JAMERI HEP(60 MW) - Brief Summary

INTRODUCTION : Jameri Hydro Electric Project (60 MW) is envisaged as a Run of River Scheme (RoR) on River Tenga in West Kameng Dist. of Arunachal Pradesh and identified as an upstream development of Tenga Dam .The project shall be developed between El. 1060 m(FRL) & El. 800m(TWL). The project proponent, i.e. M/s KSK Energy Ventures Ltd , entered into a MoA with the Govt. of Arunachal Pradesh on 27th December 2007 for implementation of the project. Subsequently SPV in the name & style KSK Jameri Hydro Power Pvt. Ltd. has been incorporated for implementation of the project. The validity of ToR Dt. 25.10.2010 for EIA/EMP studies as issued earlier with its extensions by MoEF was up to 24.10.2015.The Survey & Investigation works of the project are completed and preparation of DPR is in advanced stage . While the Base line Data collection is completed, the Land & Socio Economic Survey including property survey & Public Hearing is remaining , for which the Project Proponent seeks fresh ToR.

FEASIBILITY STUDY: Feasibility Study Report of the project was prepared in April 2010 with proposed Installed capacity(IC) of 90 MW . However with further advancement on study of the project and approved Hydrology (by CWC), the IC is now being proposed as 60 MW (2x30MW) with basic project parameters remaining unchanged. The Engineering and Environment Consultants of the project are Tata Consulting Engineers (TCE) and R S Envirolink Technologies Pvt. Ltd. respectively.

LOCATION OF PROJECT : Jameri HEP is located on the Tenga River in the West Kameng District of Arunachal Pradesh . The main control structures of the Project are located in the Jameri Tehsil of the West Kameng District. The coordinates of the dam axis and those of the power house centre line are 27°12′0.32″ N and 92°36′1.39″ E and 92°38′58.89″E and 27°12′51.89″N respectively. The dam site is on the east of Jameri village whereas the power house is on the south-west of Gohainathan village and north-east of Khuppi village.

PROJECT VICINITY: The Tenga Dam of NEEPCO's Kameng HE Project is located downstream of Jameri HE Project. The FRL of Tenga Dam is at EL 770.6 m. In the upper reaches, 13 MW Phudung HE Project is envisaged by an Independent Power Producer with its TWL at El. 1735 m. In the light of the plan of overall development of the Tenga River basin, it is found that Jameri HEP fits well within the plan for utilization of head between EL 1060 m and EL 800 m which are the boundary limits of the Project as per the MoA.

PROJECT APPROACH : The Project can be approached from Bhalukpong on the border of Assam and Arunachal Pradesh by NH-52 up to Nag Mandir (close to Jameri) via Tippi, Pinjoli, Krishna, Sessa, Sedol, Nechiphu Pass and Dedza and further beyond by a Jeepable road up to Jameri Staging Hut in the Jameri village. Jameri is about 90 km from Bhalukpong. The Dam Site can now be accessed on foot by a steeply descending trace path taking off from a Jeepable road from Nag Mandir to Buragaon. The power House site can be accessed on foot from an existing metalled road connecting Pinjoli to the Bichom Dam site of the ongoing 600 MW Kameng HE Project , presently being implemented by NEEPCO.

HYDROLOGY : The Catchment Area of the Project is 958 Sq. Km Average rainfall is 2000mm. For hydrological analysis, daily discharge data recorded at Central Water Commission (CWC)'s Jameri G&D site only were used. In order to derive data for the water year 1979-80, observed discharge data of the Bichom River in the neighbouring basin were suitably transposed using appropriate regression relation by following suggestions of CWC. Based on the derived discharge data series of 12 water years, the 50% and 90% dependable year for the Project was found to be 1971-72, 1972-73 and the corresponding annual flow volumes estimated as 733.03 Million Cubic Metre (MCM) and 471.90 MCM respectively. The design flood for the spillway at the proposed dam site on the Tenga River is the Probable Maximum Flood having peak flow of 4865 Cumecs. The Diversion Flood is estimated as 47 Cumecs. Hydrology of the project is approved by CWC.

