PROJECT INFORMATION AND EVALUATION CRITERIA FOR SHORTLISTING OF CONSULTANTS

1. Project Information

Introduction:

Upper Arun Hydroelectric Project (UAHEP) is a peaking Run-of River type hydroelectric Project. The project site was identified during the master plan study of Koshi River Water Resources Development in 1985. The site was subsequently the subject of a reconnaissance study conducted by the NEA in summer of 1986. In 1987, the first phase of the feasibility was carried out by Morrison Knudsen Engineers (MKE). The Joint Venture of Morrison Knudsen Corporation, Lahmeyer International, Tokyo Electric Power Services Co. and NEPECON completed the Feasibility Study Phase II in December 1991 under the financing services provided by UNDP.

The Updated Feasibility Study Report (UFSR) of the project was prepared in May 2021. The JV of Changjiang Survey, Planning, Design and Research Co. Ltd and Sinotech Engineering Consultants Ltd. in association with Soil Test (P) Ltd. has carried out the UFSR in financial support of World Bank under IDA credit.

Upper Arun Hydroelectric Project (UAHEP)

Location and Access:

The Project is located at Sankhuwasabha District, Province-1, along the Arun River in Nepal. The project area is situated between 87°20'30" and 87°26'45" East and Latitude 27°40'18" and 27°45'25" North. The proposed dam site is located in a narrow gorge about 350 m upstream of the confluence of the Arun River with Chepuwa Khola near Chepuwa Village in ward no 2 of Bhotkhola Rural Municipality. The powerhouse lies in Chhongrak Village, ward no 4 of Bhotkhola Rural Municipality near the confluence of Arun River with Leksuwa Khola.

The Project is located approximately 200 km east of Kathmandu and approximately 140 km north of Biratnagar. Fair weather motorable access is available to the project area at present. The road from Num Bazaar to the UAHEP powerhouse site is about 35 km, which is under construction under North-South Koshi Road Project of Department of Roads. This part of the road is expected to be constructed to the extent of gravel road (all weather road) in near future. Furthermore, access road of about 21 km including a road tunnel of 2.02 km and a bridge across the Arun River will be required to reach the dam site of the project.

Salient Features:

The salient features of the Project based on the Updated Feasibility Study Report, 2021 are as follows:

Purpose:	Electricity generation to fulfill domestic demand; sell surplus to neighboring countries
Hydrology:	
Catchment area of Arun Basin	30,400 km²
Annual average flow	217 m3/s
Average annual runoff	6.85 billion m3
Probable Maximum Flood (Dam site/ Powerhouse site)	4,990 / 6,060 m3/s
100-year Flood	2,620/2,980 m³/s
Glacial Lake Outburst Flood (Dam site/ Powerhouse site)	7,596 / 9, 852 m3/s
Sedimentation:	
Annual average suspended sediment	13.81 x 106 t/yr
Reservoir Characteristics:	
Full supply level	El. 1,640 m
Minimum operating level during peaking	El. 1,625 m
Storage under full supply level	5.07 million m3
Storage under minimum operating level during peak	2.66 million m3

Peaking pondage (live storage)	2.41 million m3
River Diversion During Construction:	
Diversion flood	a) Flood with 20-year return period b) 203 m³/s in dry season, and 1950 m³/s in monsoon season
Dimension of diversion tunnel	7 m×8 m (W×H)
Length of diversion tunnel	490.41 m
Cofferdams	a) Upstream overflow rock fill cofferdam: height of 12 m, scouring prevention by RCC, seepage control by concrete secant pile wall b) Downstream overflow rock fill cofferdam: height of 5 m, scouring prevention by cast-in-situ concrete, seepage control by concrete secant pile wall
Dam	
Type	Concrete gravity dam
Dam Crest elevation	1,653 m
Dam Crest length	183 m
Maximum dam height	100 m
Crest length of overflow dam section	97 m
Crest length of non-overflow dam section	86 m
Top width of dam	15 m
Power Intake:	
Type	Dam intake with a skimming wall
Size of the orifice and Number	6.7 m×8.64 m (W×H) × 1 Pc
Sill elevation	1,606.80 m
Spillway:	
Type	a) Four 6m×6m (W×H) low-level outlets with invert elevation of 1,590m b) Two 6m×6m (W×H) mid-level outlets with invert elevation of 1,596m c) Seven 11m-wide bays of free overflow spillway with crest elevation at 1,640m
Discharge Capacity	Four low-level outlets: 3,633 m3/s at 1,640m Two mid-level outlets: 1,691 m³/s at 1,640m Free overflow spillway: 5,015 m³/s at 1,650m
Type	Concrete gravity dam
Sediment Bypass Tunnel:	
Type	Free flow tunnel
Design discharge capacity	815 m3/s
Cross section of sediment bypass tunnel	Inverted D-shape with width of 9 m, height of 10.8 ~ 14.0 m
Length of sediment bypass tunnel	1.4 km
Low Pressure Headrace Tunnel:	
Number	1
Length	8,362 m
Section net diameter	8.40 m
Lining type	Concrete lining
Flow velocity	4.29 m/s
Surge Tank:	
Type	Open surge tank with restricted orifice with 4.3m diameter
Inner Diameter	20 m

