



**BHARAT HEAVY ELECTRICALS LIMITED**

CORPORATE RESEARCH & DEVELOPMENT DIVISION

VIKASNAGAR, HYDERABAD - 500 093, INDIA

**ENQUIRY**

PHONES: 23774494 (EXCHANGE)

DIRECT: 23882104/23882204/

23778474/23776772

FAX : 91 40 23770698

RD:DP:MPX:F-04

To - Enquiry No: Enq Date: Due Date: Delivery By:  
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Email :

Attn. .

PLEASE SUBMIT YOUR QUOTATION IN SEALED COVER SUPERSCRIBED WITH ENQUIRY NO, ENQUIRY DATE AND DUE DATE SUBJECT TO OUR TERMS AND CONDITIONS ENCLOSED, FOR THE FOLLOWING MATERIALS SO AS TO REACH US ON OR BEFORE THE DUE DATE BY 12 NOON. THE TENDERS WILL BE OPENED AT 2 PM ON THE SAME DAY

PLEASE GIVE REFERENCE OF ENQ NUMBER , ENQ .DATE AND DUE DATE IN ALL YOUR CORRESPONDENCE FOR PROMPT ACTION. IN CASE IF YOU ARE NOT MAKING THE OFFER PLEASE POST A REGRET LETTER AND RETURN THE DOCUMENTS.

SL NO	DESCRIPTION / SPECIFICATION	UNIT	QTY
1	SOFTWARE DEVELOPMENT OF IEC61850 CLIENT APPLICATION AND SERVER SIMULATION	NO	1

Note: Please submit your offer in two parts as per the enclosed annexure "aa" in separate sealed covers as detailed below:

1) First cover shall contain the following:

A) Technical commercial bid along with compliance statement, mentioning applicable duties, taxes etc., and delivery time clearly, (terms, conditions and compliance form enclosed)

B) A copy of the price bid without the prices (unpriced price bid)

2) Second cover containing price bid

3) If the price bid is found to be different from the unpriced price bid in any way, your offer will be rejected

Important: Taxes & duties quoted by you will be taken for cost evaluation and order placement and no change will be entertained later except in the case of changes made by the government. Changes in taxes and duties because of the changes in turnover etc also will be to the supplier's account. In case no tax/duty is included, a self declaration for the exemption may be attached along with the offer.

AS WE ARE ENGAGED IN R&D ACTIVITY "C" FORM WILL NOT BE ISSUED

Yours faithfully  
for

BHARAT HEAVY ELECTRICALS LTD

PLEASE FILL UP THE ENCLOSED VENDOR REGISTRATION FORM AND SEND IT ALONG WITH YOUR QUOTATION. OTHERWISE YOUR QUOTATION WILL NOT BE CONSIDERED. (IGNORE THIS IF YOU HAVE ALREADY SUBMITTED THIS FORM)

SEETA RAM. M  
Dy General Manager

Email: [mseetaram@bhelrnd.co.in](mailto:mseetaram@bhelrnd.co.in)

# Software Requirement Specifications

*For*

## **Development Of IEC-61850-Client driver & Server Simulator**

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**Software Requirement Specifications**  
**For**  
**Development Of IEC-61850-Client driver and Server Simulator**

## **1.0 Introduction**

This document describes the software requirements specification for the development of Client and Server software to implement the IEC-61850 protocol for SCADA application. The application shall be based on the field proven source libraries for IEC61850 from reputed and established vendors

The application runtime environment shall be Microsoft Windows Xp / Vista and similar Microsoft platforms

## **2.0 Scope**

The scope of the work includes:

- i. Submitting the detailed design document in line with the requirement specifications.
- ii. Conducting a presentation session on IEC61850 standard at BHEL R&D, The presentation shall cover the data models for various substation equipment and relevant applicable sections of the standard. This will be followed by a presentation on the design.
- iii. Developing the software as per the approved design document.
- iv. Demonstration of the software features at vendor premises.
- v. Configuring the software for a typical substation which will be provided by BHEL R&D
- vi. Supply of the software - source code of application and executables, along with Software Documentation including data diagrams, flow charts, Users Manual etc
- vii. Installing the software at BHEL R&D in a Client Server configuration
- viii. Training on the development and configuration
- ix. Maintenance and Warranty for a period of one year after successful installation at R&D

## **3.0 Deliverables**

The deliverables include:

- i. IEC-61850 Client software with interfaces for SCADA –Application Source Code and executable
- ii. Configuration software for local and remote configuration of IEC-61850 devices into SCADA for IEC61850 Client SCADA - Source Code and application executable
- iii. IEC-61850 Server Simulator software with capability to simulate all standard Logical Nodes per the 61850 spec.
- iv. Configuration files in the form of 61850 ICD files for three kinds of protection simulation (three servers simulation for Line protection, Transformer protection and Differential protection)
- v. The entire development environment for Client , Server and Configuration applications.
- vi. Design documentation and User Manual
- vii. Training on IEC 61850 standard as well as Server and Client software.

## 4.0 Client Application Overview

The Client Application will have two executables.

- **Client Configuration software**  
The configuration executable will allow for configuring new 61850 devices into the system via a local XML file or by using the directory services of connected devices (discovery).
- **Client Runtime software**  
The runtime executable will perform all runtime communication between the Client and remote devices

### 4.1 Interfaces for Client Application

The two executables of the Client Application shall have the suitable interfaces to interact with external hardware/software.

#### 4.1.1 Hardware Interfaces

The client driver is to be integrated as a software task. It is built as Windows executables and shall have an Ethernet interface to the outside world

#### 4.1.2 Software Interfaces

The following interfaces will be used by the Client Configuration software and Client Runtime software.

