



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

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ABSTRACT

Sengulam Hydro Electric Project - Rectification/Replacement of High Pressure and Low Pressure Penstocks & allied works and R&M of Butterfly Valves based on the RLA study report of M/s. Central Power Research Institute - Administrative Sanction -Orders issued.

CORPORATE OFFICE (SBU-G/C)

B.O (DB) No. 536 /2019 (DGC / AEE-II / Sengulam /2018) Tvpm.

Dated. 11 .07.2019

- Read:-
1. Note No. CE(CC-S)/SRN/DESIGN/19-20/224 dated 11.4.2019 of the Chief Engineer (CC- South), Thiruvananthapuram.
 2. Note No. DGC/AEE-II/ Sengulam/2018 dated. 06.05.2019 of the Chairman & Managing Director, KSEBL.
 3. Proceedings of the 47th meeting of the Board of Directors held on 29.06.2019. (Agenda Item No. 7-6/2019)

ORDER

The Sengulam Hydro Electric Project, 48MW (4x12 MW) was commissioned in 1954 for the generation of electricity by utilising the tail race water of the Pallivasal Project.

The generating units in the Sengulam Power Station were renovated during 2000-2002 and re-commissioned with an enhanced capacity of 51.2 MW (4x12.8 MW). The water conductor system of the project consists of one Low Pressure Penstock (LPP) of length 2730 ft & diameter 8.5 ft from tunnel exit to surge and two High Pressure Penstocks (HPP) each of length 3140 ft & diameter 58 inches, from the valve house to the Power House.

The Chief Engineer (CC-South) vide note read as 1st above has reported that, during RMU works of machines of Sengulam HEP, no repair or modifications were made to the Intake, Penstocks, Butterfly valves, Surge shaft and allied water conducting systems, which are installed almost 64 years back. Due to this, leakages are occurring at several points of the Penstock. Hence, M/s. CPRI was entrusted to carry out the Remaining Life Assessment (RLA) study of the Penstocks by the Chief Engineer (Generation) and they have submitted the report on 22.05.2017. Subsequently, the Board vide B.O. (FTD) No. 2024/2018 (DGE/G3/Sengulam-penstock/2018-19) dated 20.12.2018 had authorised the Civil Design wing under the Chief Engineer (CC-South) for arranging inspection of the HPPs and LPP and for preparing design and estimate for the rectification/ replacement works of the above and the PED wing under the Chief Engineer (Generation & Projects - Electrical Designs) for preparing design and estimate for the R&M of Butterfly valve of Sengulam HEP, on the basis of the report from M/s. CPRI.

After conducting various tests, M/s. CPRI in their report, stated that the RLA of penstock was arrived based on its physical condition, remaining thickness, rivets joints corrosion, weld

integrity, civil structure conditions, laboratory analysis of corrossions and micro structures, friction plate effectiveness and design compliances.

In view of the recommendations of M/s. CPRI and after conducting the inspection by the Design wing, the Chief Engineer (CC-South) has suggested

- a) to replace the Penstock in full as a one-time replacement as against the recommendation of CPRI to replace some portion immediately and others in phased manner.
- b) to provide manholes in between anchors since no manholes are provided in the Penstocks.
- c) to replace corroded steel plate at the saddle supports.
- d) to rectify the damaged concrete portion.
- e) to cut the Penstocks at a distance of 60 cm from each anchor, and strengthening this portion additionally.

The Chief Engineer has also reported that the estimate of the subject work is prepared as per current rates (DSOR 2016 + Cost Index) using PRICE software. The estimate for rectification / replacement of HPPs and LPP of Sengulam HEP is prepared in two appendices - Appendix I for penstock civil works amounting to Rs.6,81,25,209/- and Appendix II for penstock fabrication works amounting to Rs. 72,08,22,705/-. A lumpsum provision of Rs. 3,00,000/- is also provided in the estimate for conducting hydrostatic test of HPPs. An amount of Rs.31,24,967/- is provided to meet unforeseen and contingencies. Accordingly the total estimated cost of rectification / replacement of HPPs and LPP of Sengulam HEP excluding GST comes to Rs. 79,23,72,881/- (Rupees Seventy Nine Crore Twenty Three Lakh Seventy Two Thousand Eight Hundred and Eighty One only). The applicable GST @ 18% comes to Rs.14,26,27,119/- (Rupees Fourteen Crore Twenty Six Lakh Twenty Seven Thousand One Hundred and Nineteen only). Hence the total estimated cost including GST comes to Rs.93,50,00,000 (Rupees Ninety Three Crore Fifty Lakh only). The work is proposed to be completed in 24 months.

The estimate for the design, supply, erection and commissioning of 2 No's Butterfly Valves with fully automated driving system for the project as furnished by the Deputy Chief Engineer (Projects- Electrical Designs) including GST comes to Rs.3,50,00,000/- (Rupees Three Crore Fifty Lakh only).

Accordingly, the total estimated cost of rectification/replacement works of Sengulam HEP including GST comes to Rs.97,00,00,000/- (Rupees Ninety Seven Crore only).

The Chief Engineer has also stated that, considering the deteriorated condition of the existing penstock and its leakage, the rectification / replacement works are to be executed urgently and hence requested to accord Administrative sanction for an amount of Rs.97,00,00,000/- (Rupees Ninety Seven Crore only) including GST with a time of completion of 24 months for the subject work of Sengulam Hydro Electric Project.

The Government in Power Department vide letter No.145/B2/18/PD dated 01.01.2019 directed KSEBL to replace the old penstock pipes of Sengulam Power House, which was commissioned in 1954.

The matter was placed before the 47th meeting of Board of Directors held on 29.06.2019 vide note read as 2nd above. While discussing the agenda, the Additional Chief Secretary (Finance) opined that the butterfly valves are available indigenously and to explore the possibility of adopting indigenous items with a view to get reasonable and prescribed quality. It was also directed that lowest prevailing market rates alone need to be considered for estimation. After discussion, the Board,

Resolved to accord Administrative Sanction for the rectification / replacement of penstocks and allied works and Butterfly valves of Sengulam Hydro Electric Project for an amount of Rs.97,00,00,000/- (Rupees Ninety Seven Crore only) including GST based on DSOR 2016 + cost index with a time of completion of 24 months.


Orders are issued accordingly.

By Order of the Director Board,

Sd/-

Lekha .G
Company Secretary i/c

To

 The Chief Engineer(Civil- Construction South)

Copy to:

1. The Chief Engineer(Generation &PED), Moolamattom.
2. Financial Adviser/ The Chief Internal Auditor
3. The RCAO/RAO
4. The Deputy Chief Engineer(IT)
5. TA to CMD/ TA to Dir(GC & HRM)/ Dir(CP,GE,SCM & S)/ Dir(T&SO)/Dir(D&IT)
6. PA to Dir (F)/ Company Secretary ✓
7. FC Supt/ Librarian
8. Stock file / File

Forwarded / By Order


Assistant Executive Engineer

