



INDIAN AGRICULTURAL STATISTICS RESEARCH INSTITUTE
Centre for Agricultural Bioinformatics (CABin)
(I.C.A.R.)
Library Avenue, New Delhi-11001



BIDDING DOCUMENT (SINGLE-STAGE)

on: 16th August, 2011

for the

Procurement of

Equipments / Goods/ Services for

Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations
of the High Performance Computing Systems under

“Establishment of National Agricultural Bioinformatics Grid in ICAR”

at IASRI New Delhi.

IFB No: 36(17)/2010 - CPS

Project: *National Agricultural Innovation Project – ICAR*

Issued

Purchaser:

The Director

Indian Agricultural Statistics Research Institute (IASRI)

Library Avenue, Pusa, New Delhi - 110012, India.

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Invitation for Bids (IFB)

16th August 2011

India

National Agricultural Innovation Project - ICAR

International competitive bidding for Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems for “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi under National agriculture innovation project.

Credit 4161-IN/4162-IN

1. This Invitation for Bids (IFB) follows the General Procurement Notice (GPN) for this project that appeared in UNDB print Edition, issue No. 675, of 31st March 2006 and dgMarket online of 14th March, 2006.
2. The Government of India *has received* a *credit* from the *International Development Association* toward the cost of the National Agricultural Innovation Project, and intends to apply part of the proceeds of this *credit* to payments under the agreement(s) resulting from this IFB. All procurements beyond the Credit Closing date i.e 31-12-2012 (or as extended in agreement with the World Bank) shall be financed by Govt. of India's own resources.
3. The *Indian Agricultural Statistics Research Institute (IASRI) (Indian Council of agricultural Research), New Delhi* India now invites sealed bids from eligible bidders as per following details and description :

Brief description	Bid Security Amount in INR or its equivalent in a freely Convertible currency.
Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance and Operations of the High Performance Computing Systems for three years at six different locations i.e. IASRI New Delhi, NBPGR New Delhi, NBAGR Karnal, NBFGR Lucknow, NBAIM Mau, and NBAII Bangalore under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi	`1,00,00,000 (10 Millions INR)

4. Bidding will be conducted using the International Competitive Bidding (ICB) procedures specified in the World Bank’s Guidelines: Procurement under IBRD Loans and IDA Credits May 2004 revised 2006 and is open to all Bidders from eligible source countries as defined in the Guidelines that meet the following minimum qualification criteria.

S. No.	Qualification Criteria
1.	The domestic bidders should be companies registered in India under the company Act 1956 since last 3 years. Similarly the foreign bidders should be registered under the relevant Act prevailing in their country since last 3 years.
2.	Bidder should be System Integrator or HPC OEM firm
3.	Bidder or one of its JV partner should be an established HPC solution providing company and should have experience as per Instruction to bidders (ITB).
4.	Bidder or one of its JV partner should be an established System Integrator company and should have experience and financial capacity as per Instruction to bidders (ITB).
5.	Bidder or one of its JV partner should be an established Data Centre Solution providing company and should have work experience as per Instruction to bidders (ITB).
6.	Bidder should have annual turnover of at least Rs. 300 crores for preceding three Financial Years.
7.	Bidder should have installed and commissioned successfully similar HPC and Data center project through single work order of value not less than Rs 15 crore or two separate work orders value of Rs. 10 Crore each. for Government Institutions/ Private or Public Organizations in last five years

5. Interested eligible Bidders may obtain further information from Assistant Administrative Officer, CP Section Email: cps@iasri.res.in and inspect the bidding documents at the address given below from 23rd August, 2011 between 10.00 AM to 4.00 PM on all working days.
6. A complete set of Bidding Documents in English may be purchased by interested bidders on the submission of a written application to the address below and upon payment of a non refundable fee of Indian Rupees 5,000/- or US\$ 100 in the form of a Demand Draft/Banker's cheque in favour of **"Director IASRI" payable at New Delhi** from 23rd August, 2011 to 2nd November, 2011. Bidding document requested by mail will be dispatched by courier on payment of an extra amount of Indian Rupees 1,000/- for domestic bidders and US\$ 50 for overseas bidder. IASRI, New Delhi India will not be held responsible for postal delay, if any in the delivery of document or non-receipt of the same.

or

The bidders may visit IASRI's website www.iasri.res.in and/or NAIP's website www.naip.icar.org.in for more information and/or download the bid document. The cost of bid document may be submitted along with the bid before opening. Please note that in case of any discrepancy between the documents downloaded by the prospective bidder and the Bidding Documents (hard copy) of IASRI New Delhi India, the latter shall prevail.

7. A pre-bid meeting with potential bidders will be held on 26th September, 2011.
8. Bids must be delivered to the address below at or before 11:00 AM, 3rd November, 2011. All bids must be accompanied by a bid security amount indicated above and in bidding documents or an equivalent amount in a freely convertible currency. Late bids will be rejected. Bids will be opened in the presence of the Bidders' representatives who choose to attend at the address below at 11:30 AM, 3rd November, 2011

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9. The attention of prospective Bidders is drawn to (i) the fact that they will be required to certify in their bids that all software is either covered by a valid license or was produced by the Bidder and (ii) that violations are considered fraud, which can result in ineligibility to be awarded World Bank-financed contracts.
10. The complete address for communications, Bids submission ,Pre-bid meeting and Bid opening :

Assistant Administrative Officer (Central Purchase Section)

Address: Indian Agricultural Statistics Research Institute (IASRI)

Library Avenue, Pusa, New Delhi - 110012, India.

Tel: 91-11-25847122-24 Extn: 4137/4130

Fax: 91-11-25841564

E-mail: director@iasri.res.in, cps@iasri.res.in

Web site: www.iasri.res.in

SECTION I. INSTRUCTIONS TO BIDDERS (ITB)
(Single-Stage Bidding)

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Instructions to Bidders

A. GENERAL

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- | | |
|--|---|
| 1. Scope of Bid and Bidding Process | <p>1.1 The Purchaser named in the BDS and the SCC for GCC Clause 1.1 (b) (i), or its duly authorized Purchasing Agent if so specified in the BDS (interchangeably referred to as “the Purchaser” in these Bidding Documents), invites bids for the supply and installation of the Information System (IS), as briefly described in the BDS and specified in greater detail in these Bidding Documents.</p> <p>1.2 The title and identification number of the Invitation for Bids (IFB) and resulting Contract(s) are provided in the BDS.</p> <p>1.3 Throughout the Bidding Documents, the term "in writing" means communicated in written form (e.g. by mail, e-mail, fax, telex) with proof of receipt, and the term "days" means calendar days unless a different meaning is evident from the context.</p> <p>1.4 If the BDS so provides, alternative procedures forming part or all of what is commonly known as e-Tendering are available to the extent specified in, or referred to by, the BDS.</p> |
| 2. Source of Funds | <p>2.1 The Borrower named in the BDS has applied for or received a loan or credit (as identified in the BDS, and called a “loan” in these Bidding Documents) from the International Bank for Reconstruction and Development or the International Development Association (called “the Bank” in these Bidding Documents) equivalent to the amount indicated in the BDS toward the cost of the Project specified in the BDS. The Borrower intends to apply a portion of the proceeds of this loan to eligible payments under the Contract for which these Bidding Documents are issued.</p> <p>2.2 Payment by the Bank will be made only at the request of the Borrower, or the Borrower’s executing agency, and upon approval by the Bank in accordance with the terms and conditions of the Loan Agreement, and will be subject in all respects to the terms and conditions of that agreement. The Loan Agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of goods, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the loan proceeds.</p> |

3. Fraud and Corruption

3.1 It is the Bank's policy to require that Borrowers (including beneficiaries of Bank loans), as well as bidders, suppliers, and contractors and their subcontractors under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts.¹ In pursuance of this policy, the Bank:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
 - (i) "corrupt practice"² is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
 - (ii) "fraudulent practice"³ is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
 - (iii) "collusive practice"⁴ is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
 - (iv) "coercive practice"⁵ is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
 - (v) "obstructive practice" is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a

¹ In this context, any action taken by a bidder, supplier, contractor, or a sub-contractor to influence the procurement process or contract execution for undue advantage is improper.

² "Another party" refers to a public official acting in relation to the procurement process or contract execution]. In this context, "public official" includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

³ A "party" refers to a public official; the terms "benefit" and "obligation" relate to the procurement process or contract execution; and the "act or omission" is intended to influence the procurement process or contract execution.

⁴ "Parties" refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

⁵ A "party" refers to a participant in the procurement process or contract execution.

corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

- (bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under sub-clause 3.1 (e) below.
 - (b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;
 - (c) will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur;
 - (d) will sanction a firm or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a Bank-financed contract if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a Bank-financed contract; and
 - (e) will have the right to require that a provision be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers, and contractors and their sub-contractors to permit the Bank to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by the Bank.
- 3.2 Furthermore, Bidders shall be aware of the provision stated in Clause 9.8 and Clause 41.2 of the General Conditions of Contract.
- 3.3 Any communications between the Bidder and the Purchaser related to matters of alleged fraud or corruption must be made in writing.

3.4 By signing the Bid Submission Form, the Bidder represents that it either is the owner of the Intellectual Property Rights in the hardware, software or materials offered, or that it has proper authorization and/or license to offer them from the owner of such rights. For the purpose of this Clause, Intellectual Property Rights shall be as defined in GCC Clause 1.1 (c) (xvii). Willful misrepresentation of these facts shall be considered a fraudulent practice subject to the provisions of Clauses 3.1 through 3.4 above, without prejudice of other remedies that the Purchaser may take.

4. Eligible Bidders

4.1 A Bidder, and all parties constituting the Bidder, may have the nationality of any country, subject to the restrictions specified in Section III, Eligible Countries. A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country.

4.2 If a prequalification process has been undertaken for the Contract(s) for which these Bidding Documents have been issued, only those Bidders may participate that had been prequalified and continue to meet the eligibility criteria of this Clause. A prequalified Joint Venture may not change partners or its structure when submitting a bid.

4.3 A firm may be excluded from bidding if:

- (a) it was engaged by the Purchaser to provide consulting services for the preparation of the design, specifications, or other documents to be used for the procurement of the Information System described in these Bidding Documents; or
- (b) it is a government-owned enterprise in the Borrower's country, unless it can establish that it (i) is legally and financially autonomous and (ii) operates under commercial law. No dependent agency of the Borrower or Sub-Borrower shall be permitted to bid.

4.4 A firm that has been determined to be ineligible by the Bank in relation to the Bank Guidelines On Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants shall be not be eligible to be awarded a contract.

4.5 A firm or individual is or will be disqualified from participation in this bidding if, at any time from advertisement of the bidding until and including contract award, the firm or individual is under:

- (a) a suspension by the Purchaser agreed by the Bank as a result of execution of a Bid-Securing Declaration pursuant to ITB Clause 17.6 in another Bank-financed procurement, or under a suspension by the Purchaser for other reasons that have been agreed by the Bank; or
- (b) a declaration of ineligibility by the Bank in accordance with ITB Clause 3.1 (d). The list of individuals and firms debarred from participating in World Bank projects is available at <http://www.worldbank.org/debarr/>, or
- (c) a sanction imposed by the United Nations Security Council, as mentioned in ITB Clause 2.2.

4.6 A firm or other entity that is ineligible according to any of the above provisions of this Clause, may also not participate as a Joint Venture partner, or as Subcontractor for or supplier of goods, works or services. If a bid becomes materially incomplete after removing ineligible entities, the bid may be disqualified.

4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.

5. Eligible Goods and Services

5.1 For the purposes of these Bidding Documents, the Information System means all:

- (a) the required information technologies, including all information processing and communications-related hardware, software, supplies, and consumable items that the Supplier is required to supply and install under the Contract, plus all associated documentation, and all other materials and goods to be supplied, installed, integrated, and made operational (collectively called “the Goods” in some clauses of the ITB); and
- (b) the related software development, transportation, insurance, installation, customization, integration, commissioning, training, technical support, maintenance, repair, and other services necessary for proper operation of the Information System to be provided by the selected Bidder and as specified in the Contract.

5.2 Funds from Bank loans are disbursed only for expenditures for an Information System made up of goods and services provided by nationals of, and produced in or supplied from, eligible source countries as defined in Section III, Eligible Countries.

An Information System is deemed to be produced in a certain country when, in the territory of that country, through software development, manufacturing, or substantial and major assembly or integration of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

- 5.3 For purposes of this clause, the nationality of the Bidder is distinct from the country in which the Information System and its goods components are produced or from which the related services are supplied.

6. Qualifications of the Bidder

- 6.1 By submission of documentary evidence in its bid, the Bidder must establish to the Purchaser's satisfaction:

- (a) that it has the financial, technical, and production capability necessary to perform the Contract, meets the qualification criteria **specified in the BDS**, and has a successful performance history. If a prequalification process has been undertaken for the Contract(s) for which these Bidding Documents have been issued, the Bidder shall, as part of its bid, update any information submitted with its application for prequalification;

(For the purposes of establishing a Bidder's qualifications, and unless stated to the contrary in the BDS, the experience and / or resources of any Subcontractor will not contribute to the Bidder's qualifications; only those of a Joint Venture partner will be considered.)

- (b) that, in the case of a Bidder offering to supply key goods components of the Information System, as **identified in the BDS**, that the Bidder does not itself produce, the Bidder is duly authorized by the producer to supply those components in the Purchaser's country under the Contract(s) that may result from this bidding; (This will be accomplished by including Manufacturer's Authorizations in the bid, based on the sample found in Section VII.)
- (c) that, if a Bidder proposes Subcontractors for key services if and as **identified in the BDS**, these Subcontractors have agreed in writing to serve for the Bidder under the Contract(s) that may result from this bidding; and
- (d) that, in the case of a Bidder not doing business within the Purchaser's country, the Bidder is or will be (if awarded the Contract) represented by an Agent in that country who is equipped and able to carry out the Bidder's

maintenance, technical support, training, and repair obligations prescribed in the General and Special Conditions of Contract, and/or Technical Requirements.

6.2 Bids submitted by a Joint Venture of two or more firms as partners shall also comply with the following requirements:

- (a) the bid shall be signed so as to be legally binding on all partners;
- (b) one of the partners shall be nominated as being in charge, and this nomination shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners;
- (c) the partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the Joint Venture, and the entire execution of the Contract, including payment, shall be done exclusively with the partner in charge;
- (d) the partner or combination of partners that is responsible for a specific component of the Information System must meet the relevant minimum qualification criteria for that component;
- (e) a firm may submit bids either as a single Bidder on its own, or as partner in one, and only one, Joint Venture. If, as a result of the bid opening pursuant to ITB Clause 24, this requirement is not met, all bids involving the firm as a single Bidder or Joint Venture partner will be disqualified;
- (f) all partners of the Joint Venture shall be liable jointly and severally for the execution of the Contract in accordance with the Contract terms, and a statement to this effect shall be included in the authorization mentioned under ITB Clause 6.2 (b) above, in the bid as well as in the Contract (in case of a successful bid).

6.3 If a Bidder intends to subcontract major items of supply or services, it shall include in the bid details of the name and nationality of the proposed Subcontractor for each of those items and shall be responsible for ensuring that any Subcontractor proposed complies with the requirements of ITB Clause 4, and that any Goods or Services components of the Information System to be provided by the Subcontractor comply with the requirements of ITB Clause 5 and the related evidence required by ITB Clause 13.1 (e) (iii) is submitted. Bidders are free to list

more than one Subcontractor against each item. Quoted rates and prices will be deemed to apply, whichever Subcontractor is appointed, and no adjustment of the rates or prices will be permitted. The Purchaser reserves the right to delete any proposed Subcontractor from the list. This shall be done prior to Contract signature, by deleting such unacceptable Subcontractors from Appendix 3 to the Contract Agreement, which shall list the approved Subcontractors for each item prior to Contract signature. Subsequent additions and deletions from the list of approved Subcontractors shall be performed in accordance with GCC Clause 20 (as revised in the SCC, if applicable) and Appendix 3 to the Contract Agreement.

For the purposes of these Bidding Documents, a Subcontractor is any vendor or service provider with whom the Bidder contracts for the supply or execution of any part of the Information System to be provided by the Bidder under the Contract (such as the supply of major hardware, software, or other components of the required Information Technologies specified, or the performance of related Services, e.g., software development, transportation, installation, customization, integration, commissioning, training, technical support, maintenance, repair, etc.).

- 6.4 A firm which is a Bidder, whether as a single Bidder or as a partner in a Joint Venture, cannot be a Subcontractor in other bids, except for the supply of commercially available hardware or software by the firm, as well as purely incidental services such as installation/configuration, routine training, and ongoing maintenance/support. If the BDS for ITB Clause 6.1 (a) allows the qualification of Subcontractors nominated for certain components to be taken into account in assessing the Bidder's overall qualifications, any Subcontractor so nominated by any Bidder is automatically disqualified from being a Bidder itself or a partner in a Joint Venture. The same will normally apply to firms that have provided Subcontractor agreements for certain services pursuant to ITB Clause 6.1 (c). Non-compliance may result in the rejection of all bids in which the affected firm participates as Bidder or as partner in a Joint Venture. As long as in compliance with these provisions, or as long as unaffected by them due to not participating as Bidder or as partner in a Joint Venture, a firm may be proposed as a Subcontractor in any number of bids. If the BDS for ITB 28.1 permits the submission of bids for Subsystems, lots, or slices, then the provisions of this Clause 6.4 apply only to bids for the same Subsystem(s), lot(s), or slice(s);

-
- 7. Cost of Bidding**
- 7.1 The Bidder shall bear all costs associated with the preparation and submission of its bid, and the Purchaser will in no case be responsible or liable for those costs.
- 8. Site Visit**
- 8.1 The Bidder may wish to visit and examine the site or sites of the Information System and obtain for itself, at its own responsibility and risk, all information that may be necessary for preparing the bid and entering into the Contract. The costs of visiting the site or sites shall be at the Bidder's own expense.
- 8.2 The Purchaser will arrange for the Bidder and any of its personnel or agents to gain access to the relevant site or sites, provided that the Bidder gives the Purchaser adequate notice of a proposed visit of at least fourteen (14) days. Alternatively, the Purchaser may organize a site visit or visits concurrently with the pre-bid meeting, as specified in the BDS for ITB Clause 10.2. Failure of a Bidder to make a site visit will not be a cause for its disqualification.
- 8.3 No site visits shall be arranged or scheduled after the deadline for the submission of the Bids and prior to the award of Contract.

B. THE BIDDING DOCUMENTS

- 9. Content of Bidding Documents**
- 9.1 The contents of the Bidding Documents are listed below and should be read in conjunction with any addenda issued in accordance with ITB Clause 11:
- | | |
|-------------|---|
| Section I | Instructions to Bidders (ITB) |
| Section II | Bid Data Sheet (BDS) |
| Section III | Eligible Countries for the Provision of Goods, Works, and Services in Bank-Financed Procurement |
| Section IV | General Conditions of Contract (GCC) |
| Section V | Special Conditions of Contract (SCC) |
| Section VI | Technical Requirements (including Implementation Schedule) |
| Section VII | Sample Forms |
- 9.2 Bidders are expected to examine all instructions, forms, terms, specifications, and other information in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or to submit a bid not substantially responsive to the

Bidding Documents in every respect will be at the Bidder's risk and may result in the rejection of its bid.

- 9.3 The Invitation for Bids is not formally part of the Bidding Documents and is included for reference only. In case of inconsistencies, the actual Bidding Documents shall prevail.

10. Clarification of Bidding Documents and Pre-bid Meeting

- 10.1 A prospective Bidder requiring any clarification of the Bidding Documents may notify the Purchaser in writing at the Purchaser's address and by one of the means **indicated in the BDS**. Similarly, if a Bidder feels that any important provision in the documents will be unacceptable, such an issue should be raised as soon as possible. The Purchaser will respond in writing to any request for clarification or modification of the Bidding Documents that it receives no later than twenty-one (21) days prior to the deadline for submission of bids prescribed by the Purchaser. Copies of the Purchaser's response (including an explanation of the query but not identifying its source) will be sent to all prospective Bidders that received the Bidding Documents from the Purchaser.

- 10.2 When **specified in the BDS**, the Purchaser will organize and Bidders are welcome to attend a pre-bid meeting at the time and place **indicated in the BDS**. The purpose of the meeting will be to clarify issues and answer questions on any matter that may be raised at this stage, with particular attention to issues related to the Technical Requirements. Bidders are requested to submit any questions in writing to reach the Purchaser not later than one week before the meeting. Questions and answers will be transmitted in accordance with ITB Clause 10.1. Minutes of the meeting, including the questions raised and responses given, together with any responses prepared after the meeting, will be transmitted without delay to all those that received the Bidding Documents from the Purchaser. Any modification to the Bidding Documents listed in ITB Clause 9.1, which may become necessary as a result of the pre-bid meeting, shall be made by the Purchaser exclusively by issuing an Addendum pursuant to ITB Clause 11 and not through the minutes of the pre-bid meeting.

11. Amendment of Bidding Documents

- 11.1 At any time prior to the deadline for submission of bids, the Purchaser may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, amend the Bidding Documents. Later amendments on the same subject modify or replace earlier ones.
- 11.2 Amendments will be provided in the form of Addenda to the Bidding Documents, which will be sent in writing to all

prospective Bidders that received the Bidding Documents from the Purchaser. Addenda will be binding on Bidders. Bidders are required to immediately acknowledge receipt of any such Addenda. It will be assumed that the amendments contained in such Addenda will have been taken into account by the Bidder in its bid.

- 11.3 In order to afford prospective Bidders reasonable time in which to take the amendment into account in preparing their bids, the Purchaser may, at its discretion, extend the deadline for the submission of bids, in which case, the Purchaser will notify all Bidders in writing of the extended deadline.

C. PREPARATION OF BIDS

12. Language of Bid

- 12.1 The bid prepared by the Bidder and all correspondence and documents related to the bid exchanged by the Bidder and the Purchaser shall be written in the **language specified in the BDS**, or, if the BDS so provides, in either one of two languages specified there. Any printed literature furnished by the Bidder as part of its bid may be in a language not specified in the BDS, as long as such literature is accompanied by a translation of its pertinent passages into the language of the bid, in which case, for purposes of interpretation of the bid, the translation shall govern.

13. Documents Comprising the Bid

- 13.1 The bid submitted by the Bidder shall comprise:
- (a) Bid Submission Form completed and signed by a person or persons duly authorized to bind the Bidder to the Contract;
 - (b) all Price Schedules duly completed in accordance with ITB Clauses 14, 15, and 18 and signed by a person or persons duly authorized to bind the Bidder to the Contract;
 - (c) if required, Bid-securing Declaration or Bid Security furnished in accordance with ITB Clause 17;
 - (d) written confirmation authorizing the signatory of the bid to commit the Bidder, in accordance with ITB Clause 19.2;
 - (e) Attachments:
 - (i) Attachment 1: Bidder's Eligibility

In the absence of prequalification, documents establishing to the Purchaser's satisfaction the Bidder's eligibility to bid, including but not limited

to documentary evidence that the Bidder is legally incorporated in a territory of an eligible source country as defined under ITB Clause 4;

(ii) Attachment 2: Bidder's Qualifications

Documentary evidence establishing to the Purchaser's satisfaction, and in accordance with ITB Clause 6, that the Bidder is qualified to perform the Contract if its bid is accepted. In the case where prequalification of Bidders has been undertaken, and pursuant to ITB Clause 6.1 (a), the Bidder must provide evidence on any changes in the information submitted as the basis for prequalification or, if there has been no change at all in said information, a statement to this effect;

Any Manufacturer's Authorizations and Subcontractor agreements specified as required in the BDS for ITB Clauses 6.1 (b) and 6.1 (c);

(iii) Attachment 3: Eligibility of Goods and Services

Documents establishing, to the Purchaser's satisfaction, that the Goods and Services components of the Information System to be supplied, installed, and/or performed by the Bidder are eligible Goods and Services as defined under ITB Clause 5. If awarded the Contract, the Bidder shall submit for such components of the Information System evidence of eligibility, which shall be confirmed by a certificate of origin issued at the time of shipment;

(iv) Attachment 4: Conformity of the Information System to the Bidding Documents

Documentary evidence establishing to the Purchaser's satisfaction, and in accordance with ITB Clause 16, that the Goods and Services components of the Information System to be supplied, installed, and/or performed by the Bidder conform to the Bidding Documents;

(v) Attachment 5: Proposed Subcontractors

A list of all major items of Goods or Services that the Bidder proposes to purchase or subcontract from others, and the name and nationality of the proposed Subcontractor, including vendors, for each of those items;

(vi) Attachment 6: Intellectual Property

A list of:

- (1) all Software included in the Bidder's bid, assigning each item to one of the software categories defined in GCC Clause 1.1 (c):

- (A) System, General Purpose, and Application Software; and

- (B) Standard and Custom Software.

- (2) all Custom Materials, as defined in GCC Clause 1.1 (c), included in the Bidder's bid.

All Materials not identified as Custom Materials shall be deemed Standard Materials, as defined in GCC Clause 1.1 (c).

Re-assignments among the Software and Materials categories, if necessary, will be made during the implementation of the Contract according to GCC Clause 39 (Changes to the System).

14. Bid Prices

14.1 All Goods and Services identified in the Supply and Installation Cost Sub-Table and the Recurrent Cost Sub-Table in Section VII (Forms 2.5 and 2.6), and all other Goods and Services proposed by the Bidder to fulfill the requirements of the Information System, must be priced separately in the format of the same tables and summarized in the corresponding Cost Summary Tables in the same Section. Prices must be quoted in accordance with the instructions provided in Section VII for the various cost tables, in the manner specified below.

14.2 The price of items that the Bidder has left blank in the cost tables provided in Section VII shall be assumed to be included in the price of other items. Items omitted altogether from the cost tables shall be assumed to be omitted from the bid and, provided that the bid is substantially responsive, an adjustment to the bid price will be made during evaluation in accordance with ITB Clause 28.6 (c) (iii).

14.3 Unit prices must be quoted at a level of detail appropriate for calculation of any partial deliveries or partial payments under the contract, in accordance with the Implementation Schedule in Section VI, and with GCC and SCC Clause 12 – Terms of Payment. Bidders may be required to provide a breakdown of any composite or lump-sum items included in the Cost Tables.

14.4 The prices for Goods components of the System are to be expressed and shall be defined and governed in accordance with the rules prescribed in the edition of Incoterms **specified in the BDS**, and quoted in the appropriate columns of the cost tables of Section VII as follows:

(a) Goods supplied from outside the Purchaser's country:

Unless otherwise **specified in the BDS**, the prices shall be quoted on a CIP (named place of destination) basis, exclusive of all taxes, stamps, duties, levies, and fees imposed in the Purchaser's country. The named place of destination and special instructions for the contract of carriage are as **specified in the BDS**. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible countries. Similarly, the Bidder may obtain insurance services from any eligible source country.

(b) Locally supplied Goods:

Unit prices of Goods offered from within the Purchaser's Country, shall be quoted on an EXW (ex factory, ex works, ex warehouse or off-the-shelf, as applicable) basis, including all customs duties, levies, fees, sales and other taxes incurred until delivery of the Goods, but excluding all VAT or sales and other taxes and duties/fees incurred for the Goods at the time of invoicing or sales transaction, if the Contract is awarded.

(c) Inland transportation:

Unless otherwise **stated in the BDS**, inland transportation, insurance and related local costs incidental to the delivery of the Goods to the designated Project Sites must be quoted separately as a Service item in accordance with ITB Clause 14.5, whether the Goods are to be supplied locally or from outside the Purchaser's country, except when these costs are already included in the price of the Goods, as is, e.g., the case, when ITB Clause 14.4 (a) specifies CIP, and the named places of destination are the Project Sites.

14.5 The price of Services shall be quoted in total for each service (where appropriate, broken down into unit prices), separated into their local and foreign currency components. Prices must include all taxes, duties, levies and fees whatsoever, except only VAT or other indirect taxes, or stamp duties, that may be assessed and/or apply in the Purchaser's country on/to the price of the Services invoiced to the Purchaser, if the Contract is

awarded. Unless otherwise **specified in the BDS**, the prices must include all costs incidental to the performance of the Services, as incurred by the Supplier, such as travel, subsistence, office support, communications, translation, printing of materials, etc. Costs incidental to the delivery of the Services but incurred by the Purchaser or its staff, or by third parties, must be included in the price only to the extent such obligations are made explicit in these Bidding Documents (as, e.g., a requirement for the Bidder to include the travel and subsistence costs of trainees).

- 14.6 Prices for Recurrent Costs beyond the scope of warranty services to be incurred during the Warranty Period, defined in SCC Clause 29.4 and prices for Recurrent Costs to be incurred during the Post-Warranty Period, defined in SCC Clause 1.1. (e) (xii), shall be quoted as Service prices in accordance with ITB Clause 14.5 on the Recurrent Cost Sub-Table in detail, and on the Recurrent Cost Summary Table in currency totals. Recurrent costs are all-inclusive of the costs of necessary Goods such as spare parts, software license renewals, labor, etc., needed for the continued and proper operation of the System and, if appropriate, of the Bidder's own allowance for price increases.
- 14.7 Unless otherwise **specified in the BDS**, prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to increases on any account. Bids submitted that are subject to price adjustment will be rejected.

15. Bid Currencies 15.1 Prices shall be quoted in the following currencies:

- (a) The Bidder may quote its prices for all Information Technologies, associated Goods, and Services to be supplied from outside the Purchaser's Country in the currencies of countries eligible according to Section III. If the Bidder wishes to be paid in a combination of different currencies, it must quote unit prices accordingly, but no more than three foreign currencies may be used.
- (b) Unless otherwise **specified in the BDS**, the Bidder shall express its prices for such Information Technologies, associated Goods, and Services to be supplied locally (i.e., from within the Purchaser's Country) in the currency of the Purchaser's Country.

**16. Documents
Establishing
the Conformity
of the
Information
System to the
Bidding
Documents**

16.1 Pursuant to ITB Clause 13.1 (e) (iv), the Bidder shall furnish, as part of its bid, documents establishing the conformity to the Bidding Documents of the Information System that the Bidder proposes to supply and install under the Contract.

16.2 The documentary evidence of conformity of the Information System to the Bidding Documents shall be in the form of written descriptions, literature, diagrams, certifications, and client references, including:

- (a) the Bidder's technical bid, i.e., a detailed description of the Bidder's proposed technical solution conforming in all material aspects with the Technical Requirements (Section VI) and other parts of these Bidding Documents, overall as well as in regard to the essential technical and performance characteristics of each component making up the proposed Information System;
- (b) an item-by-item commentary on the Purchaser's Technical Requirements, demonstrating the substantial responsiveness of the Information System offered to those requirements. In demonstrating responsiveness, the commentary shall include explicit cross references to the relevant pages in the supporting materials included in the bid. Whenever a discrepancy arises between the item-by-item commentary and any catalogs, technical specifications, or other preprinted materials submitted with the bid, the item-by-item commentary shall prevail;
- (c) a Preliminary Project Plan describing, among other things, the methods by which the Bidder will carry out its overall management and coordination responsibilities if awarded

the Contract, and the human and other resources the Bidder proposes to use. The Plan should include a detailed Contract Implementation Schedule in bar chart form, showing the estimated duration, sequence, and interrelationship of all key activities needed to complete the Contract. The Preliminary Project Plan must also address any other topics **specified in the BDS**. In addition, the Preliminary Project Plan should state the Bidder's assessment of what it expects the Purchaser and any other party involved in the implementation of the Information System to provide during implementation and how the Bidder proposes to coordinate the activities of all involved parties;

- (d) a written confirmation that the Bidder accepts responsibility for the successful integration and interoperability of all components of the Information System as required by the Bidding Documents.

16.3 For purposes of the commentary to be furnished pursuant to ITB Clause 16.2 (b), the Bidder shall note that references to brand names or model numbers or national or proprietary standards designated by the Purchaser in its Technical Requirements are intended to be descriptive and not restrictive. Except where explicitly **prohibited in the BDS** for specific items or standards, the Bidder may substitute alternative brand/model names or standards in its bid, provided that it demonstrates to the Purchaser's satisfaction that the use of the substitute(s) will result in the Information System being able to perform substantially equivalent to or better than that specified in the Technical Requirements.

17. Securing the Bid

17.1 The BDS for this Clause specifies whether bids must be secured, and if so, whether by a Bid-Securing Declaration or by a Bid Security. If a Bid Security is required or optional, the **BDS also specifies the amount**.

17.2 Securing the bids shall be substantially in accordance with the related sample forms included in Section VII or other forms approved by the Purchaser prior to bid submission. Bids must remain secured for a period of 28 days beyond the validity period of the bids, as extended, if applicable, in accordance with ITB Clause 18.2. In case of a Bid Security, it shall also:

- (a) at the Bidder's option, be in the form of either a certified check, letter of credit, or a bank guarantee from a banking institution, or a bond issued by a surety;

- (b) be issued by a reputable institution selected by the Bidder and located in any eligible country; if the institution issuing the security is located outside the Purchaser's Country, it shall have a correspondent financial institution located in the Purchaser's Country to make the security enforceable;
- (c) be payable promptly upon written demand by the Purchaser in case any of the conditions listed in ITB Clause 17.6 is/are invoked;
- (d) be submitted in its original form; copies will not be accepted.