- |          |                                 |   |
|----------|---------------------------------|---|
| <b>1</b> | <b>Configuration API</b>        | Used by Configuration software to store and read configuration information. The configuration API allows for adding servers to the configuration using local configuration ICD files or remote discovery.   |
| <b>2</b> | <b>Runtime API</b>              | Used mainly by the runtime driver to access/modify tag values, receive writes and controls from an external application like SCADA etc. The runtime driver maintains an in-memory database of all values received from devices. The runtime API is left as empty functions and can be used to “attach” to a SCADA to update the values into the SCADA database. |
| <b>3</b> | <b>Local File system access</b> | Used by configuration instance to read/store SCL XML files<br>Used by Runtime driver to store Client Logs   |

## **4.2 User Interfaces of Client Software**

The Configuration Software will be triggered off the Configuration Tool and has a minimal GUI that allows the user to start a Configuration-read task. The GUI also will notify the user on completion and provide result information (success/failure/reason).

The Runtime application will also have a GUI with tree-based views of data from all connected Servers. The trees will allow navigation through all the data and selected data can be added to a Watch window for online monitoring.

## **4.3 SCADA Interface of Client Software**

Suitable interface to be provided for interfacing the client Runtime application with SCADA for data updates, events, writes and controls. Vendor should specify the details of the interface offered in the Design document.

## **4.4 Detailed Functional requirements of Client Software**

### **4.4.1 Configuration**

The client software should support configuration options for adding:

- i. servers,
- ii. logical devices, logical nodes,
- iii. Data, data attributes, Datasets,
- iv. Unbuffered and Buffered Control Blocks,
- v. Log control Blocks, Log files,
- vi. Setting Group Control Blocks
- vii. Goose control-blocks.

Two options shall be provided for loading the configuration:

- i. From a local SCL XML file
- ii. Use the configuration driver instance to poll a connected device and retrieve its configuration structure. In this mode, the configuration instance will build a local XML file from the retrieved configuration

### **4.4.2 Logging**

The Client software should support logging of client activity to a rotating Log file, for which the number of lines of logging and Log levels can be programmed.

#### 4.4.3 Redundancy

The Client software should support dual-node redundancy. The runtime application will maintain a global tag to indicate the mode of operation (Active / Standby). In Standby mode, SCADA interface will be deactivated. The attached SCADA shall synchronize the data between the redundant systems.

#### 4.5 Features of Client Software

##### 4.5.1 Standard Features of Configuration Software

The Client configuration software should support the following features as per IEC61850 application requirements:

<b>Sno</b>	<b>Feature/Function</b>
1	Local XML file configuration loading
2	Remote configuration loading
3	Multiple servers
4	Multiple domains per server
5	Tag creation for values of ST,MX,CO,SP,CF,DC,SV,SG/SE,BR,RP, LG,GO,EX functional constraints
6	Tag creation for modifying Control Block values for BRCB,URCB,LCB,GOCB
7	Dataset listing and display in Config tool with associated Data values
8	Display of configuration in Config tool grouped by LN and FC

##### 4.5.2 Additional Features of Configuration Software

In addition to the requirements as per standard, the following features should also be supported:

<b>Sno</b>	<b>Feature/Function</b>
1	Global Active/Standby Tag in Scada, Log level tag in SCADA.
2	Per-Domain Tag creation for Disable domain, Poll Domain and completion tags, Domain status (communication status)
3	Tag creation for controls structured-writes (CO/SP values)
4	License check function

#### 4.5.3 Standard Features of Runtime Software

The Client runtime software should support the following features as per IEC61850 application requirements:

Sno	Feature/Function
1	Handling of report data triggered by BRCB, URCB and update to SCADA
2	Enable/Disable BRCB/URCB triggered by Enable Tag
3	Trigger General Interrogation of BRCB / URCB and update data as well as completion tags
4	Trigger PurgeBuf on BRCBs to clear the buffered reports
5	Send Controls and Setpoints in all supported modes like Direct Operate, SBO, Enhanced Security models etc.
6	Modify LCB values
7	Query Log
8	Modify GOCB values
9	Handle GOOSE reports and update data
10	Trigger changes of SV values
11	Trigger changes of SG values and SGCB values

The specific IEC61850 Client features, for which Conformance is required is indicated in the enclosed Annexure-1.

#### 4.5.4 Additional Features of Runtime Software

In addition to the requirements as per standard, the following features should also be supported:

Sno	Feature/Function
1	Runtime behavior as per Global Active/Standby tag
2	Runtime behavior as per Global Log Level tag
3	Domain Enable/Disable triggered by Disable Tag
4	Poll all ST/MX/CF/DC values in a domain triggered by PollTrigger Tag and update data as well as Completion tags
5	License check function



## 5.0 Server Application Overview

The Server application will consist of a Server simulator executable which can be run on different machines using different configuration files (ICD) to simulate devices with different protection schemes.

The Server application will simulate the data model of the server, for all the logical nodes specified in the IEC 61850 standard.

### 5.1 Interfaces for Server Application

#### 5.1.1 Hardware Interfaces

The simulator software shall be built as Windows executable and will run on Windows systems. The communication driver shall use Ethernet interface.

#### 5.1.2 Software Interfaces

The following interfaces will be used by the simulator software:

- |          |                            |   |
|----------|----------------------------|---|
| <b>1</b> | <b>Configuration files</b> | The software will read an ICD files from the base location and derive its configuration information from the same. The ICD files can contain references to standard Logical Nodes as per 61850 standards and the simulator will create the necessary data objects and attributes accordingly. |
| <b>2</b> | <b>User Interface</b>      | The data attributes and current values can be viewed and set through the user interface provided.   |

### 5.2 User Interfaces of Server Software

A Windows GUI shall be provided which shall serve as the User Interface for the application, which contains a tree-based display of the configured data model. The GUI will enable users to view a list of all Data attributes, read their current values, set their values to new ones to simulate events

## **5.3 Detailed Functional requirements of Server Software**

### **5.3.1 Configuration**

The Server driver should support configuration options for adding logical devices, logical nodes, Data, data attributes, Datasets, Unbuffered and Buffered Report Control Blocks, Log control Blocks, SettingGroup Control Blocks and Goose control-blocks as defined in IEC-61850.

