

INVITATION FOR EXPRESSION OF INTEREST (EOI)

1.0 INTRODUCTION

UJVN Limited is a wholly owned enterprise of Government of Uttarakhand formed in the year 2001 for hydro power generation, development of new hydro power projects and renovation, modernization & Upgradation of existing hydro power plants within the state. UJVN Limited operates hydro power plants ranging in capacity from 2.25 MW to 304 MW, of a total capacity about 1306 MW.

2.0 PROJECT IN FOCUS

Ramganga Power Project is a multipurpose river valley project constructed for irrigation, flood control and power. The project site is located about 45 kms. from the nearest rail head, Dhampur. The rain water is stored in the dam during the monsoon season every year.

Ramganga Power Station is located on the downstream toe of main dam and has three generating units of 66 MW each. Out of the two diversion tunnels, one adjacent to the power station and laid with steel penstock, controlled by a single cylindrical gate at reservoir end, feeds all the three generating units through branch penstock which trifurcates from the main penstock. Each unit is controlled by an individual butterfly valve, located inside the power station. The water is discharged directly into the tail race.

The power house was under erstwhile UPSEB before trifurcation of the Board. After trifurcation of the Board, the power Station was transferred to U.P. Jal Vidyut Nigam. Finally, on 09.11.2001 the project was handed over to UJVN Limited after creation of Uttarakhand State. The power house is being operated by UJVN Limited while dam is being controlled by U.P. Irrigation Department. The operation of Ramganga Power Station is dependent on the water releases from the reservoir according to irrigation demand. The power station is envisaged as a peaking station and daily running of the generating units is in accordance with daily releases.

A water submerged Intake Structure over a vertical shaft which in turn supplies water from vertical shaft to power tunnel and then to power house through branched penstocks has been constructed. This structure is a 6.45 meter diameter vertical tower just above the intake shaft opening & forms a bell mouth entry to the 5.64 meter dia. vertical shaft. Trash racks are located near the upstream nose of the pier at radius of 12 meter from the centre line of the shaft. To reduce the span of the trash racks, intermediate short piers have also been introduced in between the main piers for providing uniform transition to the entering flow. The tower has a dome shaped top and has been divided into two chambers by a water tight concrete slab.

The lower chamber is used for housing the cylindrical gate while the upper chamber is to accommodate the hoisting equipment for the gate. The intake chamber is connected to the top of the dam through a steel lined gallery followed by a tunnel. The purpose of the cylindrical gate is to close or open the entry of water from the reservoir to Power House. The main components of cylindrical gate are as follows:

- (i) Cylindrical Gate housed in vertical shaft below the partition slab.
- (ii) Hoist installed in Water Tight Hoist Chamber.
- (iii) Main and Auxiliary pressuring equipments in control room and hoist chamber respectively.
- (iv) Control equipments in control room and remote control panel in power house.

Other Equipments:

- (i) Air tube and butterfly valve in air tube.
- (ii) Dewatering arrangement.
- (iii) Trolley in access tunnel.
- (iv) Manhole cover in partition slab.
- (v) Trash racks.

3.0 CYLINDRICAL GATE

The gate is of cylindrical shape of 6180 mm diameter and 5489 mm height. At the centre of the gate, cross shaped frames have been provided. The cylindrical gate rests on a horizontal stainless steel seat at an El. 303.145 meter. The surface of the shaft from El. 300.800 meters to El. 304.344 meters is steel lined with 18 mm thick steel plate with suitable anchors and stiffeners embedded in the concrete.

A 202 mm wide step at an elevation of 303.145 meters has been provided, over which a 6 mm thick x 80 mm wide stainless steel plate is fixed to work as bottom seal seat. The gate rests on bottom seal seat. Flat rubber seal 12 mm thick and 100 mm wide is used for stopping water through the bottom edge of the gate. Top seal seat is a 6 mm thick and 100 mm high vertical stainless steel plate. The rubber seal is a double stem type 280 mm wide, circular in shape with 48 mm thickness in the centre and 16 mm thickness stem, which will press against the stainless steel seat.

To restrict the sway of the gate, 8 nos. billets, 4 nos. at bottom and 4 nos. at the top, on the location of the alternate piers are provided. Billet tracks, which are stainless steel plates, screwed on the pier on which the billets may strike during sway of the gate, when under operation.

