Central Water and Power Research Station, Pune

KALPAKKAM NUCLEAR POWER PROJECT, TAMILNADU

Background

Kalpakkam is located on the east coast about 70 km south of Chennai in Tamil Nadu State. The Madras Atomic Power Station (MAPS) having two units of 220 MW was established in 1983-85 by Nuclear Power Corporation of India Ltd (NPCIL). MAPS is operating on once-through cooling water system for which the cooling water (i.e. about 35 m$^3$/s) required for the power station is drawn from the sea through an intake well which is located at 360 m from seashore and connected to the forebay of the pump house by a submarine tunnel. Department of Atomic Energy has proposed to establish a Fast Breeder Reactor Project (PFBR) of 500 MW capacity at a location 500 m south of MAPS.

Studies conducted

- Field data collection and analysis for Condenser Cooling Water System (CCWS) of PFBR,
- Mathematical model studies for location of intake/outfall for 500 MWe Prototype Fast Breeder Reactor using Numerical Model MIKE 21
- Wave Flume studies for the design of outfall guide bund and shore protection works
- Mathematical model studies for littoral drift and thermal recirculation using Numerical Model LITPACK.

Location Map and Intakes
Outcome and Benefits

- Field studies provided the data useful for physical as well as mathematical model studies.
- Numerical Model studies evolved the location of intakes to avoid recirculation of warm water.
- Wave Flume studies accorded the criteria for design of outfall guide wall and shore protection works. Location map of Kalpakkam NPP.
- Littoral drift studies confirmed the advancement of coastline and its effect on nearby shoreline.
- Allowable recirculation to intakes
- Power plant is operational to its capacity, commercial power generation yet to start.
- Outfall channel is working properly
- Recommended layout and implemented in field.
- Shoreline advancement is limited.