The Server software shall support configuration options to add the following as defined in IEC-61850:

- i. logical devices, logical nodes,
- ii. Data, data attributes, Datasets,
- iii. Unbuffered and Buffered Report Control Blocks,
- iv. Log control Blocks, Log files,
- v. Setting Group Control Blocks
- vi. Goose control-blocks.

The Server software shall provide for the following as defined in IEC-61850-7-2 :

- i. Reporting model (Unbuffered and Buffered),
- ii. Server Logs,
- iii. Setting Groups model
- iv. Substitution model
- v. the GOOSE model

### **5.3.2 Logging**

The Server software should support logging of server activity to a rotating Log file, for which the number of lines of logging and Log levels can be programmed.

### **5.3.3 Simulation**

The simulator driver should allow users to simulate events by changing the value of any Data attribute through the GUI menu. The simulator will also display the value of any attribute so as to verify correct updation of control commands from a client.

#### 5.4 Features of Server Software

Sno	Feature/Function
1	Local XML file configuration loading
2	Multiple domains per instance
3	Tag creation for values of ST,MX,CO,SP,CF,DC,SV,SG/SE,BR,RP, LG,GO,EX functional constraints
4	Display of configuration in GUI window grouped by LN and FC
5	Handling for Log level (activity log)
6	Generation of report data triggered by BRCB, URCB and update to client
7	Respond to Polls for all ST/MX/CF/DC values in a domain
8	Handle Enable/Disable BRCB/URCB triggered by Enable command from client
9	Handle General Interrogation of BRCB / URCB and update data in response to client
10	Handle PurgeBuf on BRCBs to clear the buffered reports
11	Handle Controls and Setpoints in all supported modes
12	Modify Attribute values on user trigger from GUI
13	Handle GOCB values changes from client
14	Generate GOOSE reports and update data
15	Handle changes of SV values
16	Handle changes of SG/SE values and SGCB values

## **6.0 General**

- 6.1 The application shall be developed based on the field proven source libraries for IEC61850 from reputed and established vendors. The source from which the libraries are used and the reference list of the clients, where it is used, should be enclosed with the Technical Proposal.
- 6.2 The vendor has to substantiate his competence in executing the job. A client reference list indicating similar jobs undertaken should be enclosed with the Technical Proposal. Technical Offers of competent vendors, with proven client list, only shall be considered.
- 6.3 The vendor should have the development environment and all the software and hardware components to carry out the development. The vendor should substantiate the same in the offer
- 6.4 The offer should specify the development environment and the entire development environment has to be supplied and the same has to be included in the Technical Proposal
- 6.5
  - a) The successful bidder shall submit a design document within 2 weeks time from the date of Purchase Order. This will be followed by a presentation as specified in Clause ii of 1.0.
  - b) After the design is approved by BHEL R&D, vendor shall take up the implementation.
  - c) BHEL R&D shall review the work at suitable stages of the development.
  - d) The functioning of the software shall be inspected at vendor premises, before dispatch.
  - e) Vendor shall install the software at BHEL R&D, on the runtime hardware platform provided by BHEL.
  - f) Testing shall be conducted as per a mutually agreed Acceptance Criteria. This shall include modifications on the source code, compiling in the development environment and porting on to the runtime platform at BHEL R&D.
- 6.6 The source code is deliverable to BHEL. The source code should be compiled and executed in the presence of BHEL. The executable module generated by this compilation should be delivered
- 6.7 The application and configuration software modules for Client and Server are property of BHEL R&D and should not be used for any other purpose by the vendor

***Annexure -1***

**Conformance features  
Of  
The IEC 61850 Client to be supported**

**Annexure -1**  
**Conformance features of the IEC 61850 Client to be supported**

**ACSI Basic conformance statement**

		Client/Subscriber	Value
<b>Client-server roles</b>			
B11	<b>Server</b> side (of TWO- PARTYAPPLICATION-ASSOCIATION)	-	
B12	<b>Client</b> side of (TWO-PARTYAPPLICATION-ASSOCIATION)	c1	Yes
<b>SCSMs supported</b>			
B21	<b>SCSM:</b> IEC 61850-8-1 used		Yes
B22	<b>SCSM:</b> IEC 61850-9-1 used		No
B23	<b>SCSM:</b> IEC 61850-9-2 used		No
B24	<b>SCSM:</b> other		
<b>Generic substation event model (GSE)</b>			
<b>B31</b>	<b>Publisher</b> side	-	No
<b>B32</b>	<b>Subscriber</b> side	O	Yes
<b>Transmission of sampled value model (SVC)</b>			
<b>B41</b>	<b>Publisher</b> side	-	No
<b>B42</b>	<b>Subscriber</b> side	O	No
c1 – shall be 'M' if support for <b>LOGICAL-DEVICE</b> model has been declared. O – Optional M – Mandatory			

**ACSI Models conformance statement**

		Client/Subscriber	Value
<b>If Server side (B11) supported</b>			
M1	<b>Logical device</b>	c2	Yes
M2	<b>Logical node</b>	c3	Yes
M3	<b>Data</b>	c4	Yes
M4	<b>Data set</b>	c5	Yes
M5	<b>Substitution</b>	O	Yes
M6	<b>Setting group control</b>	O	Yes
	<b>Reporting</b>		Yes
M7	<b>Buffered report control</b>	O	Yes
M7-1	sequence-number		
M7-2	report-time-stamp		

