





	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 1 of 11

TECHNICAL SPECIFICATION FOR INSERTION TYPE ULTRASONIC FLOW MEASUREMENT SYSTEM

REV.NO.		DISTRIBUTION	QTY.	APPROVED:		
PREPARED				 मनीष साहू / MANISH SAHU अपर महाप्रबंधक / Addl. General Manager एच.पी.ई. विभाग / H.P.E. Division बी.एच.ई.एल., भोपाल / BHEL, Bhopal		
CHECKED		HPE	01	PREPARED	CHECKED	DATE
APPROVED		MM(H)	04	 रश्मि गौर / RASHMI GOUR प्रबंधक / Manager एच.पी.ई. विभाग / H.P.E. Division बी.एच.ई.एल., भोपाल / BHEL, Bhopal RG	 विक्रम कुमार नामदेव / V.K. NAMDEO अपर महाप्रबंधक / Dy. General Manager एच.पी.ई. विभाग / H.P.E. Division बी.एच.ई.एल., भोपाल / BHEL, Bhopal VKM	12.05.2025

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 2 of 11

PROJECT: ARUN-III HEP, NEPAL

1. SCOPE:


SL. NO.	ITEM DESCRIPTION	QUANTITY
1.	Supply of 8-path insertion type externally mounted Ultrasonic flow measurement system as per detailed scope of supply clause no. 3	4 Sets
2.	Supply of 8 nos. insertion type externally mounted sensors as spares for Ultrasonic flow measurement system	1 Set
3.	Supply of 2-path insertion type externally mounted Ultrasonic flow measurement system for over velocity protection, tripping and flow measurement as per detailed scope of supply clause no. 3	2 Sets
4.	Installation of 2 sets of 8-path Ultrasonic flow measurement sensors and 1 set of over velocity protection, tripping & flow measurement sensors at Arun-III HEP, Nepal	1 Lot
5.	Commissioning of 2 sets of 8-path Ultrasonic flow measurement system and 1 set of over velocity protection, tripping & flow measurement system at Arun-III HEP, Nepal	1 Lot
6.	Installation of remaining 2 sets of 8-path Ultrasonic flow measurement sensors and 1 set of over velocity protection, tripping & flow measurement sensors at Arun-III HEP, Nepal	1 Lot
7.	Commissioning of remaining 2 sets of 8-path Ultrasonic flow measurement system and 1 set of over velocity protection, tripping & flow measurement system at Arun-III HEP, Nepal	1 Lot

2. APPLICATION:



8-path Ultrasonic Flow Measurement System (Acoustic type) asked in this specification are to be used individually for continuous on-line monitoring of flow passing through the Turbine in all the 4 units. Externally Mounted Insertion Type Turbine Flow Meter in '4-Planes 8-Paths with 16 sensors' shall be provided in each Penstock for measurement of flow. The Turbine Flow Meter shall be supplied, installed and commissioned in accordance with IEC-60193, Appendix J for each Turbine for measurement of flow. The supplied instrument shall be compliant to IEC 60041-1991 and shall be suitable for dam/river water applications with high silt content.

The flow meter system supplied shall include all the equipment and interconnecting wiring required to measure the flow rate & flow velocity for displaying the measured values. The interconnecting cables between the transducers (sensors) and the flow meter system shall be properly shielded to keep the transducer signal free of undesirable noise normally encountered in a Hydro Power House. The Flow meter shall measure Flow velocity and totalize the volume of Flow to a **guaranteed accuracy of $\pm 1\%$** or better compliant to IEC-60041 requirement.

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 3 of 11

The equipment shall indicate flow rate through each Penstock via local display at flow meter console, the path velocity, signal strength and mean velocity in the pipe, 4-20 mA analogue output for the flow rate of each pipe and suitable communication port for data transfer and PC interface. Necessary power supply backup UPS with battery (power backup of approximately 1 hours) to be supplied along with device.




The 2-Path Over Velocity Detection, Tripping & Flow Measurement system Device shall use Externally Mounted Insertion Type Ultrasonic Sensors installed near Penstock Guard Valve.

The flow measurement system shall not get affected by suspended solids like silt / pebbles etc in the Penstock water. The signals from the 8-Path Flow Meters installed near Turbine shall be summed and compared with the Flow Measured by this flow meter installed near Penstock guard valve.


An alarm shall be given when the difference in flow exceeds 5% of maximum Penstock flow. Further, the units shall be stopped and Penstock Valve shall be closed when the difference in flow exceeds 10% (Penstock Burst Condition). The over velocity protection system shall provide the potential free contacts for alarm and tripping the penstock valve. The system shall also be used for Over velocity trip mechanism to detect rupture of the Penstock. This shall actuate closing solenoid of the Penstock Valve, when the velocity of water exceeds a pre-determined value (in addition to the Penstock differential flow condition stated above). The alarm and trip contacts of the over velocity protection system should have provision to configure with "On delay" of (0~300 seconds, adjustable).

The mechanism shall be so designed as to make easy and accurate adjustment for operation on overload. The adjustment shall be free from ageing effect and shall have no chance of Penstock vibration disturbing adjustment or causing faulty operations. The Penstock rupture device shall operate even during power failure. Necessary power supply backup UPS with battery (power backup of approximately 1 hours) to be supplied along with device. The Instrument shall measure Flow velocity and totalize the volume of flow to a **guaranteed accuracy of $\pm 1\%$** or better compliant to IEC- 60041 requirement.


