CENTRAL WATER AND POWER RESEARCH STATION

HYDRAULIC MODEL STUDIES FOR LEFT FLANK HEAD REGULATOR OF POLAVARAM IRRIGATION PROJECT, ANDHRA PRADESH

STUDY OVERVIEW

The Polavaram Irrigation project is a Multipurpose National project on the River Godavari in Andhra Pradesh. The project aims to provide irrigation benefits to 7.2 lakh acres and will generate 960 MW Hydropower. The Left main Canal is proposed to divert 80 TMC of water through the Left Main Canal Head Regulator during the flood season, for irrigation, industrial, drinking water to various districts. The present study is intended to assess the discharging capacity of the Left Mai Canal head Regulator safely for the intended purposes.

APPROACH

1:20 scale 2D sectional model constructed and hydraulic model studies were carried out to optimize the design components of Head Regulator, while diverting the design discharge of 875 m3/s through its 9 vents, each 8 m wide and 5.65 m high, The components included the overflow section, piers, breast walls, stilling basin with end sill and chute blocks.

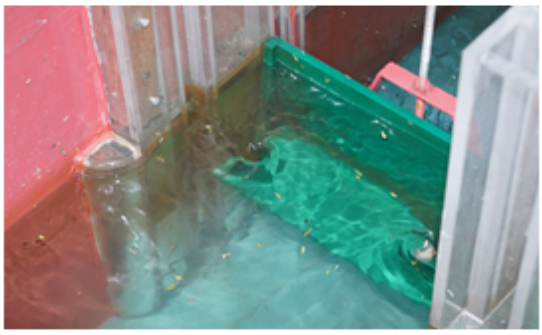
KEY FINDINGS

- The Head regulator is capable of diverting 1576 m3/s at FSL El. 41.09 m, which is more than the design discharge of 875 m3/s.
- The 23.66 m long stilling basin with cistern level at El. 25.4 m and solid endsill with a top elevation of El. 29.269 m is sufficient to contain the hydraulic jump.
- Chute blocks were not contributing to energy dissipation.
- Alignment of breast wall needs to be modified to prevent vortex formation.

SIGNIFICANCE

The research facilitates optimization of various components of Head regulator- including overflow section, piers, breast walls, stilling basin with solid endsill, for the its effective performance for which it is proposed under Polavaram Irrigation Project.

Performance of Stilling Basin



Vortex formation in front of gates