**Annexure -1**  
**Conformance features of the IEC 61850 Client to be supported**

M7-3	reason-for-inclusion		
M7-4	data-set-name		
M7-5	data-reference		
M7-6	buffer-overflow		
M7-7	entryID		
M7-8	BufTm		
M7-9	IntgPd		
M7-10	GI		
M8	<b>Unbuffered report control</b>	O	Yes
M8-1	sequence-number		
M8-2	report-time-stamp		
M8-3	reason-for-inclusion		
M8-4	data-set-name		
M8-5	data-reference		
M8-6	BufTm		
M8-7	IntgPd		
M8-8	GI		
	<b>Logging</b>	O	Yes
M9	<b>Log control</b>	O	Yes
M9-1	IntgPd		
M10	<b>Log</b>	O	Yes
M-11	<b>Control</b>	M	Yes
<b>If GSE (B31/B32) is supported</b>			
	<b>GOOSE</b>	O	Yes
M12-1	entryID		
M12-2	DataRefInc		
M13	<b>GSSE</b>	O	No
<b>If SVC (B41/B42) is supported</b>			
M14	Multicast SVC	O	No
M15	Unicast SVC	O	No
M16	<b>Time</b>	M	Yes
M17	<b>File Transfer</b>	O	Yes
C2 – shall be 'M' if support for <b>LOGICAL-NODE</b> model has been declared. c3 – shall be 'M' if support for <b>DATA</b> model has been declared. c4 – shall be 'M' if support for <b>DATA-SET</b> , Substitution, Report, Log Control, or Time model has been declared. c5 – shall be 'M' if support for Report, GSE, or SV models has been declared.			

**Annexure -1**  
**Conformance features of the IEC 61850 Client to be supported**

M – Mandatory

**ACSI Service conformance statement**

	Services	AA: TP/MC	Client/Subscriber	Comments
<b>Server (Clause 6)</b>				
S1	ServerDirectory	TP		Yes
<b>Application association (Clause 7)</b>				
S2	Associate		M	Yes
S3	Abort		M	Yes
S4	Release		M	Yes
<b>Logical device (Clause 8)</b>				
S5	LogicalDeviceDirectory	TP	M	Yes
<b>Logical node (Clause 9)</b>				
S6	LogicalNodeDirectory	TP	M	Yes
S7	GetAllDataValues	TP	O	Yes
<b>Data (Clause 10)</b>				
S8	GetDataValues	TP	M	Yes
S9	SetDataValues	TP	O	Yes
S10	GetDataDirectory	TP	O	Yes
S11	GetDataDefinition	TP	O	Yes
<b>Data set (Clause 11)</b>				
S12	GetDataSetValues	TP	O	Yes
S13	SetDataSetValues	TP	O	No
S14	CreateDataSet	TP	O	No
S15	DeleteDataSet	TP	O	No
S16	GetDataSetDirectory	TP	O	Yes
<b>Substitution (Clause 12)</b>				
S17	SetDataValues	TP	M	Yes
<b>Setting group control (Clause 13)</b>				
S18	SelectActiveSG	TP	O	Yes
S19	SelectEditSG	TP	O	Yes
S20	SetSGValues	TP	O	Yes
S21	ConfirmEditSGValues	TP	O	Yes
S22	GetSGValues	TP	O	Yes
S23	GetSGCBValues	TP	O	Yes



**Annexure -1**  
**Conformance features of the IEC 61850 Client to be supported**

<b>Reporting (Clause 14)</b>				
Buffered report control block (BRCB)				
S24	Report	TP	c6	Yes
S24-1	data-change (dchg)			
S24-2	qchg-change (qchg)			
S24-3	data-update (dupd)			
S25	GetBRCBValues	TP	c6	Yes
S26	SetBRCBValues	TP	c6	Yes
Unbuffered report control block (URCB)				
S27	Report	TP	c6	Yes
S27-1	data-change (dchg)			
S27-2	qchg-change (qchg)			
S27-3	data-update (dupd)			
S28	GetURCBValues	TP	c6	Yes
S29	SetURCBValues	TP	c6	Yes
c6 – shall declare support for at least one (BRCB or URCB).				
<b>Logging (Clause 14)</b>				
Log control block				
S30	GetLCBValues	TP	M	Yes
S31	SetLCBValues	TP	O	Yes
Log				
S32	QueryLogByTime	TP	c7	Yes
S33	QueryLogAfter	TP	c7	Yes
S34	GetLogStatusValues	TP	M	Yes
c7 – shall declare support for at least one (QueryLogByTime or QueryLogAfter).				
<b>Generic substation event model (GSE) (14.3.5.3.4)</b>				
GOOSE-CONTROL-BLOCK				
S35	SendGOOSEMessage	MC	c8	Yes
S36	GetGoReference	TP	O	
S37	GetGOOSEElementNumber	TP	O	
S38	GetGoCBValues	TP	O	

**Annexure -1**  
**Conformance features of the IEC 61850 Client to be supported**

S39	SetGoCBValues	TP	O	
<b>GSSE-CONTROL-BLOCK</b>				
S40	SendGSSEMessage	MC	c8	No
S41	GetGsReference	TP	O	
S42	GetGSSEElementNumber	TP	O	
S43	GetGsCBValues	TP	O	
S44	SetGsCBValues	TP	O	
c8 – shall declare support for at least one (SendGOOSEMessage or SendGSSEMessage). c9 – shall declare support if TP association is available.				
<b>Transmission of sampled value model (SVC) (Clause 16)</b>				
Multicast SVC				
S45	SendMSVMessage	MC	c10	No
S46	GetMSVCBValues	TP	O	
S47	SetMSVCBValues	TP	O	
Unicast SVC				
S48	SendUSVMessage	TP	c10	No
S49	GetUSVCBValues	TP	O	
S50	SetUSVCBValues	TP	O	
c10 – shall declare support for at least one (SendMSVMessage or SendUSVMessage).				
<b>Control (17.5.1)</b>				
S51	Select		M	Yes
S52	SelectWithValue	TP	M	Yes
S53	Cancel	TP	O	No
S54	Operate	TP	M	Yes
S55	Command-Termination	TP	M	Yes
S56	TimeActivated-Operate	TP	O	Yes
<b>File transfer (Clause 20)</b>				
S57	GetFile	TP	O	Yes
S58	SetFile	TP	O	Yes
S59	DeleteFile	TP	O	Yes
S60	GetFileAttributeValues	TP	O	Yes

