

Title:

Condition assessment of penstock supporting structures of Nagarjuna sagar main powerhouse

Duration: 4 months

Deliverables:

- Based on the investigation and interpretation of test results, the prevailing condition of Penstock supporting structures/structural components have been evaluated. Possible repair measures have been suggested to improve the quality, integrity and strength of the Penstock supporting structures.

Significant Achievements:

- Detailed visual inspection at accessible locations reveal that (i) dampness/seepage of water, (ii) poor quality of concrete, (iii) aging of the structures, (iv) pump mode operation, (v) inadequate cover to the rebars, (vi) poor maintenance, etc. could be the causes for the deterioration of Penstock support structures. In supporting structures, cracking is dominant in construction joints/cold joints.
- Tests such as UPV, RH, and other electrochemical tests were conducted.
- Wherever, UPV value is less than 3.0km/sec (in the case of direct scanning) or 2km/sec (in the case of indirect scanning) for three or more consecutive grid locations, cement grouting and followed by epoxy grouting is suggested to improve the quality and integrity of concrete.
- Carbonation depth is more in selected locations of Unit 4, Unit 5 and Unit 8, which could be the reason for corrosion initiation of rebars.
- Based on core sampling and testing, the strength of concrete is not satisfying for M20 grade of concrete in Units 5 and 8. Grouting was suggested at these areas for improving the quality and integrity of concrete.

Team:

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Photographs:



Typical photograph of Steel Penstock and its supporting structures/pedestals

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