At the top of cylindrical gate, 4 nos. rollers are provided to guide the rotational movement of the gate. The rollers are double flanged which are guided with the roller track placed on the surface of vertical shaft.

The **filler valve** is provided in the centre of the lower gate frame of cylindrical gate. This valve is provided to fill up the main penstock before raising the cylindrical gate up. The valve is housed in a 750 mm dia. shell which is connected to 4 nos., 200 mm diameter pipes the other end of which are connected to the skin plate of the gate. It feeds water to filler valve from reservoir. The valve opening is 500 mm. It operates through the same vertical stem, which lifts the gate.

A robust **packing gland** for piston stem passing through the floor of hoist chamber has been provided to prevent any entry of water in the chamber. This consists of a set of chevron packing with a guide bush housed in plate which can be adjusted in any direction for alignment with piston rod and gate.

A vertical **hoist** with 135 Tonne capacity has been installed just above the cylindrical gate in a water tight hoist chamber.

The hydraulic system consists of a single acting hydraulic cylinder with a built in damping device which starts functioning when the piston is 800 mm from the bottom. For operation of hoists, two pressuring equipments one in control room named as **Main Pressuring Equipment** and other in hoist chamber named as **Auxiliary Equipment** are installed. The pressuring equipment in hoist chamber is encased in a sealed chamber so that the pressuring equipment shall be operative even if water enters in the hoist chamber.

3 nos. tanks are provided for storage of oil for operation purpose of cylindrical gate. **Main oil tank** of 3000 litres capacity is installed in control room. This supplies oil or receives back, when gate is operated with main pressuring equipment. The **Auxiliary oil tank** of 1500 litres capacity is placed in hoist chamber near the auxiliary equipment and supplied or received back oil, when gate is operated through auxiliary equipment. The **Make up oil tank** is placed on the steel beam, on which hoist is installed. The hoist being single acting, the make up oil tank feeds oil to cylinder of the hoist during lowering of the gate & receives back during lifting. All the pressure pipes and return lines for cylindrical oil inside the hydraulic controls are made of seamless pipes. The pressure pipes connecting controls and cylindrical are also made of seamless pipes.

For control of various hoisting requirements limit switches are provided. The drive to limit switches is obtained through chain sprocket, one end of the chain which passed over the sprocket is connected to a suitable counter weight and the other end to the indicator shaft.

The cylindrical gate shall only be operated in balanced condition except emergency closure, if required. To ensure opening only in balanced condition, two nos. differential pressure switches have therefore been provided.

For operation of cylindrical gate, the **Main Control Panel** is installed in control room and has push buttons and indicating lamps. An **Auxiliary Control Panel** for operation of auxiliary equipment has been installed in control room which has the push buttons and indicating lamps.

Please refer enclosed drawings for details.

4.0 SCOPE OF WORK

The aforesaid cylindrical gate is in open condition and has not been in operation since Oct. 2010. It is presumed that hoist, main and auxiliary pressuring equipments and control equipments are not in operative conditions. UJVN Limited intends to make cylindrical gate operative and close it without any leakage for carrying out repair and maintenance work of machines in power house.

The scope of work shall include but not limited to:

- a) Underwater Videography after entry through the trash racks
- b) Repair of cylindrical gates, its bottom stainless steel seal seat, bottom rubber seal, top stainless steel seal seat, top rubber seal
- c) Repair of Rollers and Roller Tracks
- d) Packing gland of hoist chamber
- e) Blocking the water entry into air vent tube so as to facilitate installation of new air vent tube & butterfly valve.
- f) Repair of trash rack
- g) Any other system required to ensure perfect sealing without any leakage

Firms/contractor should submit their proven methodology to carry out aforesaid works in a fixed time frame.

Bidder is advised to visit and examine the site, its surroundings and familiarize himself of the existing facilities and environment, and collect all other information which he may require for preparing and submitting the EoI. Claims and objections due to ignorance of existing conditions or inadequacy of information shall not be considered after submission of the EoI, bidding and during implementation.

