



**BHARAT HEAVY ELECTRI CAL LIMITED**

**UNIT'S ADDRESS:**

**UNIT'S PHONE NO.:**

**CONTACT PERSON'S NAM E/DESGN./PHONE NO./E- MAIL**  
**(FROM PURCHASE DEPT.)**

**Enquiry No. :**

**Due Date :**

**No.:**

**Date :**

**SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR**  
**DATA ACQUISITION, INTERPRETING AND ANALYSIS SOFTWARE**

**NOTE:-**

1. Vendor must submit complete information against all Clauses. Only the offer meeting clause No. 3 Pre offer Visit & clause no.5 Qualifying criteria would be proces sed further.
2. The "Offered" Colum n and where applicable, the "Deviations " & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.
3. The offer and all docum ents enclosed with offer should be in English language only.

**ADDRESS OF THE SUPPLIER :**

**TELEPHONE NOS.:**

**FAX NOS.:**

**E-MAIL ADDRESS :**

**ADDRESS OF LOCAL ( BHOPAL/MP) AGENTS :**

**TELEPHONE NOS.:**

**FAX NOS.:**

**E-MAIL ADDRESS :**

## ON, INTERPRETING AND ANALYSIS SOFTWARE AS SPECIFIED BELOW

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	<b>PURPOSE :</b> Software is required in LabVIEW (supplied by National Instrument) for data acquisition, interpretation, analysis of test data and report generation for Data Acquisition system at Hydro Lab BHEL Bhopal. This would be used during model testing of hydro turbine.				
2.0	<b>SCOPE OF SUPPLY :</b>				
2.1	Software for Data Acquisition, interpretation, analysis of test data and report generation developed in LabVIEW 8.6. LabVIEW professional version 8.6 software is available with Hydro Lab BHEL Bhopal. Source code and executable file of the software is to be supplied .	As per specifications given in clause no. 3	Vendor to confirm		
2.2	Operating/User manual	As per clause No. 7.1	Vendor to confirm		
3.0	<b>PRE OFFER VISIT</b>				
3.1	For technical clarification and understanding the scope of work the vendor must necessarily visit Hydro Laboratory, BHEL Bhopal before submitting the offer.Vendor to enclose copy of MOM along with the offer that verifies his visit to Hydro Laboratory.	Vendor to Submit			
4.0	<b>SPECIFICATION :</b>				
4.1	The software should be developed using LabVIEW on existing PXI system along with necessary accessories if required. The proposed data acquisition system should acquire data for the below mentioned parameters from existing hardware elaborated at clause no.3.2. (a) Flow (b) Temperature (c) Speed (d) Pressure (f) Torque/Load cell (g) Strain Gage (h) Pressure pulsation	Vendor to confirm			

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4.2	<p>The data acquisition system should be able to interface with the below motioned modules and acquire the data. Interfacing to be done using standard drivers/ developed drivers by vendor.</p> <p>a) HP/Agilent 3497A : Data Acquisition System and Control Unit with 3498A Extender with below mentioned modules,</p> <p>I. 44426A : 100 KHz reciprocal counter card (8 Nos.)</p> <p>II. 44427A : 120 Ohm Strain gage/Bridge Completion Assembly card (1 No.)</p> <p>III. 44427B : 350 Ohm Strain gage/Bridge Completion Assembly card (1 No.)</p> <p>IV. 44420A : 20 Channel Relay Multiplexer ( 1 No.)</p> <p>b) HP5334B: for time Universal counter (For Time measurement) ( 1 No.)</p> <p>c) HP/Agilent 5316B Frequency Counter (2 Nos.)</p> <p>d) HP/Agilent 34401A / Keithley 2000 Digital multimeter ( 2 Nos.)</p> <p>e) HP/Agilent 34980A with 34950A Counter Module ( 4 Nos.) and multiplexer module 34921A (1No.)</p> <p>f) HP/Agilent 34970A DAS/ Switch unit with multiplexer Module ( 1 No.)</p> <p>g) NI PXI chasis 1042 with embedded controller NIPXI-8187 having NI 6123 module for simultaneous voltage measurement. (1 No.)</p>	Vendor to Note & confirm			
4.3	Data acquisition and data processing and storing data to file from existing hardware at clause no.3.2 is being done by software developed in HP BASIC. The proposed new software should perform all function of existing software in consultation with BHEL in addition to new features elaborated in the following clauses.	Vendor to Note & confirm			
4.4	Software should generate proper error codes along with descriptive information on Errors as per BHEL requirement.	Vendor to confirm			
4.5	Software should have provision to configure each and every channel (typicaly assigning the proper name, scaling, communication interface, card number, chassis number and etc.) and save the Configuration into file.	Vendor to confirm			