17.3 The Bid-Securing Declaration or the Bid Security of a Joint Venture shall be issued in the name of the Joint Venture submitting the bid provided the Joint Venture has legally been constituted, or else it shall be issued in the name of all partners proposed for the Joint Venture in the bid. Sanctions due to a breach of the terms of a Bid-Securing Declaration pursuant to ITB Clause 17.6 will apply to all partners to the Joint Venture.

17.4 If a Bid-Securing Declaration or Bid Security is required in accordance with ITB Clause 17.1, any bid not accompanied by a substantially acceptable Bid-Securing Declaration or Bid Security in accordance with ITB Clauses 17.2 and 17.3, shall be rejected by the Purchaser as non-responsive.

17.5 Unless executed or forfeited pursuant to ITB Clause 17.6, Bid-Securing Declarations, if any, will expire for, or Bid Securities, if any, will be returned as promptly as possible to,

- (a) all Bidders upon annulment of the bidding pursuant to ITB Clause 34;
- (b) Bidders refusing a request to extend the period of validity of their bids pursuant to ITB Clause 18.2;
- (c) the successful Bidder once it has signed the Contract Agreement and furnished a valid Performance Security as required;
- (d) the unsuccessful Bidders at the same time as in (c), that is, when they are informed about the successful establishment of the contract with the successful Bidder.

17.6 The Bid-Securing Declaration, if any, may be executed, or the Bid Security, if any, may be forfeited:

- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Bid Submission Form or any extension of validity the Bidder has agreed to pursuant to ITB Clause 18.2; or
- (b) in the case of the successful Bidder, if the Bidder fails to:
 - (i) sign the Contract Agreement in accordance with ITB Clause 36; or
 - (ii) furnish the Performance Security in accordance with ITB Clause 37.

17.7 If a bid security is **not required in the BDS**, and

- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid Form, except as provided in ITB 18.2, or
- (b) if the successful Bidder fails to: sign the Contract in accordance with ITB 36; or furnish a performance security in accordance with ITB 37;

the Borrower may, **if provided for in the BDS**, declare the Bidder disqualified to be awarded a contract by the Employer for a period of time **as stated in the BDS**.

18. Period of Validity of Bids

18.1 Bids shall remain valid, at a minimum, for the period **specified in the BDS** after the deadline date for bid submission prescribed by the Purchaser, pursuant to ITB Clause 21. A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive. For the convenience of Bidders, the BDS spells out the minimal original expiration dates for the validity of the bid and, if applicable pursuant to ITB Clause 17.1, for securing the bid. However, Bidders are responsible for adjusting the dates in the BDS in accordance with any extensions to the deadline date of bid submission pursuant to ITB Clause 21.2.

18.2 In exceptional circumstances, prior to expiry of the bid validity period, the Purchaser may request that the Bidders extend the period of validity for a specified additional period. The request and the responses to the request shall be made in writing. A Bidder may refuse the request without risking execution of the Bid-Securing Declaration or forfeiting the Bid Security, but in this case the bid will be out of the competition for the award. Except as provided in ITB Clause 18.3, a Bidder agreeing to the

request will not be required or permitted to modify its bid, but will be required to ensure that the bid remains secured for a correspondingly longer period, pursuant to ITB Clause 17.2.

18.3 In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the contract price will be adjusted as specified in the request for extension. Bid evaluation will be based on the bid prices without taking into consideration the above correction.

19. Format and Signing of Bid

19.1 The Bidder shall prepare an original and the number of copies/sets of the bid **specified in the BDS**, clearly marking each one as “ORIGINAL BID,” “COPY NO. 1,” “COPY NO. 2,” etc., as appropriate. In the event of any discrepancy between them, the original shall govern.

19.2 The original and all copies of the bid, each consisting of the documents listed in ITB Clause 13.1, shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Bidder. The authorization must be in writing and included in the bid pursuant to ITB Clause 13.1 (d). The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid, except for unamended printed literature, shall be initialed by the person or persons signing the bid.

19.3 The bid shall contain no interlineations, erasures, or overwriting, except to correct errors made by the Bidder, in which case such corrections shall be initialed by the person or persons signing the bid.

19.4 The Bidder shall furnish in the Bid Submission Form (a sample of which is provided in the Sample Forms Section of the Bidding Documents) information regarding commissions or gratuities, if any, paid or to be paid to agents relating to this procurement and to the execution of the Contract should the Bidder be successful.

D. SUBMISSION OF BIDS

20. Sealing and Marking of Bids

- 20.1 The Bidder shall seal the original and each copy of the bid in separate envelopes, duly marking the envelopes as “ORIGINAL BID” and “COPY NO. [number].” The envelopes shall then be sealed in an outer envelope.
- 20.2 The inner and outer envelopes shall
- (a) be addressed to the Purchaser at the address **given in the BDS**, and
 - (b) bear the loan/Project name indicated in the BDS for ITB Clause 2.1, the Invitation for Bids title and number, and the Contract name(s), as indicated in the BDS for ITB Clause 1.2, and the statement “DO NOT OPEN BEFORE [time and date],” to be completed with the time and date specified in the BDS for ITB Clause 24.1.
- 20.3 The inner envelopes shall also indicate the name and address of the Bidder so that the bid can be returned unopened in case it is declared “late.”
- 20.4 If the outer envelope is not sealed and marked as required by ITB Clause 20.2 above, the Purchaser will assume no responsibility for the bid’s misplacement or premature opening. If the outer envelope discloses the Bidder’s identity, the Purchaser will not guarantee the anonymity of the bid submission, but this disclosure will not constitute grounds for bid rejection.

21. Deadline for Submission of Bids

- 21.1 Bids must be received by the Purchaser at the address specified in the BDS for ITB Clause 20.2 no later than the time and date **stated in the BDS**.
- 21.2 The Purchaser may, at its discretion, extend this deadline for submission of bids by amending the Bidding Documents in accordance with ITB Clause 11.3, in which case all rights and obligations of the Purchaser and Bidders will thereafter be subject to the deadline as extended.

22. Late Bids

- 22.1 Any bid received by the Purchaser after the bid submission deadline prescribed by the Purchaser in the BDS for ITB Clause 21, will be rejected and returned unopened to the Bidder.

**23. Withdrawal,
Substitution,
and
Modification of
Bids**

23.1 The Bidder may withdraw, substitute, or modify its bid after submission, provided that written notice of the withdrawal, substitution, or modification is received by the Purchaser prior to the deadline prescribed for bid submission. All notices must be duly signed by an authorized representative and shall include a copy of the authorization (the power of attorney) in accordance with ITB Sub-Clause 19.2.

23.2 All notices of withdrawal, substitution, or modification shall

- (a) be addressed to the Purchaser at the address named in the BDS for ITB Clause 20.2 (a), and
- (b) bear the Contract name, the IFB Title and IFB Number, and the words “BID WITHDRAWAL NOTICE”, BID SUBSTITUTION NOTICE”, or “BID MODIFICATION NOTICE”.

23.3 A notice may also be sent by electronic means such as fax or e-mail, but in this case must include a scan of the mailing receipt showing both the sender's and receiver's addresses for the signed hardcopy of the notice, and a scan of the power of attorney.

23.4 Bids requested to be withdrawn in accordance with ITB 23.1 shall be returned unopened to the Bidders. Bid withdrawal notices received after the bid submission deadline will be ignored, and the submitted bid will be deemed to be a validly submitted bid.

23.5 The substitution or modification of the bid shall be prepared, sealed, marked, and dispatched as follows:

- (a) The Bidders shall provide an original and the number of copies specified in the BDS for ITB Clause 19.1 of any substitution or modification to its bid, clearly identified as such, in two inner envelopes duly marked “BID SUBSTITUTION -- ORIGINAL” or “BID MODIFICATION -- ORIGINAL” and “BID SUBSTITUTION -- COPIES” or “BID MODIFICATION -- COPIES.” The inner envelopes shall be sealed in an outer envelope, which shall be duly marked “BID SUBSTITUTION” or “BID MODIFICATION”.
- (b) Other provisions concerning the marking and dispatch of a bid substitution or modification shall be in accordance with ITB Clauses 20.2, 20.3, and 20.4.

23.6 No bid may be withdrawn, substituted, or modified in the interval between the bid submission deadline and the expiration of the bid validity period specified by the Bidder in the Bid Submission Form, or any extension thereof agreed to by the Bidder. Withdrawal of a bid during this interval may result in the execution of the Bid-Securing Declaration, if any, or forfeiture of the Bid Security, if any, pursuant to ITB Clause 17.6.

E. BID OPENING AND EVALUATION

24. Opening of Bids by Purchaser

- 24.1 The Purchaser will open all bids, including withdrawals, substitutions, and modifications, in public, in the presence of Bidders' representatives who choose to attend, at the time, on the date and at the place **specified in the BDS**. Bidders' representatives shall sign a register as proof of their attendance.
- 24.2 First, envelopes marked "BID WITHDRAWAL NOTICE" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked "BID SUBSTITUTION NOTICE" shall be opened and read out and exchanged with the corresponding bid being substituted, and the substituted bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked "BID MODIFICATION NOTICE" shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only bids that are opened and read out at bid opening shall be considered further.
- 24.3 Bids shall be opened one at a time, reading out: the name of the Bidder and whether there is a modification; the total bid price including any unconditional discounts, and, if applicable, the prices and unconditional discounts for Subsystems, lots, or slices; the presence or absence of a Bid-Securing Declaration or a Bid Security if one was required; any conditional discounts offered for the award of more than one Subsystem, lot, or slice, if the BDS for ITB Clause 28.1 permits such discounts to be considered in the bid evaluation; and any other such details as the Purchaser may consider appropriate.
- 24.4 Bids and modifications that are not opened and read out at bid opening shall not be considered for further evaluation, irrespective of the circumstances. These bids, including any bids validly withdrawn in accordance with ITB Clause 24.2, will promptly be returned, unopened, to their Bidders.
- 24.5 The Purchaser will prepare minutes of the bid opening, including the information disclosed to those present in accordance with ITB Clause 24.3. The minutes will promptly be

distributed to all Bidders that met the deadline for submitting bids.

25. Clarification of Bids

25.1 During the bid evaluation, the Purchaser may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing, and no change in the price or substance of the bid shall be sought, offered, or permitted.

26. Preliminary Examination of Bids

26.1 The Purchaser will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order. In the case where a prequalification process has been undertaken for the Contract(s) for which these Bidding Documents have been issued, the Purchaser will ensure that each bid is from a prequalified Bidder, and in the case of a Joint Venture, that partners and structure of the Joint Venture are unchanged from those in the prequalification.

26.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between added or subtracted subtotals and totals, the unit or subtotal price shall prevail and the total price shall be corrected, unless in the opinion of the Purchaser there is an obvious misplacement of the decimal point in the unit or subtotal prices, in which case the line item total as quoted shall govern and the unit price or sub-total shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail, unless the discrepancy is the result of a typo/error for which the correction is self-evident to the Purchaser. If the Bidder with the Lowest Evaluated Bid does not accept the correction of errors, the bid shall be rejected.

26.3 The Purchaser may waive any minor informality, nonconformity, or irregularity in a bid that does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

26.4 Prior to the detailed evaluation, the Purchaser will determine whether each bid is of acceptable quality, is complete, and is substantially responsive to the Bidding Documents. For purposes of this determination, a substantially responsive bid is one that conforms to all the terms, conditions, and specifications of the Bidding Documents without material deviations, exceptions, objections, conditionalities, or reservations. A material deviation, exception, objection, conditionality, or

reservation is one: (i) that limits in any substantial way the scope, quality, or performance of the Information System; or (ii) that limits, in any substantial way that is inconsistent with the Bidding Documents, the Purchaser's rights or the successful Bidder's obligations under the Contract; or (iii) the acceptance of which would unfairly affect the competitive position of other Bidders who have submitted substantially responsive bids.

26.5 If a bid is not substantially responsive, it will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the nonconformity. The Purchaser's determination of bid responsiveness will be based on the contents of the bid itself.

27. Conversion to Single Currency

27.1 For evaluation and comparison purposes, the Purchaser shall convert all bid prices expressed in various currencies and amounts into a single currency **specified in the BDS**, using the selling exchange rate established by the source and on the date also **specified in the BDS**.

28. Evaluation and Comparison of Bids

28.1 The Purchaser will evaluate and compare the bids that have been determined to be substantially responsive, pursuant to ITB Clause 26. The evaluation will be performed assuming either that:

- (a) the Contract will be awarded to the lowest evaluated Bidder for the entire Information System; or
- (b) if **specified in the BDS**, Contracts will be awarded to the Bidders for each individual Subsystem, lot, or slice defined in the Technical Requirements whose bids result in the lowest combined evaluated price for the entire System.

In the latter case, discounts that are conditional on the award of more than one Subsystem, lot, or slice may be offered in bids. However, such discounts will only be considered in the price evaluation if so **confirmed in the BDS**.

28.2 To be considered for Contract award, Bidders must have submitted bids

- (a) for which detailed bid evaluation using the same standards for compliance determination as listed in ITB Clauses 26.3 and 26.4 confirms that the bids are commercially and technically responsive, and include the hardware, Software, related equipment, products, Materials, and other Goods and Services components of the Information System in, substantially, the full required quantities for the entire Information System or, if allowed in the BDS for

ITB Clause 28.1, the individual Subsystem, lot or slice bid on; and

- (b) that offer Information Technologies that are proven to perform up to the standards promised in the bid by having successfully passed the performance, benchmark, and/or functionality tests the Purchaser may require, pursuant to ITB Clause 31.2.

28.3 The Purchaser's evaluation of a bid will be made on the basis of prices quoted in accordance with ITB Clause 14 (Bid Prices).

28.4 If **indicated by the BDS**, the Purchaser's evaluation of responsive bids will take into account technical factors, in addition to cost factors. An Evaluated Bid Score (B) will be calculated for each responsive bid using the following formula, which permits a comprehensive assessment of the bid price and the technical merits of each bid:

$$B \equiv \frac{C_{low}}{C} X + \frac{T}{T_{high}} (1 - X)$$

where

C = Evaluated Bid Price

C_{low} = the lowest of all Evaluated Bid Prices among responsive bids

T = the total Technical Score awarded to the bid

T_{high} = the Technical Score achieved by the bid that was scored highest among all responsive bids

X = weight for the Price as **specified in the BDS**

The bid with the highest Evaluated Bid Score (B) among responsive bids shall be termed the Lowest Evaluated Bid and is eligible for Contract award, provided the Bidder was prequalified and/or it was found to be qualified to perform the Contract in accordance with ITB Clause 31 (Postqualification).

28.5 If, in addition to the cost factors, the Purchaser has chosen to give weight to important technical factors (i.e., the price weight, X, is less than 1 in the evaluation), that cannot be reduced to life-cycle costs or pass/fail criteria, the Total Technical Points assigned to each bid in the Evaluated Bid Formula will be determined by adding and weighting the scores assigned by an evaluation committee to technical features of the bid in accordance with the criteria set forth below.

-
- (a) The technical features to be evaluated are generally defined below and specifically **identified in the BDS**:
 - (i) Performance, capacity, or functionality features that either exceed levels specified as mandatory in the Technical Requirements; and/or influence the life-cycle cost and effectiveness of the Information System.
 - (ii) Usability features, such as ease of use, ease of administration, or ease of expansion, which influence the life-cycle cost and effectiveness of the Information System.
 - (iii) The quality of the Bidder's Preliminary Project Plan as evidenced by the thoroughness, reasonableness, and responsiveness of: (a) the task and resource schedules, both general and specific, and (b) the proposed arrangements for management and coordination, training, quality assurance, technical support, logistics, problem resolution, and transfer of knowledge, and other such activities as specified by the Purchaser in Section VI (Technical Requirements) or proposed by the Bidder based on the Bidder's experience.
 - (b) Feature scores will be grouped into a small number of evaluation categories, generally defined below and specifically **identified in the BDS**, namely:
 - (i) The technical features that reflect how well the Information System meets the Purchaser's Business Requirements (including quality assurance and risk-containment measures associated with the implementation of the Information System).
 - (ii) The technical features that reflect how well the Information System meets the System's Functional Performance Standards.
 - (iii) The technical features that reflect how well the Information System meets the General Technical Requirements for hardware, network and communications, Software, and Services.
 - (c) As **specified in the BDS**, each category will be given a weight and within each category each feature may also be given a weight.

- (d) During the evaluation process, the evaluation committee will assign each desirable/preferred feature a whole number score from 0 to 4, where 0 means that the feature is absent, and 1 to 4 either represent predefined values for desirable features amenable to an objective way of rating (as is the case for, e.g., extra memory, or extra mass storage capacity, etc., if these extras would be conducive for the utility of the system), or if the feature represents a desirable functionality (e.g., of a software package) or a quality improving the prospects for a successful implementation (such as the strengths of the proposed project staff, the methodology, the elaboration of the project plan, etc., in the bid), the scoring will be 1 for the feature being present but showing deficiencies; 2 for meeting the requirements; 3 for marginally exceeding the requirements; and 4 for significantly exceeding the requirements.
- (e) The score for each feature (i) within a category (j) will be combined with the scores of features in the same category as a weighted sum to form the Category Technical Score using the following formula:

$$S_j \equiv \sum_{i=1}^k t_{ji} * w_{ji}$$

where:

t_{ji} = the technical score for feature “i” in category “j”

w_{ji} = the weight of feature “i” in category “j”

k = the number of scored features in category “j”

and $\sum_{i=1}^k w_{ji} = 1$

- (f) The Category Technical Scores will be combined in a weighted sum to form the total Technical Bid Score using the following formula:

$$T \equiv \sum_{j=1}^n S_j * W_j$$

where:

S_j = the Category Technical Score of category “j”

W_j = the weight of category “j” as **specified in the BDS**

n = the number of categories

and $\sum_{j=1}^n W_j = 1$

28.6 The Evaluated Bid Price (C) for each responsive bid will be determined as the sum of the Adjusted Supply and Installation Costs (P) plus the Recurrent Costs (R);

where the Adjusted Supply and Installation Costs (P) are determined as:

- (a) The price of the hardware, Software, related equipment, products, Materials and other Goods offered from within or from outside the Purchaser's Country, in accordance with ITB 14.4; plus
- (b) The total price for all software development, transportation, insurance, installation, customization, integration, Commissioning, testing, training, technical support, repair, and other Services, in accordance with ITB 14.5;
- (c) with adjustments for:
 - (i) Deviations proposed to the Implementation Schedule in the Technical Requirements resulting in delayed completion of the entire Information System, if **permitted in the BDS** and provided they do not exceed the maximum permissible delay period **specified in the BDS**. For evaluation purposes, a pro rata increase of the total Supply and Installation Costs will be added using the percentage(s) **specified in the BDS** for each week of delay. Bids offering deliveries beyond the maximum permissible delay specified may be rejected.
 - (ii) Deviations taken to the Contract payment schedule specified in the SCC. If deviations are **permitted in the BDS**, for evaluation purposes the total Supply and Installation Costs will be increased pro rata by the amount of interest that could otherwise be earned on the amount of any payments that would fall due under the proposed schedule earlier than the schedule stipulated in the SCC, at the interest rate **specified in the BDS**.
 - (iii) Goods and Services that are required for the Information System but have been left out or are necessary to correct minor deviations of the bid will be added to the total Supply and Installation Costs using costs taken from the highest prices from other responsive bids for the same Goods and Services, or in the absence of such information, the cost will be

estimated at prevailing list prices. If the missing Goods and Services are a scored technical feature, the relevant score will be set at zero.

- (iv) Corrections to errors in arithmetic, in accordance with ITB Clause 26.2.
- (v) Any discounts offered for the award of more than one Subsystem, lot, or slice, if the BDS for ITB Clause 28.1 permits the consideration of discounts in the price evaluation.
- (d) The Recurrent Costs (R) are reduced to net present value and determined using the following formula:

$$R \equiv \sum_{x=1}^{N+M} \frac{R_x}{(1+I)^x}$$

where

N = number of years of the Warranty Period, defined in SCC Clause 29.4

M = number of years of the Post-Warranty Services Period, as defined in SCC Clause 1.1.(e) (xii)

x = an index number 1, 2, 3, ... $N + M$ representing each year of the combined Warranty Service and Post-Warranty Service Periods.

R_x = total Recurrent Costs for year “ x ,” as recorded in the Recurrent Cost Sub-Table.

I = discount rate to be used for the Net Present Value calculation, as **specified in the BDS**.

29. Domestic Preference

29.1 No margin of domestic preference will apply.

30. Contacting the Purchaser

30.1 From the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Purchaser on any matter related to the bid, it should do so in writing.

30.2 If a Bidder tries to directly influence the Purchaser or otherwise interfere in the bid evaluation process and the Contract award decision, its bid may be rejected.

F. POST QUALIFICATION AND AWARD OF CONTRACT

- | | |
|--|--|
| 31. Post-qualification | <p>31.1 The Purchaser will determine at its own cost and to its satisfaction whether the Bidder (including Joint Venture Partners, and any Subcontractors for which the BDS for ITB Clause 6.1 (a) permits that their qualifications count towards the required Bidder qualifications) that is selected as having submitted the Lowest Evaluated Bid is qualified to perform the Contract satisfactorily, in accordance with ITB Clause 6. If a prequalification process was undertaken for the Contract(s) for which these Bidding Documents were issued, the Purchaser will determine in the manner described above that no material changes have occurred after the prequalification that negatively affect the ability of the Bidder that has submitted the Lowest Evaluated Bid to perform the Contract.</p> <p>31.2 Pursuant to ITB Clauses 6 and 16, and as additionally may be specified in the BDS, the determination will evaluate the Bidder's financial, technical, design, integration, customization, production, management, and support capabilities and will be based on an examination of the documentary evidence of the Bidder's qualifications, as well as other information the Purchaser deems necessary and appropriate. This determination may include visits or interviews with the Bidder's clients referenced in its bid, site inspections, and any other measures. If so specified in the BDS, at the time of postqualification the Purchaser may also carry out tests to determine that the performance or functionality of the Information System offered meets those stated in the Technical Requirements.</p> <p>31.3 An affirmative postqualification determination will be a prerequisite for award of the Contract to the Lowest Evaluated Bidder. A negative determination will result in rejection of the Bidder's bid, in which event the Purchaser will proceed to the next lowest evaluated Bidder to make a similar determination of that Bidder's capabilities to perform satisfactorily.</p> |
| 32. Award Criteria | <p>32.1 Subject to ITB Clause 34, the Purchaser will award the Contract to the Bidder whose bid has been determined to be substantially responsive and the Lowest Evaluated Bid, provided further that the Bidder has been determined to be qualified to perform the Contract satisfactorily, pursuant to ITB Clause 31.</p> |
| 33. Purchaser's Right to Vary Quantities at Time of Award | <p>33.1 The Purchaser reserves the right at the time of Contract award to increase or decrease, by the percentage(s) indicated in the BDS, any of the following:</p> <p style="margin-left: 40px;">(a) the quantity of substantially identical Subsystems; or</p> |

-
- (b) the quantity of individual hardware, Software, related equipment, Materials, products, and other Goods components of the Information System; or
- (c) the quantity of Installation or other Services to be performed,
- from that originally specified in the Technical Requirements (as amended by any Addenda issued pursuant to ITB Clause 11), without any change in unit prices or other terms and conditions.
- 34. Purchaser's Right to Accept Any Bid and to Reject Any or All Bids**
- 34.1 The Purchaser reserves the right to accept or reject any bid or to annul the bidding process and reject all bids at any time prior to Contract award, without thereby incurring any liability to the Bidders.
- 35. Notification of Award**
- 35.1 Prior to the expiration of the period of bid validity, the Purchaser shall notify the successful Bidder, in writing, that its bid has been accepted.
- 35.2 Until a formal Contract is prepared and executed, the notification of award shall constitute a binding Contract.
- 35.3 The Purchaser shall promptly publish in UNDB online and in dgMarket the results, identifying the bid and lot numbers and the following information: (i) name of each Bidder who submitted a bid; (ii) bid prices as read out at bid opening; (iii) name, evaluated price and, if the bidding conditions included scoring for technical quality, the technical score of each bid that was evaluated; (iv) name of Bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, the price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful Bidders may make a request in writing to the Purchaser for a debriefing seeking explanations on the grounds on which their bids were not selected. The Purchaser shall promptly respond in writing to any unsuccessful Bidder who, after publication of contract award, requests a debriefing.
- 35.4 Upon the successful Bidder furnishing the signed Contract Agreement and the Performance Security pursuant to ITB Clause 37, the Purchaser will promptly notify each unsuccessful Bidder, and will discharge all remaining Bid Securities, if any, as provided in ITB Clause 17.5 (c) and (d).
- 36. Signing of Contract**
- 36.1 At the same time as the Purchaser notifies the successful Bidder that its bid has been accepted, the Purchaser will send the Bidder the Contract Agreement provided in the Bidding Documents,

incorporating all agreements between the parties.

- 36.2 As soon as practically possible, but no more than twenty-eight (28) days following receipt of the Contract Agreement, the successful Bidder shall sign and date it, and return it to the Purchaser.

37. Performance Security

- 37.1 As soon as practically possible, but no more than twenty-eight (28) days following receipt of notification of award from the Purchaser, the successful Bidder shall furnish the Performance Security in accordance with the GCC, using the Performance Security form provided in the Bidding Documents or another form acceptable to the Purchaser.
- 37.2 Failure of the successful Bidder to comply with the requirements of ITB Clause 36 or ITB Clause 37.1 shall constitute sufficient grounds for the annulment of the award and, if and as applicable, execution of the Bid-Securing Declaration or forfeiture of the Bid Security, in which event the Purchaser may make the award to the next lowest evaluated bid submitted by a qualified Bidder or call for new bids.

38. Adjudicator

- 38.1 Unless otherwise **stated in the BDS**, the Purchaser proposes that the person named in the BDS be appointed as Adjudicator under the Contract to assume the role of informal Contract dispute mediator, as described in GCC Clause 6. In this case, a résumé of the named person is **attached to the BDS**. The proposed hourly fee for the Adjudicator is **specified in the BDS**. The expenses that would be considered reimbursable to the Adjudicator are also **specified in the BDS**. If a Bidder does not accept the Adjudicator proposed by the Purchaser, it should state its non-acceptance in its Bid Submission Form and make a counterproposal of an Adjudicator and an hourly fee, attaching a résumé of the alternative. If the successful Bidder and the Adjudicator nominated in the BDS happen to be from the same country, and this is not the country of the Purchaser too, the Purchaser reserves the right to cancel the Adjudicator nominated in the BDS and propose a new one. If by the day the Contract is signed, the Purchaser and the successful Bidder have not agreed on the appointment of the Adjudicator, the Adjudicator shall be appointed, at the request of either party, by the Appointing Authority specified in the SCC clause relating to GCC Clause 6.1.4, or if no Appointing Authority is specified there, the Contract will be implemented without an Adjudicator.

SECTION II. BID DATA SHEET (BDS)

Bid Data Sheet

The following specific information relating to the System to be procured and the procurement procedures that will be used shall complement, supplement, or amend the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions in the Bid Data Sheet (BDS) shall prevail over those in the ITB.

A. GENERAL

ITB 1.1	<p>Name of Purchaser: Director, Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi - 110012, India.</p> <p>Description: Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems</p>
ITB 1.2& 20.2 (b)	<p>Title of IFB: Bids for Equipment / Goods/ Services for</p> <p>Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi</p> <p>IFB No.: 36(17)/2010-CPS</p> <p>Name of resulting contract (S):-</p> <p>Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi</p>
1.4	Alternative e-Tendering procedures are not available in this procurement.
ITB 2.1	<p>Name of the Borrower: <i>Government of India</i></p> <p>Credit number: <i>(Credit 4161-IN / 4162-IN)</i></p> <p>Name of Project: <i>National Agricultural Innovation Project – ICAR</i></p> <p>Credit Amount : US \$ 200 Million</p> <p>Note: Goods/items delivered after the Credit Closing Date 31-12-2012 or as extended in agreement with the World Bank beyond which it shall be financed under Govt. of India's own resources.</p>
ITB 4.1(a) & 5.2	Applicable World Bank's Guidelines: Procurement under IBRD Loans and IDA Credits May 2004 revised 2006

ITB 6.1 (a)

Qualification requirements for Bidders are:

The bidder must possess the requisite experience, strength and capabilities in providing the services necessary to meet the requirements, as described in the bidding documents. The bidder must also possess the technical know-how and the financial capability that would be required to successfully provide the Data Centre HPC Systems and support services sought by the IASRI New Delhi, India/ICAR, for the entire period of the contract. The bids must be complete in all respect and should cover the entire scope of work as stipulated in the bidding document. The bidder including JV's as a whole should meet the following qualification criteria as given below:

Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under "National Agricultural Bioinformatics Grid in ICAR" at IASRI New Delhi		
S. No.	Clause	Minimum Documents required to be submitted as proof
1.	The domestic bidders should be companies registered in India under the company Act 1956 since last three years. Similarly the foreign bidders should be registered under the relevant Act prevailing in their country since three years.	Certificate of incorporation
2.	<p>Bidder should be System Integrator or HPC OEM firm</p> <p>The bidder must have following experience , financial capability and eligibility:</p> <p>a. have at least 100 technically qualified professionals in DBMS, networking, systems integration, High end Storage Systems , Programmers and prior experience in providing HPC and Data Center Infrastructure maintenance services as on date of opening of bid and should provide HR Department Certificates for the same.</p> <p>b. Bidder or JV as a whole should have annual turnover of at least Rs. 300 crores for preceding three Financial Years.</p>	<p>Documentary proof is to be submitted</p> <p>a. Certificate from HR department is to be submitted</p> <p>b. Chartered Accountant certificate for Net-worth, turnover, etc. Copy of the audited profit and loss account of the company showing turnover of the company for last three years</p> <p>c. Declaration in this regard by the authorized signatory of the bidder</p> <p>d. Relevant Documents or Undertaking</p> <p>e. Necessary proof in this regard shall be submitted. Valid ISO or equivalent certificate needs to be attached</p>

		<p>c. Bidder should have an appropriate and acceptable arrangements/ facilities within India to provide support to the domain institutions of the project located in different part of the country i.e. in Delhi/NCR, Karnal Haryana, Lucknow, U.P., Bangalore Karnatka and Mau U.P.</p> <p>d. shall ensure that all the OEMs whose IT products have been offered in the bid shall have Technical Assistance Centre(TAC) and shall have Toll Free Number for TAC. IT Products of the OEM not complying with this requirement shall not be acceptable.</p> <p>e. bidder as well as the OEM/manufacturers whose products are being offered should submit the Internationally recognized Quality certificates such as BS, ISO, etc. and/or their equivalent."</p>	
	3.	<p>Bidder or one of its JV partner should be an established HPC solution providing company and should have following experience related to HPC solution:</p> <p>a. have been in the business for a period exceeding three years as on the date of opening.</p> <p>b. must have on its roll at least 100 technically qualified professionals in Hardware maintenance, networking, system designing , High end Storage Systems and minimum 5 engineers with prior experience in providing HPC maintenance</p>	<p>a. Documentary proof of confirming year and area of activity. Memorandum and Articles of Associations.</p> <p>b. Certificate from HR department is to be submitted</p> <p>c. Copy of work order / client certificates</p> <p>d. Documentary proof</p>

		<p>services should have supplied similar HPC systems for Government Institutions/ Private or Public Organizations that meets the following requirements during the last five (5) years:</p> <p>Single work order of 512 cluster nodes HPC or Two work orders of 256 cluster nodes HPC</p> <p>or</p> <p>Maximum five work orders with at least one 256 cluster nodes HPC with a total of 512 cluster nodes HPC</p> <p>or</p> <p>Maximum five work orders with less than 256 cluster nodes HPC with a total of 512 cluster nodes HPC</p>	
	4.	<p>Bidder or one of its JV partner should be an established System Integrator company and should have following experience and financial capacity:</p> <ol style="list-style-type: none"> have been in the business for a period exceeding three years as on the date of opening should have installed and commissioned similar HPC and Data center project for Government Institutions/ Private or Public Organizations that meets the following requirements during the last five (5)years: <p>A single work order value of not less than Rs 15 crore or two separate work orders value of Rs. 10 Crore each.</p>	<ol style="list-style-type: none"> Documentary proof of confirming year and area of activity. Memorandum and Articles of Associations Copy of work order / client certificates and certificate as desired Copy of the certification

		<p>c. BS 7799 / ISO 27001 certification for at least one commissioned Data Center</p> <p>Note: Bidder's in house data centers shall not be considered unless 50% or more of the facility is used for commercial use.)</p>	
	5.	<p>Bidder or one of its JV partner should be an established Data Centre Solution providing company and should have following work experience:</p> <p>a. have been in the business for a period exceeding three years as on the date of opening</p> <p>b. must have on its roll at least 50 technically qualified professionals in data centre designing, implementing and operational management and minimum 5 engineer with prior experience in providing data centre maintenance services During past 4 years the Bidder must have completed 3 successful contracts involving the development ,installation and providing technical support for similar information system of similar functional/technical characteristics and of comparable scale for government or private institution/organization/entity/P SU i.e it meets the following requirement:</p> <p>Single data centre capable of having 50 racks space of 42U each or Two data centres capable of having 30 racks space of 42U each</p> <p>or</p> <p>Maximum five work orders with at least one order of 30 racks space of 42U each with a total of 50 racks space of 42U each</p>	<p>a. Documentary proof of confirming year and area of activity. Memorandum and Articles of Associations</p> <p>b. Certificate from HR department working in different domains as desired is to be submitted</p> <p>c. Copy of work order / client certificates</p>

		<p>or</p> <p>Maximum five work orders with one order of 20 racks space of 42U each with a total of 50 racks space of 42U each</p> <p>(Note: Bidder's in house data centres shall not be considered unless 50% or more of the facility is used for commercial use)</p>	
	6	Bidder should commit full time manpower on regular employment exclusively for the assignment of the system	
ITB 6.1 (b) & 13.1(e) (ii)	Manufacturer's Authorizations for Information Technologies - except for those technologies which the Bidder itself manufactures - are required for following type/categories : All active (i.e. powered) equipment and all software.		
ITB 6.1 (c)	<p>If the Bidder proposes to use Subcontractors for the provision of certain key services, written agreements by the proposed firms to provide these services in case of contract(s) resulting from this bidding are required for the following types/categories of services:</p> <p><i>“Civil work, furnishing, cabling, wood work, training, post warranty maintenance services required to make the whole system operational” However, Only the bidder will be ultimately responsible for Designing, Site Preparation, Supply, Installation, Commissioning, Maintenance and Operations of the entire project.</i></p>		
ITB 6.2 (g)	Add the following sub-clauses ITB 6.2 (g), (h) and (i)		
ITB 6.2 (g)	The joint venture agreement should indicate precisely the responsibility of all members of JV in respect of planning, software development, manufacture, design, supply, installation, commissioning, training for the project. This should not be varied/modified subsequently without prior approval of the Purchaser.		
ITB 6.2 (h)	The joint venture agreement should be registered in Delhi (India), so as to legally valid and binding on partners; and		
ITB 6.2 (i)	A copy of the Joint Venture Agreement entered into by the partners shall be submitted with the bid. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful bid shall be signed by all partners and submitted with the bid, together with a copy of the proposed agreement.		