	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 4 of 11

3. DETAILED SCOPE OF SUPPLY:

SL. NO.	ITEM DESCRIPTION	QTY	EACH SET COMPRISING OF
1	8-Path Insertion Type Externally Mounted Ultrasonic Flow Measurement System	4 Sets	<p>(a) Flow Meter Console - With Digital Signal Processing, IP65/ NEMA6X Wall Mounted Enclosure, 2 Line Front Panel Display, 8-Path Flow Measurement Capacity, Measuring Range For Up To ± 15 m/s, Cabinet to be inclusive of internal Surge Protection, 4-20mA isolated Output Channels, Communication Modbus RTU, Modbus TCP, IEC 60870-5-104, Embedded Computer Module, Internal Data Logger, Watchdog Timer, Web Interface / browser, no software required, independent of operating system, With UPS along battery backup.</p> <p>(b) 16 Number Insertion Type Sensing Feed Through Transducers (Sensors) suitable for 40 bar pressure, Penstock Wall Thickness as specified in drawing, ± 15 m/sec Velocity, Frequency based on application and also suitable for partially filled pipe.</p> <p>(c) 16 Sets of Connectors each with 50 Meter Long cable and all the necessary hardware like cable conduits, clamps, Junction Boxes and other accessories etc required for connection of cables to Flow meter Console.</p> <p>(d) Common Items for 4 Units: Programming Tool with Software, Special Tools & Tackles required for Installation & Commissioning (Like Hydraulic Jack etc), Technical Interface Manual for O&M.</p>
2	Spare Insertion Type Externally Mounted Ultrasonic Sensors	8 Nos	<p>(a) 8 Number Insertion Type Sensing Feed Through Transducers (Sensors) as Spare suitable for 40 bar pressure, Penstock Wall Thickness as specified in drawing, ± 15 m/sec Velocity, Frequency based on application and also suitable for partially filled pipe.</p>

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 5 of 11

3	2-Path Insertion Type Externally Mounted Ultrasonic Flow Measurement System for Over Velocity Protection, Tripping and Flow Measurement	2 Sets	<p>(a) Flow Meter Console - With Digital Signal Processing, IP65/ NEMA6X Wall Mounted Enclosure, 2 Line Front Panel Display, 2-Path Flow Measurement Capacity, Measuring Range For Up To $\pm 15\text{m/S}$, Cabinet to be inclusive of internal Surge Protection, 4-20mA isolated Output Channels, Relay outputs for alarm and trip, Communication Modbus RTU, Modbus TCP, IEC 60870- 5-104, Embedded Computer Module, Internal Data Logger, Watchdog Timer, Web Interface / browser, no software required, independent of operating system, With UPS along battery backup.</p> <p>(b) 4 Number Insertion Type Sensing Feed Through Transducers (Sensors) suitable for 40 bar pressure, Penstock Wall Thickness as specified in drawing, ± 15 m/sec Velocity, Frequency based on application and also suitable for partially filled pipe.</p> <p>(c) 4 Sets of Connectors each with 50Meter Long cable and all the necessary hardware like cable conduits, clamps, Junction Boxes and other accessories etc required for connection of cables to Flow Console.</p> <p>(d) Common Items for 2 Units: Programming Tool with Software, Special Tools & Tackles required for Installation & Commissioning (Like Hydraulic Jack etc), Technical Interface Manual for O&M.</p>
4	Installation of 2 Sets of 8-Path Ultrasonic Flow Measurement sensors & 1 Set of 2 Path Ultrasonic flow measurement sensors of Over Velocity Protection & Tripping Device at ARUN-III HEP NEPAL	1 Lot	As per Clause 7.0

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 6 of 11

5	Commissioning of 2 Sets of 8-Path Ultrasonic Flow Measurement System & 1 Set of 2 Path Ultrasonic flow measurement system of Over Velocity Protection & Tripping Device at ARUN-III HEP NEPAL	1 Lot	As per Clause 7.0
6	Installation of remaining 2 Sets of 8-Path Ultrasonic Flow Measurement sensors & 1 Set of 2 Path Ultrasonic flow measurement sensors of Over Velocity Protection & Tripping Device at ARUN-III HEP NEPAL	1 Lot	As per Clause 7.0
7	Commissioning of remaining 2 Sets of 8-Path Ultrasonic Flow Measurement System & 1 Set of 2 Path Ultrasonic flow measurement system of Over Velocity Protection & Tripping Device at ARUN-III HEP NEPAL	1 Lot	As per Clause 7.0

4. SYSTEM DESCRIPTION:


a. Flow Meter Console:

The flow meter console shall be an embedded computer based multi-path, acoustic transit-time type system with digital ISP technique or equivalent.

The Flow Meter shall be capable of operating 8 acoustic paths for Measurement of Flow for 8 path flow measurement system and shall be capable of operating 2 acoustic paths for Measurement of Flow in 2 path Ultrasonic flow measurement system of Over Velocity Protection & Tripping Device.

The processing unit should have the **embedded processor** and it shall be the latest processor utilized by the manufacturer with real time OS (operating Software).

The flow meter console shall measure discrete acoustic travel times to arrive on an average velocity for each of the acoustic paths. The consoles shall evaluate each acoustic signal based on digital signal processing where the processor will have advance knowledge of the shape of the signal, which is expected, and then carries out correlation to identify the correct reflected signal and filter out all those which are distorted by reflections or reverberations.

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 7 of 11

The flow meter console shall be equipped with an Automatic Gain Control feature to ensure that all received acoustic signals are continuously amplified to useable levels without noise interference. The console shall have the feature to increase the system sensitivity if the processor detects weak signals because of silt/solid deposition on any sensor.

The console shall evaluate and display each acoustic signal received. Each travel time resulting from accepted signals shall be checked to ensure that the measured time is within user-selectable limits.