5.0 SUBMISSION & OPENING OF EOI

- 5.1 The EoI document in two copies with the required information should be submitted in a sealed envelope superscripting “**EoI for the work of Underwater Inspection & Repair of Cylindrical Gate of Ramganga Power House**” should reach the following address latest by 15:00 Hrs. on 7.09.2015:

General Manager (RM&U)
UJVN Limited,
Ganga Bhawan, Yamuna Colony,
Dehradun-248001
UTTARAKHAND
Phone: 0315 – 2530708
Fax: 0135 – 2530705

- 5.2 EoI may be sent by post/courier service or delivered personally at the tender box placed in the office as detailed above. However, UJVN Limited will not be responsible for any delay in receipt or non receipt of the same.
- 5.3 If however the above date happens to be a holiday/Bandh at Dehradun, EoI shall be received up to the next working day till 15:00 Hrs.
- 5.4 The EoI shall be opened on the same date as date of submission i.e. 7.09.2015 at 15.30 Hrs.

6.0 GENERAL NOTES

- 6.1 All the copies of documents submitted alongwith the EoI should be clear, legible and self certified by the authorized representative of the Applicant.

- 6.2 UJVN Limited reserves the right to physically check the original documents/certificates, copies of which are submitted alongwith EoI.
- 6.3 The EoI is liable to be ignored in case of submission of any misleading and false representation by the applicant in the form, statements and attachments.
- 6.4 UJVN Limited reserves the right to ignore any or all EoIs without assigning any reason thereof.
- 6.5 UJVN Limited reserves the right to curtail/enhance the scope of work stated above or cancel, if required, without assigning any reason thereof.
- 6.6 Please ensure to enclose the duly filled in Check List.

7.0 CRITERIA FOR EVALUATION & SELECTION PROCESS

The interested firms/contractors shall be called to give presentation. Based on the credentials and the presentation, the firms/contractor shall be short listed. Thereafter, the scope of the work will be finalized and bids shall be invited from short listed bidders.

8.0 ENCLOSURES

Following are being enclosed herewith to facilitate the interested firms/contractors to have better understanding of the work and help in submission of the EoI:

- a) Salient Features of the Project
- b) Drawing of relevant Structures: 6 Nos.

9.0 FORMAT OF SUBMISSION OF EoI

The EoI is to be submitted in the following format:

- a) General Information as per Format A-1
- b) Financial Details as per Format A-2
- c) Details of works and experience of similar nature underwater inspection & repair etc. carried out during the last ten years as per Format A-3
- d) Additional Information as per Format A-4

CHECKLIST**Please note:**

To help the interested firms/contractor prepare the best application, all items below need to be considered and ticked in the remarks column.

During EoI submission, please keep this page after the cover page.

(Put ✓ / x in the appropriate box under remarks column)

Have you checked and enclosed:

Sl. No.	Description	No. of Pages	Remarks
1	Format A-1		<input type="checkbox"/>
2	Format A-2		<input type="checkbox"/>
3	Format A-3		<input type="checkbox"/>
4	Format A-4		<input type="checkbox"/>
5	Photo-copies of VAT/ST Registration Certificate		<input type="checkbox"/>
6	Photo-copies of Provident Fund Registration Certificate		<input type="checkbox"/>
7	Photo-copies of IT PAN		<input type="checkbox"/>
8	Photo-copies of Service Tax Registration Certificate		<input type="checkbox"/>

Seal of Company

Signature:

Name:

Designation:

Date:

SALIENT FEATURES

1.0 LOCATION

Main Dam	41.8 km from Dhampur Rly. Station Distt. Pauri Garhwal
Power House	At the toe of Dam

2.0 HYDROLOGY

Catchment Area above Dam Site	3133.9 Sq. km
Maximum rain fall	1552 mm
Mean annual run off at Dam site	1737.97 million cu.m.

3.0 MAIN DAM

Type of Dam	Earth & Boulder Fill
Total crest length	630 m
Bed Level	258.41 m
Top Level	372.0 m
Height of dam above deepest foundation	127.5 m
Width of Dam at Top Bottom	550 m

4.0 RESERVOIR

Total storage capacity at RL 365.3 m	2442.6 million cu.m
Dead storage below RL 317.0 m	254.1 cu.m
Live Storage at RL 365.3 m	2195.5 m. cu.m
Maximum Storage level	366.2 m
Maximum reservoir level	367.9 m
Normal storage level (FSL)	365.3 m
Dead storage level	317.0 m
Submergence	78.31 sq. km
Water spread	80.13 sq. km