B. THE BIDDING DOCUMENTS

ITB 9.1	Sample forms are as listed in the table of clauses under section VII
ITB 10.1	<p>Purchaser's address:</p> <p>Attention: The Director</p> <p>Address: Indian Agricultural Statistics Research Institute (IASRI) Library Avenue, Pusa</p> <p>City: New Delhi</p> <p>ZIP Code: 110012</p> <p>Country: India</p> <p>Tel: 91-11-25847122-24 Extn: 4130</p> <p>Fax: 91-11-25841564</p> <p>Electronic mail address: director@iasri.res.in ; cps@iasri.res.in</p> <p>Any inquiries regarding clarification/interpretation/contents in connection with this Bid should be sent in writing only to the Director, IASRI New Delhi India at the address given above on or before 12th October, 2011. Any queries received after the stipulated date & time will not be entertained.</p>
ITB 10.2 & 8.2	<p><u>Dates, times, and places for the pre-bid meeting:</u></p> <p>Pre-Bid Conference shall be held on 26th September, 2011 at 11:00 AM at Committee Room 106, Training-Cum-Administrative Block, IASRI New Delhi, Pusa Campus, New Delhi, India..</p>

C. PREPARATION OF BIDS

ITB 12.1	The language of the bid and of all correspondence and documents related to it is: <i>English</i>
ITB 13.1 (e) (ii)	See the above data for ITB para 6.1(b), for the required Manufacturer's authorization form to be included in attachment 2 to the bid.
ITB 13.1 (e) (vii)	<p>Add a new sub-clause as 13.1 (e) (vii)</p> <p>Attachment 7 : Local Representation</p> <p>If a foreign bidder has engaged an Indian agent, it will be required to give the following details in its bid as per the format enclosed in the Bidding Documents :-</p>

	<ul style="list-style-type: none"> (i) The name and address of the local agent; (ii) What service the agent renders; and (iii) The fixed amount of remuneration for the agent included in the offer. <p>The agency commission shall be indicated in the specifications provided for in the Price Schedule and will be paid to the Bidder's agent in India in Indian Rupees using the Telegraphic Transfer buying market rate of exchange ruling on the date of award of contract and shall not be subject to any escalation or any further exchange variations.</p>
ITB 14.1	Recurrent cost items are Operation and Maintenance of HPC systems including data centre and storage systems for three years from the date of Commissioning and acceptance of complete HPC systems and its related infrastructure developed under this contract.
ITB 14.4	The Incoterms edition is <i>Incoterms 2010</i>
ITB 14.4	<p>Bidders shall give the required details and a breakdown of their prices as follows in the price schedules:-</p> <ul style="list-style-type: none"> (a) For foreign goods priced on a CIP (named place of destination) basis: <ul style="list-style-type: none"> (i) The contract of carriage shall include the cost of unloading the goods at destination, as well as payment by the Supplier of the cost of custom formalities, duties, taxes or other charges payable on the foreign Goods for their transit through any country other than the Purchaser's country. (ii) The named place of destination shall be the <i>Project Sites</i> – Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa,, India., New Delhi-110 012. However, some of the items/ goods will be supplied to respective sites as specified in the Technical Requirements in Section VI. (b) Information System (hardware/software) and associated goods to be supplied from within INDIA shall be quoted on an EXW (ex factory, ex works, ex warehouse or off-the shelf, as applicable) basis, and shall be inclusive of all costs as well as duties and taxes paid or payable on components and raw materials incorporated or to be incorporated in the facilities. Sales tax, local tax and other levies in respect of direct transactions between the purchaser and the supplier shall not be include in the ex-works price but shall be quoted separately as indicated below:- (c) Local transportation, insurance, port clearance and port charges and other local costs incidental to delivery of the hardware, software and associated goods. The purchaser shall be

	<p>responsible and be liable only for payment of custom duty on CIF/CIP component of the Information Systems (hardware/software) and associated goods to be supplied from abroad. (However, the purchaser, as an importer, shall furnish promptly necessary clarifications and documents as may be required to be furnished by the importer for the purpose of customs clearance).</p> <p>(d) Installation, customization, integration, commissioning, testing, training, technical support, maintenance, repair and other services for proper installation and operation of the Information System shall be quoted separately and shall include rates of prices for all labour, supplier's equipment, materials, consumables and all matters and things of whatsoever nature, provision of operations and maintenance manuals, training, etc., as necessary for the proper execution of the Installation Services, including all taxes, duties, levies and charges payable in India as of twenty-eight (28) days prior to the deadline for submission of bids.</p> <p>(e) Recurrent costs to be incurred either during the three years Warranty period, and/or during the Post-Warranty Service Period of 3 years that commences at the end of the Warranty Period on the recurrent Costs form as follows:</p> <p>(i) The cost of all items, such as diagnostic equipment spare parts, consumables, supplies, software update and recurrent licensing fees, that are needed to operate the Information System, as indicated in the Recurrent Costs Form and described in the Technical Requirements and/or the SCC, quoted on a CIP Delhi Port cleared, taxes-paid basis and ;</p> <p>(ii) The recurrent cost of all maintenance, technical support, and other services, as indicated in the Recurrent Costs Form and described in the Technical Requirements and/or the SCC, including all taxes payable by the Bidder on these services, broken down into local and foreign currency components.</p> <p>(f) Sales tax, local taxes and other levies as defined at 14.4 (b) above.</p>
ITB 14.4.1	<p>Add new sub clause 14.4.1 as below:</p> <p>“Deemed export benefits: Bidders may like to ascertain availability of Deemed Export or other benefits. They are solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits for reasons whatsoever; the purchaser will not compensate the bidder.</p> <p>Where the bidder has quoted taking into account such benefits, he must give all information required for issue of Project Authority/Payment/Other Certificates in terms of the import</p>

	<p>Export Policy or certain excise notifications along with his bid in the Form provided in Section IV. The Project authority/Payment /Other Certificates will be issued on this basis only and no subsequent change will be permitted. Where such certificates are issued by the Purchaser, Excise Duty will not be reimbursed separately.</p> <p>Bids which do not conform to this provision, will be treated as non responsive and rejected.”</p>
ITB 14.7	<p>Prices quoted by the Bidder shall be “fixed” However, in the case of recurrent cost components the prices need to be quoted as per the format-“Systems Inventory Table (Recurrent Cost Items[B]in Section VI-Technical Requirements.</p>
ITB 15.1 (b)	<p>The currency to be used for quoting prices of the Goods and Services components of the System offered from India as well as local currency expenditures for local technical support, training, maintenance is as follows :-</p> <p>Local transportation, insurance and other local costs incidental to delivery of the Information Systems (hardware and software) and associated goods covered under ITB Sub-clause 14.4 (a), & (b) and services covered under ITB Sub-clause 14.4 (c), (d) & (e) shall be quoted in Indian Rupees. However, foreign component, if any, of installation services or insurance may be quoted in foreign currency.</p>
ITB 16.2 (b)	<p>Substitute sub-clause 16.2 (b) as under :-</p> <p>“An item-by item commentary on the Purchaser’s Technical Requirements, demonstrating the substantial responsiveness of the Information Systems offered to meet those requirements. In demonstrating responsiveness, the commentary shall include explicit cross-references to the relevant pages in the supporting materials included in the bid.”</p>
ITB 16.2 (c)	<p>In addition to the topics described in ITB Clause 16.2 (c), the Preliminary Project Plan must address the following topics :-</p> <ul style="list-style-type: none"> i) List of persons going to be deputed as Project Manager, Business Process Re-Engineering Consultant, Quality Assurance Expert, Business Analysis, Project Leader, Data Base Designer, Application Designer, Website Designer, Training Expert and Developers/trainers giving their name, the minimum professional experience and the details of the project handled by each. ii) Description of methodology & work plant for performing the assignment. iii) Team composition and task assignments. iv) Curriculum Vitae (CV) of proposed professional staff,

	<p>specifying the following :-</p> <ul style="list-style-type: none"> a. Key qualifications – Description of staff member’s in depth and successful experience in maximum five assignments most pertinent to tasks on this assignment. b. Education – Summarize college/university and other specified/management/professional education, giving names of the school, dates attended and degree obtained. c. Employment record – Starting with present position, list in reverse order, every employment hold. List on positions held by staff members since Graduation giving date, names of employing organizations, titles of position held, and locations of assignments. <p>The CV should be signed by the concerned employee and the authorized representative of the bidder.</p> <ul style="list-style-type: none"> v) Time schedule for professional personnel; vi) Activity (work schedule)
ITB 16.3	<p>In the interest of effective integration, cost-effective technical support, and reduced re-training and staffing costs, Bidders are required to offer specific brand names and models for the following items :-</p> <p>Servers, workstation, SMP, Storage, operating system, switches, including all peripheral items as indicated in the technical requirements under Section - VI.</p>
ITB 17.1	<p>Bids <i>need</i> to be secured <i>by a Bid Security</i>. The amount of bid security required is equivalent of Indian rupees 1,00,00,000 (10 Millions INR) in the bid currency or US dollar or Indian rupees. In case the bid security is furnished in the form of demand draft/pay order the same shall be in the name of Director IASRI, New Delhi payable at New Delhi.</p>
ITB 17.2	<p>Change the words “28 days” to “forty five (45) days” in line 4</p>
ITB 17.2 (a)	<p>Add the words “cashier’s or” in the beginning of line 2.</p> <p>Add the word “irrevocable” before the words “letter of credit” in line 2.</p>
ITB 17.7	<p>Not Applicable</p>
ITB 18.1	<p>The bid validity period shall be 120 days after the deadline for bid submission as specified below in reference to ITB clause 21.</p> <p>Accordingly, each bid shall be valid through 120 days</p> <p>Bid security must be valid forty five (45) days after the end of the</p>

	bid validity period. Accordingly, a bid with a bid security that expires before 45 days after the end of the bid validity period shall be rejected as non-responsive.
ITB 18.3	Delete ITB sub-clause 18.3
ITB 19.1	Required number of bid copies, besides the original: <i>Three</i>

D. SUBMISSION OF BIDS

ITB 20.2 (a), 21.1 & 23.3 (a)	<p>The address for bid submission is:</p> <p style="padding-left: 40px;">Attention: The Director</p> <p style="padding-left: 40px;">Address: Indian Agricultural Statistics Research Institute(IASRI)</p> <p style="padding-left: 40px;">Library Avenue, Pusa</p> <p style="padding-left: 40px;">City: Delhi</p> <p style="padding-left: 40px;">ZIP Code: 110012</p> <p style="padding-left: 40px;">Country: India</p>
ITB 20.2 (b),	<p>See the above data for ITB 1.2 for the name of the contract.</p> <p>All the inner and outer envelopes shall also bear the following additional identification marks:</p> <p>(a) IFB No. 36(17)/2010-CPS</p> <p style="padding-left: 40px;">Bids for Equipments / Goods/ Services for</p> <p style="padding-left: 40px;">Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi</p> <p>(b) the name and address of the bidder.</p> <p>(c) “Do Not Open before 11:30 A.M, 3rd November, 2011”</p> <p>See the below data for ITB 21.1 for the deadline for bid submission</p>
ITB 21.1	<p>See the above data for ITB Paragraph 21.1 for the address and deadline for bid submission</p> <p>Deadline for bid submission is 11:00 AM, 3rd November, 2011</p> <p>Add at the end of the sub-clause as follows :-</p> <p>“In the event of the specified date for the submission of bids being declared a holiday for the Purchaser, the bids will be received upto the appointed time on the next working day.”</p>

ITB 22.1	See the above data for ITB Paragraph 21.1 for the deadline for bid submission
ITB 23.2 (a)	The required number of copies of bid modifications is the same as the number of copies of the original bid specified above in the data for ITB sub-clause 19.1.
ITB 23.3 (a)	See the above data for ITB Paragraph 20.2 (a) for the address to use for submission of a bid withdrawal notice.

E. BID OPENING AND EVALUATION

ITB 24.1	<p>Time, date, and place for bid opening are: 11:30 AM, 3rd November, 2011</p> <p>Place of Bid Opening: Committee Room 106, Training-Cum-Administrative Block , Indian Agricultural Statistics Research Institute(IASRI) Library Avenue, Pusa City: Delhi Country: India</p> <p>“In the event of the specified date for the opening of bids being declared a holiday for the Purchaser, the bids will be opened at the appointed time & location on the next working day.”</p>
ITB 26.4	Add the word “generally” after the word “is” and before the word “complete” in line 2
ITB 26.4.1	<p>Add the following</p> <p>Bids containing deviation from the critical provision relating to the following clauses</p> <ul style="list-style-type: none"> • Settlement of Disputes (GCC 6) • Performance Security (GCC 13.3) • Taxes and duties (GCC 14) • Operational Acceptance Time Guarantee (GCC 28) • Defect Liability (GCC 29) • Functional Guarantees (GCC 30) • Intellectual property rights indemnity (GCC 32_ • Limitation of Liability (GCC 33) • Governing Law (GCC 5)

	As read with corresponding SCC clauses, will be considered as non-responsive.		
ITB 26.5	Replace the second sentence with the following :- “The Purchaser’s determination of bid responsiveness will be based on the contents of bid itself without recourse to extrinsic evidence.”		
ITB 27.1	The currency chosen for the purpose of converting to a common currency is INR The source of exchange rate is: B.C. selling exchange rate as established by the State Bank of India as on the date of opening of bids. In case that no exchange rates are available on this date from the source indicated above, the latest available exchange rates from the same source prior to this date will be used.		
ITB 28.1 (b) & 28.2 (a)	Bids for Subsystems, lots, or slices of the overall Information System will not be accepted.		
ITB 28.4	The bid evaluation will take into account technical factors in addition to cost factors including recurrent cost specified in ITB 14.1. The weight of the evaluated bid Price (“X” in the evaluated Bid formula) = 40% (Forty percent)		
ITB 28.5	The following technical evaluation categories and the features shall be used & marked to evaluate the technical bids. All the bids scoring total technical score (points) of 60 and above of maximum points (100) in the technical evaluation will be qualified for further consideration for final evaluation. The bids scoring less than 60 points will be treated as non-responsive. Also, the bid must score the minimum points designated against each criteria of A in the table to be a responsive bid. It is, however, clarified that, subject to other provisions of this Document, every bidder will have to fulfill the minimum technical specifications laid down in the this Bidding document for being responsive.		
	S. No.	Criteria	Point System
	A. Organizational Strengths		40
	1.	Bidder/ or one of its JV partner should be an established HPC solution providing company and should have been in the business for a period exceeding three years as on the date of opening.	>10years = 3; 7-10 years = 2; 3-6 years = 1

	2.	Bidder/ or one of its JV partner should be an established System Integrator company and should have been in the business for a period exceeding three years as on the date of opening.	>10years = 3; 7-10 years = 2; 3-6 years = 1	3	
	3.	Bidder/ or one of its JV partner should be an established Data Centre Solution providing company and should have been in the business for a period exceeding three years as on the date of opening	>10years = 3; 7-10 years = 2; 3-6 years = 1	3	
	4	The HPC OEM should have supplied similar HPC systems for Government Institutions/ Private/PSU Organizations that meets the following requirements during the last five (5) years: a. Single work order of 512 cluster nodes HPC or Two work orders of 256 cluster nodes HPC b. Maximum five work orders with at least one 256 cluster nodes HPC with a total of 512 cluster nodes HPC c. Maximum five work orders with less than 256 cluster nodes HPC with a total of 512 cluster nodes HPC	For a =6, b=4, c =2	6	
	5	The bidder/ or one of its JV partner /System Integrator should have installed and commissioned similar HPC and Data center project with BS 7799 / ISO 27001 certification for at least one commissioned Data Center, for Government Institutions/ Private/PSU Organizations that meets the following requirements during the last five (5) years: A single work order value of not less than Rs 15 crore or two separate work orders value of Rs. 10 Crore each. Note: Bidder's in house data centers shall not be considered unless 50% or more of the facility is used for commercial use.	In case of single HPC and Data Center Project not less than Rs.15Cr. + Certification as asked: a. > = 2DC Project=8; b. 1DC Project = 4 In case of two HPC and Data Center Project with order value of Rs.10 Cr. each. + Certification as asked: a. > 2DC Projects = 5; b. 2DC Project = 3	8	

	6	<p>Data centre solution providing company should have designed, supplied, installed and commissioned similar data centres system for government or private institution/ organization/entity/PSU that meets the following requirement during the last five(5) years:</p> <p>a. Single data centre capable of having 50 racks space of 42U each or Two data centres capable of having 30 racks space of 42U each</p> <p>b. Maximum five work orders with at least one order of 30 racks space of 42U each with a total of 50 racks space of 42U each</p> <p>c. Maximum five work orders with one order of 20 racks space of 42U each with a total of 50 racks space of 42U each</p> <p>Note: Bidder's in house data centres shall not be considered unless 50% or more of the facility is used for commercial use.</p>	<p>For a = 6 b = 4, c =2</p>	6	
	7.	The bidder must have on its roll at least 100 technically qualified professionals in DBMS, networking, systems integration, High end Storage Systems , Programmers and prior experience in providing HPC and Data Center Infrastructure maintenance services as on date of opening of bid.	<p>> 300 = 3; 200 – 300 =2; 100 – 200 = 1</p>	3	
	8.	The HPC OEM must have on its roll at least 100 technically qualified professionals in Hardware maintenance, networking, system designing , High end Storage Systems and prior experience in providing HPC maintenance services as on date of opening of bid .	<p>>300 = 3; 200 – 300 =2; 100 – 200 = 1</p>	3	
	9	Data Centre solution providing company must have on its roll at least 50 technically qualified professionals in data centre designing, implementing and operational management and prior experience in providing data centre maintenance services as on date of opening of bid.	<p>>100 = 5; 75 – 100 =3; 50 – 75 = 2</p>	5	
	B. Technical Solution offered			60	
	1.	<p>Solution/Design Description covering:</p> <ul style="list-style-type: none"> ▪ HPCs Architecture design and layout (6 marks) ▪ Data Centre designing (6 marks). 	Marks to be awarded on the basis of solution offered :	35	

		<ul style="list-style-type: none"> ▪ Security solutions (3 marks) ▪ Storage & Backup solution (3 marks) ▪ Project Implementation Plan cum Methodology (6 marks) ▪ HPC Cluster Monitoring and Management (2 marks). ▪ Energy efficiency solution (2 mark). ▪ Integration and synchronization with domains (5 mark). ▪ Environment Monitoring and Management (2 mark). 	<ul style="list-style-type: none"> ▪ Solution meeting the requirements ▪ Clarity of the solution offered ▪ Availability ▪ Reliability ▪ Scalability ▪ Any improvement / innovations / suggestion in the proposed solution 	
	2.	Compliance with various National and International standard in respect with HPC solution and data centre designing.	As per Technical Standard	5
	3.	Core Project team including Number and Quality of People proposed for implementation.		5
	4.	Plan for implementation of training for operational management of the complete system		5
	5.	Plan for providing documents on <ul style="list-style-type: none"> • Data Centre management (2) • HPC architectural management (2) • System administration (2) • Storage and backup Management (1) • Disaster recovery (1) • Trouble shooting techniques(1) • Emergency management strategies (1) 		10
ITB 28.6 (c) (i)	Completion of installation and commissioning offered by Bidders can be beyond that specified in the Implementation in the Technical Requirements by upto a maximum of NIL weeks.			
ITB 28.6 (c) (ii)	The Purchaser will not accept deviations in the payment schedule in the SCC.			
ITB 28.6 (c) (v)	See the above data for ITB Paragraph 28.1 (b) whether or not discounts will be considered in bid evaluation.			
ITB 28.6 (d)	Interest Rate (I) for net present value calculations of recurrent costs as per ITB 14.1 for Indian rupee= 10 percent per annum and for foreign currency= 4 percent per annum.			

F. POST QUALIFICATION AND AWARD OF CONTRACT

ITB 31.2	<p>In addition to ITB 6 and ITB 16, the purchaser shall evaluate the Information Technologies offered by the bidder prior to the contract award through:</p> <ul style="list-style-type: none"> • Performance Benchmarks reports • Quality Assurance Reports • Reference of the site(s) visit facilitated by the bidder to demonstrate its capability <p>Documentary evidence of standard certification(s) for e.g. BS, ISO, etc., if available.</p>
ITB 33.1	Percentage for quantity increase or decrease: <i>15 percent.</i>
ITB 36.2	Add “along with JV agreement as per Clause 6.2(i) above [if only a letter of intent to execute the JV agreement was submitted with the bid]”
ITB 38.1	<p>The proposed Adjudicator is: Dr. R K Gupta, Retired Deputy Director General, National Informatics Centre with expertise in Information Technology.</p> <p>The proposed hourly fee is <i>INR 2000/- per hour + Service Tax.</i></p> <p>The expenses that would be considered reimbursable to the Adjudicator are: <i>Hiring of mediation room/chamber, secretarial work, clerkage and travel.</i></p> <p>All the expenses related to Adjudicator would be shared by both the contracting parties.</p>

Annexure- A**RAVI KANT GUPTA***Mobile: +91-9810278427; E-Mail: rkg@nic.in, ravi.rkg@gmail.com*

Senior Level Assignment
INFORMATION TECHNOLOGY
Enterprise Project Management - EPM
Business Intelligence, Modelling & Simulation,
Strategic Planning & Consultancy

CAREER CONSPECTUS**Information Technology**

- **Interfacing IT, Modelling & BI for the development of a system/process**
- **Planning & decision making as a process, within the govt. using IT, Quantitative and BI tools**
- **Keeping track of the developments in the area and application development**

Business Intelligence

- **Data Warehousing, OLAP, Reporting & Data Mining**
- **Project proposal, SRS, Data warehousing; BI, objective based software tool selection & costing**
- **Development of BI as a process within govt.**

Modelling & Simulation

- **Large scale Optimization**
- **Time Series Forecasting**
- **Project Management**
- **Statistical modelling**
- **System Dynamics**

37 years of varied experience in the various Institutions of the Central Government covering diversified areas of national importance viz. Economic Policy formulations, Defence R&D organizations, CSIR – Road Transportation, Petroleum & Petro chemical Industries and Information Technology (IT) as a service based Business Intelligence, Modelling & Simulation at National Informatics Centre, Deptt. of IT, Govt. of India. Recently retired as Deputy Director General & Head BI, Modelling & Simulation Division at NIC Hq's, New Delhi. The broad responsibilities includes :

- To promote scientific decision making activity as a process within the govt, based on proven scientific methodology interfaced with IT & Quantitative/Bi Techniques, including EPM.
- Development of Computer Aided Modelling Infrastructure for the centre, state & district level administration & Planners by making available state-of-the-art modelling software system.
- Propagation of Planning and Decision making Systems using statistics, optimisation and OR, Project Management, Econometric, Forecasting & Time Series, Network Analyses, Simulation & System Dynamics besides Business Intelligence (BI) System in the govt.
- Operationalization of Project GITA – Government Intelligence Through Analytics.
- To undertake planning & Operational studies/system/processes on behalf of the centre, state govt. department(s).
- Developed expertise to provide consultancy to different govt. Deptt. On modelling system, BI tools, software packages & Systems availability besides objective based benchmarking & in-depth evaluations.
- Keeping pace with the technological development in the area, specially
- Business Intelligence (BI), Enterprise Project Management (EPM) and short/long range forecasting system(s).

ACADEMIC CREDENTIALS

- **University of Delhi** – 1st class, Post graduate Degree in Statistics with specialization in Operation Research in the year 1971.
- **University of Delhi** - 1st class degree in Science in the year 1969.
- **IIT Delhi** – Advance level courses in Computer in the year 1973.
- **Defence Science Laboratory** – Advance level course in computers in the year 1978.

SELECT EXPERIENCE (OF THE TOTAL: 37+ years)

Out of Total Experience :

- Information Technology : 23 years
- Management Consultancy : 13 years
- Research & Consultancy : One year

Jan'04-to-date; Deputy Director General, National Informatics Centre (NIC) – Hq's New Delhi.

Head, Business Intelligence (BI), Modelling & Simulation Division

- A support division to various Application Divisions of NIC, both at Centre & State level.
- Providing support & consultancy to various NIC Application divisions, as a centralized activity.
- Development of an objective based system/process and its implementation along with in-depth training in the area of responsibility.
- Inducing project GITA (Government Intelligence Through Analytics), as a major step for scientific decision making as a process in the govt.
- Executed Project worth 4 crores in last two years.

Jan'97 – Dec'03 ; Senior Technical Director-NIC

Head, Business Intelligence, Modelling & Simulation Division

- Played a pivotal part in inducing Quantitative & IT Technologies for Planning & Decision making as a process in the government.
- Inducing planning & decision making, as a scientific process in key government departments.

Jan'90 – Jan,97 : Technical Director, NIC

Head, BI, Modelling & Simulation Division

- Informatics Development across NICNET by inducing state-of-the art tools; statistical; optimisation – Linear & Non-linear; Strategic planning, Project Management, Data warehousing, OLAP, Reporting and Data Mining.
- Design and Development of various sectors based application & its implementation with in-depth user training.

Nov,85 – June,90 : Principal Systems Analyst, NIC

Head, Modelling & Simulation Division

- Interfacing with various application divisions – to introduce modelling & simulation activity as major step for planning & decision making in the govt. process.
- A large number of POC developed, exposure to end-users, training & implementation across govt. departments in India.

June'83-Nov'85 & May,77 – June,80 : Scientist 'C' – Projects Division, Indian Institute of Petroleum – CSIR Lab; Auto Orgn. Of GOI

As an active Team member of Refinery Optimization Modelling

- Development & implementation of medium range production, planning optimisation modelling for Haldia & Gujarat refinery.
- Development of short term forecasting system for major Petroleum products.
- Optimal location of two Indian Grass root refinery based on optimisation model(s).
- Market Research Studies – Petroleum & Petrochemical sector.

June,80 – June,83 : Senior Statistician, World Bank Project – CRRI – CSIR Lab (On deputation)

Senior member of a study team and a co-ordinator for data management and analyses group – A collaborative project of a world bank, Ministry of Shipping & transport, Govt. of India.

- Senior member of a study team, World Bank sponsored project – Road User Cost Study (RUCS) – responsible for in-depth analyses for the development of Road sector.
- Member of a team responsible for various in-depth studies pertaining to Road Transportation & transportation economics.
- Development of MIS for road sector in India.

Sept,72 – May,77 : Senior Scientific Assistant – Defence Res. & Dev. Organization, New Delhi

Associated with number of studies for Indian Air force for R&D schemes/projects.

- Studies pertaining to system/Operational Research/ Reliability system.
- System reliability using OR & Statistical Model building for R&D Studies.

Sept,71-Sept,72 : Research Associate – Institute of Economic Growth, New Delhi

Associated with Economic Research studies/projects.

- Social Cost benefit Analyses of Ratangiri Fisheries project.
- Teaching of Computer Applications to Indian Economic Service (IES) Probationers.

ACCOLADES

- Participated on regular basis, in varying capacities, both National and International events in the area of Business Intelligence, Quantitative modelling, statistics & Operational Research, Project Management Conferences, seminars, workshops.
- Participated in various technical forums, training programmes in varying capacity within the country.
- Guest faculty at various Research & Management Institutes of repute, including MDI-Gurgaon, Fores School of Management, Delhi; IMI-Delhi; AIMA-Delhi; ASCI-Hyderabad; NIFM, Faridabad; IEG, Delhi; IIM-Banalore; CRID, Chandigarh; Centre for Policy Research, IAMR, IIT, Delhi.
- Member of Scientific Advisory Board, Institute of Change Research, GOA.
- Chairman/Member – Accreditation Team, AICTE.
- Member-Committee on National Data Warehouse of official state.

- Member – High Power Expert Committee on Basic Statistics for local level development – Planning Commission.

Member of large number of technical committees in the govt.

- Chaired number of technical session in conferences/symposium.
- Delivered, key-note addresses in large number of seminar/workshops/ conferences in the area.
- Organized and actively participated in large number of technical meeting in the area of Computer Aided Planning & decision making process interfaced with information technology.
- MDP for senior executive in the government.
- etc. etc.

MEMBERSHIP – PROFESSIONAL BODIES:

Life Members:

- Operational Research Society of India
- System Dynamics Society of India

SUMMARY OF MAJOR ACTIVITIES:

- Projects : 147
- Studies : 123
- Systems : 227
- Technical Papers : 117
- Research Papers : 40
- Conference National & International : 57

PERSONAL VITAE

Date of Birth : 14th April, 1949.

Address : 154, Green Towers, Sector # 23, Plot # 7-C, Dwarka, New Delhi-110071

Passport Details : Passport No. : E-5788242

: Date of Issue : 15.7.2003

: Date of Expiry : 14.7.2013

: Place of issue : New Delhi

ALUMNI OF

Dyal Singh College, University of Delhi
Hindu College, University of Delhi.

**SECTION III. ELIGIBLE COUNTRIES FOR THE PROVISION OF
GOODS, WORKS, AND SERVICES IN BANK-FINANCED
PROCUREMENT**

Eligible Countries for the Provision of Goods, Works, and Services in Bank-Financed Procurement

1. Eligible for this procurement are firms of, and goods manufactured in, all countries except countries, if any, listed in the following restrictions.
2. In accordance with para. 1.8 (a) of the Guidelines: Procurement under IBRD Loans and IDA Credits, firms of a Country or goods manufactured in a Country may be excluded if
 - (i) as a matter of law or official regulation, the Borrower's Country prohibits commercial relations with that Country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of the goods or works required, or
 - (ii) by an Act of Compliance with a Decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from that Country or any payments to persons or entities in that Country.
3. For the information of borrowers and bidders, at the present time firms, goods and services from the following countries are excluded from this bidding:

With reference to paragraph (i) above: ***"none"***

With reference to paragraph (ii) above: The Bidder may *refer to World Bank's site—www.worldbank.org/procure/india*

SECTION IV. GENERAL CONDITIONS OF CONTRACT

Notes on the General Conditions of Contract (GCC)

The General Conditions of Contract (GCC) contained in this section are to be read in conjunction with the Special Conditions of Contract (SCC) in Section V and the other documents listed in the Contract Agreement. Together they form a complete document expressing all the rights and obligations of the parties to the Contract.