***Annexure -1***  
**Conformance features of the IEC 61850 Client to be supported**


	Services	AA: TP/MC	Client/subscriber	Comments
<b>Time(5.5)</b>				
T1	Time Resolution of Internal Clock			Nearest Negative Power of 2 in seconds
T2	Time Accuracy of Internal Clock			T0
				T1
				T2
				T3
				T4
				T5
T3	Supported Time Stamp Resolution			Nearest Value of $2^{** -n}$ in seconds according to 5.5.3.7.3.3



## BHARAT HEAVY ELECTRICALS LIMITED

CORPORATE R&D DIVISION, VIKAS NAGAR, HYDERABAD – 500 093, AP, India

Ph: 0091-40 – 23778474, FAX: 0091-40 – 23770698

### General Terms and Conditions of Enquiry & Contract for the Purchase of Goods/ Services

1. The quotation and any order resulting from this enquiry shall be governed by these General Terms and Conditions of enquiry and contract for the supply of goods and the supplier quoting against this enquiry shall, unless specifically stipulates any different terms or conditions, be deemed to have read and agreed to the same.
2. Sealed quotations in double cover with tenderer's distinctive seal, superscribing enquiry number, date and due date are to be submitted so as to reach on or before due date & time, addressed to **Additional General Manager(MM), Bharat Heavy Electricals Limited, Corporate Research & Development Division, Vikasnagar, Hyderabad, Andhra Pradesh, India – PIN-500 093, India.**

In the case of **Two-part bid**, each inner cover shall clearly be labeled as a) **Technical & Commercial Bid** containing technical data/ drawings/ catalogues/ quality plans along with commercial terms and conditions & copy of the price bid with the price columns left blank (unpriced price bid), b) **Price bid** containing prices quotes. Installation and/or Commissioning charges shall be spelt out in absolutely lucid terms, taking into account total charges, rather than quoting vaguely, such as charges per man-day or charges per engineer per day etc. **If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected summarily.**

3. **Tender/ Technical bid Opening:** Unless specified otherwise, tenders/ technical bids will be opened on appointed date and time as mentioned in the enquiry or as communicated changed date/time, if any, in the presence of such of those tenderers who may be present.
4. **Delayed/ Late Tender:** Tenders, which have been posted by registered post through the postal department in time before opening date but received after tender opening, shall be treated as regular tenders. Other tenders received after tender opening time shall be treated as late tenders and normally they may be rejected.
5. The Quotation should be free from overwriting and erasures. Corrections and additions, if any, must be attested. Supplier should indicate in the quotation dimensions (Size), weight, rate etc., in the metric system unless the enquiry calls for different unit.
6. **Validity of Quotation:** All quotations shall be kept open for acceptance for a period of ninety days from the date of opening of Tenders/ Technical bid and this shall be deemed to be an express condition of all quotations. The rate shall be quoted in both figures and in words.
7. In the case of Two-part bid, the vendor should furnish technical clarifications, if any, within stipulated time mentioned, failing which, it will be construed that the vendor is not interested in the tender and BHEL shall not consider the offer for further evaluation.
8. **Revision of Pricebid:** In the event of any bidder, after finalizing the technical specifications and scope of supply, opting to revise and submit their latest price bid, then BHEL reserves the right to open their original / previous price bid also while evaluating revised bid.
9. **Pricebid Opening:** Unless specified otherwise in the enquiry, the Price bids of technically qualified vendors shall be opened with prior intimation in the presence of such of those tenderers who may be present.
10. **Conformity to Specifications:** The material should be of the best quality and shall be conforming to our specification given in our enquiry. Unless otherwise agreed upon by BHEL, no payment shall be due by BHEL in respect of any sample. Offers without details of specifications/ applicable catalogues will not be considered and are liable to be rejected.
11. **Terms of Delivery:** All suppliers shall quote the lowest prices on ex-works and FOB/FCA basis. Foreign suppliers will also indicate their Indian agent's name and address with percentage of agency commission out of the quoted price, if any. Name and Address of the supplier's Bankers address should also be given. Indian suppliers for the indigenously manufactured/ imported stock shall quote on Ex-works /Free-on-Rail/Road /FOR-destination basis, indicating packing & forwarding charges, if any, separately.
12. **Taxes and Duties:** Unless specified otherwise in the enquiry, BHEL do not provide "C" or "D" Form as it is engaged in R&D. All Indian suppliers shall clearly mention Sales Tax/ VAT, Excise Duty, and Service Tax etc, if any, payable in addition to the quoted price and indicate applicable rates/ percentage, item-wise. It will be paid

only if Registration Number under State(TIN)/ Central Sales Tax or Service Tax is specifically mentioned in the Bill/Invoice. Vendors without a Sales Tax/VAT registration and applicable Service Tax registration will not be considered.