These velocity data points shall be integrated to determine the flow rate through the pipe. The method of measuring and computing water velocity shall be independent of the speed of sound in water. The calculation must include the correction of protrusion effects, change in area of cross section, etc.

Flow meter console should be equipped with the integration method for flow and average velocity calculation software as per IEC-60041 recommendation. Flow profiles influenced by size and shape of pipe, by approach flow conditions or by eddies, swirls and wall roughness etc. shall be considered for flow calculation.

The flow meter shall provide Web interface / browser. The user shall be able to enter all site-specific and operational parameters via notebook locally or remote. Parameter entry shall be aided by menu-driven, English language prompts on the unit display or through equivalent HMI application.

The Console shall be capable of storing all measurement values for a minimum time period of one year. It shall be possible to download all values from this database.

The console shall be installed in an enclosure suitable for wall mounting. The console shall be equipped LED / LCD Display with touch panel. The display shall be mounted inside of the enclosure and shall be visible without opening the front door of the enclosure.

The system shall have the capability to display individual path variables inclusive a message that indicates the type and path location of a signal interruption or transducer failure.


The system shall have the capability to display individual received signals without using a separate analogous or digital oscilloscope.

The flow meter console shall have a self-test routine that periodically checks for proper operation of the flow meter transceiver, processor, and timing functions. The system shall alert the user to any self-test or acoustic path failure by displaying an error message on the flow meter display. The flow meter shall also provide a message indicating the type and location of any acoustic path problems.

The system shall provide analogous outputs of 4-20 mA current loops representing flow rate, mean velocity, mean signal strength and water temperature in the pipe. The instrument shall provide relay outputs contact closure. An Ethernet port for use with PC type computer shall be provided.

RTU & TCP slave console shall be provided. The RTU & TCP interface shall make flow rate variable including but not limited to flow volume path velocities, gains signals to noise ratio available using standard TRU protocol.

The flow meter console shall be designated to return to full operation following a short-term power interruption with all stored operational parameters value retained.

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 8 of 11

b. Insertion Type Feed-through Transducers (Sensors):

The ultrasonic transit time sensing transducer faces shall be of wetted type in direct contact with the flowing water. Sensing transducer assemblies and mountings shall be constructed of 316L type stainless steel. Maximum design pressure rating of the feed through sensing transducer shall be 40 bars.

The sensor feed through assembly must have safety interlock in order to prevent accidental removal under pressure.

The sensors offered shall necessarily be of Stainless Steel.

Special water resistance connectors must be used for the sensors. The sensors should be capable of operating in **high silt conditions (silt concentration of 5000 ppm)**.

c. Transducer Cables & accessories:

The flow meter supplier shall furnish all cables between the transducers and the flow meter console, which shall be the Co-axial cable which are suitable for long term monitoring in the specified application. **Further accessories i.e. lugs, ferrules, clamps, Junction Boxes, cable conduits or any other items required for the installation of the system shall be in the scope of the vendor.**

d. Programming tool and Windows Interface:

The vendor shall supply a suitable programming tool containing necessary software for running the system. This web application independent of operating system shall allow the flow meter operator to easily configure the flow meter for specific operational conditions, provide capability for flow data retrieval, storage & display. Web – application independent of operating system.

5. PENSTOCK DIAMETER AND DISCHARGE:


Please refer to the following enclosed drawings for details of Penstock and proposed location of Ultrasonic Flow Measurement System & Over Velocity Tripping Device:

1. PS-C2-AR3-C22/R1 (Drg. For location of flow meter for Penstock flow near MIV)
2. PS-C2-AR3-C23 (Drg. For location of flow meter for Over velocity tripping device in BVC)

The un-concreted straight length available (Cavity for installation of Ultrasonic flow meter) and access to the respective installation location has been elaborated in the above drawings.

For 8-Path Ultrasonic Flow Measurement System:

Penstock Internal Diameter	:	4000 mm
Un-concreted Straight Length available	:	3800 mm
Penstock plate thickness	:	34 mm
Material of Penstock plate	:	ASTM 517 Gr F
Rated Discharge	:	86.17 cubic meter / sec
Net Head	:	286.21 meters
Ambient Temperature Range	:	8 to 45 degrees Celsius
Humidity	:	95%

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 9 of 11

For 2-Path Over Velocity Protection and Tripping System:

Penstock Internal Diameter	:	5500 mm
Un-concreted Straight Length available	:	5100 mm
Penstock plate thickness	:	25 mm
Material of Penstock plate	:	ASTM 537 CL-II
Rated Discharge	:	172.4 cubic meter / sec
Static Head	:	60.89 meters
Ambient Temperature Range	:	8 to 45 degrees Celsius
Humidity	:	95%

6. FLOW ACCURACY AND STANDARDS APPLICABLE:

As per contractual requirement, a Flow Accuracy of ± 1 % shall be required from both the system. The equipment shall be complaint to IEC 60041-1991 and shall be in accordance with IEC-60193, Appendix J.

7. INSTALLATION & COMMISSIONING:

Site Location:

The installation and commissioning of the system shall be carried out at Arun-III HEP, Nepal. The project site is located at a distance of 50 km from Khandbari, the headquarter of Sankhuwa sabha district of Nepal. It is about 240 km from Biratnagar and about 740 km from Kathmandu. The distance from Tumlingtar Town (nearest domestic airport) is about 68 km.

Installation:


Complete installation of all the sensors of all 4 units 8-path system and 2 units of Over Velocity Tripping Device shall be carried out by the vendor. Depending upon the site readiness, vendor shall be given 3 weeks advance intimation for deputation of installation engineer to site for carrying out the complete installation of sensors. The Penstock shall be dry and water filling / Penstock charging will not be done during this stage.