The GCC must remain unaltered. Contract-specific information, deletions, extensions, and modifications to the GCC shall be introduced only through the SCC.

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General Conditions of Contract

A. CONTRACT AND INTERPRETATION

1. Definitions

1.1 In this Contract, the following terms shall be interpreted as indicated below.

(a) contract elements

- (i) “Contract” means the Contract Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein. The Contract Agreement and the Contract Documents shall constitute the Contract, and the term “the Contract” shall in all such documents be construed accordingly.
- (ii) “Contract Documents” means the documents specified in Article 1.1 (Contract Documents) of the Contract Agreement (including any amendments to these Documents).
- (iii) “Contract Agreement” means the agreement entered into between the Purchaser and the Supplier using the form of Contract Agreement contained in the Sample Forms Section of the Bidding Documents and any modifications to this form agreed to by the Purchaser and the Supplier. The date of the Contract Agreement shall be recorded in the signed form.
- (iv) “GCC” means the General Conditions of Contract.
- (v) “SCC” means the Special Conditions of Contract.
- (vi) “Technical Requirements” means the Technical Requirements Section of the Bidding Documents.
- (vii) “Implementation Schedule” means the Implementation Schedule Sub-section of the Technical Requirements.
- viii) “Contract Price” means the price or prices defined in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.

-
- (ix) “Procurement Guidelines” refers to the edition **specified in the SCC** of the World Bank Guidelines: Procurement under IBRD Loans and IDA Credits.
 - (x) “Bidding Documents” refers to the collection of documents issued by the Purchaser to instruct and inform potential suppliers of the processes for bidding, selection of the winning bid, and Contract formation, as well as the contractual conditions governing the relationship between the Purchaser and the Supplier. The General and Special Conditions of Contract, the Technical Requirements, and all other documents included in the Bidding Documents reflect the Procurement Guidelines that the Purchaser is obligated to follow during procurement and administration of this Contract.
- (b) entities
- (i) “Purchaser” means the entity purchasing the Information System, as **specified in the SCC**.
 - (ii) “Project Manager” means the person **named as such in the SCC** or otherwise appointed by the Purchaser in the manner provided in GCC Clause 18.1 (Project Manager) to perform the duties delegated by the Purchaser.
 - (iii) “Supplier” means the firm or Joint Venture whose bid to perform the Contract has been accepted by the Purchaser and is named as such in the Contract Agreement.
 - (iv) “Supplier’s Representative” means any person nominated by the Supplier and named as such in the Contract Agreement or otherwise approved by the Purchaser in the manner provided in GCC Clause 18.2 (Supplier’s Representative) to perform the duties delegated by the Supplier.
 - (v) “Subcontractor” means any firm to whom any of the obligations of the Supplier, including preparation of any design or supply of any Information Technologies or other Goods or Services, is subcontracted directly or indirectly

by the Supplier.

- (vi) “Adjudicator” means the person named in Appendix 2 of the Contract Agreement, appointed by agreement between the Purchaser and the Supplier to make a decision on or to settle any dispute between the Purchaser and the Supplier referred to him or her by the parties, pursuant to GCC Clause 6.1 (Adjudication).
- (vii) “The World Bank” (also called “The Bank”) means the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).

(c) scope

- (i) “Information System,” also called “the System,” means all the Information Technologies, Materials, and other Goods to be supplied, installed, integrated, and made operational (exclusive of the Supplier’s Equipment), together with the Services to be carried out by the Supplier under the Contract.
- (ii) “Subsystem” means any subset of the System identified as such in the Contract that may be supplied, installed, tested, and commissioned individually before Commissioning of the entire System.
- (iii) “Information Technologies” means all information processing and communications-related hardware, Software, supplies, and consumable items that the Supplier is required to supply and install under the Contract.
- (iv) “Goods” means all equipment, machinery, furnishings, Materials, and other tangible items that the Supplier is required to supply or supply and install under the Contract, including, without limitation, the Information Technologies and Materials, but excluding the Supplier’s Equipment.
- (v) “Services” means all technical, logistical, management, and any other Services to be provided by the Supplier under the Contract to

supply, install, customize, integrate, and make operational the System. Such Services may include, but are not restricted to, activity management and quality assurance, design, development, customization, documentation, transportation, insurance, inspection, expediting, site preparation, installation, integration, training, data migration, Pre-commissioning, Commissioning, maintenance, and technical support.

- (vi) “The Project Plan” means the document to be developed by the Supplier and approved by the Purchaser, pursuant to GCC Clause 19, based on the requirements of the Contract and the Preliminary Project Plan included in the Supplier’s bid. The “Agreed and Finalized Project Plan” is the version of the Project Plan approved by the Purchaser, in accordance with GCC Clause 19.2. Should the Project Plan conflict with the Contract in any way, the relevant provisions of the Contract, including any amendments, shall prevail.
- (vii) “Software” means that part of the System which are instructions that cause information processing Subsystems to perform in a specific manner or execute specific operations.
- (viii) “System Software” means Software that provides the operating and management instructions for the underlying hardware and other components, and is identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Systems Software. Such System Software includes, but is not restricted to, micro-code embedded in hardware (i.e., “firmware”), operating systems, communications, system and network management, and utility software.
- (ix) “General-Purpose Software” means Software that supports general-purpose office and software development activities and is identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be General-

Purpose Software. Such General-Purpose Software may include, but is not restricted to, word processing, spreadsheet, generic database management, and application development software.

- (x) “Application Software” means Software formulated to perform specific business or technical functions and interface with the business or technical users of the System and is identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Application Software.
- (xi) “Standard Software” means Software identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Standard Software.
- (xii) “Custom Software” means Software identified as such in Appendix 4 of the Contract Agreement and such other Software as the parties may agree in writing to be Custom Software.
- (xiii) “Source Code” means the database structures, dictionaries, definitions, program source files, and any other symbolic representations necessary for the compilation, execution, and subsequent maintenance of the Software (typically, but not exclusively, required for Custom Software).
- (xiv) “Materials” means all documentation in printed or printable form and all instructional and informational aides in any form (including audio, video, and text) and on any medium, provided to the Purchaser under the Contract.
- (xv) “Standard Materials” means all Materials not specified as Custom Materials.
- (xvi) “Custom Materials” means Materials developed by the Supplier at the Purchaser’s expense under the Contract and identified as such in Appendix 5 of the Contract Agreement and such other Materials as the parties may agree in writing to be

Custom Materials. Custom Materials includes Materials created from Standard Materials.

(xvii) “Intellectual Property Rights” means any and all copyright, moral rights, trademark, patent, and other intellectual and proprietary rights, title and interests worldwide, whether vested, contingent, or future, including without limitation all economic rights and all exclusive rights to reproduce, fix, adapt, modify, translate, create derivative works from, extract or re-utilize data from, manufacture, introduce into circulation, publish, distribute, sell, license, sublicense, transfer, rent, lease, transmit or provide access electronically, broadcast, display, enter into computer memory, or otherwise use any portion or copy, in whole or in part, in any form, directly or indirectly, or to authorize or assign others to do so.

(xviii) “Supplier’s Equipment” means all equipment, tools, apparatus, or things of every kind required in or for installation, completion and maintenance of the System that are to be provided by the Supplier, but excluding the Information Technologies, or other items forming part of the System.

(d) activities

(i) “Delivery” means the transfer of the Goods from the Supplier to the Purchaser in accordance with the current edition Incoterms specified in the Contract.

(ii) “Installation” means that the System or a Subsystem as specified in the Contract is ready for Commissioning as provided in GCC Clause 26 (Installation).

(iii) “Pre-commissioning” means the testing, checking, and any other required activity that may be specified in the Technical Requirements that are to be carried out by the Supplier in preparation for Commissioning of the System as provided in GCC Clause 26 (Installation).

(iv) “Commissioning” means operation of the

System or any Subsystem by the Supplier following Installation, which operation is to be carried out by the Supplier as provided in GCC Clause 27.1 (Commissioning), for the purpose of carrying out Operational Acceptance Test(s).

- (v) “Operational Acceptance Tests” means the tests specified in the Technical Requirements and Agreed and Finalized Project Plan to be carried out to ascertain whether the System, or a specified Subsystem, is able to attain the functional and performance requirements specified in the Technical Requirements and Agreed and Finalized Project Plan, in accordance with the provisions of GCC Clause 27.2 (Operational Acceptance Test).
 - (vi) “Operational Acceptance” means the acceptance by the Purchaser of the System (or any Subsystem(s) where the Contract provides for acceptance of the System in parts), in accordance with GCC Clause 27.3 (Operational Acceptance).
- (e) place and time
- (i) “Purchaser’s Country” is the **country named in the SCC**.
 - (ii) “Supplier’s Country” is the country in which the Supplier is legally organized, as named in the Contract Agreement.
 - (iii) “Project Site(s)” means the place(s) **specified in the SCC** for the supply and installation of the System.
 - (iv) “Eligible Country” means the countries and territories eligible for participation in procurements financed by the World Bank as defined in the Procurement Guidelines. (**Note:** The World Bank maintains a list of countries from which Bidders, Goods, and Services are not eligible to participate in procurement financed by the Bank. The list is regularly updated and can be obtained from the Public Information Center of the Bank or its web site on procurement. A copy of the list is contained

in the Section of the Bidding Documents entitled “Eligible Countries for the Provision of Goods, Works, and Services in Bank-Financed Procurement”).

- (v) “Day” means calendar day of the Gregorian Calendar.
- (vi) “Week” means seven (7) consecutive Days, beginning the day of the week as is customary in the Purchaser’s Country.
- (vii) “Month” means calendar month of the Gregorian Calendar.
- (viii) “Year” means twelve (12) consecutive Months.
- (ix) “Effective Date” means the date of fulfillment of all conditions specified in Article 3 (Effective Date for Determining Time for Achieving Operational Acceptance) of the Contract Agreement, for the purpose of determining the Delivery, Installation, and Operational Acceptance dates for the System or Subsystem(s).
- (x) “Contract Period” is the time period during which this Contract governs the relations and obligations of the Purchaser and Supplier in relation to the System, as **specified in the SCC**.
- (xi) “Defect Liability Period” (also referred to as the “Warranty Period”) means the period of validity of the warranties given by the Supplier commencing at date of the Operational Acceptance Certificate of the System or Subsystem(s), during which the Supplier is responsible for defects with respect to the System (or the relevant Subsystem[s]) as provided in GCC Clause 29 (Defect Liability).
- (xii) “The Post-Warranty Services Period” means the number of years **defined in the SCC** (if any), following the expiration of the Warranty Period during which the Supplier may be obligated to provide Software licenses, maintenance, and/or technical support services for the System, either under this Contract or under separate contract(s).

(xiii) “The Coverage Period” means the Days of the Week and the hours of those Days during which maintenance, operational, and/or technical support services (if any) must be available.

2. Contract Documents

2.1 Subject to Article 1.2 (Order of Precedence) of the Contract Agreement, all documents forming part of the Contract (and all parts of these documents) are intended to be correlative, complementary, and mutually explanatory. The Contract shall be read as a whole.

3. Interpretation

3.1 Governing Language

3.1.1 All Contract Documents and related correspondence exchanged between Purchaser and Supplier shall be written in the language **specified in the SCC**, and the Contract shall be construed and interpreted in accordance with that language.

3.1.2 If any of the Contract Documents or related correspondence are prepared in a language other than the governing language under GCC Clause 3.1.1 above, the translation of such documents into the governing language shall prevail in matters of interpretation. The originating party, with respect to such documents shall bear the costs and risks of such translation.

3.2 Singular and Plural

The singular shall include the plural and the plural the singular, except where the context otherwise requires.

3.3 Headings

The headings and marginal notes in the GCC are included for ease of reference and shall neither constitute a part of the Contract nor affect its interpretation.

3.4 Persons

Words importing persons or parties shall include firms, corporations, and government entities.

3.5 Incoterms

Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by the current Incoterms (“Incoterms 2000” or a more recent version if

and as published). Incoterms are the international rules for interpreting trade terms published by the International Chamber of Commerce, 38 Cours Albert 1er, 75008 Paris, France.

3.6 Entire Agreement

The Contract constitutes the entire agreement between the Purchaser and Supplier with respect to the subject matter of Contract and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect to the subject matter of the Contract made prior to the date of Contract.

3.7 Amendment

No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party to the Contract.

3.8 Independent Supplier

The Supplier shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture, or other joint relationship between the parties to the Contract.

Subject to the provisions of the Contract, the Supplier shall be solely responsible for the manner in which the Contract is performed. All employees, representatives, or Subcontractors engaged by the Supplier in connection with the performance of the Contract shall be under the complete control of the Supplier and shall not be deemed to be employees of the Purchaser, and nothing contained in the Contract or in any subcontract awarded by the Supplier shall be construed to create any contractual relationship between any such employees, representatives, or Subcontractors and the Purchaser.

3.9 Joint Venture

If the Supplier is a Joint Venture of two or more firms, all such firms shall be jointly and severally bound to the Purchaser for the fulfillment of the provisions of the Contract and shall designate one of such firms to act as a leader with authority to bind the Joint Venture. The composition or constitution of the Joint Venture shall not be

altered without the prior consent of the Purchaser.

3.10 Nonwaiver

3.10.1 Subject to GCC Clause 3.10.2 below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

3.10.2 Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, must be dated and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

3.11 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity, or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

3.12 Country of Origin

"Origin" means the place where the Information Technologies, Materials, and other Goods for the System were produced or from which the Services are supplied. Goods are produced when, through manufacturing, processing, Software development, or substantial and major assembly or integration of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components. The Origin of Goods and Services is distinct from the nationality of the Supplier and may be different.

4. Notices

4.1 Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing and shall be sent, pursuant to GCC Clause 4.3 below, by personal delivery, airmail post, special courier, cable, telegraph, telex, facsimile, electronic mail, or Electronic Data Interchange (EDI), with the following provisions.

4.1.1 Any notice sent by cable, telegraph, telex, facsimile,

electronic mail, or EDI shall be confirmed within two (2) days after dispatch by notice sent by airmail post or special courier, except as otherwise specified in the Contract.

4.1.2 Any notice sent by airmail post or special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of dispatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped, and conveyed to the postal authorities or courier service for transmission by airmail or special courier.

4.1.3 Any notice delivered personally or sent by cable, telegraph, telex, facsimile, electronic mail, or EDI shall be deemed to have been delivered on the date of its dispatch.

4.1.4 Either party may change its postal, cable, telex, facsimile, electronic mail, or EDI addresses for receipt of such notices by ten (10) days' notice to the other party in writing.

4.2 Notices shall be deemed to include any approvals, consents, instructions, orders, certificates, information and other communication to be given under the Contract.

4.3 Pursuant to GCC Clause 18, notices from/to the Purchaser are normally given by, or addressed to, the Project Manager, while notices from/to the Supplier are normally given by, or addressed to, the Supplier's Representative, or in its absence its deputy if any. If there is no appointed Project Manager or Supplier's Representative (or deputy), or if their related authority is limited by the SCC for GCC Clauses 18.1 or 18.2.2, or for any other reason, the Purchaser or Supplier may give and receive notices at their fallback addresses. The address of the Project Manager and the fallback address of the Purchaser are as **specified in the SCC** or as subsequently established/amended. The address of the Supplier's Representative and the fallback address of the Supplier are as specified in Appendix 1 of the Contract Agreement or as subsequently established/amended.

5. Governing Law

5.1 The Contract shall be governed by and interpreted in accordance with the laws of the country specified in the SCC.

6. Settlement of Disputes

6.1 Adjudication

6.1.1 If any dispute of any kind whatsoever shall arise between the Purchaser and the Supplier in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity, or termination, or the operation of the System (whether during the progress of implementation or after its achieving Operational Acceptance and whether before or after the termination, abandonment, or breach of the Contract), the parties shall seek to resolve any such dispute by mutual consultation. If the parties fail to resolve such a dispute by mutual consultation within fourteen (14) days after one party has notified the other in writing of the dispute, then, if the Contract Agreement in Appendix 2 includes and names an Adjudicator, the dispute shall, within another fourteen (14) days, be referred in writing by either party to the Adjudicator, with a copy to the other party. If there is no Adjudicator specified in the Contract Agreement, the mutual consultation period stated above shall last twenty-eight (28) days (instead of fourteen), upon expiry of which either party may move to the notification of arbitration pursuant to GCC Clause 6.2.1.

6.1.2 The Adjudicator shall give his or her decision in writing to both parties within twenty-eight (28) days of the dispute being referred to the Adjudicator. If the Adjudicator has done so, and no notice of intention to commence arbitration has been given by either the Purchaser or the Supplier within fifty-six (56) days of such reference, the decision shall become final and binding upon the Purchaser and the Supplier. Any decision that has become final and binding shall be implemented by the parties forthwith.

6.1.3 The Adjudicator shall be paid an hourly fee at the rate specified in the Contract Agreement plus reasonable expenditures incurred in the execution of duties as Adjudicator, and these costs shall be divided equally between the Purchaser and the Supplier.

6.1.4 Should the Adjudicator resign or die, or should the Purchaser and the Supplier agree that the Adjudicator is not fulfilling his or her functions in accordance with

the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Purchaser and the Supplier. Failing agreement between the two within twenty-eight (28) days, the new Adjudicator shall be appointed at the request of either party by the Appointing Authority **specified in the SCC**, or, if no Appointing Authority is **specified in SCC**, the Contract shall, from this point onward and until the parties may otherwise agree on an Adjudicator or an Appointing Authority, be implemented as if there is no Adjudicator.

6.2 Arbitration

6.2.1 If

- (a) the Purchaser or the Supplier is dissatisfied with the Adjudicator's decision and acts before this decision has become final and binding pursuant to GCC Clause 6.1.2, or
- (b) the Adjudicator fails to give a decision within the allotted time from referral of the dispute pursuant to GCC Clause 6.1.2, and the Purchaser or the Supplier acts within the following fourteen (14) days, or
- (c) in the absence of an Adjudicator from the Contract Agreement, the mutual consultation pursuant to GCC Clause 6.1.1 expires without resolution of the dispute and the Purchaser or the Supplier acts within the following fourteen (14) days,

then either the Purchaser or the Supplier may act to notice to the other party, with a copy for information to the Adjudicator in case an Adjudicator had been involved, of its intention to commence arbitration, as provided below, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.

- 6.2.2 Any dispute in respect of which a notice of intention to commence arbitration has been given, in accordance with GCC Clause 6.2.1, shall be finally settled by arbitration. Arbitration may be commenced prior to or after Installation of the Information System.

6.2.3 Arbitration proceedings shall be conducted in accordance with the rules of procedure **specified in the SCC**.

6.3 Notwithstanding any reference to the Adjudicator or arbitration in this clause,

- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree;
- (b) the Purchaser shall pay the Supplier any monies due the Supplier.

B. SUBJECT MATTER OF CONTRACT

7. Scope of the System

7.1 Unless otherwise expressly **limited in the SCC** or Technical Requirements, the Supplier's obligations cover the provision of all Information Technologies, Materials and other Goods as well as the performance of all Services required for the design, development, and implementation (including procurement, quality assurance, assembly, associated site preparation, Delivery, Pre-commissioning, Installation, Testing, and Commissioning) of the System, in accordance with the plans, procedures, specifications, drawings, codes, and any other documents specified in the Contract and the Agreed and Finalized Project Plan.

7.2 The Supplier shall, unless specifically excluded in the Contract, perform all such work and / or supply all such items and Materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Operational Acceptance of the System as if such work and / or items and Materials were expressly mentioned in the Contract.

7.3 The Supplier's obligations (if any) to provide Goods and Services as implied by the Recurrent Cost tables of the Supplier's bid, such as consumables, spare parts, and technical services (e.g., maintenance, technical assistance, and operational support), are as **specified in the SCC**, including the relevant terms, characteristics, and timings.

8. Time for Commencement and Operational Acceptance

8.1 The Supplier shall commence work on the System within the period **specified in the SCC**, and without prejudice to GCC Clause 28.2, the Supplier shall thereafter proceed with the System in accordance with the time schedule specified in the

Implementation Schedule in the Technical Requirements Section and any refinements made in the Agreed and Finalized Project Plan.

- 8.2 The Supplier shall achieve Operational Acceptance of the System (or Subsystem(s) where a separate time for Operational Acceptance of such Subsystem(s) is specified in the Contract) within the time **specified in the SCC** and in accordance with the time schedule specified in the Implementation Schedule in the Technical Requirements Section and any refinements made in the Agreed and Finalized Project Plan, or within such extended time to which the Supplier shall be entitled under GCC Clause 40 (Extension of Time for Achieving Operational Acceptance).

9. Supplier's Responsibilities

- 9.1 The Supplier shall conduct all activities with due care and diligence, in accordance with the Contract and with the skill and care expected of a competent provider of information technologies, information systems, support, maintenance, training, and other related services, or in accordance with best industry practices. In particular, the Supplier shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand.
- 9.2 The Supplier confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the System provided by the Purchaser and on the basis of information that the Supplier could have obtained from a visual inspection of the site (if access to the site was available) and of other data readily available to the Supplier relating to the System as at the date twenty-eight (28) days prior to bid submission. The Supplier acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Contract.
- 9.3 The Supplier shall be responsible for timely provision of all resources, information, and decision making under its control that are necessary to reach a mutually Agreed and Finalized Project Plan (pursuant to GCC Clause 19.2) within the time schedule specified in the Implementation Schedule in the Technical Requirements Section. Failure to provide such resources, information, and decision making may constitute grounds for termination pursuant to GCC Clause 41.2.

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- 9.4 The Supplier shall acquire in its name all permits, approvals, and/or licenses from all local, state, or national government authorities or public service undertakings in the Purchaser's Country that are necessary for the performance of the Contract, including, without limitation, visas for the Supplier's and Subcontractor's personnel and entry permits for all imported Supplier's Equipment. The Supplier shall acquire all other permits, approvals, and/or licenses that are not the responsibility of the Purchaser under GCC Clause 10.4 and that are necessary for the performance of the Contract.
- 9.5 The Supplier shall comply with all laws in force in the Purchaser's Country. The laws will include all national, provincial, municipal, or other laws that affect the performance of the Contract and are binding upon the Supplier. The Supplier shall indemnify and hold harmless the Purchaser from and against any and all liabilities, damages, claims, fines, penalties, and expenses of whatever nature arising or resulting from the violation of such laws by the Supplier or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC Clause 10.1. The Supplier shall not indemnify the Purchaser to the extent that such liability, damage, claims, fines, penalties, and expenses were caused or contributed to by a fault of the Purchaser.
- 9.6 The Supplier shall, in all dealings with its labor and the labor of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs, and all local laws and regulations pertaining to the employment of labor.
- 9.7 Any Information Technologies or other Goods and Services that will be incorporated in or be required for the System and other supplies shall have their Origin, as defined in GCC Clause 3.12, in a country that shall be an Eligible Country, as defined in GCC Clause 1.1 (e) (iv).
- 9.8 The Supplier shall permit the Bank and/or persons appointed by the Bank to inspect the Supplier's offices and/or the accounts and records of the Supplier and its sub-contractors relating to the performance of the Contract, and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank. The Supplier's attention is drawn to Sub-Clause 41.2.1(c), which provides, inter alia, that acts intended to materially impede the exercise of the

Bank's inspection and audit rights provided for under Sub-Clause 9.8 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility under the Procurement Guidelines)

9.9 Other Supplier responsibilities, if any, are as **stated in the SCC**.

10. Purchaser's Responsibilities

10.1 The Purchaser shall ensure the accuracy of all information and/or data to be supplied by the Purchaser to the Supplier, except when otherwise expressly stated in the Contract.

10.2 The Purchaser shall be responsible for timely provision of all resources, information, and decision making under its control that are necessary to reach an Agreed and Finalized Project Plan (pursuant to GCC Clause 19.2) within the time schedule specified in the Implementation Schedule in the Technical Requirements Section. Failure to provide such resources, information, and decision making may constitute grounds for Termination pursuant to GCC Clause 41.3.1 (b).

10.3 The Purchaser shall be responsible for acquiring and providing legal and physical possession of the site and access to it, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract.

10.4 If requested by the Supplier, the Purchaser shall use its best endeavors to assist the Supplier in obtaining in a timely and expeditious manner all permits, approvals, and/or licenses necessary for the execution of the Contract from all local, state, or national government authorities or public service undertakings that such authorities or undertakings require the Supplier or Subcontractors or the personnel of the Supplier or Subcontractors, as the case may be, to obtain.

10.5 In such cases where the responsibilities of specifying and acquiring or upgrading telecommunications and/or electric power services falls to the Supplier, as specified in the Technical Requirements, SCC, Agreed and Finalized Project Plan, or other parts of the Contract, the Purchaser shall use its best endeavors to assist the Supplier in obtaining such services in a timely and expeditious manner.

10.6 The Purchaser shall be responsible for timely provision of all resources, access, and information necessary for the Installation and Operational Acceptance of the System (including, but not limited to, any required telecommunications or electric power services), as identified

in the Agreed and Finalized Project Plan, except where provision of such items is explicitly identified in the Contract as being the responsibility of the Supplier. Delay by the Purchaser may result in an appropriate extension of the Time for Operational Acceptance, at the Supplier's discretion.

- 10.7 Unless otherwise specified in the Contract or agreed upon by the Purchaser and the Supplier, the Purchaser shall provide sufficient, properly qualified operating and technical personnel, as required by the Supplier to properly carry out Delivery, Pre-commissioning, Installation, Commissioning, and Operational Acceptance, at or before the time specified in the Technical Requirements Section's Implementation Schedule and the Agreed and Finalized Project Plan.
- 10.8 The Purchaser will designate appropriate staff for the training courses to be given by the Supplier and shall make all appropriate logistical arrangements for such training as specified in the Technical Requirements, SCC, the Agreed and Finalized Project Plan, or other parts of the Contract.
- 10.9 The Purchaser assumes primary responsibility for the Operational Acceptance Test(s) for the System, in accordance with GCC Clause 27.2, and shall be responsible for the continued operation of the System after Operational Acceptance. However, this shall not limit in any way the Supplier's responsibilities after the date of Operational Acceptance otherwise specified in the Contract.
- 10.10 The Purchaser is responsible for performing and safely storing timely and regular backups of its data and Software in accordance with accepted data management principles, except where such responsibility is clearly assigned to the Supplier elsewhere in the Contract.
- 10.11 All costs and expenses involved in the performance of the obligations under this GCC Clause 10 shall be the responsibility of the Purchaser, save those to be incurred by the Supplier with respect to the performance of the Operational Acceptance Test(s), in accordance with GCC Clause 27.2.
- 10.12 Other Purchaser responsibilities, if any, are **as stated in the SCC.**

C. PAYMENT

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|-----------------------------|--|
| 11. Contract Price | <p>11.1 The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement.</p> <p>11.2 The Contract Price shall be a firm lump sum not subject to any alteration, except:</p> <ul style="list-style-type: none"> (a) in the event of a Change in the System pursuant to GCC Clause 39 or to other clauses in the Contract; (b) in accordance with the price adjustment formula (if any) specified in the SCC. <p>11.3 The Supplier shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.</p> |
| 12. Terms of Payment | <p>12.1 The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, as appropriate, the System or Subsystem(s), Delivered, Pre-commissioned, Installed, and Operationally Accepted, and by documents submitted pursuant to GCC Clause 22.5 and upon fulfillment of other obligations stipulated in the Contract.</p> <p style="padding-left: 40px;">The Contract Price shall be paid as specified in the SCC.</p> <p>12.2 No payment made by the Purchaser herein shall be deemed to constitute acceptance by the Purchaser of the System or any Subsystem(s).</p> <p>12.3 Payments shall be made promptly by the Purchaser, but in no case later than forty five (45) days after submission of a valid invoice by the Supplier. In the event that the Purchaser fails to make any payment by its respective due date or within the period set forth in the Contract, the Purchaser shall pay to the Supplier interest on the amount of such delayed payment at the rate(s) specified in the SCC for the period of delay until payment has been made in full, whether before or after judgment or arbitration award.</p> <p>12.4 All payments shall be made in the currency(ies) specified in the Contract Agreement, pursuant to GCC Clause 11. For Goods and Services supplied locally, payments shall be made in the currency of the Purchaser's Country, unless otherwise specified in the SCC.</p> |

- 12.5 Unless otherwise **specified in the SCC**, payment of the foreign currency portion of the Contract Price for Goods supplied from outside the Purchaser's Country shall be made to the Supplier through an irrevocable letter of credit opened by an authorized bank in the Supplier's Country and will be payable on presentation of the appropriate documents. It is agreed that the letter of credit will be subject to Article 10 of the latest revision of Uniform Customs and Practice for Documentary Credits, published by the International Chamber of Commerce, Paris.

13. Securities

13.1 Issuance of Securities

The Supplier shall provide the securities specified below in favor of the Purchaser at the times and in the amount, manner, and form specified below.

13.2 Advance Payment Security

13.2.1 As **specified in the SCC**, the Supplier shall provide a security equal in amount and currency to the advance payment, and valid until the System is Operationally Accepted.

13.2.2 The security shall be in the form provided in the Bidding Documents or in another form acceptable to the Purchaser. The amount of the security shall be reduced in proportion to the value of the System executed by and paid to the Supplier from time to time and shall automatically become null and void when the full amount of the advance payment has been recovered by the Purchaser. The way the value of the security is deemed to become reduced and, eventually, voided is as **specified in the SCC**. The security shall be returned to the Supplier immediately after its expiration.

13.3 Performance Security

13.3.1 The Supplier shall, within twenty-eight (28) days of the notification of Contract award, provide a security for the due performance of the Contract in the amount and currency **specified in the SCC**.

13.3.2 The security shall be a bank guarantee in the form provided in the Sample Forms Section of the Bidding Documents, or it shall be in another form acceptable to the Purchaser.

13.3.3 The security shall automatically become null and void once all the obligations of the Supplier under the Contract have been fulfilled, including, but not limited to, any obligations during the Warranty Period and any extensions to the period. The security shall be returned to the Supplier no later than twenty-eight (28) days after its expiration.

13.3.4 Upon Operational Acceptance of the entire System, the security shall be reduced to the amount **specified in the SCC**, on the date of such Operational Acceptance, so that the reduced security would only cover the remaining warranty obligations of the Supplier.

14. Taxes and Duties

14.1 For Goods or Services supplied from outside the Purchaser's country, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's country. Any duties, such as importation or customs duties, and taxes and other levies, payable in the Purchaser's country for the supply of Goods and Services from outside the Purchaser's country are the responsibility of the Purchaser unless these duties or taxes have been made part of the Contract Price in Article 2 of the Contract Agreement and the Price Schedule it refers to, in which case the duties and taxes will be the Supplier's responsibility.

14.2 For Goods or Services supplied locally, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods or Services to the Purchaser. The only exception are taxes or duties, such as value-added or sales tax or stamp duty as apply to, or are clearly identifiable, on the invoices and provided they apply in the Purchaser's country, and only if these taxes, levies and/or duties are also excluded from the Contract Price in Article 2 of the Contract Agreement and the Price Schedule it refers to.

14.3 If any tax exemptions, reductions, allowances, or privileges may be available to the Supplier in the Purchaser's Country, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.

14.4 For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Contract Agreement is based on the taxes,

duties, levies, and charges prevailing at the date twenty-eight (28) days prior to the date of bid submission in the Purchaser's Country (also called "Tax" in this GCC Clause 14.4). If any Tax rates are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of the Contract, which was or will be assessed on the Supplier, its Subcontractors, or their employees in connection with performance of the Contract, an equitable adjustment to the Contract Price shall be made to fully take into account any such change by addition to or reduction from the Contract Price, as the case may be.

D. INTELLECTUAL PROPERTY

15. Copyright

- 15.1 The Intellectual Property Rights in all Standard Software and Standard Materials shall remain vested in the owner of such rights.
- 15.2 The Purchaser agrees to restrict use, copying, or duplication of the Standard Software and Standard Materials in accordance with GCC Clause 16, except that additional copies of Standard Materials may be made by the Purchaser for use within the scope of the project of which the System is a part, in the event that the Supplier does not deliver copies within thirty (30) days from receipt of a request for such Standard Materials.
- 15.3 The Purchaser's contractual rights to use the Standard Software or elements of the Standard Software may not be assigned, licensed, or otherwise transferred voluntarily except in accordance with the relevant license agreement or as may be otherwise **specified in the SCC**.
- 15.4 As applicable, the Purchaser's and Supplier's rights and obligations with respect to Custom Software or elements of the Custom Software, including any license agreements, and with respect to Custom Materials or elements of the Custom Materials, are specified in the SCC. **Subject to the SCC**, the Intellectual Property Rights in all Custom Software and Custom Materials specified in Appendices 4 and 5 of the Contract Agreement (if any) shall, at the date of this Contract or on creation of the rights (if later than the date of this Contract), vest in the Purchaser. The Supplier shall do and execute or arrange for the doing and executing of each necessary act, document, and thing that the Purchaser may

consider necessary or desirable to perfect the right, title, and interest of the Purchaser in and to those rights. In respect of such Custom Software and Custom Materials, the Supplier shall ensure that the holder of a moral right in such an item does not assert it, and the Supplier shall, if requested to do so by the Purchaser and where permitted by applicable law, ensure that the holder of such a moral right waives it.

