks to state-of-the-art ultrasonic Doppler-technology
- Absolutely simple installation in the water body
- Requires no cable crossing in the water
- Remote maintenance of the complete system



Site visit at the plant inflows 1 and 2



OTT Hydras 3 – Data evaluation WS1, WS2 and Q1, Q2

Summary

Two measuring sites at the inflows 1 and 2 of the plant, equipped with state-of-the-art OTT instruments are now delivering flow data online 24 hours.

- Equipment of two discharge measurement sites
- Instruments are in use since May 2009
- Thanks to professional service all stations could be taken into operation on schedule.

More information on OTT solutions and OTT products:
www.ott.com