Commissioning:

Commissioning of 4 units of 8- Path System and 2 unit of Over Velocity Tripping device shall be done by the vendor. The commissioning of the system shall include the installation of flow meter console, cable laying & connection b/w sensors & flow meter console, power charging of the flow meter system, alignment of the sensors & wet calibration of the system on full load. Based on the Penstock filling schedule of the end customer, vendor shall be given advance intimation of 3 weeks for deputing their service engineer for commissioning of the system.

Intimation for installation and commissioning of the ultrasonic flow measuring systems will depend upon site readiness. Vendor may consider minimum 4 nos. of visit to site (in line with each lot as per scope) for complete installation & commissioning activities of 4 sets of 8 path flow measuring system and 2 sets Over velocity tripping device. However, if further visit is required for completing the installation & commissioning then vendor shall have to complete the work without any additional charges.

Vendor shall offer lump-sum price (including to & fro travel charges, boarding / lodging and local transport, Visa, Airport Charges etc) of Installation / Commissioning under respective

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 10 of 11

head. Offer of installation / commissioning on per day charge basis / number of visits basis / to-and-fro fare basis etc. shall not be accepted.

The installation / commissioning of the equipment shall be completely in the scope of vendor. Manpower & material required for installation including boarding / lodging and local transport, Visa, Airport Charges etc shall be borne by the vendor.

Vendors are advised to get necessary information regarding site conditions before submitting their offer.

Note regarding installation of sensors: The necessary holes required in the penstock for mounting of sensors to be done through drilling operation only. **Holes through gas cutting is not allowed.** DP & UT (as applicable) of the weld joints of boss with penstock shall be in vendor scope.

8. DOCUMENTS REQUIRED WITH THE OFFER:

The vendor shall submit complete Technical Details / catalogues / write-up of the model offered complying to the specification. Detailed arrangement drawing for installation of sensors shall be required with the offer for our review. Tentative time required for installation of both types of sensors should also be mentioned in the offer for our information purpose. The relevant electrical wiring diagrams shall also be included with the offer.

The above documents shall include Sensor Installation and Simulation Procedure.

Vendor has to submit the credentials of OEM in line with the enclosed Annexure-J Subvendor Assessment Sheet (F-060-01) (3). This format is required for vendor approval from customer and hence to be mandatorily filled by the vendor and shall be submitted along with the offer.

Further, BHEL may ask for other relevant documents related to the offered model during technical evaluation of the offer.

9. DOCUMENTS REQUIRED AFTER PLACEMENT OF ORDER:

After award of contract, vendor shall submit following drawings / documents for end customer approval within 6 weeks of PO placement:


1. Sensor Installation Drawing of 8-Path System
2. Sensor Installation Drawing of 2-Path System
3. GA Drawing of Flow Meter Console
4. Complete Datasheet of Flow Meter
5. Complete Wiring Diagram along with BOM

The resubmission of revised drawings/ documents shall be within 1 week of comments.

The vendor shall submit calibration certificates, material test certificates and applicable type test reports for BHEL approval and dispatch clearance as per enclosed QA Plan.

10. GUARANTEE:

Instrument shall bear suppliers warranty for trouble free operation and good workmanship for a period of 24 Months from the date of dispatch or 12 months from the date of commissioning.

	HYDRO PROJECTS ENGINEERING DIVISION	SPECIFICATION NO.	REV 00
	TITLE : ULTRASONIC FLOW MEASUREMENT SYSTEM	241556476	Page 11 of 11

Supplier should undertake to replace free of charge any material / components found defective in operation during warranty period.

11. PACKING AND O&M MANUALS:

Instruments shall be packed in with silica gel packet and placed in a cartoon or case with adequate cushioning material to minimize the movement of internals and then covered with water proof cover and ensure that the instrument is capable of withstanding the transit condition without damage.

The vendor shall provide one CD (soft copy of O&M Manuals) with the equipment. The box containing the equipment shall clearly mention Arun-III Project and other relevant details of the equipment inside the box including the Bill of Material.


Soft copy of the O & M manuals to be submitted to BHEL.


12. DEVIATIONS FROM THE SPECIFICATION:

All the vendors have to strictly comply to BHEL's specification while offering the instruments. However, deviations (if any) and exclusions in the scope of supply, installation and commissioning shall be categorically enumerated separately by the vendor in the offer.

*_*_*_*_*_*_*_*_*_*_*_*_*_*_*_*




		SHEET 1 OF 2	
APPD.		CONSULTANT एसजेवीएन लिमिटेड SJVN LIMITED	
SUBM.		एसएपीडीसी प्रा० लिमिटेड SAPDC (P.) LIMITED	
CHKD.	अरुण ३ जल विद्युत परियोजना नेपाल (९०० मेगावाट) ARUN-3 HYDRO ELECTRIC PROJECT NEPAL (900MW)		
DRWN.	PRESSURE SHAFTS THRUST BLOCKS BEHIND MIV & BVC CONCRETE & REINFORCEMENT DETAILS		
DSGN.	अभिकल्पित Sd/- DSGN. E: PRITI THAKUR	मॉडलिङ Sd/- CHKD. E: VINOD KUMAR	संशुद्ध Sd/- RECM. E: RAVATI RAMAN
DATE	रेखांकित Sd/- DRWN. SH. R.K. SHARMA	प्रस्तुत Sd/- SUBM. E: REVATI RAMAN	अनुमोदित Sd/- APPD. E: RAKESH SHEGAL
REV.	DRG.NO. PS-C2-AR3-C22/R1 19TH JANUARY, 2020 CD1-AR3-354		

