TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED
PAPANASAM DIVERSION WEIR
COMPREHENSIVE PLAN FOR REMOVAL OF SILT IN RESERVOIR

1. Siltation problem in Papanasam Diversion Weir:

Papanasam diversion weir is a masonry gravity structure constructed during 1939 – 1944 across Thambraparani river. This weir acts as a forebay dam for Papanasam Power House generating 4×8 MW.

The siltation, in a span of about 70 years, had considerably reduced the effective storage capacity of the weir and the operating head of water. The study conducted during January 2021 revealed an accumulation of silt for about 55% i.e. 1.171 M.Cum out of gross capacity of 2.139 M.Cum. This large deposition of silt resulted in frequent spilling of water over the weir. The effective storage depth of 8 m near the intake has got reduced. Available operating head of 4 m has been now reduced to 1.5 m which is hindering the continuous power generation in the Power House.

As a trial measure, about 15,500 m^3 of sediment, nearby intake and weir masonry, was removed in about 16 working days during May 2001. Open excavation was done by deploying Poclain and JCB excavators. Tippers utilized for transporting and dumping of sediment in the dumping yard located on the boundary of camp area with a lead distance of about 2 km. About 1400 m^3/ day was removed within the limited working hours of 8.00 AM to 6.00 PM.

2. Present proposal in DRIP phase II and III:

Now, it is proposed to clear silt quantity of 4,50,000 m^3 so as to retain the live storage volume in 4 seasonal years. This work is to be taken up under the guidance of Central Water Commission and funded by World Bank under Dam Rehabilitation and Improvement Project Phase II & III.

i. Availability of Dumping yard:

Two dumping yard locations which are on the downstream side of weir, having an area of 11.25 Acre & 9.75 Acre each have been identified in the Papanasam Lower Camp in TANGEDCO's own land within the KMTR forest boundary. The distance between the reservoir and to the dumping yards is about 1 to 2 Km only.

ii. Sediment Transportation Plan:

Removal of silt is proposed to be done in 4 years during lean season of 2 months every year by open excavation as follows:

Net quantity of silt required to be dumped	= 4,00,000 m^3
In one season, the quantity of silt required to be removed	= 1,00,000 m^3
Working period available in the above 2 months	= 50 days
Silt removal quantity per day of 10 hrs duration (between 8.00AM to 6.00PM)	= 2000 m^3
Vehicle (Tipper) trips / day @ 5 m^3 / Tipper trip	= 2000 / 5 = 400
Number of Tippers required @ 25 trips / vehicle	= 400/25 = 16 Tippers.
Number of poclains for excavation & loading for 400 Trips	= 4 Nos.

Sufficient work fronts are available for the operation of 4 Nos of Poclains for excavation and loading into tippers from four different locations continuously throughout the 50 working days available in the lean season of every year. The balance quantity can be removed in a phased manner during the next 3 year lean season periods.

iii. Activities proposed at dumping yard sites after depositing the silt:

Protection walls, wherever necessary, to retain the dumped silt in the dumping yard site, Gabion wall at the periphery of the dumping yard site for slope protection, longitudinal drain in the dumping yard, before dumping the silt for draining the surface water by using 1 meter dia. perforated Hume pipes and filter media around the pipes. Finally, laying of grass for slope turfing works and planting various types of tree saplings have also been proposed.

2. Catchment area treatment works:

To keep the flow of silt from reaching the reservoir, series of check dams are being proposed on the upstream of the weir.

3. Advantages of Removal of silt:

Completion of total silt removal works will result in,

a) Retrieval of lost storage capacity of 0.45 Mm^3.
b) Apart from increasing the storage capacity of the reservoir it also improves the Tiger habitat, improves the embedded eco system, micro climate of the surrounding environment inside the Kalakad Mundunthurai Tiger Reserve.
c) Both the Servalar Power House (1×20 MW) and the Papanasam Power House (4×8 MW) can be operated continuously, during peak hours, without any intermittent stopping/ without surplussing of water over diversion weir.
d) The operation head of water at the diversion weir will be retrieved back to its original position.
e) The quality of water gets improved resulting in lesser abrasion to the turbine blades at Papanasam Power House.
f) Since the water holding capacity of the reservoir is increased, frequent spill over without power generation is restricted.

As the proposed work of removal of silt is to restore the reservoir's original storage capacity (and not for increasing the storage capacity), this work is essentially required to be carried out.

There is no alternate arrangement for the above work other than those proposed above.

Detailed Project Screening Template (DPR) has been prepared by TANGEDCO, reviewed by the Central Water Commission and approved by the World Bank.

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