



DHI MARKET AREA: ENERGY

THERMAL AND NUCLEAR POWER PLANTS

Optimising cooling water systems in power plants

Large conventional power plants are often located close to the coast. This facilitates access to fuel being transported by vessels as well as to cooling water taken from the sea. Cooling water systems in power plants need to be optimised in order to ensure safety, cost-efficiency and mitigation of impacts on the ambient water environment. We offer a wide variety of services especially for cooling water processes and systems.

- THE CHALLENGES**
- Optimising the design and verifying intake and outfall structures such as head and pipelines
 - Enabling efficient and environmentally sustainable operation of power, desalination and other industrial plants
 - Ensuring accurate hydraulic design conditions

OUR APPROACH At DHI, we take a pragmatic approach to helping power plant operators optimise their cooling water systems sustainably. We can help you achieve this in a cost-efficient manner with the help of our experience, global knowledge and our unique ability to combine services. We aim to provide valuable and realistic engineering solutions with respect to cooling water systems.

OUR SOLUTIONS Our solutions are based on state-of-the-art technologies with respect to physical and numerical modelling. We also use survey and measurement campaigns (for the collection of hydraulic, meteorological, sediment, biological and chemical parameters). Output from these investigations form the basis for optimisation of plant design and plant operation schemes. Thus, we provide the appropriate solutions for optimising the sustainability of cooling water discharge and mitigating potential negative impacts on the ambient environment.

THE ULTIMATE GOAL OPTIMISED AND SUSTAINABLE COOLING WATER SYSTEMS IN POWER PLANTS

In 2005, cooling water withdrawals accounted for nearly 49% of all water withdrawals in the USA

Kenny, J.F., et al., Estimated use of water in the United States in 2005, U.S. Geological Survey Report, (2009)



OUR TOOLS AND SERVICES

We can deliver numerical and physical modelling as well as survey, monitoring and consulting for nuclear power plants in accordance with the quality assurance requirements for nuclear facility application (NQA-1).

A wide range of tools and services for power plant cooling water system optimisation are offered. These include:

- optimisation of intake/outfall layout, location and design
- optimisation of plant operation schemes
- assessment of potential for pollution of the aquatic recipient
- coastal impact assessment
- establishment of Metocean data statistics
- detailed description of flow velocity, pressure fields and loads
- hydraulic design conditions
- numerical studies by using models based on MIKE Powered by DHI software (especially MIKE 3)
- laboratory testing, model testing and Computational Fluid Dynamics (CFD) analysis
- marine and bathymetric surveys as well as general biological surveys
- Environmental Impact Assessments (EIAs)
- thermal recirculation/dispersion
- water quality assessment
- survey measurement campaigns
- sedimentation, marine growth and intrusion of seaweed, fish and debris
- transient flow phenomena
- internal flow and pump optimisation
- capacity building and training by THE ACADEMY by DHI

Contact us: info@dhigroup.com
For more information, visit: www.dhigroup.com