15.5 The parties shall enter into such (if any) escrow arrangements in relation to the Source Code to some or all of the Software as are **specified in the SCC** and in **accordance with the SCC**.

16. Software License Agreements

16.1 Except to the extent that the Intellectual Property Rights in the Software vest in the Purchaser, the Supplier hereby grants to the Purchaser license to access and use the Software, including all inventions, designs, and marks embodied in the Software.

Such license to access and use the Software shall:

- (a) be:
 - (i) nonexclusive;
 - (ii) fully paid up and irrevocable (except that it shall terminate if the Contract terminates under GCC Clauses 41.1 or 41.3);
 - (iii) valid throughout the territory of the Purchaser's Country (or such other territory as **specified in the SCC**); and
 - (iv) subject to additional restrictions (if any) as **specified in the SCC**.
- (b) permit the Software to be:
 - (i) used or copied for use on or with the computer(s) for which it was acquired (if specified in the Technical Requirements and/or the Supplier's bid), plus a backup computer(s) of the same or similar capacity, if the primary is(are) inoperative, and during a reasonable transitional period when use is being transferred between primary and backup;
 - (ii) as **specified in the SCC**, used or copied for use on or transferred to a replacement computer(s),

(and use on the original and replacement computer(s) may be simultaneous during a reasonable transitional period) provided that, if the Technical Requirements and/or the Supplier's bid specifies a class of computer to which the license is restricted and unless the Supplier agrees otherwise in writing, the replacement computer(s) is(are) within that class;

- (iii) if the nature of the System is such as to permit such access, accessed from other computers connected to the primary and/or backup computer(s) by means of a local or wide-area network or similar arrangement, and used on or copied for use on those other computers to the extent necessary to that access;
- (iv) reproduced for safekeeping or backup purposes;
- (v) customized, adapted, or combined with other computer software for use by the Purchaser, provided that derivative software incorporating any substantial part of the delivered, restricted Software shall be subject to same restrictions as are set forth in this Contract;
- (vi) as **specified in the SCC**, disclosed to, and reproduced for use by, support service suppliers and their subcontractors, (and the Purchaser may sublicense such persons to use and copy for use the Software) to the extent reasonably necessary to the performance of their support service contracts, subject to the same restrictions as are set forth in this Contract; and
- (vii) disclosed to, and reproduced for use by, the Purchaser and by such other persons as are **specified in the SCC** (and the Purchaser may sublicense such persons to use and copy for use the Software), subject to the same restrictions as are set forth in this Contract.

16.2 The Standard Software may be subject to audit by the Supplier, in accordance with the terms **specified in the SCC**, to verify compliance with the above license agreements.

17. Confidential Information

17.1 Except if otherwise **specified in the SCC**, the "Receiving Party" (either the Purchaser or the Supplier) shall keep confidential and shall not, without the written consent of the other party to this Contract ("the Disclosing Party"), divulge to any third party any documents, data, or other information of a confidential nature ("Confidential Information") connected with this Contract, and furnished directly or indirectly by the Disclosing Party prior to or during performance, or following termination, of this Contract.

17.2 For the purposes of GCC Clause 17.1, the Supplier is also deemed to be the Receiving Party of Confidential Information generated by the Supplier itself in the course of the performance of its obligations under the Contract and relating to the businesses, finances, suppliers, employees, or other contacts of the Purchaser or the Purchaser's use of the System.

17.3 Notwithstanding GCC Clauses 17.1 and 17.2:

- (a) the Supplier may furnish to its Subcontractor Confidential Information of the Purchaser to the extent reasonably required for the Subcontractor to perform its work under the Contract; and
- (b) the Purchaser may furnish Confidential Information of the Supplier: (i) to its support service suppliers and their subcontractors to the extent reasonably required for them to perform their work under their support service contracts; and (ii) to its affiliates and subsidiaries,

in which event the Receiving Party shall ensure that the person to whom it furnishes Confidential Information of the Disclosing Party is aware of and abides by the Receiving Party's obligations under this GCC Clause 17 as if that person were party to the Contract in place of the Receiving Party.

17.4 The Purchaser shall not, without the Supplier's prior written consent, use any Confidential Information received from the Supplier for any purpose other than the operation, maintenance and further development of the System. Similarly, the Supplier shall not, without the Purchaser's prior written consent, use any Confidential Information received from the Purchaser for any purpose other than those that are required for the performance of the Contract.

17.5 The obligation of a party under GCC Clauses 17.1 through 17.4 above, however, shall not apply to that information which:

- (a) now or hereafter enters the public domain through no fault of the Receiving Party;
- (b) can be proven to have been possessed by the Receiving Party at the time of disclosure and that was not previously obtained, directly or indirectly, from the Disclosing Party;
- (c) otherwise lawfully becomes available to the Receiving Party from a third party that has no obligation of confidentiality.

17.6 The above provisions of this GCC Clause 17 shall not in any way modify any undertaking of confidentiality given by either of the parties to this Contract prior to the date of the Contract in respect of the System or any part thereof.

17.7 The provisions of this GCC Clause 17 shall survive the termination, for whatever reason, of the Contract for three (3) years or such longer period as may be **specified in the SCC**.

E. SUPPLY, INSTALLATION, TESTING, COMMISSIONING, AND ACCEPTANCE OF THE SYSTEM

18. Representatives 18.1 Project Manager

If the Project Manager is not named in the Contract, then within fourteen (14) days of the Effective Date, the Purchaser shall appoint and notify the Supplier in writing of the name of the Project Manager. The Purchaser may from time to time appoint some other person as the Project Manager in place of the person previously so appointed and shall give a notice of the name of such other person to the Supplier without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the System. Such appointment shall take effect only upon receipt of such notice by the Supplier. Subject to the extensions and/or limitations **specified in the SCC** (if any), the Project Manager shall have the authority to represent the Purchaser on all day-to-day matters relating to the System or arising from the Contract, and shall normally be the person giving or receiving notices on behalf of the Purchaser pursuant to GCC Clause 4.

18.2 Supplier's Representative

18.2.1 If the Supplier's Representative is not named in the Contract, then within fourteen (14) days of the Effective Date, the Supplier shall appoint the Supplier's Representative and shall request the Purchaser in writing to approve the person so appointed. The request must be accompanied by a detailed curriculum vitae for the nominee, as well as a description of any other System or non-System responsibilities the nominee would retain while performing the duties of the Supplier's Representative. If the Purchaser does not object to the appointment within fourteen (14) days, the Supplier's Representative shall be deemed to have been approved. If the Purchaser objects to the appointment within fourteen (14) days giving the reason therefor, then the Supplier shall appoint a replacement within fourteen (14) days of such objection in accordance with this GCC Clause 18.2.1.

18.2.2 Subject to the extensions and/or limitations **specified in the SCC** (if any), the Supplier's Representative shall have the authority to represent the Supplier on all day-to-day matters relating to the System or arising from the Contract, and shall normally be the person giving or receiving notices on behalf of the Supplier pursuant to GCC Clause 4.

18.2.3 The Supplier shall not revoke the appointment of the Supplier's Representative without the Purchaser's prior written consent, which shall not be unreasonably withheld. If the Purchaser consents to such an action, the Supplier shall appoint another person of equal or superior qualifications as the Supplier's Representative, pursuant to the procedure set out in GCC Clause 18.2.1.

18.2.4 The Supplier's Representative and staff are obliged to work closely with the Purchaser's Project Manager and staff, act within their own authority, and abide by directives issued by the Purchaser that are consistent with the terms of the Contract. The Supplier's Representative is responsible for managing the activities of its personnel and any subcontracted personnel.

18.2.5 The Supplier's Representative may, subject to the approval of the Purchaser (which shall not be unreasonably withheld), at any time delegate to any person any of the powers, functions, and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Supplier's Representative and shall specify the powers, functions, and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until the notice of it has been delivered.

18.2.6 Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with GCC Clause 18.2.5 shall be deemed to be an act or exercise by the Supplier's Representative.

18.3 Objections and Removals

18.3.1 The Purchaser may by notice to the Supplier object to any representative or person employed by the Supplier in the execution of the Contract who, in the reasonable opinion of the Purchaser, may have behaved inappropriately, be incompetent, or be negligent. The Purchaser shall provide evidence of the same, whereupon the Supplier shall remove such person from work on the System.

18.3.2 If any representative or person employed by the Supplier is removed in accordance with GCC Clause 18.3.1, the Supplier shall, where required, promptly appoint a replacement.

19. Project Plan

19.1 In close cooperation with the Purchaser and based on the Preliminary Project Plan included in the Supplier's bid, the Supplier shall develop a Project Plan encompassing the activities specified in the Contract. The contents of the Project Plan shall be as **specified in the SCC** and/or Technical Requirements.

19.2 The Supplier shall formally present to the Purchaser the Project Plan in accordance with the procedure specified in the SCC.

- 19.3 If required, the impact on the Implementation Schedule of modifications agreed during finalization of the Agreed and Finalized Project Plan shall be incorporated in the Contract by amendment, in accordance with GCC Clauses 39 and 40.
- 19.4 The Supplier shall undertake to supply, install, test, and commission the System in accordance with the Agreed and Finalized Project Plan and the Contract.
- 19.5 The Progress and other reports **specified in the SCC** shall be prepared by the Supplier and submitted to the Purchaser in the format and frequency specified in the Technical Requirements.

20. Subcontracting

- 20.1 Appendix 3 (List of Approved Subcontractors) to the Contract Agreement specifies critical items of supply or services and a list of Subcontractors for each item that are considered acceptable by the Purchaser. If no Subcontractors are listed for an item, the Supplier shall prepare a list of Subcontractors it considers qualified and wishes to be added to the list for such items. The Supplier may from time to time propose additions to or deletions from any such list. The Supplier shall submit any such list or any modification to the list to the Purchaser for its approval in sufficient time so as not to impede the progress of work on the System. The Purchaser shall not withhold such approval unreasonably. Such approval by the Purchaser of a Subcontractor(s) shall not relieve the Supplier from any of its obligations, duties, or responsibilities under the Contract.
- 20.2 The Supplier may, at its discretion, select and employ Subcontractors for such critical items from those Subcontractors listed pursuant to GCC Clause 20.1. If the Supplier wishes to employ a Subcontractor not so listed, or subcontract an item not so listed, it must seek the Purchaser's prior approval under GCC Clause 20.3.
- 20.3 For items for which pre-approved Subcontractor lists have not been specified in Appendix 3 to the Contract Agreement, the Supplier may employ such Subcontractors as it may select, provided: (i) the Supplier notifies the Purchaser in writing at least twenty-eight (28) days prior to the proposed mobilization date for such Subcontractor; and (ii) by the end of this period either the Purchaser has granted its approval in writing or fails to respond. The Supplier shall not engage any Subcontractor to which the Purchaser has objected in writing prior to the end of the notice period. The absence of a written objection by the Purchaser during the above

specified period shall constitute formal acceptance of the proposed Subcontractor. Except to the extent that it permits the deemed approval of the Purchaser of Subcontractors not listed in the Contract Agreement, nothing in this Clause, however, shall limit the rights and obligations of either the Purchaser or Supplier as they are specified in GCC Clauses 20.1 and 20.2, in the SCC, or in Appendix 3 of the Contract Agreement.

21. Design and Engineering

21.1 Technical Specifications and Drawings

21.1.1 The Supplier shall execute the basic and detailed design and the implementation activities necessary for successful installation of the System in compliance with the provisions of the Contract or, where not so specified, in accordance with good industry practice.

The Supplier shall be responsible for any discrepancies, errors or omissions in the specifications, drawings, and other technical documents that it has prepared, whether such specifications, drawings, and other documents have been approved by the Project Manager or not, provided that such discrepancies, errors, or omissions are not because of inaccurate information furnished in writing to the Supplier by or on behalf of the Purchaser.

21.1.2 The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification, or other document, or any modification of such design, drawings, specification, or other documents provided or designated by or on behalf of the Purchaser, by giving a notice of such disclaimer to the Project Manager.

21.2 Codes and Standards

Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of bid submission shall apply unless otherwise **specified in the SCC**. During Contract execution, any changes in such codes and standards shall be applied after approval by the Purchaser and shall be treated in accordance with GCC Clause 39.3.

21.3 Approval/Review of Technical Documents by the Project Manager

21.3.1 The Supplier shall prepare and furnish to the Project Manager the documents as **specified in the SCC** for the Project Manager's approval or review.

Any part of the System covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval of these documents.

GCC Clauses 21.3.2 through 21.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.

21.3.2 Within fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC Clause 21.3.1, the Project Manager shall either return one copy of the document to the Supplier with its approval endorsed on the document or shall notify the Supplier in writing of its disapproval of the document and the reasons for disapproval and the modifications that the Project Manager proposes. If the Project Manager fails to take such action within the fourteen (14) days, then the document shall be deemed to have been approved by the Project Manager.

21.3.3 The Project Manager shall not disapprove any document except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good industry practice.

21.3.4 If the Project Manager disapproves the document, the Supplier shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC Clause 21.3.2. If the Project Manager approves the document subject to modification(s), the Supplier shall make the required modification(s), and the document shall then be deemed to have been approved, subject to GCC Clause 21.3.5. The procedure set out in GCC Clauses 21.3.2 through 21.3.4 shall be repeated, as appropriate, until the Project Manager approves such documents.

21.3.5 If any dispute occurs between the Purchaser and the Supplier in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) to a document that cannot be settled between the parties within a reasonable period, then, in case the Contract Agreement includes and names an Adjudicator, such dispute may be referred to the Adjudicator for determination in accordance with GCC Clause 6.1 (Adjudicator). If such dispute is referred to an Adjudicator, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Supplier shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Adjudicator upholds the Supplier's view on the dispute and if the Purchaser has not given notice under GCC Clause 6.1.2, then the Supplier shall be reimbursed by the Purchaser for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions as the Adjudicator shall decide, and the Time for Achieving Operational Acceptance shall be extended accordingly.

21.3.6 The Project Manager's approval, with or without modification of the document furnished by the Supplier, shall not relieve the Supplier of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager or inaccurate information furnished in writing to the Supplier by or on behalf of the Purchaser.

21.3.7 The Supplier shall not depart from any approved document unless the Supplier has first submitted to the Project Manager an amended document and obtained the Project Manager's approval of the document, pursuant to the provisions of this GCC Clause 21.3. If the Project Manager requests any change in any already approved document and/or in any document based on such an approved document, the provisions of GCC Clause 39 (Changes to the System) shall apply to such request.

22. Procurement, Delivery, and Transport

22.1 Subject to related Purchaser's responsibilities pursuant to GCC Clauses 10 and 14, the Supplier shall manufacture or procure and transport all the Information Technologies, Materials, and other Goods in an expeditious and orderly manner to the Project Site.

22.2 Delivery of the Information Technologies, Materials, and other Goods shall be made by the Supplier in accordance with the Technical Requirements.

22.3 Early or partial deliveries require the explicit written consent of the Purchaser, which consent shall not be unreasonably withheld.

22.4 Transportation

22.4.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during shipment. The packing, marking, and documentation within and outside the packages shall comply strictly with the Purchaser's instructions to the Supplier.

22.4.2 The Supplier will bear responsibility for and cost of transport to the Project Sites in accordance with the terms and conditions used in the specification of prices in the Price Schedules, including the terms and conditions of the associated Incoterms.

22.4.3 Unless otherwise **specified in the SCC**, the Supplier shall be free to use transportation through carriers registered in any eligible country and to obtain insurance from any eligible source country.

22.5 Unless otherwise **specified in the SCC**, the Supplier will provide the Purchaser with shipping and other documents, as specified below:

22.5.1 For Goods supplied from outside the Purchaser's Country:

Upon shipment, the Supplier shall notify the Purchaser and the insurance company contracted by the Supplier to provide cargo insurance by telex, cable, facsimile, electronic mail, or EDI with the full details of the shipment. The Supplier shall promptly send the following documents to the Purchaser by mail or courier, as appropriate, with a copy to the cargo

insurance company:

- (a) two copies of the Supplier's invoice showing the description of the Goods, quantity, unit price, and total amount;
- (b) usual transportation documents;
- (c) insurance certificate;
- (d) certificate(s) of origin; and
- (e) estimated time and point of arrival in the Purchaser's Country and at the site.

22.5.2 For Goods supplied locally (i.e., from within the Purchaser's country):

Upon shipment, the Supplier shall notify the Purchaser by telex, cable, facsimile, electronic mail, or EDI with the full details of the shipment. The Supplier shall promptly send the following documents to the Purchaser by mail or courier, as appropriate:

- (a) two copies of the Supplier's invoice showing the Goods' description, quantity, unit price, and total amount;
- (b) delivery note, railway receipt, or truck receipt;
- (c) certificate of insurance;
- (d) certificate(s) of origin; and
- (e) estimated time of arrival at the site.

22.6 Customs Clearance

- (a) The Purchaser will bear responsibility for, and cost of, customs clearance into the Purchaser's country in accordance the particular Incoterm(s) used for Goods supplied from outside the Purchaser's country in the Price Schedules referred to by Article 2 of the Contract Agreement.
- (b) At the request of the Purchaser, the Supplier will make available a representative or agent during the process of customs clearance in the Purchaser's country for goods supplied from outside the Purchaser's country. In the event of delays in customs clearance that are not the

fault of the Supplier:

- (i) the Supplier shall be entitled to an extension in the Time for Achieving Operational Acceptance, pursuant to GCC Clause 40;
- (ii) the Contract Price shall be adjusted to compensate the Supplier for any additional storage charges that the Supplier may incur as a result of the delay.

23. Product Upgrades

- 23.1 At any point during performance of the Contract, should technological advances be introduced by the Supplier for Information Technologies originally offered by the Supplier in its bid and still to be delivered, the Supplier shall be obligated to offer to the Purchaser the latest versions of the available Information Technologies having equal or better performance or functionality at the same or lesser unit prices, pursuant to GCC Clause 39 (Changes to the System).
- 23.2 At any point during performance of the Contract, for Information Technologies still to be delivered, the Supplier will also pass on to the Purchaser any cost reductions and additional and/or improved support and facilities that it offers to other clients of the Supplier in the Purchaser's Country, pursuant to GCC Clause 39 (Changes to the System).
- 23.3 During performance of the Contract, the Supplier shall offer to the Purchaser all new versions, releases, and updates of Standard Software, as well as related documentation and technical support services, within thirty (30) days of their availability from the Supplier to other clients of the Supplier in the Purchaser's Country, and no later than twelve (12) months after they are released in the country of origin. In no case will the prices for these Software exceed those quoted by the Supplier in the Recurrent Costs tables in its bid.
- 23.4 During the Warranty Period, unless otherwise **specified in the SCC**, the Supplier will provide at no additional cost to the Purchaser all new versions, releases, and updates for all Standard Software that are used in the System, within thirty (30) days of their availability from the Supplier to other clients of the Supplier in the Purchaser's country, and no later than twelve (12) months after they are released in the country of origin of the Software.

23.5 The Purchaser shall introduce all new versions, releases or updates of the Software within eighteen (18) months of receipt of a production-ready copy of the new version, release, or update, provided that the new version, release, or update does not adversely affect System operation or performance or require extensive reworking of the System. In cases where the new version, release, or update adversely affects System operation or performance, or requires extensive reworking of the System, the Supplier shall continue to support and maintain the version or release previously in operation for as long as necessary to allow introduction of the new version, release, or update. In no case shall the Supplier stop supporting or maintaining a version or release of the Software less than twenty four (24) months after the Purchaser receives a production-ready copy of a subsequent version, release, or update. The Purchaser shall use all reasonable endeavors to implement any new version, release, or update as soon as practicable, subject to the twenty-four-month-long stop date.

**24. Implementation,
Installation, and
Other Services**

24.1 The Supplier shall provide all Services specified in the Contract and Agreed and Finalized Project Plan in accordance with the highest standards of professional competence and integrity.

24.2 Prices charged by the Supplier for Services, if not included in the Contract, shall be agreed upon in advance by the parties (including, but not restricted to, any prices submitted by the Supplier in the Recurrent Cost Schedules of its Bid) and shall not exceed the prevailing rates charged by the Supplier to other purchasers in the Purchaser's Country for similar services.

**25. Inspections and
Tests**

25.1 The Purchaser or its representative shall have the right to inspect and/or test any components of the System, as specified in the Technical Requirements, to confirm their good working order and/or conformity to the Contract at the point of delivery and/or at the Project Site.

25.2 The Purchaser or its representative shall be entitled to attend any such inspections and/or tests of the components, provided that the Purchaser shall bear all costs and expenses incurred in connection with such attendance, including but not limited to all inspection agent fees, travel, and related expenses.

- 25.3 Should the inspected or tested components fail to conform to the Contract, the Purchaser may reject the component(s), and the Supplier shall either replace the rejected component(s), or make alterations as necessary so that it meets the Contract requirements free of cost to the Purchaser.
- 25.4 The Project Manager may require the Supplier to carry out any inspection and/or test not specified in the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such inspection and/or test shall be added to the Contract Price. Further, if such inspection and/or test impedes the progress of work on the System and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Achieving Operational Acceptance and the other obligations so affected.
- 25.5 If any dispute shall arise between the parties in connection with or caused by an inspection and/or with regard to any component to be incorporated in the System that cannot be settled amicably between the parties within a reasonable period of time, either party may invoke the process pursuant to GCC Clause 6 (Settlement of Disputes), starting with referral of the matter to the Adjudicator in case an Adjudicator is included and named in the Contract Agreement.

26. Installation of the System

- 26.1 As soon as the System, or any Subsystem, has, in the opinion of the Supplier, been delivered, Pre-commissioned, and made ready for Commissioning and Operational Acceptance Testing in accordance with the Technical Requirements, the SCC and the Agreed and Finalized Project Plan, the Supplier shall so notify the Purchaser in writing.
- 26.2 The Project Manager shall, within fourteen (14) days after receipt of the Supplier's notice under GCC Clause 26.1, either issue an Installation Certificate in the form specified in the Sample Forms Section in the Bidding Documents, stating that the System, or major component or Subsystem (if Acceptance by major component or Subsystem is specified pursuant to the SCC for GCC Clause 27.2.1), has achieved Installation by the date of the Supplier's notice under GCC Clause 26.1, or notify the Supplier in writing of any defects and/or deficiencies, including, but not limited to, defects or deficiencies in the interoperability or integration of the various components and/or Subsystems making up the System. The Supplier shall use all reasonable endeavors to

promptly remedy any defect and/or deficiencies that the Project Manager has notified the Supplier of. The Supplier shall then promptly carry out retesting of the System or Subsystem and, when in the Supplier's opinion the System or Subsystem is ready for Commissioning and Operational Acceptance Testing, notify the Purchaser in writing, in accordance with GCC Clause 26.1. The procedure set out in this GCC Clause 26.2 shall be repeated, as necessary, until an Installation Certificate is issued.

- 26.3 If the Project Manager fails to issue the Installation Certificate and fails to inform the Supplier of any defects and/or deficiencies within fourteen (14) days after receipt of the Supplier's notice under GCC Clause 26.1, or if the Purchaser puts the System or a Subsystem into production operation, then the System (or Subsystem) shall be deemed to have achieved successful Installation as of the date of the Supplier's notice or repeated notice, or when the Purchaser put the System into production operation, as the case may be.

27. Commissioning and Operational Acceptance

27.1 Commissioning

27.1.1 Commissioning of the System (or Subsystem if specified pursuant to the SCC for GCC Clause 27.2.1) shall be commenced by the Supplier:

- (a) immediately after the Installation Certificate is issued by the Project Manager, pursuant to GCC Clause 26.2; or
- (b) as otherwise specified in the Technical Requirement or the Agreed and Finalized Project Plan; or
- (c) immediately after Installation is deemed to have occurred, under GCC Clause 26.3.

27.1.2 The Purchaser shall supply the operating and technical personnel and all materials and information reasonably required to enable the Supplier to carry out its obligations with respect to Commissioning.

Production use of the System or Subsystem(s) shall not commence prior to the start of formal Operational Acceptance Testing.

27.2 Operational Acceptance Tests

27.2.1 The Operational Acceptance Tests (and repeats of

such tests) shall be the primary responsibility of the Purchaser (in accordance with GCC Clause 10.9), but shall be conducted with the full cooperation of the Supplier during Commissioning of the System (or major components or Subsystem[s] if **specified in the SCC** and supported by the Technical Requirements), to ascertain whether the System (or major component or Subsystem[s]) conforms to the Technical Requirements and meets the standard of performance quoted in the Supplier's bid, including, but not restricted to, the functional and technical performance requirements. The Operational Acceptance Tests during Commissioning will be conducted as **specified in the SCC**, the Technical Requirements and/or the Agreed and Finalized Project Plan.

At the Purchaser's discretion, Operational Acceptance Tests may also be performed on replacement Goods, upgrades and new version releases, and Goods that are added or field-modified after Operational Acceptance of the System.

27.2.2 If for reasons attributable to the Purchaser, the Operational Acceptance Test of the System (or Subsystem[s] or major components, pursuant to the SCC for GCC Clause 27.2.1) cannot be successfully completed within the period **specified in the SCC**, from the date of Installation or any other period agreed upon in writing by the Purchaser and the Supplier, the Supplier shall be deemed to have fulfilled its obligations with respect to the technical and functional aspects of the Technical Specifications, SCC and/or the Agreed and Finalized Project Plan, and GCC Clause 28.2 and 28.3 shall not apply.

27.3 Operational Acceptance

27.3.1 Subject to GCC Clause 27.4 (Partial Acceptance) below, Operational Acceptance shall occur in respect of the System, when

- (a) the Operational Acceptance Tests, as specified in the Technical Requirements, and/or SCC and/or the Agreed and Finalized Project Plan have been successfully completed; or
- (b) the Operational Acceptance Tests have not been successfully completed or have not been carried

out for reasons that are attributable to the Purchaser within the period from the date of Installation or any other agreed-upon period as specified in GCC Clause 27.2.2 above; or

- (c) the Purchaser has put the System into production or use for sixty (60) consecutive days. If the System is put into production or use in this manner, the Supplier shall notify the Purchaser and document such use.

27.3.2 At any time after any of the events set out in GCC Clause 27.3.1 have occurred, the Supplier may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate.

27.3.3 After consultation with the Purchaser, and within fourteen (14) days after receipt of the Supplier's notice, the Project Manager shall:

- (a) issue an Operational Acceptance Certificate; or
- (b) notify the Supplier in writing of any defect or deficiencies or other reason for the failure of the Operational Acceptance Tests; or
- (c) issue the Operational Acceptance Certificate, if the situation covered by GCC Clause 27.3.1 (b) arises.

27.3.4 The Supplier shall use all reasonable endeavors to promptly remedy any defect and/or deficiencies and/or other reasons for the failure of the Operational Acceptance Test that the Project Manager has notified the Supplier of. Once such remedies have been made by the Supplier, the Supplier shall notify the Purchaser, and the Purchaser, with the full cooperation of the Supplier, shall use all reasonable endeavors to promptly carry out retesting of the System or Subsystem. Upon the successful conclusion of the Operational Acceptance Tests, the Supplier shall notify the Purchaser of its request for Operational Acceptance Certification, in accordance with GCC Clause 27.3.3. The Purchaser shall then issue to the Supplier the Operational Acceptance Certification in accordance with GCC Clause 27.3.3 (a), or shall notify the Supplier of further defects, deficiencies, or other reasons for the failure of the Operational

Acceptance Test. The procedure set out in this GCC Clause 27.3.4 shall be repeated, as necessary, until an Operational Acceptance Certificate is issued.

27.3.5 If the System or Subsystem fails to pass the Operational Acceptance Test(s) in accordance with GCC Clause 27.2, then either:

(a) the Purchaser may consider terminating the Contract, pursuant to GCC Clause 41.2.2;

or

(b) if the failure to achieve Operational Acceptance within the specified time period is a result of the failure of the Purchaser to fulfill its obligations under the Contract, then the Supplier shall be deemed to have fulfilled its obligations with respect to the relevant technical and functional aspects of the Contract, and GCC Clauses 30.3 and 30.4 shall not apply.

27.3.6 If within fourteen (14) days after receipt of the Supplier's notice the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Supplier in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the System or Subsystem shall be deemed to have been accepted as of the date of the Supplier's said notice.

27.4 Partial Acceptance

27.4.1 If so specified in the SCC for GCC Clause 27.2.1, Installation and Commissioning shall be carried out individually for each identified major component or Subsystem(s) of the System. In this event, the provisions in the Contract relating to Installation and Commissioning, including the Operational Acceptance Test, shall apply to each such major component or Subsystem individually, and Operational Acceptance Certificate(s) shall be issued accordingly for each such major component or Subsystem of the System, subject to the limitations contained in GCC Clause 27.4.2.

27.4.2 The issuance of Operational Acceptance Certificates for individual major components or Subsystems pursuant to GCC Clause 27.4.1 shall not relieve the Supplier of its obligation to obtain an Operational Acceptance

Certificate for the System as an integrated whole (if so specified in the SCC for GCC Clauses 12.1 and 27.2.1) once all major components and Subsystems have been supplied, installed, tested, and commissioned.

27.4.3 In the case of minor components for the System that by their nature do not require Commissioning or an Operational Acceptance Test (e.g., minor fittings, furnishings or site works, etc.), the Project Manager shall issue an Operational Acceptance Certificate within fourteen (14) days after the fittings and/or furnishings have been delivered and/or installed or the site works have been completed. The Supplier shall, however, use all reasonable endeavors to promptly remedy any defects or deficiencies in such minor components detected by the Purchaser or Supplier.

F. GUARANTEES AND LIABILITIES

28. Operational Acceptance Time Guarantee

28.1 The Supplier guarantees that it shall complete the supply, Installation, Commissioning, and achieve Operational Acceptance of the System (or Subsystems, pursuant to the SCC for GCC Clause 27.2.1) within the time periods specified in the Implementation Schedule in the Technical Requirements Section and/or the Agreed and Finalized Project Plan pursuant to GCC Clause 8.2, or within such extended time to which the Supplier shall be entitled under GCC Clause 40 (Extension of Time for Achieving Operational Acceptance).

28.2 If the Supplier fails to supply, install, commission, and achieve Operational Acceptance of the System (or Subsystems pursuant to the SCC for GCC Clause 27.2.1) within the time for achieving Operational Acceptance specified in the Implementation Schedule in the Technical Requirement or the Agreed and Finalized Project Plan, or any extension of the time for achieving Operational Acceptance previously granted under GCC Clause 40 (Extension of Time for Achieving Operational Acceptance), the Supplier shall pay to the Purchaser liquidated damages at the rate **specified in the SCC** as a percentage of the Contract Price, or the relevant part of the Contract Price if a Subsystem has not achieved Operational Acceptance. The aggregate amount of such liquidated damages shall in no event exceed the amount specified in the SCC (“the Maximum”). Once the Maximum is reached, the Purchaser may consider

termination of the Contract, pursuant to GCC Clause 41.2.2.

- 28.3 Unless otherwise **specified in the SCC**, liquidated damages payable under GCC Clause 28.2 shall apply only to the failure to achieve Operational Acceptance of the System (and Subsystems) as specified in the Implementation Schedule in the Technical Requirements and/or Agreed and Finalized Project Plan. This Clause 28.3 shall not limit, however, any other rights or remedies the Purchaser may have under the Contract for other delays.
- 28.4 If liquidated damages are claimed by the Purchaser for the System (or Subsystem), the Supplier shall have no further liability whatsoever to the Purchaser in respect to the Operational Acceptance time guarantee for the System (or Subsystem). However, the payment of liquidated damages shall not in any way relieve the Supplier from any of its obligations to complete the System or from any other of its obligations and liabilities under the Contract.

29. Defect Liability

- 29.1 The Supplier warrants that the System, including all Information Technologies, Materials, and other Goods supplied and Services provided, shall be free from defects in the design, engineering, Materials, and workmanship that prevent the System and/or any of its components from fulfilling the Technical Requirements or that limit in a material fashion the performance, reliability, or extensibility of the System and/or Subsystems. Exceptions and/or limitations, if any, to this warranty with respect to Software (or categories of Software), shall be as **specified in the SCC**. Commercial warranty provisions of products supplied under the Contract shall apply to the extent that they do not conflict with the provisions of this Contract.
- 29.2 The Supplier also warrants that the Information Technologies, Materials, and other Goods supplied under the Contract are new, unused, and incorporate all recent improvements in design that materially affect the System's or Subsystem's ability to fulfill the Technical Requirements.
- 29.3 In addition, the Supplier warrants that: (i) all Goods components to be incorporated into the System form part of the Supplier's and/or Subcontractor's current product lines, (ii) they have been previously released to the market, and (iii) those specific items **identified in the SCC** (if any) have been in the market for at least the minimum periods **specified in the SCC**.