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4.6	Software should have provision for recording the data in encrypted format for all the channels data that is being acquired and data is to be processed for derived quantities. Formula for these derived quantities would be provided byBHEL.	Vendor to confirm			
4.7	Software should have provision to displayin graphical formats as per BHEL requirement.	Vendor to confirm			
4.8	Software should have provision to display and print in tabular formats as per BHEL requirement.; typical output format enclosed in Annexure I.It may be noted that BHEL already has report generation module for LabView which is to be used for software development.	Vendor to confirm			
4.9	Software should have provision to print data in tabular format using line printer during testing and page printer during offline printing.	Vendor to confirm			
4.10	Graphs should have minimum features like, option of Zooming in, Zooming out ,graph and cursors.	Vendor to confirm			
4.11	Software should have provision to fetch the logged data and plot data and export the plots to JPEG,generate ASCII and excel files for further analysis.	Vendor to Confirm			
4.12	Display appropriate operating data to the operator during a run to show the Instantaneous/average values and historical trends of the conducted test points as per BHEL requirement.	Vendor to confirm			

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5.0	<b>QUALIFYING CRITERIA</b>				
5.1	<p>The supplier should be National Instrument or authorised by National Instrument for development of software on LabVIEW. The supplier should have developed software on LabVIEW for Data acquisition and data analysis and test results (both in graphical and tabular form) for atleast 2 test installation after year 2005. The test installation should have atleast one Agilent/National Instruments data acquisition system.</p> <p>List of customers is to be submitted by the vendor mentioning atleast "year of commissioning"," name &amp; address of customer","Make and details of Data acquisiton system" . Authorisation certificate from NI to be submitted alongwith offer.</p>	Vendor to Confirm and Submit			
5.2	<p>Following are to be submitted along with ofer</p> <p>Performance certificate (issued in year 2010) for satisfactory performance from atleast one Customer meeting clause 5.1,this software should be working satisfactorily for atleast one year on the date of tender</p> <p>Atleast one Copy of purchase order (P.O.) for software development as per clause 5.1</p>	Vendor to Submit			

ON FOR BHEL REQUIREMENT		SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
<b>6.0</b>	<b>INSTALLATION AND COM MISSIONING</b>				
6.1	Installation and commissioning of software on BHEL computer/PXI system shall be done by Vendor. Commissioning would be completed only after successful demonstration of software acquiring the data from the data acquisition system, interpretation , analysis of data and writing to file and printing of test data and test results ( both graphical and tabular form) on printer as per BHEL requirement.	Vendor to Confirm			
<b>7.0</b>	<b>DOCUMENTATION</b>				
7.1	Vendor should provide 2 Set of detailed Operating/User Manuals for the proposed system. One copy of the manual in CD comprising of format details along with configuration data file, application software etc shall also be supplied.	Vendor to Confirm and submit			
<b>8.0</b>	<b>GUARANTEE :</b>				
8.1	The supplier should give guarantee of proper working of Software for 12 months from the date of commissioning. Any problem during this period will be rectified by the supplier free of cost.	Vendor to confirm			