Height	90.5 m
Pressure Drop Shaft:	
Section Diameter	7.3 m
Elevation	El. 1095-1577.8 m
High Pressure Headrace Tunnel:	
Length	39m (Main pipe) 31~69m (Branch pipe)
Diameter	6 m (Main pipe) 4.2 m, 3.5 m, 2.5m (Branch pipe)
Type	Steel lining
Powerhouse:	
Type	Underground
Dimension	230.05 m×25.7 m×59.43 m (L×W×H)
Installed elevation of turbines	EL. 1,095 m
Unit bay length	28.80 m
Electromechanical Equipment:	
Turbine	6 x @173.33 MW
Generator	6 x @15.75 kV; 201.2 MVA; 0.90 pf
Transformers:	19 Nos. 15.75/400 kV @68 MVA Single phase
Transmission Line:	
Length	5.8 km (2 x 400 kV to Arun Hub)
Voltage Level	400 kV
Roads:	
Access road	23 km (including a 80m long bridge and a 2km long tunnel)
Project road	15.2 km
Power and Energy Generation18:	
Installed capacity	1,040 MW
Firm capacity	697 MW (Q95 inflow; 6 h daily peaking)
Average energy output19	4,512.6 GWh
Dry season peak energy	833.9 GWh
Dry season off-peak energy	416.1 GWh
Dry season energy /total energy ratio	27.7%
Wet season peak energy	956.4 GWh
Wet season off-peak energy	2,306.2 GWh
Plant factor	49.5%
Project Cost Estimate:	
Hydropower complex project	1,309.25 USD million
Transmission line project	8.54 USD million
Main Access from powerhouse site to headwork site	59.52 USD million
Total static project cost (CAPEX)	1,377.31 USD million

Construction Period:	
Total construction period	68 months (excluding the access road period of 27 months)
Economic Evaluation:	
Static cost per kW	1,324 USD/kW
Levelized Cost of Energy	3.9 US¢/kWh
Net Present Value (NPV)	577 USD million
Economic Internal Rate of Return (EIRR)	16.5%
Benefit-Cost Ratio	1.8

2. Short Listing Procedures

UAHEL invites eligible consulting firms ("Consultants") having satisfactory performance in the previous similar assignments to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. All the Consulting firms including JV partners must have working experience and been legally registered for at least fifteen (15) years from the last date of submission of EOI.

The long list will be prepared only of those consulting firms that have submitted Expressions of Interest (EOI) within the required deadline. The evaluation for short listing from this long list will be carried out in three steps.

Details of evaluation criteria for short listing of the consulting firms are given below:

STEP I: PRELIMINARY SCREENING OF CONSULTING FIRMS

In this step, a preliminary screening of the received EOI applications will be carried out. Consulting firms will be evaluated on 'Pass' or 'Fail' basis. Each consulting firm must 'pass' each and every threshold criterion mentioned below. Any consulting firm not complying with any of the specified threshold criteria will be failed/ disqualified and will not be considered for further evaluation.

A. General Threshold Criteria

(i) EOI application shall be duly submitted by the last date and time of submission as mentioned in the notice of REOI;

(ii) Copies of following documents shall be submitted along with the EOI proposal;

- Certificates of incorporation or Registration of the consulting firm.
- Audited Financial Statements of the preceding seven consecutive fiscal years.
- Company Profile

(iii) At the time of submission of EOI application, consulting firms must not be debarred by the World Bank or any Multilateral Banks.

(iv) Consulting firms must have working experience and been legally registered for at least fifteen (15) years from the last date of submission of EOI;

(v) Minimum average annual turnover of the best five years of the preceding seven consecutive fiscal years but not earlier than the year 2014 shall be US$ 10 Million. In case of JV, cumulative strength of JV partners will be evaluated for annual turnover. Consulting firm or JV firms not meeting this criterion will not be considered for evaluation.