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- 29.4 The Warranty Period shall commence from the date of Operational Acceptance of the System (or of any major component or Subsystem for which separate Operational Acceptance is provided for in the Contract) and shall extend for the length of time **specified in the SCC**.
- 29.5 If during the Warranty Period any defect as described in GCC Clause 29.1 should be found in the design, engineering, Materials, and workmanship of the Information Technologies and other Goods supplied or of the Services provided by the Supplier, the Supplier shall promptly, in consultation and agreement with the Purchaser regarding appropriate remedying of the defects, and at its sole cost, repair, replace, or otherwise make good (as the Supplier shall, at its discretion, determine) such defect as well as any damage to the System caused by such defect. Any defective Information Technologies or other Goods that have been replaced by the Supplier shall remain the property of the Supplier.
- 29.6 The Supplier shall not be responsible for the repair, replacement, or making good of any defect or of any damage to the System arising out of or resulting from any of the following causes:
- (a) improper operation or maintenance of the System by the Purchaser;
 - (b) normal wear and tear;
 - (c) use of the System with items not supplied by the Supplier, unless otherwise identified in the Technical Requirements, or approved by the Supplier; or
 - (d) modifications made to the System by the Purchaser, or a third party, not approved by the Supplier.
- 29.7 The Supplier's obligations under this GCC Clause 29 shall not apply to:
- (a) any materials that are normally consumed in operation or have a normal life shorter than the Warranty Period; or
 - (b) any designs, specifications, or other data designed, supplied, or specified by or on behalf of the Purchaser or any matters for which the Supplier has disclaimed responsibility, in accordance with GCC Clause 21.1.2.
- 29.8 The Purchaser shall give the Supplier a notice promptly following the discovery of such defect, stating the nature of any such defect together with all available evidence. The

Purchaser shall afford all reasonable opportunity for the Supplier to inspect any such defect. The Purchaser shall afford the Supplier all necessary access to the System and the site to enable the Supplier to perform its obligations under this GCC Clause 29.

- 29.9 The Supplier may, with the consent of the Purchaser, remove from the site any Information Technologies and other Goods that are defective, if the nature of the defect, and/or any damage to the System caused by the defect, is such that repairs cannot be expeditiously carried out at the site. If the repair, replacement, or making good is of such a character that it may affect the efficiency of the System, the Purchaser may give the Supplier notice requiring that tests of the defective part be made by the Supplier immediately upon completion of such remedial work, whereupon the Supplier shall carry out such tests.

If such part fails the tests, the Supplier shall carry out further repair, replacement, or making good (as the case may be) until that part of the System passes such tests. The tests shall be agreed upon by the Purchaser and the Supplier.

- 29.10 If the Supplier fails to commence the work necessary to remedy such defect or any damage to the System caused by such defect within the time period **specified in the SCC**, the Purchaser may, following notice to the Supplier, proceed to do such work or contract a third party (or parties) to do such work, and the reasonable costs incurred by the Purchaser in connection with such work shall be paid to the Purchaser by the Supplier or may be deducted by the Purchaser from any monies due the Supplier or claimed under the Performance Security.
- 29.11 If the System or Subsystem cannot be used by reason of such defect and/or making good of such defect, the Warranty Period for the System shall be extended by a period equal to the period during which the System or Subsystem could not be used by the Purchaser because of such defect and/or making good of such defect.
- 29.12 Items substituted for defective parts of the System during the Warranty Period shall be covered by the Defect Liability Warranty for the remainder of the Warranty Period applicable for the part replaced or three (3) months, whichever is greater.
- 29.13 At the request of the Purchaser and without prejudice to any other rights and remedies that the Purchaser may have against the Supplier under the Contract, the Supplier will

offer all possible assistance to the Purchaser to seek warranty services or remedial action from any subcontracted third-party producers or licensor of Goods included in the System, including without limitation assignment or transfer in favor of the Purchaser of the benefit of any warranties given by such producers or licensors to the Supplier.

30. Functional Guarantees

- 30.1 The Supplier guarantees that, once the Operational Acceptance Certificate(s) has been issued, the System represents a complete, integrated solution to the Purchaser's requirements set forth in the Technical Requirements and it conforms to all other aspects of the Contract. The Supplier acknowledges that GCC Clause 27 regarding Commissioning and Operational Acceptance governs how technical conformance of the System to the Contract requirements will be determined.
- 30.2 If, for reasons attributable to the Supplier, the System does not conform to the Technical Requirements or does not conform to all other aspects of the Contract, the Supplier shall at its cost and expense make such changes, modifications, and/or additions to the System as may be necessary to conform to the Technical Requirements and meet all functional and performance standards. The Supplier shall notify the Purchaser upon completion of the necessary changes, modifications, and/or additions and shall request the Purchaser to repeat the Operational Acceptance Tests until the System achieves Operational Acceptance.
- 30.3 If the System (or Subsystem[s]) fails to achieve Operational Acceptance, the Purchaser may consider termination of the Contract, pursuant to GCC Clause 41.2.2, and forfeiture of the Supplier's Performance Security in accordance with GCC Clause 13.3 in compensation for the extra costs and delays likely to result from this failure.

31. Intellectual Property Rights Warranty

- 31.1 The Supplier hereby represents and warrants that:
- (a) the System as supplied, installed, tested, and accepted;
 - (b) use of the System in accordance with the Contract; and
 - (c) copying of the Software and Materials provided to the Purchaser in accordance with the Contract

do not and will not infringe any Intellectual Property Rights held by any third party and that it has all necessary rights or at its sole expense shall have secured in writing all transfers

of rights and other consents necessary to make the assignments, licenses, and other transfers of Intellectual Property Rights and the warranties set forth in the Contract, and for the Purchaser to own or exercise all Intellectual Property Rights as provided in the Contract. Without limitation, the Supplier shall secure all necessary written agreements, consents, and transfers of rights from its employees and other persons or entities whose services are used for development of the System.

32. Intellectual Property Rights Indemnity

32.1 The Supplier shall indemnify and hold harmless the Purchaser and its employees and officers from and against any and all losses, liabilities, and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability), that the Purchaser or its employees or officers may suffer as a result of any infringement or alleged infringement of any Intellectual Property Rights by reason of:

- (a) installation of the System by the Supplier or the use of the System, including the Materials, in the country where the site is located;
- (b) copying of the Software and Materials provided the Supplier in accordance with the Agreement; and
- (c) sale of the products produced by the System in any country, except to the extent that such losses, liabilities, and costs arise as a result of the Purchaser's breach of GCC Clause 32.2.

32.2 Such indemnity shall not cover any use of the System, including the Materials, other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the System, or any products of the System produced thereby in association or combination with any other goods or services not supplied by the Supplier, where the infringement arises because of such association or combination and not because of use of the System in its own right.

32.3 Such indemnities shall also not apply if any claim of infringement:

- (a) is asserted by a parent, subsidiary, or affiliate of the Purchaser's organization;
- (b) is a direct result of a design mandated by the Purchaser's Technical Requirements and the possibility

of such infringement was duly noted in the Supplier's Bid; or

- (c) results from the alteration of the System, including the Materials, by the Purchaser or any persons other than the Supplier or a person authorized by the Supplier.

32.4 If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Clause 32.1, the Purchaser shall promptly give the Supplier notice of such proceedings or claims, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

If the Supplier fails to notify the Purchaser within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf. Unless the Supplier has so failed to notify the Purchaser within the twenty-eight (28) days, the Purchaser shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

32.5 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all losses, liabilities, and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability) that the Supplier or its employees, officers, or Subcontractors may suffer as a result of any infringement or alleged infringement of any Intellectual Property Rights arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided to the Supplier in connection with this Contract by the Purchaser or any persons (other than the Supplier) contracted by the Purchaser, except to the extent that such losses, liabilities, and costs arise as a result of the Supplier's breach of GCC Clause 32.8.

32.6 Such indemnity shall not cover

- (a) any use of the design, data, drawing, specification, or other documents or materials, other than for the

purpose indicated by or to be reasonably inferred from the Contract;

- (b) any infringement resulting from the use of the design, data, drawing, specification, or other documents or materials, or any products produced thereby, in association or combination with any other Goods or Services not provided by the Purchaser or any other person contracted by the Purchaser, where the infringement arises because of such association or combination and not because of the use of the design, data, drawing, specification, or other documents or materials in its own right.

32.7 Such indemnities shall also not apply:

- (a) if any claim of infringement is asserted by a parent, subsidiary, or affiliate of the Supplier's organization;
- (b) to the extent that any claim of infringement is caused by the alteration, by the Supplier, or any persons contracted by the Supplier, of the design, data, drawing, specification, or other documents or materials provided to the Supplier by the Purchaser or any persons contracted by the Purchaser.

32.8 If any proceedings are brought or any claim is made against the Supplier arising out of the matters referred to in GCC Clause 32.5, the Supplier shall promptly give the Purchaser notice of such proceedings or claims, and the Purchaser may at its own expense and in the Supplier's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Purchaser fails to notify the Supplier within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Supplier shall be free to conduct the same on its own behalf. Unless the Purchaser has so failed to notify the Supplier within the twenty-eight (28) days, the Supplier shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Supplier shall, at the Purchaser's request, afford all available assistance to the Purchaser in conducting such proceedings or claim and shall be reimbursed by the Purchaser for all reasonable expenses incurred in so doing.

33. Limitation of Liability

33.1 Provided the following does not exclude or limit any liabilities of either party in ways not permitted by applicable law:

- (a) the Supplier shall not be liable to the Purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and
- (b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Supplier to indemnify the Purchaser with respect to intellectual property rights infringement.

G. RISK DISTRIBUTION

34. Transfer of Ownership

- 34.1 With the exception of Software and Materials, the ownership of the Information Technologies and other Goods shall be transferred to the Purchaser at the time of Delivery or otherwise under terms that may be agreed upon and specified in the Contract Agreement.
- 34.2 Ownership and the terms of usage of the Software and Materials supplied under the Contract shall be governed by GCC Clause 15 (Copyright) and any elaboration in the Technical Requirements.
- 34.3 Ownership of the Supplier's Equipment used by the Supplier and its Subcontractors in connection with the Contract shall remain with the Supplier or its Subcontractors.

35. Care of the System

- 35.1 The Purchaser shall become responsible for the care and custody of the System or Subsystems upon their Delivery. The Purchaser shall make good at its own cost any loss or damage that may occur to the System or Subsystems from any cause from the date of Delivery until the date of Operational Acceptance of the System or Subsystems, pursuant to GCC Clause 27 (Commissioning and Operational Acceptance), excepting such loss or damage arising from acts or omissions of the Supplier, its employees, or subcontractors.
- 35.2 If any loss or damage occurs to the System or any part of the System by reason of:
 - (a) (insofar as they relate to the country where the Project Site is located) nuclear reaction, nuclear radiation,

radioactive contamination, a pressure wave caused by aircraft or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance taken out under GCC Clause 37;

- (b) any use not in accordance with the Contract, by the Purchaser or any third party;
- (c) any use of or reliance upon any design, data, or specification provided or designated by or on behalf of the Purchaser, or any such matter for which the Supplier has disclaimed responsibility in accordance with GCC Clause 21.1.2,

the Purchaser shall pay to the Supplier all sums payable in respect of the System or Subsystems that have achieved Operational Acceptance, notwithstanding that the same be lost, destroyed, or damaged. If the Purchaser requests the Supplier in writing to make good any loss or damage to the System thereby occasioned, the Supplier shall make good the same at the cost of the Purchaser in accordance with GCC Clause 39. If the Purchaser does not request the Supplier in writing to make good any loss or damage to the System thereby occasioned, the Purchaser shall either request a change in accordance with GCC Clause 39, excluding the performance of that part of the System thereby lost, destroyed, or damaged, or, where the loss or damage affects a substantial part of the System, the Purchaser shall terminate the Contract pursuant to GCC Clause 41.1.

35.3 The Purchaser shall be liable for any loss of or damage to any Supplier's Equipment which the Purchaser has authorized to locate within the Purchaser's premises for use in fulfillment of Supplier's obligations under the Contract, except where such loss or damage arises from acts or omissions of the Supplier, its employees, or subcontractors.

**36. Loss of or
Damage to
Property;
Accident or
Injury to
Workers;
Indemnification**

36.1 The Supplier and each and every Subcontractor shall abide by the job safety, insurance, customs, and immigration measures prevalent and laws in force in the Purchaser's Country.

36.2 Subject to GCC Clause 36.3, the Supplier shall indemnify and hold harmless the Purchaser and its employees and

officers from and against any and all losses, liabilities and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability) that the Purchaser or its employees or officers may suffer as a result of the death or injury of any person or loss of or damage to any property (other than the System, whether accepted or not) arising in connection with the supply, installation, testing, and Commissioning of the System and by reason of the negligence of the Supplier or its Subcontractors, or their employees, officers or agents, except any injury, death, or property damage caused by the negligence of the Purchaser, its contractors, employees, officers, or agents.

- 36.3 If any proceedings are brought or any claim is made against the Purchaser that might subject the Supplier to liability under GCC Clause 36.2, the Purchaser shall promptly give the Supplier notice of such proceedings or claims, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Supplier fails to notify the Purchaser within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf. Unless the Supplier has so failed to notify the Purchaser within the twenty-eight (28) day period, the Purchaser shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.
- 36.4 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from any and all losses, liabilities, and costs (including losses, liabilities, and costs incurred in defending a claim alleging such a liability) that the Supplier or its employees, officers, or Subcontractors may suffer as a result of the death or personal injury of any person or loss of or damage to property of the Purchaser, other than the System not yet achieving Operational Acceptance, that is caused by fire, explosion, or any other perils, in excess of the amount recoverable from insurances procured under GCC Clause 37 (Insurances), provided that such fire, explosion, or other perils were not caused by any act or failure of the Supplier.

36.5 If any proceedings are brought or any claim is made against the Supplier that might subject the Purchaser to liability under GCC Clause 36.4, the Supplier shall promptly give the Purchaser notice of such proceedings or claims, and the Purchaser may at its own expense and in the Supplier's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Purchaser fails to notify the Supplier within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Supplier shall be free to conduct the same on its own behalf. Unless the Purchaser has so failed to notify the Supplier within the twenty-eight (28) days, the Supplier shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Supplier shall, at the Purchaser's request, afford all available assistance to the Purchaser in conducting such proceedings or claim and shall be reimbursed by the Purchaser for all reasonable expenses incurred in so doing.

36.6 The party entitled to the benefit of an indemnity under this GCC Clause 36 shall take all reasonable measures to mitigate any loss or damage that has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.

37. Insurances

37.1 The Supplier shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurance set forth below. The identity of the insurers and the form of the policies shall be subject to the approval of the Purchaser, who should not unreasonably withhold such approval.

(a) Cargo Insurance During Transport

as applicable, 110 percent of the price of the Information Technologies and other Goods in a freely convertible currency, covering the Goods from physical loss or damage during shipment through receipt at the Project Site.

(b) Installation "All Risks" Insurance

as applicable, 110 percent of the price of the Information Technologies and other Goods covering the Goods at the site from all risks of physical loss or damage (excluding only perils commonly excluded under "all risks" insurance policies of this type by

reputable insurers) occurring prior to Operational Acceptance of the System.

(c) Third-Party Liability Insurance

On terms as **specified in the SCC**, covering bodily injury or death suffered by third parties (including the Purchaser's personnel) and loss of or damage to property (including the Purchaser's property and any Subsystems that have been accepted by the Purchaser) occurring in connection with the supply and installation of the Information System.

(d) Automobile Liability Insurance

In accordance with the statutory requirements prevailing in the Purchaser's Country, covering use of all vehicles used by the Supplier or its Subcontractors (whether or not owned by them) in connection with the execution of the Contract.

(e) Other Insurance (if any), as **specified in the SCC**.

37.2 The Purchaser shall be named as co-insured under all insurance policies taken out by the Supplier pursuant to GCC Clause 37.1, except for the Third-Party Liability, and the Supplier's Subcontractors shall be named as co-insured under all insurance policies taken out by the Supplier pursuant to GCC Clause 37.1 except for Cargo Insurance During Transport. All insurer's rights of subrogation against such co-insured for losses or claims arising out of the performance of the Contract shall be waived under such policies.

37.3 The Supplier shall deliver to the Purchaser certificates of insurance (or copies of the insurance policies) as evidence that the required policies are in full force and effect.

37.4 The Supplier shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Supplier.

37.5 If the Supplier fails to take out and/or maintain in effect the insurance referred to in GCC Clause 37.1, the Purchaser may take out and maintain in effect any such insurance and may from time to time deduct from any amount due the Supplier

under the Contract any premium that the Purchaser shall have paid to the insurer or may otherwise recover such amount as a debt due from the Supplier.

37.6 Unless otherwise provided in the Contract, the Supplier shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC Clause 37, and all monies payable by any insurers shall be paid to the Supplier. The Purchaser shall give to the Supplier all such reasonable assistance as may be required by the Supplier in connection with any claim under the relevant insurance policies. With respect to insurance claims in which the Purchaser's interest is involved, the Supplier shall not give any release or make any compromise with the insurer without the prior written consent of the Purchaser. With respect to insurance claims in which the Supplier's interest is involved, the Purchaser shall not give any release or make any compromise with the insurer without the prior written consent of the Supplier.

38. Force Majeure

38.1 "Force Majeure" shall mean any event beyond the reasonable control of the Purchaser or of the Supplier, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected and shall include, without limitation, the following:

- (a) war, hostilities, or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy, and civil war;
- (b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion, and terrorist acts;
- (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler, or any other act or failure to act of any local state or national government authority;
- (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine, and plague;
- (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane,

storm, lightning, or other inclement weather condition, nuclear and pressure waves, or other natural or physical disaster;

- (f) failure, by the Supplier, to obtain the necessary export permit(s) from the governments of the Country(s) of Origin of the Information Technologies or other Goods, or Supplier's Equipment provided that the Supplier has made all reasonable efforts to obtain the required export permit(s), including the exercise of due diligence in determining the eligibility of the System and all of its components for receipt of the necessary export permits.

38.2 If either party is prevented, hindered, or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances of the event of Force Majeure within fourteen (14) days after the occurrence of such event.

38.3 The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered, or delayed. The Time for Achieving Operational Acceptance shall be extended in accordance with GCC Clause 40 (Extension of Time for Achieving Operational Acceptance).

38.4 The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect of the event of Force Majeure upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GCC Clause 38.6.

38.5 No delay or nonperformance by either party to this Contract caused by the occurrence of any event of Force Majeure shall:

- (a) constitute a default or breach of the Contract;
- (b) (subject to GCC Clauses 35.2, 38.3, and 38.4) give rise to any claim for damages or additional cost or expense occasioned by the delay or nonperformance,

if, and to the extent that, such delay or nonperformance is caused by the occurrence of an event of Force Majeure.

- 38.6 If the performance of the Contract is substantially prevented, hindered, or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the time period covered by the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which, either party may terminate the Contract by giving a notice to the other.
- 38.7 In the event of termination pursuant to GCC Clause 38.6, the rights and obligations of the Purchaser and the Supplier shall be as specified in GCC Clauses 41.1.2 and 41.1.3.
- 38.8 Notwithstanding GCC Clause 38.5, Force Majeure shall not apply to any obligation of the Purchaser to make payments to the Supplier under this Contract.

H. CHANGE IN CONTRACT ELEMENTS

39. Changes to the System

39.1 Introducing a Change

39.1.1 Subject to GCC Clauses 39.2.5 and 39.2.7, the Purchaser shall have the right to propose, and subsequently require, the Project Manager to order the Supplier from time to time during the performance of the Contract to make any change, modification, addition, or deletion to, in, or from the System (interchangeably called “Change”), provided that such Change falls within the general scope of the System, does not constitute unrelated work, and is technically practicable, taking into account both the state of advancement of the System and the technical compatibility of the Change envisaged with the nature of the System as originally specified in the Contract.

A Change may involve, but is not restricted to, the substitution of updated Information Technologies and related Services in accordance with GCC Clause 23 (Product Upgrades).

39.1.2 The Supplier may from time to time during its performance of the Contract propose to the Purchaser (with a copy to the Project Manager) any Change that the Supplier considers necessary or desirable to improve the quality or efficiency of the System. The Purchaser may at its discretion

approve or reject any Change proposed by the Supplier.

39.1.3 Notwithstanding GCC Clauses 39.1.1 and 39.1.2, no change made necessary because of any default of the Supplier in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Achieving Operational Acceptance.

39.1.4 The procedure on how to proceed with and execute Changes is specified in GCC Clauses 39.2 and 39.3, and further details and sample forms are provided in the Sample Forms Section in the Bidding Documents.

39.1.5 Moreover, the Purchaser and Supplier will agree, during development of the Project Plan, to a date prior to the scheduled date for Operational Acceptance, after which the Technical Requirements for the System shall be “frozen.” Any Change initiated after this time will be dealt with after Operational Acceptance.

39.2 Changes Originating from Purchaser

39.2.1 If the Purchaser proposes a Change pursuant to GCC Clauses 39.1.1, it shall send to the Supplier a “Request for Change Proposal,” requiring the Supplier to prepare and furnish to the Project Manager as soon as reasonably practicable a “Change Proposal,” which shall include the following:

- (a) brief description of the Change;
- (b) impact on the Time for Achieving Operational Acceptance;
- (c) detailed estimated cost of the Change;
- (d) effect on Functional Guarantees (if any);
- (e) effect on any other provisions of the Contract.

39.2.2 Prior to preparing and submitting the “Change Proposal,” the Supplier shall submit to the Project Manager an “Change Estimate Proposal,” which

shall be an estimate of the cost of preparing the Change Proposal, plus a first approximation of the suggested approach and cost for implementing the changes. Upon receipt of the Supplier's Change Estimate Proposal, the Purchaser shall do one of the following:

- (a) accept the Supplier's estimate with instructions to the Supplier to proceed with the preparation of the Change Proposal;
- (b) advise the Supplier of any part of its Change Estimate Proposal that is unacceptable and request the Supplier to review its estimate;
- (c) advise the Supplier that the Purchaser does not intend to proceed with the Change.

39.2.3 Upon receipt of the Purchaser's instruction to proceed under GCC Clause 39.2.2 (a), the Supplier shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC Clause 39.2.1. The Supplier, at its discretion, may specify a validity period for the Change Proposal, after which if the Purchaser and Supplier has not reached agreement in accordance with GCC Clause 39.2.6, then GCC Clause 39.2.7 shall apply.

39.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If the nature of the Change is such that the Contract rates and prices are inequitable, the parties to the Contract shall agree on other specific rates to be used for valuing the Change.

39.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate impact of compliance with the Request for Change Proposal and with all other Change Orders that have already become binding upon the Supplier under this GCC Clause 39 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Contract Agreement by more than fifteen (15) percent, the Supplier may give a written notice of objection to this Request for Change Proposal prior to furnishing the Change

Proposal. If the Purchaser accepts the Supplier's objection, the Purchaser shall withdraw the proposed Change and shall notify the Supplier in writing of its acceptance.

The Supplier's failure to so object to a Request for Change Proposal shall neither affect its right to object to any subsequent requested Changes or Change Orders, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Supplier represents.

39.2.6 Upon receipt of the Change Proposal, the Purchaser and the Supplier shall mutually agree upon all matters contained in the Change Proposal. Within fourteen (14) days after such agreement, the Purchaser shall, if it intends to proceed with the Change, issue the Supplier a Change Order. If the Purchaser is unable to reach a decision within fourteen (14) days, it shall notify the Supplier with details of when the Supplier can expect a decision. If the Purchaser decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Supplier accordingly. Under such circumstances, the Supplier shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Supplier in its Change Estimate Proposal submitted in accordance with GCC Clause 39.2.2.

39.2.7 If the Purchaser and the Supplier cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Achieving Operational Acceptance, or any other matters identified in the Change Proposal, the Change will not be implemented. However, this provision does not limit the rights of either party under GCC Clause 6 (Settlement of Disputes).

39.3 Changes Originating from Supplier

If the Supplier proposes a Change pursuant to GCC Clause 39.1.2, the Supplier shall submit to the Project Manager a written "Application for Change Proposal,"

giving reasons for the proposed Change and including the information specified in GCC Clause 39.2.1. Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in GCC Clauses 39.2.6 and 39.2.7. However, should the Purchaser choose not to proceed or the Purchaser and the Supplier cannot come to agreement on the change during any validity period that the Supplier may specify in its Application for Change Proposal, the Supplier shall not be entitled to recover the costs of preparing the Application for Change Proposal, unless subject to an agreement between the Purchaser and the Supplier to the contrary.

40. Extension of Time for Achieving Operational Acceptance

40.1 The time(s) for achieving Operational Acceptance specified in the Schedule of Implementation shall be extended if the Supplier is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following:

- (a) any Change in the System as provided in GCC Clause 39 (Change in the Information System);
- (b) any occurrence of Force Majeure as provided in GCC Clause 38 (Force Majeure);
- (c) default of the Purchaser; or
- (d) any other matter specifically mentioned in the Contract;

by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Supplier.

40.2 Except where otherwise specifically provided in the Contract, the Supplier shall submit to the Project Manager a notice of a claim for an extension of the time for achieving Operational Acceptance, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Purchaser and the Supplier shall agree upon the period of such extension. In the event that the Supplier does not accept the Purchaser's estimate of a fair and reasonable time extension, the Supplier shall be entitled to refer the matter to the provisions for the Settlement of Disputes pursuant to GCC Clause 6.

40.3 The Supplier shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.

41. Termination

41.1 Termination for Purchaser's Convenience

41.1.1 The Purchaser may at any time terminate the Contract for any reason by giving the Supplier a notice of termination that refers to this GCC Clause 41.1.

41.1.2 Upon receipt of the notice of termination under GCC Clause 41.1.1, the Supplier shall either as soon as reasonably practical or upon the date specified in the notice of termination

- (a) cease all further work, except for such work as the Purchaser may specify in the notice of termination for the sole purpose of protecting that part of the System already executed, or any work required to leave the site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Purchaser pursuant to GCC Clause 41.1.2 (d) (ii) below;
- (c) remove all Supplier's Equipment from the site, repatriate the Supplier's and its Subcontractors' personnel from the site, remove from the site any wreckage, rubbish, and debris of any kind;
- (d) in addition, the Supplier, subject to the payment specified in GCC Clause 41.1.3, shall
 - (i) deliver to the Purchaser the parts of the System executed by the Supplier up to the date of termination;
 - (ii) to the extent legally possible, assign to the Purchaser all right, title, and benefit of the Supplier to the System, or Subsystem, as at the date of termination, and, as may be required by the Purchaser, in any subcontracts concluded between the Supplier and its Subcontractors;
 - (iii) deliver to the Purchaser all nonproprietary drawings, specifications, and other

documents prepared by the Supplier or its Subcontractors as of the date of termination in connection with the System.

41.1.3 In the event of termination of the Contract under GCC Clause 41.1.1, the Purchaser shall pay to the Supplier the following amounts:

- (a) the Contract Price, properly attributable to the parts of the System executed by the Supplier as of the date of termination;
- (b) the costs reasonably incurred by the Supplier in the removal of the Supplier's Equipment from the site and in the repatriation of the Supplier's and its Subcontractors' personnel;
- (c) any amount to be paid by the Supplier to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges;
- (d) costs incurred by the Supplier in protecting the System and leaving the site in a clean and safe condition pursuant to GCC Clause 41.1.2 (a); and
- (e) the cost of satisfying all other obligations, commitments, and claims that the Supplier may in good faith have undertaken with third parties in connection with the Contract and that are not covered by GCC Clauses 41.1.3 (a) through (d) above.

41.2 Termination for Supplier's Default

41.2.1 The Purchaser, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons therefore to the Supplier, referring to this GCC Clause 41.2:

- (a) if the Supplier becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Supplier is a corporation, a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any

part of its undertaking or assets, or if the Supplier takes or suffers any other analogous action in consequence of debt;

- (b) if the Supplier assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC Clause 42 (Assignment); or
- (c) if the Supplier, in the judgment of the Purchaser, has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, including but not limited to willful misrepresentation of facts concerning ownership of Intellectual Property Rights in, or proper authorization and/or licenses from the owner to offer, the hardware, software, or materials provided under this Contract.

For the purposes of this Clause:

- (i) “corrupt practice”¹ is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- (ii) “fraudulent practice”² is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (iii) “collusive practice”³ is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

¹ “Another party” refers to a public official acting in relation to the procurement process or contract execution]. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

² A “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

³ “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

- (iv) “coercive practice”¹ is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) “obstructive practice” is
 - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
 - (bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 9.8.

41.2.2 If the Supplier:

- (a) has abandoned or repudiated the Contract;
- (b) has without valid reason failed to commence work on the System promptly;
- (c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause;
- (d) refuses or is unable to provide sufficient Materials, Services, or labor to execute and complete the System in the manner specified in the Agreed and Finalized Project Plan furnished under GCC Clause 19 at rates of progress that give reasonable assurance to the Purchaser that the Supplier can attain Operational Acceptance of the System by the Time for Achieving

¹ A “party” refers to a participant in the procurement process or contract execution.

Operational Acceptance as extended;

then the Purchaser may, without prejudice to any other rights it may possess under the Contract, give a notice to the Supplier stating the nature of the default and requiring the Supplier to remedy the same. If the Supplier fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Purchaser may terminate the Contract forthwith by giving a notice of termination to the Supplier that refers to this GCC Clause 41.2.

41.2.3 Upon receipt of the notice of termination under GCC Clauses 41.2.1 or 41.2.2, the Supplier shall, either immediately or upon such date as is specified in the notice of termination:

- (a) cease all further work, except for such work as the Purchaser may specify in the notice of termination for the sole purpose of protecting that part of the System already executed or any work required to leave the site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Purchaser pursuant to GCC Clause 41.2.3 (d) below;
- (c) deliver to the Purchaser the parts of the System executed by the Supplier up to the date of termination;
- (d) to the extent legally possible, assign to the Purchaser all right, title and benefit of the Supplier to the System or Subsystems as at the date of termination, and, as may be required by the Purchaser, in any subcontracts concluded between the Supplier and its Subcontractors;
- (e) deliver to the Purchaser all drawings, specifications, and other documents prepared by the Supplier or its Subcontractors as at the date of termination in connection with the System.

41.2.4 The Purchaser may enter upon the site, expel the Supplier, and complete the System itself or by employing any third party. Upon completion of the

System or at such earlier date as the Purchaser thinks appropriate, the Purchaser shall give notice to the Supplier that such Supplier's Equipment will be returned to the Supplier at or near the site and shall return such Supplier's Equipment to the Supplier in accordance with such notice. The Supplier shall thereafter without delay and at its cost remove or arrange removal of the same from the site.

41.2.5 Subject to GCC Clause 41.2.6, the Supplier shall be entitled to be paid the Contract Price attributable to the portion of the System executed as at the date of termination and the costs, if any, incurred in protecting the System and in leaving the site in a clean and safe condition pursuant to GCC Clause 41.2.3 (a). Any sums due the Purchaser from the Supplier accruing prior to the date of termination shall be deducted from the amount to be paid to the Supplier under this Contract.

41.2.6 If the Purchaser completes the System, the cost of completing the System by the Purchaser shall be determined. If the sum that the Supplier is entitled to be paid, pursuant to GCC Clause 41.2.5, plus the reasonable costs incurred by the Purchaser in completing the System, exceeds the Contract Price, the Supplier shall be liable for such excess. If such excess is greater than the sums due the Supplier under GCC Clause 41.2.5, the Supplier shall pay the balance to the Purchaser, and if such excess is less than the sums due the Supplier under GCC Clause 41.2.5, the Purchaser shall pay the balance to the Supplier. The Purchaser and the Supplier shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.

41.3 Termination by Supplier

41.3.1 If:

- (a) the Purchaser has failed to pay the Supplier any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause **pursuant to the SCC**, or commits a substantial breach of the Contract, the Supplier may give a notice to the Purchaser that requires payment of

such sum, with interest on this sum as stipulated in GCC Clause 12.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Purchaser to remedy the same, as the case may be. If the Purchaser fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Supplier's notice; or

- (b) the Supplier is unable to carry out any of its obligations under the Contract for any reason attributable to the Purchaser, including but not limited to the Purchaser's failure to provide possession of or access to the site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the System;

then the Supplier may give a notice to the Purchaser of such events, and if the Purchaser has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Supplier is still unable to carry out any of its obligations under the Contract for any reason attributable to the Purchaser within twenty-eight (28) days of the said notice, the Supplier may by a further notice to the Purchaser referring to this GCC Clause 41.3.1, forthwith terminate the Contract.

- 41.3.2 The Supplier may terminate the Contract immediately by giving a notice to the Purchaser to that effect, referring to this GCC Clause 41.3.2, if the Purchaser becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Purchaser takes or suffers any other analogous action in consequence of debt.