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 1 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

VENDOR / SUB-VENDOR ASSESSMENT SHEET

TO BE FILLED-IN BY SUPPLIER / SUB-VENDOR


NAME OF SUPPLIER / SUB-VENDOR IN FULL			
	REGISTERED OFFICE	FACTORY / WORKS	
ADDRESS			
TELEPHONE NO.			
FAX NO.			
EMAIL ID			
PERSON(S) TO BE CONTACTED (NAME & DESIGNATION & MOBILE NO.)			
WEEKLY OFF			
SHIFT WORKING		Type of Company (Pl. Tick)	Type of Industry (Pl. Tick)
OFFICE	WORKS	Pvt. Ltd.	Public Ltd.
ONE	ONE	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Proprietary	Partnership
TWO	TWO	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Public Sector	
THREE	THREE	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>		
		MSME	Large Scale
		<input type="checkbox"/>	<input type="checkbox"/>
		Govt.	Contractor
		<input type="checkbox"/>	<input type="checkbox"/>
Prepared By:		Reviewed By:	Approved By:
			Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 2 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	


Sr. No.	Items / Services / Process for which Approval is desired for	Rating / Size & Type	Applicable Standards IS/DIN/BS/IEC Etc.

REGISTRATION DETAILS #			
PAN / TAN NO.	CENTRAL SALES TAX REG. NO.	STATE SALES TAX / TIN NO.	EXCISE DUTY REGISTRATION NO.
EXCISE CONTROL CODE NO.	SERVICE TAX REG. NO.	CATEGORY OF INDUSTRY	REGISTRATION NO. & VALIDITY DATE
		Micro <input type="checkbox"/> Small <input type="checkbox"/> Medium <input type="checkbox"/> Large <input type="checkbox"/>	


Prepared By:	Reviewed By:	Approved By:
		Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 3 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	


A.	ORGANISATIONAL SOUNDNESS					
SR. NO.	DESCRIPTION		DETAILS TO BE FURNISHED			
1.	Nature of Business (Strike whichever is not applicable)		Manufacturing Unit / Engineering Consultant / Agents / Distributors / Stockists / Dealers / Traders / Indian Subsidiary / EPC contractor / Channel Partner (Attach authorization certificate of principal) / Erection contractor / Other			
2.#	Year of commencement of Business / Factory Establishment					
3.	Year of Commencement of Manufacture / Services					
4.	Total Area/Covered Area in Sq. m.		Total Area	Covered Area		
5.	Electric Power-Connected Load					
6.#	Electric Power Standby Load & System					
7.	Details of Directors					
Sr. No.	Name	Designation	Qualification	Experience		
8.	Details of Employees					
Please attach copy of Company's Organization Chart (For Unit)						
Division Status	Graduate		Diploma	Skilled	Un-Skilled	Remarks
	Technical	Non-Technical				
Production						
Engineering & Quality Control						
Administration & Other Supporting activities.						
Prepared By:		Reviewed By:		Approved By:		
				Process Owner		

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 4 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016	
	FORM		


9.	Brief Details of Product and Manufacturing Capability				
Sr. No.	Item & Material	Description (Type, Size Rating)	Annual Production for Last Three Years		
			I	II	III
10.#	Details of Foreign or Indigenous Collaborator				
Sr. No.	Product	Name & Address of Collaborator	Collaboration		
			Scope	Year	Valid up to
11#	Have your product been type tested by any external agency? If so, give details				
Sr. No.	Product	Test (Size / Type & class	Test Report No.	Next Due date	
Prepared By:		Reviewed By:		Approved By:	
				Process Owner	

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 5 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	


12.#	Have you been approved by any Statutory agency / third party agency like LLOYD, ASME, NTPC, PGCIL, EIL, Railways etc. ? If so, indicate details and enclose copies of approval letters				
Sr. No.	Item / Material / Service / Process	Description (Size, Type & Class)	Agency	Date of approval	Next Due date
13.#	Indicate Approval / Certification by National / International Standards / Agencies applicable for the subject product.				
Sr. No.	Product	Codes / Standards	License No. & Date		
14.#	Reference List (Experience in Particular Type of Equipment / Service / Process). Please indicate since how many years similar type of item / equipment / service / process provided (please furnish documentary evidence).				
Sr. No.	Item / Material / Service / Process	Type & Capacity / Rating	Customer (End User with Address)	Date of Supply / Service provided	Under Operation since year / Month
#Note: Please furnish the performance feedback certificate for proposed item / equipment / process / service form end user in line with requirement stipulated in Technical Specification.					
Prepared By:		Reviewed By:		Approved By:	
				Process Owner	

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 6 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	


15.#	Business Commenced with SJVN in past				
Sr. No.	Year	Name of Department / Project Dealt with	Item Supplied / Services Offered.		
16.A#	Machinery, Instrument & other Equipment Specific to Process & Product Facilities / service				
Sr. No.	Description of Machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.
Prepared By:		Reviewed By:		Approved By:	
				Process Owner	

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 7 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

16.B#	Other General Facilities				
Sr. No.	Description of Machine	Capacity & Nos.	Location Shop	Make	Year of Manufg.
i	Material Handling Mobile Crane Fork Lift Over Head Cranes				
ii	Metal Cutting & Bending				
iii	Casting				
iv	Forging				
v	Fabrication				
vi	Welding				
vii	Machining				
viii	Heat Treatment				
ix	Sheet Metal				
x	Fettling & Cleaning, Sand Blasting, Shot Blasting & Pickling				
xi	Painting				
xii	Metal Coating				
xiii	Protection before packing				
xiv	Packing				
xv	Other				
17.#	If In-House Manufacturing Facilities not available, inform source of manufacturing details along with their facilities and experience				
Sr. No.	Process outsourced	Name of the company	Description of machine / Equipment	Remarks	
Prepared By:		Reviewed By:		Approved By:	
				Process Owner	