13. **Insurance:** Insurance will be arranged by BHEL in case of Ex-Works as well as FOB basis supplies.
14. **Terms of Payment:** Full payment will be made within 30 days after receipt, inspection and acceptance of the material (and where involved, Erection and commissioning of the material/ equipment at BHEL/Destination) by Crossed cheque and no Bank commission charges are admissible. The Cheque will be sent by registered post and BHEL is in no way responsible if loss occurs due to delay by postal authorities and cheques falling into improper hands or through forgery or fraud. Suppliers having RBI-SEFT-enabled accounts can seek payment through Electronic Fund transfer. For foreign suppliers, the preferred payment term will be on Sight Draft basis and bank charges inside India will be to BHEL account and outside India will be to supplier's account.
15. Suppliers shall quote competitive price and best delivery for all the items mentioned in the enquiry. BHEL reserves the right to reject partial quotations and to place order on overall landed cost basis. Correct date of effecting supplies in the event of an order should be indicated in the offer. If the supplier's quoted terms are different from BHEL standard payment terms, interest @10.5% per annum (or as indicated in the enquiry) will be loaded to the quoted prices for difference of payment period.
16. **Packing:** The supplier shall be responsible for the goods being properly and adequately packed so as to prevent any loss, damage or deterioration during transit and indicate packing charges, if any, separately.
17. **Part/ Split Ordering:** BHEL reserves right to Order part of the item/ quantity of the enquiry and split the order among qualified vendors.
18. In case the goods enquired are on Rate Contract basis with any other unit of BHEL, such fact should be clearly indicated in the quotation giving full particulars of Rate Contract number, validity and price and also your willingness to comply with order if placed against such Rate Contract. A true copy of Rate contract signed by the supplier should be sent with the quotation.
19. **Inspection:** On receipt, the goods shall be subjected to inspection and also test, if necessary, and our decision regarding the acceptability of the goods shall be final and binding on the suppliers.
20. **Consequences of Failure To Deliver:** The time stipulated for delivery of goods shall be deemed to be the essence of the contract and delivery must be completed within the stipulated date/s. In the event of supplier's failure to supply the goods by the stipulated date/s, BHEL shall be entitled to levy a penalty of ½% per week for the delayed no of weeks or part thereof for the undelivered portion of PO subject to a maximum of 10% total order value.
21. **Withdrawal from the Contract:** In case the supplier withdraws the quotation after its acceptance by BHEL or fails to supply the goods as per the terms and conditions of contract, or at any time repudiated the contract wholly or in part, BHEL shall be at liberty to cancel the Purchase Order and to recover from the supplier the extra cost and other loss incidental to the breach of contract on the part of the supplier.
22. **Guarantee/ Warranty certificate and Manufacturer's Test report:** Invariably in all cases where it is so stipulated, the supplier should furnish Guarantee/ Warranty certificate valid for a period of 18 months from date of supply or 1 year from the date of receipt, acceptance and commissioning(or more, if provide by oem) whichever earlier and manufacturer's Test report along with the goods, failing which, BHEL shall have the right to reject the goods.
23. All ferrous/ non-ferrous items shall be colour coded as per bureau of Indian standards/ or IS standards/ BHEL Standards.
24. **Recovery of Dues:** BHEL shall recover any amount due from the supplier or any amount outstanding to the credit of the supplier with BHEL R&D unit or any other BHEL unit(s) and/or by legal action.
25. **Arbitration & Forum for Legal Proceedings:** All disputes arising in connection with indigenous/ foreign supplies shall be settled through arbitration held at Hyderabad, AP, India and arbitration shall be appointed by Arbitration Tribunal of the Federation of Andhra Pradesh Chambers of Commerce and Industry, Hyderabad, AP, India. The Courts at Secunderabad/ Hyderabad, AP, India shall have jurisdiction in respect of any suit or other legal proceeding arising from or relating to this contract

The rights and remedies of BHEL stated in these General terms and conditions shall be in addition and supplemental to its rights and remedies under law and custom or usage of trade or business and shall in no way be deemed to limit, curtail, supercede or derogate from its said rights and remedies.



**ANNEXURE “AA**  
**BHARAT HEAVY ELECTRICALS LIMITED**  
**CORPORATE RESEARCH & DEVELOPMENT DIVISION**  
**VIKASNAGAR, HYDERABAD – 500 093. INDIA**

**MATERIALS MANAGEMENT DEPARTMENT**  
**(Information for Technical & Commercial bids with general terms)**

**ENCLOSURE TO ENQ No:**

**DATE:**

- a) Please indicate( \_/ ) for applicable or ( X ) for not applicable against each clause of the enquiry
- b) Vendor shall confirm their compliance for applicable clauses ( \_/ ) in their offer without deviation.

**1) Technical offer:-**

- a) Vendors to confirm compliance to all points of specifications, attached if any. Deviations if any should be specified in the offer.
- b) Vendors shall furnish relevant technical Documents / Catalogues. Drawings and Quality plan duly taking care of Purchase Specification and Quality requirements along with their offer in duplicate for Purchaser’s review / Verification.

**2) Two Part Bid:-**

Vendor shall submit their offer in 2 parts.

**2.1 Technical Bid:-** Containing relevant technical data, drawings, catalogues, Quality Plan etc, along with Commercial Terms and Conditions and a copy of the price bid with the price columns left blank (unpriced price bid). If the price bid was found later to be different from the unpriced price bid in any way, the offer will be rejected.

**2.2 Price Bid:-** Containing the Price(s) quoted. Installation and or commissioning charges shall be spelt out in absolutely lucid terms taking into account the total charges rather than quoting vaguely such as charges as per man day or charges per Engineer per day etc.,

Technical bids will be opened on the due date of the enquiry or any other date fixed by BHEL. Further, vendor should furnish clarifications, if any, required within seven days after the same is sought by Purchaser. If no clarifications/reply received within 7 days, it will be construed that vendor is not interested in the tender and Purchaser will finalise tender accordingly. Price bids received on due date along with technical offers will be recorded and opened subsequently with due intimation to vendors after finalising of technical scope of supply.

These bids shall be submitted in separate sealed covers superscribing the nature of the offer (technical bid or price bid). BHEL Enq No. Due date etc.