41.3.3 If the Contract is terminated under GCC Clauses 41.3.1 or 41.3.2, then the Supplier shall immediately:

- (a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the System already executed, or any work required to leave the site in a clean and safe condition;
- (b) terminate all subcontracts, except those to be assigned to the Purchaser pursuant to Clause 41.3.3 (d) (ii);
- (c) remove all Supplier's Equipment from the site and repatriate the Supplier's and its Subcontractor's personnel from the site.
- (d) In addition, the Supplier, subject to the payment specified in GCC Clause 41.3.4, shall:
 - (i) deliver to the Purchaser the parts of the System executed by the Supplier up to the date of termination;
 - (ii) to the extent legally possible, assign to the Purchaser all right, title, and benefit of the Supplier to the System, or Subsystems, as of the date of termination, and, as may be required by the Purchaser, in any subcontracts concluded between the Supplier and its Subcontractors;
 - (iii) to the extent legally possible, deliver to the Purchaser all drawings, specifications, and other documents prepared by the Supplier or its Subcontractors as of the date of termination in connection with the System.

41.3.4 If the Contract is terminated under GCC Clauses 41.3.1 or 41.3.2, the Purchaser shall pay to the Supplier all payments specified in GCC Clause 41.1.3, and reasonable compensation for all loss, except for loss of profit, or damage sustained by the Supplier arising out of, in connection with, or in consequence of such termination.

41.3.5 Termination by the Supplier pursuant to this GCC Clause 41.3 is without prejudice to any other rights

or remedies of the Supplier that may be exercised in lieu of or in addition to rights conferred by GCC Clause 41.3.

- 41.4 In this GCC Clause 41, the expression “portion of the System executed” shall include all work executed, Services provided, and all Information Technologies, or other Goods acquired (or subject to a legally binding obligation to purchase) by the Supplier and used or intended to be used for the purpose of the System, up to and including the date of termination.
- 41.5 In this GCC Clause 41, in calculating any monies due from the Purchaser to the Supplier, account shall be taken of any sum previously paid by the Purchaser to the Supplier under the Contract, including any advance payment paid **pursuant to the SCC.**

42. Assignment

- 42.1 Neither the Purchaser nor the Supplier shall, without the express prior written consent of the other, assign to any third party the Contract or any part thereof, or any right, benefit, obligation, or interest therein or thereunder, except that the Supplier shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

SECTION V. SPECIAL CONDITIONS OF CONTRACT (SCC)

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Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions of the SCC shall prevail over those in the General Conditions of Contract. For the purposes of clarity, any referenced GCC clause numbers are indicated in the left column of the SCC. All Special Conditions of Contract (SCC) will be applicable to both the schedule of this ICB until and unless specified.

A. CONTRACT AND INTERPRETATION

1. Definitions (GCC Clause 1)

GCC 1.1 (a) (ix)	The applicable edition of the Procurement Guidelines is dated May 2004 revised October 2006
GCC 1.1 (b) (i)	The Purchaser is: Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi - 110012, India
GCC 1.1 (b) (ii)	The Project Manager is: Dr. Anil Rai
GCC 1.1 (e) (i)	The Purchaser's Country is: India
GCC 1.1 (e) (iii)	<p>The Project Site(s)/Final Destination(s) is :</p> <p>Lead Centre:</p> <p>Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi - 110012, India</p> <p>Domain Centres:</p> <ol style="list-style-type: none"> 1. National Bureau of Plant Genetic Resources, Pusa Campus, New Delhi-11001, Ph: 011-25843697 / 25841177, Fax: 011-25842495. Contact Person: Dr Soma Sunder Marla (CCPI) Email: ssmarl@yahoo.com; soma.marla@nbpgr.ernet.in 2. National Bureau of Animal Genetic Resources, G.T. Road Bye-Pass, P.B.No.129, Near Basant Vihar, Karnal-132001 Haryana, Ph: 0184-2267918, Fax: 0184-2267654, Contact Person: Dr Avnish Kumar(CCPI) Email: director@nbagr.ernet.in ; avnish@lycos.com 3. National Bureau of Fish Genetic Resources, Canal Ring Road, P.O. Dilkusha, Lucknow -226 002 Lucknow-226004, U.P. Ph: 0522-2441735 / 2442441,

	<p>Fax: 0522-2442403, Contact Person: Dr N. S. Nagpure(CCPI) Website:www.nbfgr.res.in; nagpurens@yahoo.co.in</p> <p>4. National Bureau of Agriculturally Important Microorganisms, Kusmaur (Post Bag- Kaithauli), Post Box-6, Maunath Bhanjan, Uttar Pradesh-275101, Ph: 0547-2530158 / 2530080, Fax: 0547-2530381, Contact Person: Dr D. P. Singh(CCPI) Email: nbaimicar@gmail.com; dpsfarm@rediffmail.com</p> <p>5. National Bureau of Agriculturally Important Insects (NBAIL),P.Bag No:2491, H.A. Farm Post, Bellary Road, Bangalore - 560 024, Karnataka.Ph: 080-23414220, Fax: 080-23411961, Contact Person: Dr S. K. Jalali (CCPI) Email: rjabindra@rediffmail.com; jalalisk1910@yahoo.co.in</p>
GCC 1.1 (e) (x)	<p>Time for completion for information systems :-</p> <p>186 weeks (includes 30 weeks of implementation of HPC Systems and 156 weeks of operational management and maintenance) as specified in the implementation schedule attached with the Technical specification Section VI</p>
GCC 1.1. (e) (xii)	<p>There are no post warranty service requirements, however on successful testing and acceptance of the system, the bidder will provide operational support of 3 years through its Engineers/experts. During these 3 years, the information system will be under 3 year of comprehensive warranty during which. Bidder must support, operate, update, upgrade and maintain the supplied system in accordance with section VI</p>

2. Contract Documents (GCC Clause 2)

GCC 2	<i>“There are no Special Conditions of Contract applicable to GCC Clause 2.”</i>
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3. Interpretation (GCC Clause 3)

GCC 3.1.1	<p>The Contract's governing language ,all correspondence and communication to be given and all other documentation to be prepared and supplied under the contract not otherwise specified in the technical requirement shall be : <i>English</i></p>
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4. Notices (GCC Clause 4)

GCC 4.3	<p>Address of the Project Manager: Dr. Anil Rai, Principal Scientist Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi - 110012, India.</p> <p>Fallback Address: Assistant Administrative Officer, C.P. Section, Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi - 110012, India</p>
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5. Governing Law (GCC Clause 5)

GCC 5.1	The Contract shall be interpreted in accordance with the laws of: <i>India</i>
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6. Settlement of Disputes (GCC Clause 6)

GCC 6.1.4.	The appointing authority for the Adjudicator shall be the Computer Society of India. The dispute settlement mechanism to be applied shall be as follows:
GCC 6.2.3	<p>(a) In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Purchaser and the Supplier. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the Indian Council of Arbitration.</p> <p>(b) In the case of a dispute with a Foreign Supplier, the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules. The Arbitral Tribunal shall consist of three Arbitrators one each to be appointed by the Purchaser and the Supplier. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the parties, and shall act as presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the Indian Council of Arbitration.</p>

	<p>(c) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (a) and (b) above, within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the Indian Council of Arbitration, both in cases of the Foreign supplier as well as Indian supplier, shall appoint the arbitrator. A certified copy of the order of the Indian Council of Arbitration, making such an appointment shall be furnished to each of the parties.</p> <p>(d) Arbitration proceedings shall be held at New Delhi, India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.</p> <p>(e) The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.</p>
	(f) The arbitrator shall give reasoned award.

B. SUBJECT MATTER OF CONTRACT

7. Scope of the System (GCC Clause 7)

GCC 7.3	<p>The Supplier's obligations under the Contract will include the following recurrent cost items, as identified in the Recurrent Cost tables in the Supplier's Bid:</p> <ul style="list-style-type: none"> i) Operation and Maintenance of HPC systems including data centre and storage systems for three years from the date of Commissioning and acceptance. ii) Technical assistance during warranty period by minimum three technical person. iii) Warranty maintenance support: All infrastructure of this schedule will be under Comprehensive warranty of three years. iv) Changeover to higher version of the offered standard software and operating system during warranty period.
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8. Time for Commencement and Operational Acceptance (GCC Clause 8)

GCC 8.1	The Supplier shall commence work on the System within: <i>thirty (30) days</i> from the Effective Date of the Contract.
GCC 8.2	Operational Acceptance will occur as specified in Section VI Technical Requirements, within 30 days from the date of completion of installation, commissioning, testing and running the services

9. Supplier's Responsibilities (GCC Clause 9)

GCC 9.5	<p>Add the following at the end of GCC Clause 9.5</p> <p>Salient features of some major laws applicable to establishments engaged in building and other construction works:</p> <ul style="list-style-type: none"> a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment. b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees. PAGE 2 OF 3 c) Employee P.F. and Miscellaneous Provision Act 1952: The Act provides for monthly contribution by the Owner plus workers @ 10% or 8.33%. The benefits under the Act are: <ul style="list-style-type: none"> i) Pension or family pension on retirement or death, as the case may be. ii) Deposit linked insurance on death in harness of the worker. iii) Payment of P.F. accumulation on retirement/death etc. d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc. e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Owner by law. The Principal Owner is required to take Certification of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or contractor of Principal Owner if they employ 20 or more contract labour. f) Minimum Wages Act 1948: The Owner is supposed to pay not less than the Minimum Wages fixed by appropriate Govt. as per provision of the Act if the employment is a scheduled employment. Construction of
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	<p>Buildings, Roads, Runways are scheduled employments.</p> <p>g) Payment of Wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.</p> <p>h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against female employees in the matters of transfer, training and promotions etc.</p> <p>i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/- per month or less. The bonus is to be paid to employees getting Rs.2500/- per month or above upto Rs.3500/- per month shall be worked out by taking wages as Rs.2500/- per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.</p> <p>j) Industrial Dispute Act 1947: The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.</p> <p>k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Owner on matters provided in the Act and get the same certified by the designated Authority.</p> <p>l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and Owners. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.</p> <p>m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.</p> <p>n) Inter-State Migrant Workmen's (Regulation of Employment & Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more interstate migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-</p>
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	<p>State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, traveling expenses from home upto the establishment and back, etc.</p> <p>o) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Owner of the establishment is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodations for workers near the work place etc. The Owner to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the government.</p> <p>p) Factories Act 1948: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.</p>
GCC 9.9	The Supplier shall have the following additional responsibilities : None

10. Purchaser's Responsibilities (GCC Clause 10)

GCC 10.12	The Purchaser shall have the following additional responsibilities: None
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C. PAYMENT

11. Contract Price (GCC Clause 11)

GCC 11.2 (b)	Prices quoted by the Bidder shall be <i>“fixed”</i>
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12. Terms of Payment (GCC Clause 12)

GCC 12.1	<p>A) Payment of non-recurring items:</p> <p>(i) Advanced payments of 10% of the total value of the contract excluding all recurrent cost will be made to the bidder within</p>
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	<p>30 days of the effective date of the contract on submission of the claim together with the evidence of export authorization against Bank Guarantee of equivalent amount valid till the date of delivery, installation and operational acceptance of the systems.</p> <p>(ii) 70 % payment of the total cost of equipments (excluding all recurrent cost,) namely UPS Systems, Secured Entry System and Electronic Surveillance System, Fire Security and Alarm System, Standby Power Supply Units (DG Set) 500KVA related to Data Centre on their supply at different institutions and after submission of relevant documents as given below.</p> <p>(iii) 70 % payment of the total cost of equipments / systems (excluding all recurrent cost) namely HPC System-I, Window Cluster, GPU Cluster, SMP Based Computing, HPC Software, Switches, Racks etc., Standalone Servers, Desktop Workstations-I, Thin Clients, HPC Systems-II, and Desktop Workstations-II on their supply at different institutions and after submission of relevant documents as given below. .</p> <p>(iv) 70 % payment of the total cost of equipments/systems (excluding all recurrent cost) namely Storage System-I and Storage System-II on their supply at different institutions and after submission of relevant documents as given below.</p> <p>(v) Balance 20% payment of the total cost of contract price (excluding all recurrent cost) subject to the adjustment of advance payment : On installation and successful commissioning, integration, testing and acceptance of complete systems/ equipments specified at (ii),(iii),(iv) above at different domain institutions of the project. The report of installation, integration, successful commissioning, testing and acceptance of the systems/equipments is to be provided by respective domain CPI/CCPI of the project.</p> <p>(vi) 100% of the total cost of contract price of HPC Infrastructure System after excluding all recurrence cost will be paid subject to the adjustment of advance payments after installation and successful commissioning, integration, testing and acceptance of complete systems/ equipments at different domain institutions of the project. The report of installation, integration, successful commissioning, testing and acceptance of the systems/equipments is to be provided by respective domain CPI/CCPI of the project.</p>
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Relevant Documents:***Goods Supplied from abroad:***

- i. One original and two copies of Suppliers invoice showing contract number, description of goods, unit price and total amount
- ii. Copy of airways bill marked freight prepaid
- iii. Three copies of packing list identifying contents of each package
- iv. Insurance certificate
- v. Manufactures test certificate
- vi. Certificate of origin
- vii. Delivery certificate and acknowledgement of receipt of goods from CPI/CCPI of the domain institutions.

Goods Supplied from within India:

- i. One original and two copies of Suppliers invoice showing contract number, description of goods, unit price and total amount
- ii. Copy of lorry/railway receipts
- iii. Three copies of packing list identifying contents of each package
- iv. Insurance certificate
- v. Manufactures test certificate
- vi. Certificate of origin
- vii. Delivery certificate and acknowledgement of receipt of goods from CPI/CCPI of the domain institutions.

B) Recurrent cost for three years towards operations of HPC systems, data centre, storage systems and related items :

On satisfactory commissioning, functioning, and operational acceptance and handing over of the entire system to be carried out by the Successful Bidder for a period of 36 months (from the date of operational acceptance).

Payment towards Operations and Management of above systems in equal quarterly installments within thirty days of receipt of claim for each previous quarter subject to providing satisfactory services of the entire system with respect to operational requirements at the rate quoted in price schedule Satisfactory report is to be provided by respective CPI/CCPI for release of funds.

Local Agent Commission: Local agent commission, if any, will be payable only in equivalent local currency. Local agent commission is not subject to any escalation what so ever and will be payable pro rata along with the base contract price payments. To effect such payments the local agents commission will be converted into local currency using the telegraphic transfer buying market rate of exchange ruling on date of

	award of contract and the amount of agent's commission in local currency so computed would be incorporated in the contract.
GCC 12.3	The Purchaser shall pay to the Supplier interest on the delayed payments at a rate of: 4% for foreign currency and 10% per year for Indian rupee.
GCC 12.4	For Goods and Services supplied locally, the Purchaser will pay to the supplier in Indian currency (INR).

13. Securities (GCC Clause 13)

GCC 13.2.1	The supplier shall provide within 28 days of the date of notification of contract award an advance payment bank guarantee equivalent to amount of advance payment in the specified currency of the contract with a validity of 60 days beyond the completion of facilities in accordance under GCC clause 8.2
GCC 13.2.2	The amount of security of the advance payments will not be adjusted against future payments as the advance payments will be fully accounted as part of the contract value at the time of operational acceptance of the system. The security shall be eventually returned after the system is operationally accepted.
GCC 13.3.1	Performance Security for an amount of 5% of the contract price in the currency of the contract excluding any recurrent cost, valid for a period of 46 months. Performance security of a JV shall be in the name of JV
GCC 13.3.2 (a)	If the performance security is bank guarantee, it shall be issued either (a) by a bank located in the country of the purchaser (Nationalised or scheduled bank in India) or a foreign bank through a correspondent bank located in the country of the purchaser (Nationalised or scheduled bank in India), or (b) directly by a foreign bank which has been determined in advance to be acceptable to the purchaser
GCC 13.3.4	During the Warranty Period (i.e., after Operational Acceptance of the System), the Performance Security shall be reduced to 2.5% of the Contract Price, excluding any Recurrent Costs and shall be received 2 months before the operational acceptance of the system valid for 36 months. The earlier performance BG to be released after operational acceptance of the system and receipt of above BG.

14. Taxes and Duties (GCC Clause 14)

GCC 14.2	<p>Add the following at the end of the Sub-clause :-</p> <p>“The Purchaser shall also bear and pay/reimburse to the Supplier Sales Tax, Local Tax and Octroi, in respect of direct transaction between the Purchaser and the Supplier imposed upon on the Information Systems (hardware & software) and associated goods specified in Price Schedule No. 2 to be incorporated into the System, by the Law of the country where the side is located.”</p>
GCC 14.3	<p>Add the following at the end of the Sub-clause</p> <p>“The above will not apply to deemed export benefits.”</p>
GCC 14.4	<p>In line 12, delete the words “Sub-contractors or their employees”.</p> <p>- Add the following at the end of the Sub-clause :-</p> <p>“However, these adjustments would be restricted to direct transactions between the Purchaser and the Supplier and not on procurement of raw materials, intermediary components, etc. by the Supplier. Further, no adjustments of the Contract Price shall be made on account of variation in deemed export benefits.”</p>
GCC 14.5	<p><i>The end user i.e. ICAR would avail Custom Duty Exemption and the necessary Documents to this effect shall be provided by IASRI, New Delhi, ICAR to the bidder on demand. The bidder shall be responsible for clearance and release of all the imported equipments/ goods from the Custom authorities. Details of the documents required and their filled copies will be provided by the bidder. Hence, all prices should be offered without Custom Duty component for imported equipments/ goods.</i></p>

D. INTELLECTUAL PROPERTY

15. Copyright (GCC Clause 15)

GCC 15.3	<p>The Purchaser may assign, license, or otherwise voluntarily transfer its contractual rights to use the Standard Software or elements of the Standard Software, without the Supplier’s prior written consent, under the following circumstances: <i>Partner institutions of National Agricultural Bioinformatics Grid (NABG) project</i></p>
GCC 15.4	<ul style="list-style-type: none"> • The Purchaser’s and Supplier’s rights and obligations with respect to Custom Software or elements of the Custom Software are as follows:

	<i>“Since there is no software development therefore this is not applicable”</i>
GCC 15.5	<ul style="list-style-type: none"> • <i>No software escrow contract is required for execution of contract</i>

16. Software License Agreements (GCC Clause 16)

GCC 16.1 (a) (iii)	The Standard Software license shall be valid <i>“throughout the territory of India;”</i>
GCC 16.1 (a) (iv)	Use of the software shall be subject to the following additional restrictions : <i>“none”</i>
GCC 16.1 (b) (ii)	The Software license shall permit the Software to be used or copied for use or transferred to a replacement computer : <i>“provided the replacement computer falls within approximately the same class of machine and maintains approximately the same number of users, if a multi-user machine;”</i>
GCC 16.1 (b) (vi)	The Software license shall permit the Software to be disclosed to and reproduced for use (including a valid sublicense) by : <i>“support service suppliers or their subcontractors, exclusively for such suppliers or subcontractors in the performance of their support service contracts;”</i> subject to the same restrictions set forth in this Contract.
GCC 16.1 (b) (vii)	In addition to the persons specified in GCC Clause 16.1 (b) (vi), the Software may be disclosed to IASRI New Delhi and its partner institution under NABG project subject to the same restrictions as are set forth in this Contract.
GCC 16.2	There is no application software, therefore, it is not applicable

17. Confidential Information (GCC Clause 17)

GCC 17.1	<i>There are no modifications to the confidentiality terms expressed in GCC Clause 17.1</i>
GCC 17.3	<i>There are no modifications to the confidentiality terms expressed in GCC Clause 17.3</i>
GCC 17.7	The provisions of this GCC Clause 17 shall survive the termination, for whatever reason, of the Contract for <i>the period of contract</i> .

E. SUPPLY, INSTALLATION, TESTING, COMMISSIONING, AND ACCEPTANCE OF THE SYSTEM

18. Representatives (GCC Clause 18)

GCC 18.1	The Purchaser's Project Manager shall have the following additional powers and / or limitations to his or her authority to represent the Purchaser in matters relating to the Contract : <i>no additional powers or limitations.</i>
GCC 18.2.2	The Supplier's Representative shall have the following additional powers and / or limitations to his or her authority to represent the Supplier in matters relating to the Contract : <i>no additional powers or limitations.</i>

19. Project Plan (GCC Clause 19)

GCC 19.1	<p>Chapters in the Project Plan shall address the following subject:</p> <ul style="list-style-type: none"> (a) Project Organization and Management Plan; (b) Delivery and Installation Plan (c) Implementation schedule (d) Training Plan (e) Pre-commissioning and Operational Acceptance Testing Plan (f) Warranty Service Plan (g) Task, Time, and Resource Schedules (h) Post-Warranty Service Plan (i) Technical Support Plan (j) Operations and Maintenance Plan; (k) any other item
GCC 19.2	Within thirty days from the Effective Date of the Contract, the Supplier shall present a Project Plan, in consultation and with the approval of the Purchaser.
GCC 19.5	<p>The Supplier shall submit to the Purchaser the following reports:</p> <ul style="list-style-type: none"> I. Monthly progress reports, summarizing results accomplished during the prior period;

	<p>II. cumulative deviations to date from schedule of progress milestones as specified in the Agreed and Finalized Project Plan;</p> <p>III. corrective actions to be taken to return to planned schedule of progress; proposed revisions to planned schedule;</p> <p>IV. other issues and outstanding problems; proposed actions to be taken;</p> <p>V. resources that the Supplier expects to be provided by the Purchaser and/or actions to be taken by the Purchaser in the next reporting period</p> <p>VI. other issues or potential problems the Supplier foresees that could impact on project progress and/or effectiveness.</p> <p>(a) Inspection and quality assurance reports</p>
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20. Subcontracting (GCC Clause 20)

GCC 20	<i>“There are no Special Conditions of Contract applicable to GCC Clause 20”.</i>
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21. Design and Engineering (GCC Clause 21)

GCC 21.2	The Contract shall be executed in accordance with the edition or the revised version of all referenced codes and standards current at the date <i>“as specified in the GCC”</i>
GCC 21.3.1	The Supplier shall prepare and furnish to the Project Manager the documents, required as per bid document, for which the Supplier must obtain the Project Manager’s approval before proceeding with work on the System or any Subsystem covered by the documents.
GCC 21.3.4	<p>In line 6, after the words “modification(s)”, insert the words “and upon resubmission with the required modifications”.</p> <p>Add the following at the end of the sub-clause :</p> <p>“The procedure for submission of the documents by the Supplier and their approval by the Project Manager shall be discussed and finalized with the Supplier”.</p>

22. Procurement, Delivery, and Transport (GCC Clause 22)

GCC 22.4.3	The Supplier <i>shall be</i> free to use transportation through carriers registered in any eligible country and <i>shall</i> obtain insurance from any eligible source country.
GCC 22.5	In addition to the shipping and other documents <i>specified in the GCC</i> , the Supplier shall provide the Purchaser with following documents: <ul style="list-style-type: none"> i) Two copies of packing list identifying contents of each package ii) Manufacturers/suppliers warranty certificate iii) Inspection certificate issued by the nominated inspection agency (if any) and suppliers’/manufacturers’ factory inspection report.

23. Product Upgrades (GCC Clause 23)

GCC 23.4	The Supplier shall provide the Purchaser: <i>“with all new versions, releases, and updates to all Standard Software during the Warranty Period, for free, as specified in the GCC,”</i>
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24. Implementation, Installation, and Other Services (GCC Clause 24)

GCC 24	<i>“There are no Special Conditions of Contract applicable to GCC Clause 24.”</i>
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25. Inspections and Tests (GCC Clause 25)

GCC 25	<i>“There are no Special Conditions of Contract applicable to GCC Clause 25.”</i>
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26. Installation of the System (GCC Clause 26)

GCC 26	<i>“There are no Special Conditions of Contract applicable to GCC Clause 26.”</i>
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27. Commissioning and Operational Acceptance (GCC Clause 27)

GCC 27.2.1	Operational Acceptance Testing shall be conducted in accordance with requirement specified in Section-VI Technical Requirements for respective schedules.
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GCC 27.2.2	If the Operational Acceptance Test of the System, or Subsystem(s), cannot be successfully completed within 45 days from the date of Installation or any other period agreed upon by the Purchaser and the Supplier, then GCC Clause 27.3.5 (a) or (b) shall apply, as the circumstances may dictate.
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F. GUARANTEES AND LIABILITIES

28. Operational Acceptance Time Guarantee (GCC Clause 28)

GCC 28.2	Liquidated damages shall be assessed at 0.5 percent per week. The maximum liquidated damages are 10 percent of the Contract Price.
GCC 28.3	Liquidated damages shall be assessed with respect to deliveries, installation, commissioning and acceptance milestones as specified Implementation Schedule of Project Plan finalized by mutually agreed basis by Purchaser and Supplier.

29. Defect Liability (GCC Clause 29)

GCC 29.1	For Software, exceptions or limitations to the Supplier's warranty obligations shall be as follows: <i>None</i>
GCC 29.3 (iii)	The Supplier warrants that the following items have been released to the market for the following specific minimum time periods: <i>"All Standard Software must have been commercially available in the market for at least six months"</i>
GCC 29.4	The Warranty Period (N) shall begin from the date of Operational Acceptance of the System or Subsystem and extend for 36 months;"
GCC 29.10	During the Warranty Period, the Supplier must commence the work necessary to remedy defects or damage within 2 working days of notification.
GCC 29.12	In line 3 substitute the words " remainder of the " with words "full". In line 4/5 delete the words "or three (3) months whichever is greater"

30. Functional Guarantees (GCC Clause 30)

GCC 30	<i>“There are no Special Conditions of Contract applicable to GCC Clause 30.”</i>
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31. Intellectual Property Rights Warranty (GCC Clause 31)

GCC 31	<i>Insert: “There are no Special Conditions of Contract applicable to GCC Clause 31.”</i>
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32. Intellectual Property Rights Indemnity (GCC Clause 32)

GCC 32	<i>“There are no Special Conditions of Contract applicable to GCC Clause 32.”</i>
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33. Limitation of Liability (GCC Clause 33)

GCC 33	<i>“There are no Special Conditions of Contract applicable to GCC Clause 33.”</i>
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G. RISK DISTRIBUTION

34. Transfer of Ownership (GCC Clause 34)

GCC 34	<i>“There are no Special Conditions of Contract applicable to GCC Clause 34.”</i>
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35. Care of the System (GCC Clause 35)

GCC 35	<i>“There are no Special Conditions of Contract applicable to GCC Clause 35.”</i>
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36. Loss of or Damage to Property; Accident or Injury to Workers; Indemnification (GCC Clause 36)

GCC 36	<i>“There are no Special Conditions of Contract applicable to GCC Clause 36.”</i>
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37. Insurances (GCC Clause 37)

GCC 37.1	<p>Add the following note below the para :-</p> <p>“The insurance should be in the currency of the contract or in freely convertible currency”</p>
GCC 37.1 (a)	<p>The cargo insurance should be from “ warehouse” to “warehouse (ultimate destination)” on “ all risks” basis including war risks and strikes.</p>
GCC 37.1 (c)	<p>The supplier shall obtain :</p> <ul style="list-style-type: none"> (i) Third Party liability insurance including purchaser’s personnel, with a minimum coverage of one million rupees; (ii) Employer’s liability and workers’ compensation insurance in respect of the Personnel of the Contractor including sub-contractors if any,, in accordance with the relevant provisions of the Applicable Law, as well as, with respect to such Personnel, any such life, health, accident, travel or other insurance as may be appropriate; and (iii) Insurance against loss of or damage to (i) equipment purchased in whole or in part with funds provided under this Contract, (ii) the subsystems that have been accepted by the purchaser (iii) any documents (software of the IT systems) prepared by the Contractor in the performance of the Services with a minimum coverage of two times the value of the contract. <p>Supplier shall take the above coverage for the entire period of the contract at their own cost.</p>
GCC 37.1 (e)	<p>No Party to this Agreement will at any time perform, or omit to perform, any act which they are aware, at the time of performance, will place the other Party in default under any insurance policy, mortgage or lease, governing activities at any location provided by the Project Manager.</p> <p>The supplier shall Maintain standard forms of comprehensive insurance including liability insurance, system and facility insurance and any other insurance for the personnel, Assets, data, software, etc.</p> <p>The above provisions should be made applicable for the entire period of the contract.</p>
GCC 37.6	<p>In line 4 substitute the word “all” with “the”</p> <p>In line 5 after the word “supplier” add the word “as per procedures outlined in SCC”</p>

GCC 37.7	<p>Add Clause 37.7 as under:</p> <p><u>Appropriation of Insurance Proceeds</u></p> <p>Should any loss or damage occur, the supplier shall:</p> <ul style="list-style-type: none"> a) Initiate and pursue claim till settlement; and b) Promptly make arrangements for repair and/or replacement of the damaged or lost item/s and ensure supply/commissioning in terms of the contract, irrespective of settlement of claim by the insurance company. <p>Keeping in view the above the purchaser shall give, from time to time, written authorization to the insurance company to directly pay monies payable by the insurer to the supplier after excluding any payment including advances already paid by the employer in respect of those items, such excluded payments will be payable to the Employer only and insurer will accordingly make the payment as advised by the employer from time to time. All subsequent payments, if any, due under the Contract, shall be regulated by the relevant terms of payment.</p>
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38. Force Majeure (GCC Clause 38)

GCC 38.1	Insert “(.)” after the word “affected” in line 4 and delete the rest of the sub clause including paragraph (a) to (f)
GCC 38.6	In line 7-8, replace the word “failing which, either party may terminate the Contract by giving a notice to the other” with the words “failing which, the dispute will be resolved in accordance with GCC Clause 6”
GCC 38.7	Delete this sub-clause
GCC 38.8	Re-number this clause as 38.7

H. CHANGE IN CONTRACT ELEMENTS

39. Changes to the System (GCC Clause 39)

GCC 39	<i>Insert: There are no Special Conditions of Contract applicable to GCC Clause 39</i>
GCC 39.2.5	<i>In the last sentence substitute the words “shall withdraw the proposed Change and shall notify the Supplier in writing of its acceptance.” With words “and the supplier shall agree on specific rates for valuation of the change”.</i>

GCC 39.2.6	<p>Add the following sentence in the beginning of the Sub-clause:</p> <p><i>“If rates and prices of any change are not available in the contract, the parties thereto shall agree on specific rates for the valuation of the change”.</i></p>
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40. Extension of Time for Achieving Operational Acceptance (GCC Clause 40)

GCC 40	<i>There are no Special Conditions of Contract applicable to GCC Clause 40</i>
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41. Termination (GCC Clause 41)

GCC 41	<i>There are no Special Conditions of Contract applicable to GCC Clause 41</i>
GCC 41.3.1 (b)	<p><i>At the end of the para, after the word “System” add the words “which the purchaser is required to obtain as per provision of the contract as per relevant applicable laws of the country”.</i></p> <p><i>At the end of the next para substitute the words “terminate the contract” with words “for termination and resolve the dispute in accordance with clause GCC6”.</i></p>

42. Assignment (GCC Clause 42)

GCC 42	<i>There are no Special Conditions of Contract applicable to GCC Clause 42</i>
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SECTION VI. TECHNICAL REQUIREMENTS (INCLUDING IMPLEMENTATION SCHEDULE)

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Technical Requirements

A. BACKGROUND

0.1 **The Purchaser:** Indian Agricultural Statistics Research Institute (IASRI), Indian Council of Agricultural Research (ICAR), Library Avenue, New Delhi- 110012

IASRI is a premier Institute with glorious tradition for carrying out research, teaching and training in the area of Agricultural Statistics and Computer Application in Agriculture. The mandate of the Institute is (i) to undertake basic, applied, adaptive, strategic and anticipatory research in agricultural statistics and related fields, (ii) to conduct post-graduate teaching and in-service, customized and sponsored training in Agricultural Statistics and Computer Applications at National and International level, (iii) to be a lead centre of excellence in Human Resource Development (iv) to provide advisory and consultancy services to support and strengthen the National Agricultural Research System (NARS) and National Agricultural Statistics System (NASS) and to undertake sponsored research and consultancy for National and International organizations, (v) to lead in development of Agricultural Knowledge Management and Information System for NARS, (vi) to establish closer interactions with the subject matter specialists to identify newer research areas and to effectively disseminate research to the stake holders, and (vii) to make the presence of IASRI visibly felt in NARS and NASS and to establish indispensability in these systems for research support.

The Institute functions through its six divisions namely Centre of Agricultural Bioinformatics (CABin), Sample Surveys, Design of Experiments, Biometrics and Statistical Modeling, Forecasting and Econometrics Techniques and Computer Applications. For the conduct of teaching of post graduate programmes of the Institute, the planning, organization and co-ordination of M.Sc. (Agricultural Statistics), Ph.D. (Agricultural Statistics) and M.Sc. (Computer Application) are carried out in collaboration with Post Graduate School, Indian Agricultural Research Institute (IARI), New Delhi with the aim to provide guidance to students in their research/teaching activities. This academic years M.Sc. (Bioinformatics) program is also be taken up in the CABin.