	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 8 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

18. A#	Facilities for In-house Testing & Inspection					
Sr. No.	Description	Capacity & Nos.	Make & Year of Mfg.	Calibration Status	Approval Qualification	
18.B#	If In-house testing facilities are not available, indicate source of testing with relevant details.					
Sr. No.	Source of Testing	Description	Capacity & Nos.	Make & Year of Mfg.	Calibration Status	Approval Qualification
Note: In case of outsourcing of major testing such as NDT, Electrical & Mechanical testing, no marks will be awarded. However, material composition testing by chemical method from NABL Lab shall not attract negative marking.						
18 C #	Details of any Government Laboratory facility available in area					
	Product related testing facility (type / Performance / Routine / Acceptance Test)					
Prepared By:		Reviewed By:		Approved By:		
				Process Owner		


	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 9 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016	
	FORM		

19	Sources of Raw Material and Bought out Items			
Sr. No.	Description of Raw Material / Bought Out Items	Source		
20 #	Storage Area Availability			
	Storage for finished goods (Open / Close)			
	Raw Material storage and identification			
21 #	Do you have in-house Design / R&D departments?			
22 #	Details of pending legal issues on contractual aspects with customers, if any.			
23 #	Please furnish details of Labour problems in the last three years, if any?			
B.	FINANCIAL SOUNDNESS OF ORGANIZATION			
Financial Information for last Three Years (Please furnish copy of annual report)				
Sr. No.	Parameters	Year 20	Year 20	Year 20
1#	Please furnish annual turnover of the company.			
	Growth in annual turnover w.r.t. previous years (%)			
2#	Please furnish Profit before tax (PBT) of the company.			
	Growth in PBT w.r.t. previous years (%).			
3#	Please indicate the net worth (Net current assets – Net current liabilities) of the company?			
4#	Whether the vendor has been referred to BIFR / NCLT / any other similar Govt. agency.			
5#	Whether the supplier is a potentially sick company.			
6	Please mention current order book position, as on date in terms of Value and time			

Prepared By:	Reviewed By:	Approved By:
		Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 10 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	


C.	QUALITY SYSTEM	
SR. NO.	DESCRIPTION	Sub-vendor response (along with supporting document)
1 [#]	Are you an ISO 9001 company? If yes, please furnish the certificate and what is your quality policy?	
2 [#]	Is the company an ISO 14000 approved?	
3 [#]	Is the company an OHSAS approved?	
4 [#]	Have your company won any Quality award like Rajeev Gandhi National Quality Award, IMC Ramkrishna Bajaj National Quality Award, Golden Peacock National Quality Award etc? If yes provide documentary evidence.	
5 [#]	Have you received appreciation letter from your customer. Please provide evidence.	
6	To whom your Q.C./Q.A. Chief reports to ? (Please furnish your organization structure)	
7 [#]	If you have a written quality control manual/procedure, then please furnish the same.	
7 (i) [#]	Incoming Material Control System (Furnish a copy of system and organization)	
7 (ii) [#]	Process Control: Are written procedure defining stage wise operations and functions on shop floor established and followed? (Furnish copy of work instruction and record of process control parameter)	
7 (iii) [#]	Manufacturing/Testing Procedure Qualification & Personnel Qualification (Procedure qualification specification & Record of personnel qualification (PQR) to be submitted).	
7 (IV) [#]	Are written Quality Control Instruction sheets prepared & properly used? (Please furnish evidence)	
7 (V) [#]	Are records generated during inspection maintained & available for review? (Please furnish evidence)	
7 (VI) [#]	Are quality control checks / procedure adequate to maintain desired quality level right from the incoming stage to final stage? Please furnish copy of such control checks / procedure.	
8.#	Documentation Control	
8 (i)	Does a system for clear and precise stipulation of responsibilities for documentation issue & change control exists?	
8 (ii)	Are changes made in writing?	
9 [#]	Control of Inspection, measuring and testing equipment	
Prepared By:		Approved By:
		Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 11 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

9 (i)	Are necessary gauges, testing and measuring equipment's, available and used?	
9 (ii)	Are testing and measuring equipment properly maintained?	
9 (iii)	Is recorded control on calibration of equipment available?	
10 [#]	System of Identification & Traceability of materials, tools, jigs, fixtures & processed components, etc. (Copy of procedure to be submitted).	
11 [#]	System of Storage / Preservation / Painting and Packing (copy of Procedure to be submitted)	
12 [#]	Do you have written procedure for disposing off the non-conformities? If yes, please furnish the copy of the same also furnish three copies of NCR & CAPA.	
13 [#]	Safety measures (Submit copy of safety system & record of accidents for last two years)	
14 [#]	What type of Sampling Inspection Plan is used in your factory/company? Please furnish details.	
15	How good are you in keeping your dispatch commitments? Please give details of last ten deliveries stating details as below (Provide documentary evidence) Within delivery period: Delayed but accepted by user: Delayed but accepted with penalty:	
16 [#]	Have you ever been de-listed or put in under temporary suspension by any customer / contractor.	

D.	AFTER SALES SERVICE	
SR. NO.	DESCRIPTION	Sub-vendor response (along with supporting document)
1 [#]	For overcoming product deficiencies what are the analytical methods used at Customer's premises?	
2 [#]	What is the strength of your "after-sales service" team?	
3 [#]	What is the response time after receiving complaints from the customers? Provide evidence.	
4 [#]	Customer complaints handling system (Submit list of customer complaints & status for the last three years) Please furnish complete list	

Prepared By:	Reviewed By:	Approved By:
		Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 12 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

	of complaints attended to during last one year.	
5[#]	How do you keep your “after-sales service” team updated?	
6[#]	Provide certificate from 02 customers (end user) for satisfactory after sails services.	