**Note: In case of non-compliance with the TWO\_-PART-BID ie.. clause number 2 and subclauses 2.1 and 2.2. Purchaser reserves the right to summarily reject all such offers.**

**3) Delivery:-**

**Vendor shall confirm supply of materials as per the delivery schedule indicated in the enquiry.**

**4) Negotiations:-**

**Vendor shall quote competitive price and best delivery to avoid negotiations.**

**5) Commercial Terms & Conditions:-**

**Terms of Delivery:**

- a) **Vendors shall clearly indicate terms of delivery Viz: Ex-Works/FOR Despatching station/FOR Despatching station FOR Destination/FOB port of loading/FAS Port of loading in their offer. If the terms of delivery is Ex-Works, then vendors shall clearly indicate the following:**
  - 1. Packing and forwarding charges.**
  - 2. Documentation / Handling charges if any**
  - 3. FOB FAS charges (Inland Freight & Insurance charges from vendor works to port of Loading).**
- b) **All Indian Vendors shall clearly specify the Excise Duty in percentage applicable for their supplies. Offers containing expressions such as “Extra as applicable” or “As applicable at the time of Delivery” will be summarily rejected.**
- c) **CST/Local Sales Tax in percentage shall be clearly indicated.**

**6) Validity of Quotation:-**

**Validity of offer should be 90 days after the opening of price bid.**

**7) Part or split ordering:-**

**Purchaser reserves the right to order part of item / quantity of the enquiry.**

**8) For clauses not mentioned in this document see the enclosed “GENERAL TERMS AND CONDITIONS OF ENQUIRY AND CONTRACT FOR THE PURCHASE OF GOODS”**

- 9) In case your terms of payment are different from our standard payment terms, interest at the rate of 10.5% per annum (or BHEL’s standard rate of interest) will be loaded to your prices for the difference of period of payment.**



**BHARAT HEAVY ELECTRICALS LIMITED**  
**CORPORATE R&D Division**  
**Vikasnagar, Hyderabad – 500093, India.**

**Suppliers' compliance statement to basic conditions of enquiry**

**(In case Order to be placed on Indian supplier in Indian currency)**

<b>Condition</b>	<b>BHEL R&amp; D's terms</b>	<b>Supplier's compliance</b> (indicate Yes/No. if 'No', state terms desired)
1) Validity of offer	90 days from the tender opening date	
2) Delivery requirements	Free delivery at our stores or FOR destination (as indicated in the enquiry)	
3) Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
4) Terms of payment	Full payment will be made within thirty days after receipt, inspection and acceptance of the material at BHEL R&D (and where involved, erection and commissioning of the material/equipment at BHEL/destination), by Crossed Cheque and no Bank commission charges are admissible.	
5) Taxes & Duties	Unless specifically mentioned in the enquiry, we do not provide 'C' or 'D' form. Supplier to specify rates of taxes and duties element wise and related percentages.	
6) Penalty for late delivery	0.5% per week beyond the delivery date as mentioned in the Purchase order on undelivered portion subject to a maximum of 10% of the total order value	

\* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition

\* Any other elements of cost in addition to the above may please be specified in detail

**(Signature and Stamp/Seal of Vendor)**





**BHARAT HEAVY ELECTRICALS LIMITED**  
**CORPORATE R&D Division**  
**Vikasnagar, Hyderabad – 500093.**

**IMPORTED**

**Suppliers' compliance statement to basic conditions of enquiry**

**(In case Order to be placed on the Principal and foreign currency)**

<b>Condition</b>	<b>BHEL R&amp;D's terms</b>	<b>Supplier's compliance</b> <b>(indicate Yes/No. if 'No', state terms desired)</b>
01) Validity of offer	90 days from the tender opening date ( or as per enquiry)	
02) Delivery requirements	FCA – Nearest International Airport (or as indicated in the enquiry)	
03) Warranty	Unless specifically mentioned in the enquiry, all supplied items to be provided with warrantee for one year (or more, if provided by the OEM) from the date of acceptance/ commissioning. In case of equipment involving erection and commissioning, warrantee shall be for 18 months from the date of dispatch or 12 months from the date of commissioning, whichever is earlier	
04) Terms of payment	Sight draft. All bank charges inside India will be to BHEL R&D account and out side India will be to suppliers account. Documents through State Bank of India, HAL Complex, Balanagar, Hyderabad, AP, India-500 042.	
05) Agency commission	Pl specify percentage charges, if any. Indian agency/agent commission will be in Indian Currency only.	
06) Erection/ Commission	As per enquiry	
07) Documentation	As per enquiry	
08) Insurance	BHEL will arrange Insurance based on intimation to our Insurance agency, United India Insurance Co., DO-2, Secunderabad, AP, India.	
09) Penalty for late delivery	0.5% per week beyond the delivery date as mentioned in the Purchase order on undelivered portion subject to a maximum of 10% of the total order value	

\* BHEL R&D reserves the right to reject any offer due to non-compliance with the above conditions and/or non-receipt of this form in duly filled condition

\* Any other elements of cost in addition to the above may please be specified in detail

**(Signature and Stamp/ Seal of Vendor)**



BHARAT HEAVY ELECTRICALS LTD.  
Corp. R&D DIVISION  
VIKAS NAGAR,  
HYDERABAD-500 093 (INDIA)

## VENDOR REGISTRATION FORM

[FORM TO BE SUBMITTED\* BY THE BIDDER ALONG WITH TECHNICAL-BID]

Before filling please refer to instructions on page-4

### 1.0 VENDOR PROFILE:

1.1 & 1.2 Name and address of the vender:

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Phone Nos.:

Fax No.:

Email:

1.4 Local representative of the vender in India/ Hyderabad:

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Phone Nos.:

Fax No.:

Email:

Contact person:

Mobile No.:

2.0 & 2.1 Type of Organisation:

PROPRIETORSHIP	COMPANY	SISTER CONCERN	ANY OTHER (Please specify)
PARTNERSHIP	CORPORATION	Small Scale Industry	

3.0 Annual Turn Over:

Name and address of the Banker:

Sr.No.	Bank	Address

4.0 REGISTRATION PARTICULARS

4.1 IT Permanent Account No.(PAN):

4.2 & 4.3 State and central sales tax Registration No.:

4.4 ED/ Service Tax Registration No.:

PF Account No.:

Labour Licence No.:

ESI Account No.:

5.2 Contact person:

Mobile No. :