B. Technical Threshold Criteria

Evaluation under these criteria will be based on the hydropower projects which are **constructed and commissioned**. Planned and under construction projects will not be considered for evaluation. All of the criteria listed below could be fulfilled by one single project or separate projects. Only those projects completed in the **last twenty (20) years** preceding from the last date of submission of EOI will be considered for evaluation.

i) Consulting firms must have the experience of successful completion of detailed engineering design of at least one (1) hydroelectric project of installed capacity of 500 MW or more;

ii) Consulting firms must have the experience of successful completion of detailed engineering design of at least one (1) roller compacted concrete (RCC) dam in hydropower project;

iii) Consulting firms must have the experience of preparation of Tender Document of at least one (1) hydroelectric project of installed capacity 500 MW or more;

iv) Consulting firms must have the experience of completion of construction supervision of at least One (1) hydroelectric project of installed capacity of 500 MW or more;

Notes:

Consulting firms' work experiences shall be evidenced by copies of client's references with contact addresses on the letterhead of the client's organization and shall be written in English. If the references are in other languages, it shall be accompanied by an accurate translation into the English language. Experience gained by the Applicants shall only be considered and not that of the mother firm.

C. Threshold Criteria for Joint Venture (JV) Firms

i) The lead partner of the JV firm must have at least 40% of the share of the present assignment, and each partner must have at least 25% of the share of the present assignment.

ii) Each partner of the JV firm shall meet at least one of the criteria mentioned in B (i) through B (iv) above.

iii) Each partner of the JV firm shall meet the criteria mentioned in A (ii), A (iii) and A (iv) above.

iv) The combined experience of the JV partners shall meet all the Criteria mentioned in B above.

v) JV firms shall submit the JV Agreement or memorandum of understanding (MOU) of JV Agreement or intended JV Agreement, along with their EOI application clearly indicating the tasks assigned to each JV member and the identification of the Lead JV Member.

vi) An applicant must not submit more than one (1) EOI application either as a single entity or as a partner in the JV.

Notes:

i. The Consulting firms not complying with the threshold criteria mentioned above in A, B and C will not be considered for shortlisting.

ii. Qualification and experience of the consulting firm associated as sub-consultancy will not be considered for evaluation for shortlisting.

STEP II: DETAILED EVALUATION OF CONSULTING FIRMS

The Consulting firms fulfilling all requirements in Step I are further evaluated in Step II. The Management competency of Consulting firms, quality assurance/control plan, organizational strength, experience of in the field of hydropower and experience in Asian countries shall be considered in the evaluation. The following criteria will be considered for shortlisting:

Criteria 1. Management Competency of Consulting Firm

The management competency of the Consulting firm will be evaluated based on availability of quality certificate, quality assurance/control plan, organizational strength (relevant technical and managerial staff in house).

The assessment will be based on the following:

1. Company Quality Certification
2. Quality Assurance / Control Plan of the Consulting firm
3. Organizational Strength (relevant technical and managerial staff in house)

Criteria 2: Specific Experience of the consulting firm in hydroelectric projects

Evaluation under this criterion is based on the experience of consulting firms in hydroelectric projects in the last **twenty years (20) years** preceding from the last date of submission of EOI. Only the project successfully designed, constructed, commissioned, and currently operational will be considered for the evaluation. **Planned and under construction projects will not be considered for evaluation.** The combined experience of the JV partners will be evaluated.

1. Experience in detailed engineering design of hydroelectric projects having installed capacity of not less than 500 MW;
2. Experience in detailed engineering design of hydroelectric projects with a dam height of not less than fifty (50) m.
3. Experience in detailed engineering design of hydroelectric projects having RCC dam;
4. Experience in detailed engineering design of hydroelectric projects with a headrace tunnel of a diameter of not less than five (5) meters and a length of not less than four (4) km in a single project;
5. Experience in detailed engineering design of hydroelectric projects with an underground cavern of a width of not less than twenty (20) meters;
6. Experience in preparation of a Geological Baseline Report (GBR) for construction of tunnel/underground works preferably in the Himalayan region;
7. Experience in preparation of bidding documents of hydroelectric projects having installed capacity of not less than 500 MW;
8. Experience in construction supervision of hydroelectric projects of installed capacity not less than 500 MW;
9. Experience in construction supervision of hydroelectric projects with a dam height not less than fifty (50) m.
10. Experience in construction supervision of hydroelectric projects with a headrace tunnel of diameter not less than five (5) meters and length not less than four (4) km in a single project;
11. Experience in construction supervision of hydroelectric projects with an underground cavern of a width not less than twenty (20) meters.

Criteria 3: Geographical Experiences of Consulting Firm

Evaluation under this criterion is based on the experience of consulting firms in Detailed Engineering Design or Construction Supervision of hydroelectric projects in the last **twenty(20) years** preceding from the last date of submission of EOI in the Asian Region. Only projects successfully constructed and commissioned will be considered for the evaluation. **Planned and under construction projects will not be considered for evaluation.** The combined experience of the JV partners will be evaluated.

STEP III: SHORT-LISTING OF CONSULTING FIRMS

A maximum of eight firms will be shortlisted among all qualified firms which submitted an EOI. The World Bank Procurement Regulations for Investment Project Financing (IPF) Borrowers fourth edition November 2020 will be followed.