Declaration by Director/ Partner/ Proprietor

I declare that the information furnished above and attached documents are correct to the best of my knowledge, I undertake to inform you at the earliest any change(s) in the details mentioned above.

Signature and Date

Name & Designation

Prepared By:	Reviewed By:	Approved By:
		Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 13 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	


TO BE FILLED BY MAIN CONTRACTOR FOR SUB-VENDOR (MC)

Sr. No.	Parameters	Supplier response (along with supporting document)
1	Name and address of sub-vendor:	
2 (a)	Type of equipment / item / process / service for which approval is sought:	
2 (b)	Details of equipment / item / process / service for which approval is sought (i.e. Rating, capacity, type, size, weight, etc.):	
3	Experience of main contractor with sub-vendor:	
(a) [#]	Since how many years sub-vendor is registered with you for proposed type of equipment / item / process / services (furnish documentary evidence):	
4 [#]	Whether sub-vendor is meeting the qualification criteria indicated in the technical specification (furnish documentary evidence).	
5 [#]	Sub-vendor rating as per contractor's internal procedure in the scale 0-10 or 0-100% (furnish documentary evidence).	
6 [#]	Any dispute of main contractor with vendor during execution of last 05 contracts.	
7 [#]	Have you ever de-listed or put in temporary suspension the proposed sub-vendor? If yes, please provide the reason for same.	
8	Please indicate the reason for re-approving / re-listing the sub-vendor.	

I declare that the information furnished by Sub-vendor has been verified and found in order / minor changes which have been marked and initialed on this form itself / observed the following discrepancies.

(Signature & Designation)


Prepared By:	Reviewed By:	Approved By:
		Process Owner

	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 14 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

GUIDELINES TO SUPPLIERS FOR FILLING-UP VENDOR/SUPPLIER REGISTRATION FORM

1. All columns are to be filled up properly in the space provided for. Wherever it is not applicable / not available, please mention “Not Applicable” / “Not Available”. All pages of the form are to be signed along with seal by the authorized signatory.
2. A separate sheet may be attached if the space provided is insufficient or additional information is to be given, Please put proper identification tag on the separately attached sheet.
3. Any information / clarification required by SJVN during evaluation must be given expeditiously.
4. Please ensure that all required enclosures are attached with the filled up Vendor Registration Form.
5. Marks shall be awarded on the basis of documentary evidences submitted by Vendor / sub-vendor wherever called in vendor / sub-vendor assessment form.
6. Incomplete or incorrect forms will be rejected.
7. Please fill up the check list given below and send along with the vendor registration forms to SJVN.
8. In case any information found incorrect / false, the vendor shall be rejected / de-listed at any stage.
9. Information with # marks is score able.
10. Accepting or rejecting a vendor is sole discretion of SJVN.
11. Product catalogue / manual for the proposed item / equipment / process / service, if available, shall be submitted alongwith other documents.

Prepared By:	Reviewed By:	Approved By:
		Process Owner


	SJVN Ltd.	FORM NO.: F-060-01 PAGE: 15 of 15 ISSUE: 2.0 REV. 01 DATE: 30/06/2016
	FORM	

Furnish following information/Documents:-


Sr. No.	Description	Yes / No	Page No / Annexure
1	Latest audited annual account.		
2	Balance Sheet.		
3	Valid Income Tax Clearance Certificate.		
4	Details of Pending Arbitration cases.		
5	Details of pending disputes with Statutory Authorities.		
6	Organization chart		
7	Copy of Performance certificate (minimum 03)		
8	Copy of minimum three (03) completion certificates of similar work / service.		
9	Latter of approval from ASME / NTPC/ EIL / Railway / Lloyds / Power Grid etc. if any.		
10	ISO: 9001 certificate		
11	Quality Manual		
12	ISO: 14000 certificate		
13	OHSAS, ISO 18000 certificate		
14	Experience list		
15	Type test report & approval certificate		
16	Product Approval certificate from national / international agency.		
17	Quality award certificate		
18	Process and Personnel qualification certificates		
19	Copy of registration / enlistment with reputed / large organizations		
20	Detail of existing clients and details such as address, contact number and mail address.		
21	List of works / projects of similar nature executed with documentary evidences of works executed in last 02 years.		
22	Other documents mentioned elsewhere in vendor / sub-vendor assessment form.		

(Signature & Designation)