5.3 Total Number of employees:

Graduates (Engr./Scientists/Mgmt/Fin.)	Consultants	Workers		
		Sup./Skilled	Semiskilled	Unskilled

6.0 Wish to register for supplies/ services other than one bidding for :

<u>Sr.No.</u>	<u>Service/Supplies</u>	<u>Capacity</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		

6.1 Reference list :

(Only recognized public and private sector companies, attach if printed copy available)

<u>Sr.No.</u>	<u>Customer</u>	<u>Volume / Year</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		

7.0 & 8.0 Infrastructure / facilities :

<u>Sr.No.</u>	<u>Facility (with specifications)</u>	<u>Age/ Year procured</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		
<u>5</u>		
<u>6</u>		
<u>7</u>		
<u>8</u>		
<u>9</u>		
<u>10</u>		

9.0 Registration with other BHEL Unit/Units:

<u>Sr.No.</u>	<u>9.1.1 Unit</u>	<u>9.1.2 Registration No.</u>
<u>1</u>		
<u>2</u>		
<u>3</u>		
<u>4</u>		

Any Other information :

Declaration:

The information furnished above is true and authentic.

**(CEO / Proprietor)**

**SEAL:**

**Date:**

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The competent authority reserves the right to accept or reject the registration. Registered vendors will be informed by mail / email, as convenient. Contact Sr.DGM (MM) for clarification/ additional information on registration.  
A separate communication will be sent to you in case of non-registration, citing reasons thereof.

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### **Instructions**

1. Answer all items, use NA for items not applicable.
2. BHEL units do not require this registration.
3. Submit the form in duplicate.
4. Use additional sheets for want of space if required.
5. Attach copies of latest documents in respect of items 4.0 (Registration no.s)
6. Photographs of registered office and the chief executive/proprietor shall be furnished.
7. Use A4 sheets for this document and the enclosures.

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\* REGISTERED BIDDERS, HAVING BHEL (R&D) REGISTRATION NO./ HAVE SUBMITTED THIS FORMAT EARLIER, NEED NOT FURNISH THIS INFORMATION SECOND TIME (UNLESS DESIRE TO UPDATE IT).



**BHEL CORPORATE R & D**  
**VIKAS NAGAR- HYDERABAD - 500 093**  
**ANDHRA PRADESH – INDIA**  
**SUPPLIER REGISTRATION FORM**

(FOREIGN SUPPLIER)

ALL COLUMNS SHOULD BE PROPERLY FILLED IN THE SPACE PROVIDED FOR. WHEREVER IT IS NOT APPLICABLE PLEASE WRITE “NOT APPLICABLE”. INCOMPLETE OR INCORRECT FORMS MAY NOT BE CONSIDERED.

**1.0 GENERAL INFORMATION:**

1.1....NAME OF COMPANY

1.2....DETAILS OF HEAD OFFICE:

ADDRESS :  
TELEPHONE :  
FAX :  
.EMAIL :  
.WEB SITE :

1.3....DETAILS OF FACTORY/WORKS:

ADDRESS :  
TELEPHONE :  
FAX :  
.EMAIL :  
.WEB SITE :

1.4....DETAILS OF MARKETING AGENT

ADDRESS :  
TELEPHONE :  
.FAX :  
.EMAIL :  
.WEB SITE :

1.5 CHIEF EXECUTIVE

NOTE: PLEASE ATTACH SEPARATE SHEETS, IF SPACE FOUND IS INADEQUATE

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AUTHORISED SIGNATORY

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**BHEL CORPORATE R & D**  
**VIKAS NAGAR – HYDERABAD – 500 093**  
**ANDHRA PRADESH – INDIA**

**SUPPLIER REGISTRATION FORM**

(FOREIGN SUPPLIER)

- 1.6 CONTACT PERSON(S)  
FOR PRODUCT OFFERED  
NAME(S)  
OFFICIAL CAPACITY  
ADDRESS:  
TELEPHONE  
FAX  
E-MAIL
- 1.7 YEAR OF ESTABLISHMENT
- 1.8 PRODUCTION CAPACITY PER ANNUM
- 1.9 PARTICULARS OF PRODUCT INCLUDING  
SPECIFICATION AND RANGE OFFERED  
FOR REGISTRATION  
( ATTACH BROCHERS AND CATALOGUE)
- 1.10 NAME(S) OF BANKERS
- 1.11 BANKER'S CERTIFICATE
- 1.12 PORT OF LOADING
- 1.13 NEAREST AIRPORT
- 1.14 NAME OF THE INDIAN AGENT, IF ANY  
WITH AUTHORISATION LETTER
- 1.15 ANY OTHER INFORMATION:

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AUTHORISED SIGNATORY

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**BHEL CORPORATE R & D**  
**VIKAS NAGAR – HYDERABAD – 500 093**  
**ANDHRA PRADESH – INDIA**

**SUPPLIER REGISTRATION FORM**

(FOREIGN SUPPLIER)

**2.0 FINANCIAL INFORMATION**

2.1...TOTAL CAPACITY

2.2...ANNUAL TURN OVER FOR LAST 3 YEARS

2.3...WHEHER CREDIT LICENSE ACCEPTABLE      YES/NO

**3.0    QUALITY MANAGEMENT SYSTEMS**  
ENCLOSED FORMAT PART-B

3.1    EXPERIENCE LIST FOR SAME/SIMILAR ITEMS  
TO BE ENCLOSED

**4.0.....FUTURE EXPANSION PLANS:**  
(GIVE DETAILS)

**5.0    LIST OF ENCLOSURES:**  
INCLUDING BROUCHERS, CATALOGUES, TECHNICAL  
LITERATURE etc...

**6.0    ANY OTHER INFORMATION**

SIGNATURE OF SUPPLIER  
NAME  
DESIGNATION  
DATE  
.....OFFICIAL SEAL

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AUTHORISED SIGNATORY

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