PROJECT COMPONENTS: Jameri HE Project shall comprise of a Concrete Gravity Dam having a length of 122.65 m and a maximum height of 68.5 m above the deepest foundation level. There shall be four gated spillway bays having breast wall at the top, size of radial gates being 3 nos 10.3 m (Width) × 12 m (Height) and 1no.10.3m x 13m. The reservoir created by the Dam shall have a capacity of 10.04 MCM at the MWL of EL 1060 m. The Head Race Tunnel shall be of modified horse shoe section with 3.9 m finished diameter, concrete lined, having length of about 5.2 km. Design Discharge is 26.39 Cumecs. Two intermediate Adits of 5 m diameter D-shape (one 291 m and the other 157.3 m long) have been provided to facilitate and accelerate the construction activity. The Surge Shaft shall be open-to-air restricted orifice type of 7.5 m diameter, about 36.5 m high, circular, concrete lined, with an orifice of 2.3m x3.9m. An underground steel-lined penstock of 2.75 m diameter (with 25m in the initial part & 386m after vertical shaft) shall connect the surge shaft to the surface power house. The surface power house of size 53 m × 19.5m shall accommodate two Francis turbines, each of 30 MW rating with synchronous speed of 428.6 rpm for design head of 250.28 m during monsoon and 252.28m during non-monsoon along with vertical generators of 11 kV, 50Hz. A 110 m × 65 m outdoor switchyard having double main bus type arrangement shall be located in the vicinity of the powerhouse. Total requirement of Land is estimated as 134 Ha out of which Forest & Govt. land shall be approx. 33 Ha. Submergence area is approx. 60 Ha.

POWER POTENTIAL: From power potential studies, it was found that, with the installed capacity of 60 MW, minimum peaking capability of 3 hours could be obtained in a 90% dependable flow year and the plant could be considered as a peaking station. The total annual energy from the Project with 95% machine availability in the 90% dependable year is estimated as 197.74 GWH and the net saleable annual energy, considering 1% for auxiliary consumption and transformation losses and 13% Royalty to the State Government, estimated as 170.31 GWH.

SEISMICITY: As per the Seismic Zoning Map of India (IS 1893(Pt-1):2002), the whole of the North East including Arunachal Pradesh has been placed in Zone V. Although the IS Code suggests design seismic co-efficient based on Maximum Considered Earthquake, yet these values may be taken only for preliminary designs and to be firmed up during the preparation of the DPR by carrying out study for site specific earthquake parameters.

GEOLOGICAL CONSIDERATION FOR COMPONENTS LOCATION: The dam site, is located about 1 km east of the Jameri village. Both banks of the river at this site are covered by steep rocky slope for a stretch of about 250 m. Within this stretch, at two locations, the river cross sections are very narrow and are made up of hard and massive rock exposed in both banks covering up to about 30-50 m height above the river bed. The exposures of rock in this stretch comprise quartzo-feldspathic gneiss and porphyritic gneiss of Bomdila Group. The water conductor system of the project shall be located on the right bank of the Tenga River and is generally expected to pass through banded gneiss of Bomdila group. Some part of head race tunnel, surge shaft and penstock shall be located in Gondwana group of rocks. Except for Gondwana group of rocks, the tunnel is expected to have fair to good tunnelling media away from thrust/ shear zones. The power house and switchyard , on the right bank of the Tenga River , is located in Gondwana group of rocks and comprises of alternate sequence of sandstone and carbonaceous shale with coal partings and small bends.

ENVIRONMENT: There is no National Park, Wildlife Sanctuary or nature/biosphere reserve within or in close proximity to the Project area of Jameri HEP. Although trees and shrubs exist in the submergence area, the project proponent shall adequately compensate for the forest to be lost in the submergence area by adhering to the mandatory procedures for ensuring compensatory afforestation. Human settlements containing dwellings, houses or hamlets are scanty in the submergence area and in the location of project components. However, Relief & Rehabilitation measures to be adopted by the project proponent shall be in line with the established policies and norms of relevant authorities. Subsequent to Land & Socio Economic population survey, project proponent shall ensure that the local population is adequately compensated for the cultivable land and vegetation lost in the submergence area and in the

location of project components. As a consequence to the development of the project, the socio economic condition of the local people of villages in and around the Project area shall improve. Local people shall also get employment in the Project, primarily during construction, and also during Operation & Maintenance stages. Implementation of Environmental Management Plan and Catchment Area Treatment plan shall mitigate any adverse impact in the Project area and shall reduce soil erosion, improve forest resources and cause economic uplifting of the project area in general.

PROJECT DEVELOPMENT PERIOD: The works of developing the requisite infrastructure for the project and of carrying out necessary pre-construction activities shall be undertaken subsequent to the approval of the DPR. Thereafter the completion of project shall take 4 Years.

COST OF PROJECT: The total cost of the project has been estimated as Rs 540 Cr. based on price level Sept.2015.

ECONOMIC AND FINANCIAL EVALUATION : For economic appraisal and financial evaluation, the latest Guideline No. L-7/1459160/2008-CERC dated January 19, 2009, issued by CERC, has been used. Relevant parameters for financial evaluation are as follows:

a) Pre-Construction Period- six months after approval of DPR which as of now is expected by Dec.2016

b) Construction Period 48 months

c) Plant useful life 35 years

d) Debt-Equity Ratio 70:30

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