Prepared By:	Reviewed By:	Approved By:
		Process Owner

MANUFACTURER'S Logo		MANUFACTURER'S Name and Address		SAMPLE QUALITY ASSURANCE PLAN			Project : ARUN-III HEP Indent No: 241556476				
				Item : Ultrasonic Flow measurement system		QP No. : 241556476-QAP Rev. No. : 00 Date : 02.05.2025 page : 01 OF 01					
SUB-System: Governing system											
SL. N O	COMPONENT & OPERATIONS	CHARACTERISTICS	CLAS S	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT / ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY		REMARKS	
								1	2		
1.	2.	3.	4.	5.	6.	7.	8.	9.		10.	
(A)	ULTRASONIC FLOW MEASUREMENT SYSTEM (8 Path and 2 Path):										
1.1	A) Flow Meter Console B) Insertion Type Sensing Feed Through Transducers	<ul style="list-style-type: none"> CALIBRATION CERTIFICATE / FUNCTIONAL TEST CERTIFICATE 	Major	Performance	100%	Technical Specification, Approved Drawings & Approved Data Sheet	TC	P	R		
1.2	ULTRASONIC FLOW MEASUREMENT SYSTEM	<ul style="list-style-type: none"> PACKING & IDENTIFICATION 	Major	Visual	100%	Technical Specification, Approved Drawings & Approved Data Sheet	TC / COC	P	R		
		LEGEND: 1: MANUFACTURER/SUB-SUPPLIER 2: BHEL/ NOMINATED INSPECTION AGENCY P: PERFORM W: WITNESS AND V: VERIFICATION R – REVIEW OF RECORD TC- TEST CERTIFICATE COC- CERTIFICATE OF CONFORMITY IR – INTERNAL RECORD JIR – JOINT INSPECTION REPORT					Accepted by (Vendor' QC representative)				
QA-HYDRO		ENGINEERING- HPE									
(PREPARED & REVIEWED)											

NOTE : VENDOR HAS TO SUBMIT THE MANUFACTURER'S QUALITY ASSURANCE PLAN INLINE WITH BHEL SAMPLE QUALITY PLAN AFTER PLACEMENT OF PO FOR APPROVAL.

 BHOPAL	HYDRO PROJECTS ENGINEERING DIVISION	PI No 2 415 5 6476 Doc. No.: 241556476-TPQR (Rev00) DATE: 12.05.2025
	TECHNICAL PRE-QUALIFICATION REQUIREMENTS (T-PQR)	Page 01 of 01

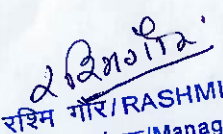
Item Description: Insertion type Ultrasonic Flow Measurement system

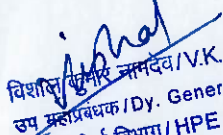
Following are the Technical Pre-Qualification Requirements (T-PQR):

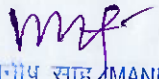
SL. No.	Description of Pre-Qualification Requirements	Vendor response	
		Complied / Not Complied	Supporting documents required to accept compliance
1	<p>a. Manufacturer / OEM with experience of design, manufacturing and supply of Ultrasonic Flow Measurement system of insertion type to Power plant OR Industrial Utility in last 20 years and supplied equipment (min. 1 number) should be in successful operation for at least 2 years in last 7 years as on date of bid opening.</p> <p>b. Trader / Authorized Dealer/Channel Partner of manufacturers are also allowed to take part on behalf of their principals. Experience of the Principal / OEM which is part of vendor's offer shall be considered for evaluation.</p>		<p>a. List of Insertion type Ultrasonic Flow measurement system supplied, indicating no. of path, name of client / customers with address to be furnished.</p> <p>b. Vendor to furnish the following correlated documents for min. 1 number of Insertion type Ultrasonic Flow measurement system supplied in the last 20 years (supplied system should be in successful operation for at least 2 years in last 7 years) as on the date of bid opening to be furnished:</p> <p>i. Documentary evidence as a proof of supplying, installation & commissioning report and successful operation (performance certificate) of the system i.e. Unpriced PO copy /Delivery Challan / Invoice /Approved drawing along with BOM.</p> <p>c. Agents / Subsidiaries to furnish valid authorization letter from Principal / OEM with validity.</p>
2	Manufacturer (OEM) should have an effective quality management system.		Valid ISO-9001 certificate.
3	Vendor Assessment Sheet (Form No F-060-01).		Duly filled Vendor Assessment Sheet along with required credentials to be furnished to obtain vendor approval from Customer.

Notes:

- Technical bid of only those vendors shall be opened who meet Pre-Qualification Requirements stated above and **vendor approval** from Customer. In absence of compliance of above requirements vendor's application is liable to be rejected.
- BHEL has right to verify information / confirmation furnished, by asking additional documents, proof etc.


रश्मि गौर/RASHMI GOUR
 प्रबंधक/Manager
 एच.पी.ई. विभाग/H.P.E. Division
 बी.एच.ई.एल., भोपाल/B.H.E.L., BHOPAL


विशाल कुमार नामदेव/V.K. NAMDEO
 उप महाप्रबंधक/Dy. General Manager
 एच.पी.ई. विभाग/H.P.E. Division
 बी.एच.ई.एल., भोपाल/B.H.E.L., BHOPAL


मनीष साहू/MANISH SAHU
 अपर महाप्रबंधक/Addl. General Manager
 एच.पी.ई. विभाग/H.P.E. Division
 बी.एच.ई.एल., भोपाल/BHEL, Bhopal

Annexure to Conflict of Interest:-

A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) they have controlling partner (s) in common ; or
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them;
or
- c) they have the same legal representative/agent for purposes of this bid; or
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder,
or
- e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; or Page 1 o/2
- f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following:
 - 1. The principal manufacturer directly or through one Indian agent on his behalf; and
 - 2. Indian/foreign agent on behalf of only one principal, or
- g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid, or
- h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. "

Make in India Certificate

In line with Government Public Procurement (Preference to Make in India), Order 2017, P-45021/2/2017-PP (BE-II) dated 16.09.2020 and subsequent clarification No P-45021/102/2019-BE-II-Part(1) (E-50310) dated 04.03.2021, we hereby certify that we **M/s** _____, are local supplier meeting the requirement of minimum local content _____ (in %) as defined in above order for the material against **Enquiry No.** _____.

Details of location at which local value addition will be made is as follows:
_____ (Place).

We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

The above declaration does not include services such as transportation, insurance, installation, commissioning, training and after sales service support like AMC/CMC etc as local value addition.

(Vendor's Seal & Sign)