

Monitoring / continuous observation at the Irsching power plant site

Temperature and oxygen monitoring in the Danube and Paar rivers

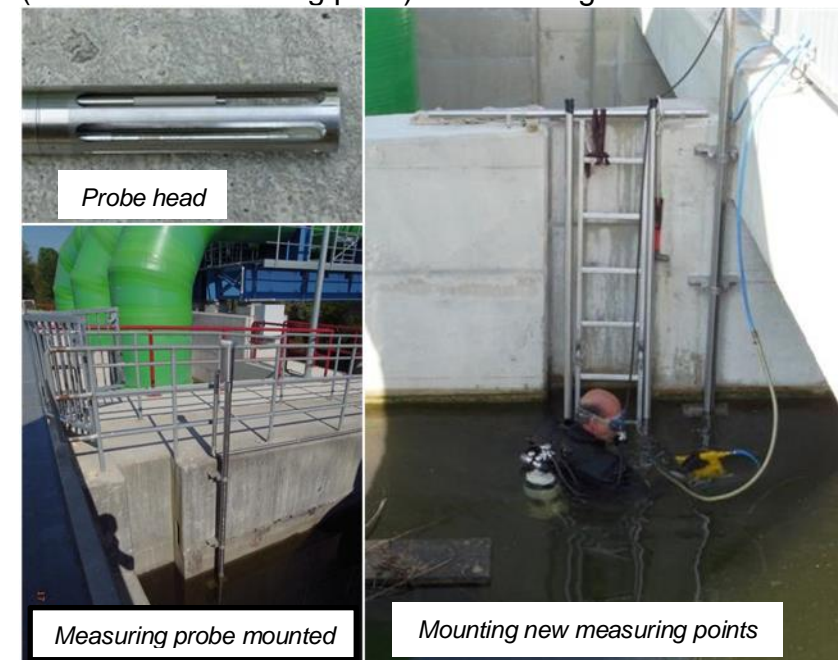
Client	Uniper Kraftwerke GmbH (until 2015 E.ON Kraftwerke GmbH) Kraftwerk Irsching
Project processing	PSU – Prof. Schaller UmweltConsult GmbH
Project period	2008 – estimated 2023
Services	Installation of temperature and oxygen measuring points Documentation and evaluation of temperature and oxygen conditions
Study area	136 Danube-km



Between 2006 and 2011, E.ON Kraftwerke GmbH expanded the power plant consisting of three units at the Irsching site in the municipality of Vohburg. A gas and steam turbine plant with an electrical output of around 800 MW (unit 5) was newly built on the site and a gas turbine plant was expanded into a gas and steam turbine plant with an electrical output of around 530 MW (unit 4). The old power plant units 1 and 2 have been decommissioned, unit 3 is used if required. In the approval notices for the construction and operation of the two new units, monitoring of possible ecological impacts of the use of the Danube for cooling purposes was included as part of a risk management requirement.

In cooperation with representatives of the technical authorities and experts, the requirements for a monitoring program were specified. According to this, the small-scale and large-scale ecological effects of the changed temperature regime (temperature increase) due to the cooling water discharge of the power plant expansion at the Irsching site in the longitudinal course of the Danube as well as on the functionality of the bypass system to the Vohburg "Paar / Rechter Vorlandgraben" barrage are to be investigated. PSU has been commissioned to document and evaluate the temperature and oxygen conditions in the Danube and Paar during the periods before, during and after commissioning of the new power plant units. Based on these evaluations, among others, BNGF (Office for Nature Conservation, Waters and Fisheries) assesses the ecological effects on fish stocks, macrophytes, phytobenthos and phytoplankton.

In order to be able to assign and make plausible the effects of temperature increases due to power plant operation as a decisive ecological impact factor on the river ecology, a more precise knowledge of the temperature processes with regard to warming and cooling in the flowing water continuum is essential, not only in the immediate vicinity of the cooling water discharge, but also over large stretches of river downstream. The study area extends over a length of 136 km from Ingolstadt (reference measuring point) to Straubing.



For the monitoring of water temperature and oxygen content, it was necessary to establish additional measuring points for thermal monitoring as well as oxygen measuring points in addition to existing measuring points of the water management. For this purpose, automatic measuring probes were installed at eleven locations (power plant, river bank, free Danube, Paar),

which send the measured values via a telephone-supported data connection to the monitoring sites at regular intervals. PSU accompanied the installation of these measuring points between June and September 2008.

The main task of PSU is the permanent monitoring of the 14 thermal and eight oxygen measuring points. The two parameters water temperature and oxygen content are analyzed annually with regard to the influence of power plant operation and documented in annual reports. In order to determine changes between the years before commissioning (2008 and 2009), during commissioning (2010 and 2011) and after commissioning (from 2012) of the new power plant units, the results of the individual reports are summarized in a comparative report and statistical trends are evaluated.



Essential aspects of the evaluation are temperature curves in the period under consideration, the comparison of different measuring points and temperature changes in the longitudinal course on the basis of daily, monthly, quarterly and annual values. Special attention was paid to the consideration of orientation and limit values according to the WU-WRRL / OGewV 2016, the comparison between the reference measuring point and the first measuring point located downstream of the cooling water discharge as well as the comparison between the Danube and the Paar. These results are included in the evaluation of the biological components of the monitoring program carried out by BNGF.