5.0 WATER CONDUCTOR SYSTEM

Power Tunnel

(a) Number	1
(b) Diameter	9.45 m
(c) Length	216.0 m

Common Penstock

(a) Number	1
(b) Diameter	7.925 m
(c) Length	249.24 m
(d) Discharge	235.6 cu.m/sec

Branch Penstock

(a) Number	3
(b) Diameter	4.115 m
(c) Discharge	78.53 cu. m/sec

Balancing Barrage

(a) Location	25 km downstream of power house
(b) Capacity	5000 ac. ft

6.0 POWER HOUSE

(a) Length	66.225 m
(b) Width	34.90 m

7.0 TURBINE

Type	Vertical Shaft, Francis
Maximum net head	108.85 m
Design net head	84.4 m
Maximum reservoir level	EL 367.9 m
Maximum tail water level	EL 278.0 m
Normal tail water level	EL 278.0 m
Minimum tail water level	EL 278.0 m
Normal Speed	187.5 RPM
Number of guide vanes	24

8.0 GENERATOR

Type	Umbrella, Vertical Shaft, salient pole, totally enclosed closed air circuit machine with oil and air cooler
Rating	73334 kVA, 0.9 PF, 11 kV, 3 phase, 50 c/s

9.0 POWER INTAKE GATES

Cylindrical gate has been installed within tunnel shape inlet of the power tunnel and its hoist located in a sealed chamber.

Pressuring Equipments

Type of pump & its rating	Hydraulic pump valve type constant discharge of 65 lit./min at 70 kg/cm ² pressure
---------------------------	---

Rating of motor driving the pump	15 HP, 1000 rpm
Capacity of oil tank	3000 liters
Required oil quantity in tank	2650 liters
Main control Panel	1 No.
Aux. control panel	1 No.
Valve of control panel	1 No.

Access Tunnel

Total length	203 m
Sloping length	134.369 m
Slope	1:4
Dewatering arrangement	At EL. 318.00 m
Size of sump	1500x1500x2000mm deep
Motor 15 HP	1 No.
Submersible Pump 7.54 HP	1 No.
Dia. of air tube	1000 mm
Location of BFV valve in air tube	41.5 m d/s of hoist chamber
Centre line of air tube opening	El. 370.00 in wall block 102 of chute spillway

Hoist Chamber

Type	Sealed Chamber
Diameter	6980 mm
Floor level	318.00 m
Top of dome	330.008 m
D.P. Switch	2 Nos.
Inspection Bucket	3.5 m long and 500 mm
Man hole opening	800 mm
Length of indicator shaft	5455 mm
Measuring scale	5500 mm
Makeup oil tank	1 No.
Chain cover sprocket	1 No.
Valve operation mechanism	1 No.
Gear set	1 No.

Pressuring Equipments (Aux. Control)

Type of pump & its rating	Hydraulic pump valve type, constant discharge of 65 litres/min. at 70 kg/cm ² pressure
Rating of motor driving the pump	15 HP, 1000 rpm
Capacity of oil tank	1500 litres
Required oil quantity in tank & pipe	1350 litres

HOIST

Capacity of hoist	135 Tonnes
Length of cylinder	6.2 m
Dia. of cylinder	510 mm
No. of hoist cylinder part	2 Nos.
Design pressure for hoist cylinder	70 kg/cm ²
Diameter of piston Steve	120 mm
El. of top of hoist supporting steel beam	325.018

GATE

Dia. of gate	6.18 m
Height of gate	5.489 m
Dia. of gate chamber	6474 mm
Lift from full closed position to full open position	5440 mm
Lift of filler valve assembly	120 mm
Dia. of filler valve opening	450 mm
Total weight of gate	55 Tonnes
Bottom rubber seal (flat rubber seal)	12 mm thick solid bulb double stem rubber seal with water pressure acting on it for positive sealing
No. of billets	4 Nos. billets at bottom & 4 Nos. at top on each alternate pier
Guide rollers	4 Nos. rollers located at the top of the gate, which travel on the roller tracks
Gate lifting speed	0.35 meter/minute
Gate lowering speed	0.35 meter
Normal closing time	15.0 minutes
El. of top gate opening	308.145 m
El. of bottom sill	303.145 m

TRASH RACK

Nos. of trash rack	16
Size	3.75 x 5.49 m