0.2 **Business Objectives of the Purchaser:**

The main objective of creation of this HPC systems and related infrastructure is to meet the following requirement:

- ❑ The Centre of Agricultural Bioinformatics (CABin) has been established in the campus of Indian Agricultural Statistics Research Institute, New Delhi to initiate research, teaching and training in the field of agricultural bioinformatics and computational biology.
- ❑ A National Agricultural Bioinformatics Grid of 06 national Institutes will be setup under the aegis of CABin. Integrating a number of other institutions/organizations in order to provide computational framework and support to carry out biotechnological research.
- ❑ This network of institutions is based on two-tier architecture and it will be able to bridge the gap between genomic information and knowledge, utilizing statistical and

computational sciences. Also, this model will help in the development of partnerships at various levels among national and international organizations. Further, this will also establish functional linkages among researchers and scientists in the field of Bioinformatics and related fields.

- ❑ CABin will also facilitate the opening up of new vistas for downstream research in bioinformatics ranging from modeling of cellular function, genetic networks, metabolic pathways, validation of drug targets to understand gene function and culminating in the development of improved varieties and breeds for enhancing agricultural productivity. It will have high-end super computational facilities for voluminous data warehousing, processing and interpretation.
- ❑ CABin will undertake the responsibility of capacity building and development of advanced and customized statistical and computational techniques and apply them on the warehoused genomic resources to derive knowledge.
- ❑ The second tier of this grid is five Domain Bioinformatics Centres (DBC) connected through dedicated high-speed connectivity with CABin. These centres will cater to the needs of the institutions working in different domains of agriculture such as crops, animals, fisheries, agricultural microbes and agricultural insects.
- ❑ The DBC's will provide services and support to institutions in their respective fields of research. The centres will also be responsible for information generation and knowledge delivery from CABin to respective domain institutions for conducting experiments. The DBC's will maintain and verify data quality of genomic information from all sources in their respective domains.
- ❑ The domain centre of this architecture will be responsible for the collection of raw genomic data from laboratories of their respective domain and share information with CABin. The *in silico* findings in genomic data will be tested and validated through wet lab experiments at the respective domain institutions.
- ❑ The CABin will be at IASRI, New Delhi. The DBC's are NBPGR, New Delhi (Crops), NBAGR, Karnal (Animals) NBFGR, Lucknow (Fisheries) and NBAIM Mau (Agricultural Microbes) and NBAII, Bangalore (Insects).
- ❑ The CABin and DBC's of National Agricultural Bioinformatics Grid will be connected through high speed Wide Area of Network (WAN) for seamless information flow. Initially it is proposed to connect the main centre by 64 Mbps and DBC' 32 Mbps bandwidths.
- ❑ It is expected that next two years, sufficient trained manpower will be available to conduct research and development in Bioinformatics and related fields. Central Data Warehousing (CDW) of genomic data and data mining facilities will have computational

capability to provide on-line system of analysis and knowledge extraction from genomic data and the data repository created in the country will be large enough to understand the underlying mechanisms of evolution. Other institutions of NARS will be connected to this grid in phased manner depending on priority of research.

0.3 Acronyms Used in These Technical Requirements

0.3.1 *A table of important organizational and technical acronyms used in the Requirements.*

Term	Explanation
HPC	High-performance computing
SMP	Symmetric Multiprocessing
GFLOPS	Giga FLoating point OPerations per Second
CUDA	Compute Unified Device Architecture
HA	High Availability
DDR	Double data rate
SDRAM	synchronous dynamic random access memory
ECC	Error Correction Codes
SAS	Serial Attached SCSI
SFF	Small form factor
IPMI	Intelligent Platform Management Interface
IB	InfiniBand
QDR	Quad Data Rate
RAID	Redundant Array of Independent Disks
HDD	hard disk drive
USB	Universal Serial Bus
PDU	power distribution unit
GUI	graphical user interface
MPI	Message Passing Interface

HPCBP	High Performance Computing Basic Profile
OFED	OpenFabrics Enterprise Distribution
UTP	Unshielded Twisted Pair
CAT-6	Category 6 cable
IPV4 or 6	Internet Protocol version 4 or 6
VLAN	Virtual Local Area Network
VRRP	Virtual Router Redundancy Protocol
CFM	Cubic Feet per Minute
CFD	computational fluid dynamics
AMC	Annual Maintenance Contract
BMS	Building Management System
bps	bits per second
CPU	Central Processing Unit
CD	Compact Disk
CCTV	Close Circuit Television
cps	characters per second
DNS	Domain Name System
DBMS	Database Management System
DOS	Disk Operating System
dpi	dots per inch
EMS	Enterprise Management System
Ethernet	IEEE 802.3 Standard LAN protocol
FC	Fiber Channel
FTP	File Transfer Protocol
GUI	Graphic User Interface
Gbps	Gigabit per second
GB	gigabyte
Hz	Hertz (cycles per second)
IASRI	Indian Agricultural Statistics Research Institute
IPS	Intrusion Prevention System

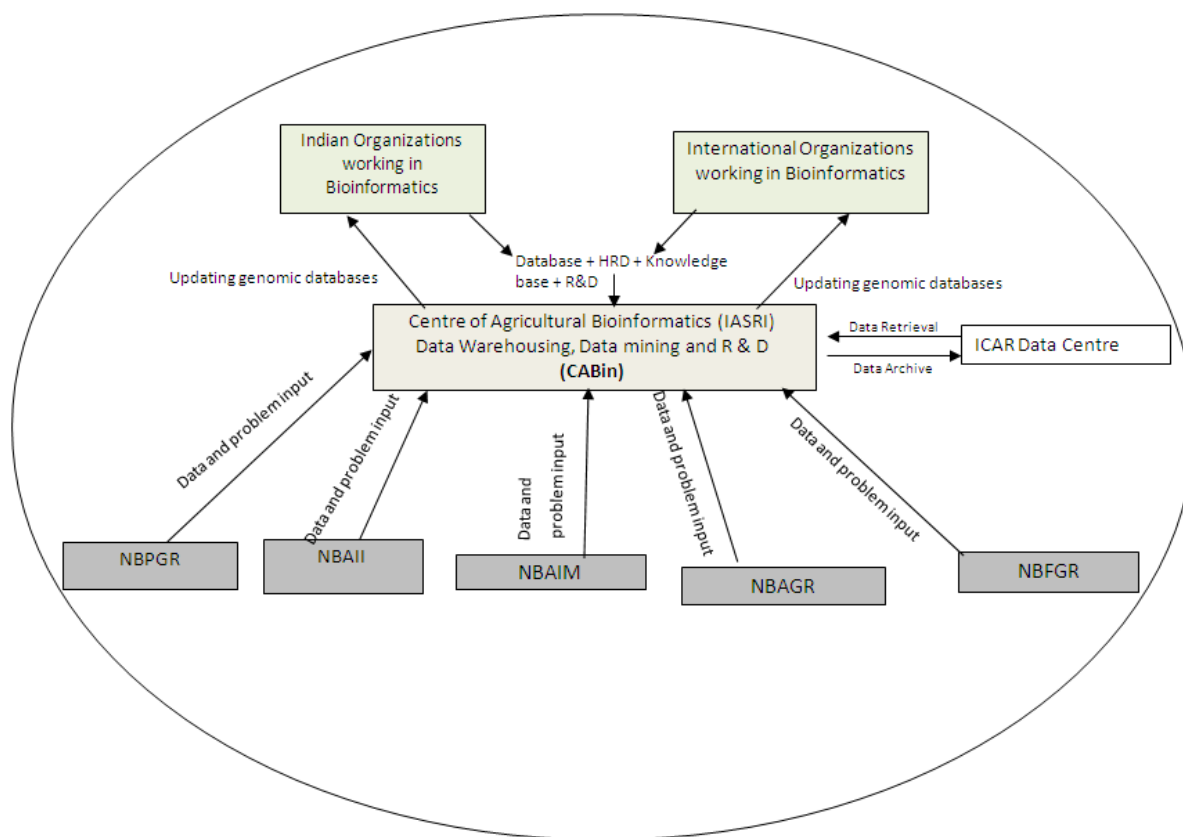
IP	Internet Protocol
IT	Information Technology
ICT	Information Communication Technology
ISDN	Integrated Services Digital Network
ITIL	Information Technology Infrastructure Library
IEEE	Institute of Electrical and Electronics Engineers
ISO	International Standards Organization
KB	kilobyte
kVA	Kilovolt ampere
LAN	Local area network
lpi	lines per inch
lpm	lines per minute
Mbps	Megabits per second
MB	megabyte
MTBF	Mean time between failures
MCU	Multipoint Control Unit
NMS	Network Management System
NAS	Network Attached Storage
NAIP	National Agricultural Innovation Project
NIC	Network interface card
NOS	Network operating system
OEM	Original Equipment Manufacturer
ODBC	Open Database Connectivity
OLE	Object Linking and Embedding
OS	Operating system
PCL	Printer Command Language
ppm	pages per minute
PS	PostScript -- Adobe page description language
RAM	Random access memory
RISC	Reduced instruction-set computer
SSL	Secure Socket Layer
SAU	State Agriculture University

SCSI	Small Computer System Interface
SAN	Storage Area Network
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SQL	Structured Query Language
TB	Tera Byte
TCP/IP	Transmission Control Protocol / Internet Protocol
URL	Universal Resource Locator
UPS	Uninterrupted Power Supply
VPN	Virtual Private Network
VC	Video Conference
V	Volt
WWW	World Wide Web
WAN	Wide Area Network
WLAN	Wireless LAN

B. BUSINESS FUNCTION AND PERFORMANCE REQUIREMENTS

1.1 Business Requirements to Be Met by the System

The CABin is to provide the platform for biologists and computational experts to join hands for genome data management and analysis. It will have high end super computational facilities for voluminous data warehousing, data processing and interpretation of data from different disciplines in bioinformatics, which is necessary to solve the problems in a phased manner. Further, it may be useful to take up research and development in the fields of statistical and computational genomics, quantitative genetics, and genomics applications: structural, comparative and functional genomics, development of models, algorithms, software tools and services etc. The centre will also provide services in bioinformatics and capacity building in the country, particularly, to ICAR institutions. The core group for development of genome data bases and data warehouse would consist of scientists from the disciplines of Agricultural Statistics, Computer Applications, Crop Science, Horticulture, Animal Science, Fisheries, Entomology and Microbiology. Advanced high end data bases and customized bioinformatics data warehouse (BinDW) will be established at IASRI, New Delhi in order to support high speed statistical and computational techniques to derive knowledge from secondary genomic information.



National Agricultural Bioinformatics Grid

Further, domain centres are responsible for identifying issues in bioinformatics and related experiments. Besides this, the domain centres are responsible for establishing linkages and providing guidance and support to the associated institutions of their domain as per their requirement in collaboration with the CABin. Maintenance and verification of data quality of secondary genomic information from all sources in respective domains will be checked and supervised by these centres. The teams of scientists at these centres are to be drawn from various disciplines of their respective domains supported by the computational scientists. CABin will assist the domain centres for development of storage and computational facilities.

It is proposed to link all projects and activities in the field of agricultural bioinformatics in the country to the National Agricultural Bioinformatics Grid. Data related to genomics will be shared with different domain centres as well as other institutions of the country based on mutual agreement. Links will be established to ICAR data centre to have backup and regular archiving of the information. The CABin and domain centres of this National Agricultural Bioinformatics Grid will be connected through high speed WAN for seamless information flow. Initially, it is proposed to connect the main centre by 48 Mbps bandwidth and domain centre by 24 Mbps bandwidth. Initially, the operational maintenance of the NABG will be outsourced and in-house capacity will be build for future maintenance.

Establishment of National Agricultural Bioinformatics Grid (NABG) in ICAR needs state of art civil work, air-conditioning systems, security systems, designing of High Performance Computing Centre (HPC), procurement of advance hardware and software for supercomputing and their integration suitable for various application areas of bioinformatics. This requires intensive experience and expertise in different fields of science and technologies. Therefore, it has been decided to invite International Competitive Bid (ICB) to carry out the task for implementation of this complete High Performance Computing (HPC) Systems which includes computing resources, data centre for environmental and security maintenance and monitoring high end storage systems and other related facilities. Apart from this, this system needs to be configured, tuned and optimized for undertaking biological computational research in advance area of agricultural bioinformatics by the researchers through on-line Web portal for routine jobs. In this all available applications and software needs to be configured and ported on parallel processing environment for efficient utilization of computing resources. Further, to specific project based problems tools and techniques will be developed and implemented.

1.1.1 Scope of Work:

Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi

Detail scope of work for each component has been provided in the technical specification, Service Level Agreement and Related Information Technology Issues and Initiatives sections given below

1.2 Service Level Agreement: Performance Requirements of the System

The purpose of this Service Level Agreement (hereinafter referred to as SLA) is to clearly define the levels of service which shall be provided by the Bidder to purchaser for the duration of this contract for respective schedule. Performance requirements of separate components are already mentioned in the technical specifications of the respective component. These requirements are in addition to the performance requirements specified in the technical specifications

Sl. No.	Item	Details
1.	Uptime	<p>The system Integrator should give uptime guarantee of 98% on quarterly basis. Calculation of up time will be as under</p> <ol style="list-style-type: none"> 1. Total Hours available per quarter = Hours per quarter – Hours for preventive maintenance 2. System Uptime = Actual Up Time in Hrs per quarter + Total Available Hrs per quarter 3. Preventive maintenance time per quarter is to be mentioned by the System Integrator
		<p>Definition of uptime</p> <ol style="list-style-type: none"> 4. If system is operational with 98% Computing Nodes, the system is said to be functional 5. If any of the master server is not functional system is said to be non-functional.

		<p>6. If any of the HPC and NAS storage servers is not functional and availability of storage space to user and / or to users' programs is affected , the system is said to be non-functional</p> <p>7. If any software problem prevents the users from compiling and executing the program in MPI and OpenMPI environment, the system is said to be non-functional</p> <p>8. If any of the software problems prevents the monitoring of critical parameters of the system, the system is said to be non-functional.</p> <p>For any reasons other than mentioned above if the system is not working it is consider to be non-functional.</p>
2.	Performance	<p>The HPL (High Performance Linpack) efficiency of the all clusters should be 80% or more.</p> <p>The efficiency claimed in the technical bid has to be demonstrated during the acceptance test.</p>
3.	Benchmarks	<p>The system integrator should list out all the benchmarks to test the performance of all clusters and SMP.</p> <p>LINPACK ratings (peak & sustained) for 256, 512, 1024, 2048 cores and for entire cluster configuration must be provided. At least 80% efficiency should be sustained in the offered solution.</p> <p>HPC-Challenge benchmarks for the entire cluster configuration must be provided.</p> <p>LINPACK rating (peak & sustained) for the proposed SMP configuration must be provided. At least 80% efficiency should be sustained in the offered SMP servers.</p> <p>Vendors should provide bioinformatics application benchmark for AMBER, HMMER, MPI BLAST etc.</p> <p>All these benchmarks should be provided and installed by the system integrator .</p> <p>PUE (Power Utilization Effectiveness) for the data centre to be maintained at an average of 1.7 over a period of 12 months. All data centre load to be considered for PUE calculation, ($PUE = 1/DCiE$);</p> <p>DCiE (Data Centre Infrastructure Efficiency) = Total IT Load/Total Input Load. Detailed calculations to be provided assuming 50 % IT load.</p>

1.3 Related Information Technology Issues and Initiatives:

The Supplier shall provide complete and legal documentation of hardware, all subsystems, operating systems, compiler, system software and the other software. The Supplier shall also provide licensed software for all software products, whether developed by it or acquired from others. The supplier shall also indemnify the purchaser against any levies/penalties on account of any default in this regard.

Manuals and Drawings:

- (a) Before the goods and equipment are taken over by the Purchaser, the Supplier shall supply operation and maintenance manuals together with drawings of the goods and equipment. These shall be in such detail as will enable the Purchaser to operate, maintain, adjust and repair all parts of the works as stated in the specifications.
- (b) The manuals and drawings shall be in the ruling language (English) and in such form and numbers as stated in the contract.
- (c) Unless and otherwise agreed, the goods and equipment shall not be considered to be completed for the purpose of taking over until such manuals and drawings have been supplied to the Purchaser.
- (d) Complete and legal documentation of all hardware, operating systems, compiler, parallel file system, job scheduler, cluster monitoring & management tools and the other software should be provided.
- (e) The bidder shall supply complete set of technical/ operations and maintenance manuals as applicable along with the delivery. The cost of such manuals supplied will be included in the cost of the system.
- (f) Perpetual License for all licensed software should be provided.

Sl. No.	Item	Details
1.	OEM/System Integrator	HPC system OEM will be responsible for the functioning of the cluster during the warranty and AMC period, and may get the work executed through the authorized System Integrator for this solution.
		The tender is on turnkey basis and System Integrator will be responsible for all components of the tender.
		Authorization certificate from every OEM is to be submitted with technical bid.
		System Integrator can represent only one System OEM for each component for the execution of this solution.
		The bidder must quote all servers (Master node, Resource Management node, Compute cluster node and Database and application Servers) and all compute cluster architecture products from the single and same OEM in this proposal

		The UPS Power, Precision Cooling, Infrastructure Management System and PDU should be from one single and same OEM.
		All hardware components must be standard/OEM, 42U rack standard compatible. Additional items necessary for integration into rack standard cabinets including the necessary PDU, must be supplied. If there are any special cooling requirements for the rack cabinets then it should be specified and supplied.
		The integration of the all components in these HPC systems is complex in nature. Therefore, the bidder will be responsible of supplying all components compatible to each other. The vendor will be fully responsible for full and complete compatibility for all items of hardware and software supplied as the technical requirement.
		System Integrator should have back to back arrangement with OEM for providing warranty and support.
		OEM should have all the responsibility of service and support during the Warranty and AMC period.
2.	Solution	Detailed plan for project execution is to be submitted.
		Detailed diagrams showing major components such as Nodes, Servers, SMP, Storage, Infiniband and Ethernet Switches, console, LCD display and workstation and network cabling to be submitted.
		Detailed diagram showing power distribution to the system and the Data Centre is to be submitted.
		Power connection of required KVA will only be supplied and other supporting equipment and panels etc. if required is to be provided by the vendor.
		Details of power consumption, heat dissipation and cooling requirements should be specified. For all power calculation, peak load is to be used.
		Any other Hardware or Software and any other component of Data Centre that is not included in this tender but is required for the completion of this solution is to be provided by the System Integrator.
		Service of Resident Engineers for operational management and maintenance for 24*7 will be required during warranty period.
		Vendor must quote for all the requirements together viz. HPC Cluster, Storage, SMP system, Data Centre Power and Air-conditioning design & build, and any other, if required, such as special Power and Cooling arrangements required for the proposed solution. Partial response to this tender will be summarily rejected.
		Detail map will be provided for the installation of HPC/IT components asked for in this tender. Only those offers that can fit within these dimensions are acceptable.
		Vendors must design a proper air-conditioning arrangement for the proposed HPC system. They must carry out a detailed data centre cooling

		study for the proposed system within the above mentioned area designated for this deployment. If any special cooling arrangement is required, vendor must discuss with IASRI prior to bidding to know whether their proposed data centre power/cooling arrangement is acceptable to IASRI. Only the pre-approved data centre cooling arrangement will be allowed to be submitted during the bid submission, otherwise the bid is liable for rejection
		Data Centre should be designed in a manner that 20% capacity enhancement should be included in the design for power and cooling at any given point of time in future.
		All equipment must be compatible with Indian electrical standards and codes. Engineering documentation on the physical sizes and weights of all major and minor components must be submitted
		Site preparation guide, i.e., requirement of space, power, AC etc., should be provided with quotation
		The proposal must include a detailed datasheet for every single IT component included in your proposal and the necessary technical whitepapers discussing the features, performance and optimization techniques
		All vendors are required to submit the documentation or proof of compliance along with the bid failing which the bids are liable to be rejected
		Complete solution must be implemented (including data centre, HPC systems installation, testing and benchmarking) within twenty (20) weeks from the date of PO release
3.	Interconnects	For the cabling sections for all the locations, the requirements must specify that UTP cable (i.e. Cat 6 cabling) shall not cross any electrical cable. In addition, the bidder/vendor will make detailed drawings of the laying network and electrical cable, take the approval from concerned authority before start pulling/laying the cable in all locations. After laying the network/electrical cables, the agency will run the pentascan test (end to end) and check that all the nodes are giving desired throughout.
		The infiniband switch should have features like single point of management, performance and error monitoring, should support congestion control.
		Infiniband interconnect should comply with IBTA vl. 2.
		Number, type and length of infiniband cables to be specify.
4.	Software	Gigabit switch with external rack is only for users to connect to the clusters
		Cluster management tools should have the feature to illustrate system usage pattern of each users with respect to a specify period.
		OEMs of operating system, compiler , parallel file system and job scheduler should certify that the versions of their software's product

		quoted are compatible with one and another
		The entire solution should be based on certified and licensed hardware/software components which are fully validated and supported by the OEM. No freeware / opensource based software will be accepted
		All software provided in the proposal should be perpetual
5.	Warranty	Three years comprehensive onsite warranty 24*7 should cover all items of hardware including the batteries of the UPS, Software and its updates, license and support.
		Warranty for all components will start only after successful completion the acceptance test.
		System OEM and OEMs of Infiniband interconnect, Operating system , Parallel file System, Job Scheduler and computer, Should certify that they will provide support for their product and will maintain spares inventory as required.
8.	Documentation	Complete and legal documentation of all hardware, operating systems, compiler, parallel file system, job scheduler , cluster monitoring & management tools and the other software should be provided.
		Perpetual License for all licensed software should be provided.
		The bidder shall supply complete set of technical/ operations and maintenance manuals as applicable along with the delivery. The cost of such manuals supplied will be included in the cost of the system.
9.	Standards	All designs, codes, developing platforms, developing techniques and workmanship shall be in accordance with the highest accepted international standards for this type of work
11.	ATP	The acceptance test will be conducted by CABIn at IASRI or any other person nominated by the same. The ways and means are to be suggested and provided by OEM/ System integrator for verification of all the points written under ATP. The acceptance test will be completed on trouble free. Operation of all systems for five consecutive days. No malfunction, partial or complete failure of any part of hardware or excessive heating of parts etc. or bugs in the software should occur. All the software should be complete and no missing modules/sections will be allowed. ATP of data centre for its entire item will also be carried out.
		In the event of the hardware and software failing to pass the acceptance test, A period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, Failing which CABIn at IASRI. Reserves the rights to get the equipment replace by the supplier at no extra cost.
		Physical verification of the all hardware Specifications and functional capability of all equipment supplied are to be checked as per technical specification.

12.	Trainings	User's Training from qualified trainer for 15 days at our site (IASRI) should be provided on entire solutions implemented. The complete training document / manual is to be provided by the trainers
		System Administrator Training from qualified trainers for 10 to 14 days at IASRI should be provided on entire solutions implemented including OS/ Cluster / Scheduler/ Parallel file system/ NFS/ User management/ Server storage management and troubleshooting etc. The complete training document / manual is to be provided by the trainers
13.	Others	Complete solution must be implemented (including data centre, HPC systems installation, testing and benchmarking) with in twenty (20) weeks from the date of PO release
		The bidder and OEM must undertake to install the IASRI HPC cluster installation and perform HPL (parallel linpack) to facilitate posting this cluster in the worldwide top500.org and in the Top_Indian_Supercomputing_sites listings of IISc Bangalore.
		Scope of work will include complete auditing, inspection and getting the Tier level (2 / 3) certificate for IASRI.
		DC to build strictly as per TIA 942 Standards for Datacenter.
		Scope of work will include the Safety and security audit of the data center to be built for IASRI (ISO 20000:1, ISO 27000:1) which may be asked at any stage by IASRI

C. TECHNICAL SPECIFICATIONS

The research in the field of agricultural bioinformatics needs high computing resources in terms of computer memory and computing speed. Therefore, there is a need to setup High Performance Computing Systems (HPC) in the Centre of Agricultural Bioinformatics (CABin) of IASRI New Delhi as well as in the domain institutions i.e NBPGR New Delhi, NBAGR Karnal, NBFGR Lucknow, NBAIM Mau and NBAII Bangalore under NAIP project of Component-I **“Establishment of National Agricultural Bioinformatics Grid in ICAR”**. It is proposed to setup Advance Super Computing facilities at IASRI New Delhi and moderate Super Computing facilities at domain institutions for undertaking research in the field of agricultural bioinformatics such as sequence analysis, genome annotation, computational evolutionary biology, analysis of gene expression, analysis of protein expression, prediction of protein structure, comparative genomics, modeling of biological systems, high-throughput image analysis, protein-protein docking, software tools and web services in bioinformatics etc. In order to undertake research in these field there is need to develop central repository i.e. Bioinformatics Data Warehouse (BinDW) at IASRI New Delhi and local data bases of different genomic resources at each domain institutions. Further, there is need to connect all six institutions i.e. one main centre and five domain institutions through high speed connectivity so that this National Agricultural Bioinformatics Grid is able to work in synchronized mode. There are four major components in establishment of these HPC systems:

- (i) High Performance Computing resources architecture
- (ii) Advance storage system architecture
- (iii) Advance Data Centre architecture
- (iv) Strong network architecture

Apart from this, there is need to integrate the above architectures in such as way that all system should work in a synchronized mode. The technical specification given below has been prepared by the project team of the institute. In the institute there is separate Division of Computer Applications which is responsible for taking up research, teaching and training in the field of Computer Applications. Apart from this, institute also provides post graduate degree in Computer Applications in collaboration with P.G. School IARI, New Delhi. There are more than 20 scientists in the institute working in this area. Most of the scientists working in this area are postgraduate in computer science but they do not have sufficient exposure and experience in the above technologies. Therefore, project team visited various institutions in the country having either HPC systems, advance data centre, undertaking research in bioinformatics to seek their opinion and learn from their experiences. Also, related literature/documents were collected for study and perceive the requirements of the project. Apart from this, number of experts and international labs having experience in the related area were contacted through electronic media for taking up their view. Considering views provided by these experts/ institutions, project team started searching on the internet for the latest technologies and OEM/Vendor/SI's capable of providing solutions in the relevant area. Based on the latest report from “Research of information technology companies and markets” i.e. IDC, project team selected top OEM/Vendor/SI's. After taking their inputs on available technologies in the market, technical specifications were defined. Apart from this, to take the inputs for other small components, relevant firms were also contacted in snowball mode based on available information. Further, number of relevant published tenders,

documents, white papers was collected either through Web or by personnel contacts from different organization for preparing draft documents of technical specifications of the project.

Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi.		
Sr. No.	Brief description of equipments	Quantity (in Nos.)
A1.0	HPC Systems-I	
Cluster Architecture	Dense compute server configuration based on Blade/Rack based architecture using 4X QDR Infiniband interconnects using Disk boot technology running Linux. Separate Windows and GPU based cluster also required to set up as per specifications given in the documents.	
SMP	SMP is Linux based and must be minimum of 500Gflops (peak).	
System Scalability	The cluster system to scale in modules of 12 or more computes Blade per chassis for blade base architecture and to a minimum of 56 Compute Nodes in dense based architecture per 42U in a single standard /OEM Rack’s footprint. The GPU compute nodes in the cluster must be suitably accommodated in the Rack keeping in view the power & cooling requirements.	
Processor Architecture	64-bit Processor from x86 family Intel XEON/AMD Opteron or latest family of processor.	
Co-Processor (GPU) Architecture	16 nodes GPU based cluster with support of CUDA, PGI Fortran/C CUDA Accelerator, C, C++, Fortran, OpenCL, direct Compute toolkits and NVidia parallel Nsight for visual studio.	
A1.1	Linux Cluster	
A1.1-(I)	Resource Management Nodes/Login Nodes	4 Nos.
(Blade\Rack mountable server 1U or maximum 2U form factor): It is to be configured with HPC cluster in HA Mode with load balanced configuration.		
Description	Technical Specification	Compliance
Processor Type	2x Intel Xeon Processor X5670 2.93Ghz or 2x AMD Opteron-6174 2.2Ghz and higher	
Cache	Minimum of 12MB L3 Cache required	
Processor	Minimum of 6 cores/Processor	

Memory Scalability	Scalable to minimum of 128 GB DDR3 ECC 1333 Mhz or higher.	
Memory Size	96GB DDR3 ECC SDRAM 1333 MHz or higher of 8 GB Module Each, Memory expandable to 128 GB or more. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Internal Storage	3x300GB 10K RPM, 6Gbps hot swap SFF SAS HDD (with RAID 0, 1)	
Internal Media Drive	16X DVD Writer	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	
I/O Ports	4x Gigabit Ethernet Port, 1x 10Gigabit Ethernet Port and QDR Infiniband 4X Port.	
PCI-E Slots	1x PCI-Express x16 slots free	
Power supply	Maximum power consumption not more than 550 Watts when fully populated. Redundant power supply with Hot-Swappable fan.	
Operating System	64 bit licensed Red Hat Enterprise Linux/Suse Linux Operating System with unlimited users.	
Certification	Server should certify Linux.	
Others	Highly Available load balanced Cluster configuration.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.1-(II)	Master Node	02 Nos.
(Blade\Rack mountable server 1U or maximum 2U form factor): It is to be configured with HPC cluster in HA Mode with NFS/NIS/PFS/Monitoring/etc with Linux Operating System.		
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670 2.93Ghz, or 2x AMD Opteron-6174 2.2Ghz or higher with minimum 12MB L3 Cache and minimum 6 Core/Processor.	
Memory	96 GB Memory (DDR3 ECC SDRAM 1333 MHz or higher of 8GB module each) upgradable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	6x450GB 10k RPM, 6Gbps hot swappable SFF SAS HDDs with RAID 0, 1, 5 capabilities with hardware	

	RAID controller.	
Ports	4x Gigabit Ethernet Port, 1x 10Gigabit Ethernet Port and QDR Infiniband 4X Port.	
USB	2x USB 2.0 or higher Ports	
PCI-E Slots	1x PCI-Express x16 slots free	
Power supply	Maximum power consumption not more than 550 Watts when fully populated. Redundant power supply with Hot-Swap Fan.	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	
Others	Other ports as per the requirement of HPC should be supplied. Internal 16X DVD Writer, 1U 17" rack mounted TFT/LCD Colour Monitor with Keyboard, Mouse.	
Form Factor	Blade/1U/2U Rack model with Rail kit	
Operating System	64 bit licensed Red Hat Enterprise Linux/Suse Linux Operating System with unlimited users.	
Certification	Server should certify Linux.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.1-(III)	HPC Compute Nodes (for Linux based Cluster)	256 Nos.
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670, 2.93Ghz or 2x AMD Opteron -6174, 2.2Ghz or higher with minimum 12MB L3 Cache and Minimum 6 Core/Processor.	
Memory	96 GB (DDR3 ECC 1333 MHz and minimum 8 GB module each or higher) Memory upgradeable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	Single 146GB 15K RPM SAS HDD or higher.	
Ports	2x Gigabit Ethernet Ports and QDR Infiniband 4X Port.	
Power supply	Maximum power consumption not more than 550Watts when fully populated. Configured with redundant power supply	

Node Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, SNMP based Manager, and etc.	
Operating System	64 bit Red Hat Enterprise/Suse Linux Operating System with unlimited users.	
Certification	Server should certified Linux.	
Others	Other ports as per the requirement of HPC should be supplied	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.2	Windows Cluster	
A1.2-(I)	Master Node	01 Nos.
(Blade\Rack mountable server 1U or maximum 2U form factor): It is to be configured with HPC cluster with Windows Operating System.		
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670 2.93Ghz, or 2x AMD Opteron-6174 2.2Ghz and higher with minimum 12MB L3 Cache and minimum 6 Core/Processor.	
Memory	96 GB Memory (DDR3 ECC SDRAM 1333 MHz or higher of 8GB module each) and upgradable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	6x300GB 10k RPM, 6Gbps hot swappable SFF SAS HDDs with RAID 0, 1, 5 capabilities with hardware RAID controller.	
Ports	4x Gigabit Ethernet Port, 1x 10Gigabit Ethernet Port and QDR Infiniband 4X Port.	
USB	2x USB 2.0 or higher Ports	
PCI-E Slots	1x PCI-Express x-16 free slots needs to be provided	
Power supply	Maximum power consumption not more than 550 Watts when fully populated. Redundant power supply with Hot-Swap Fan.	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	

Others	Other ports as per the requirement of HPC should be supplied. Internal DVD Writer, 1U 17" rack mounted TFT/LCD Colour Monitor with Keyboard, Mouse.	
Form Factor	1U/2U Rack model with Rail kit	
Anti Virus	Norton Internet Security 2011 Antivirus for 3 years License with media	
Operating System	64-bit licensed Windows HPC Server 2008 R2 Operating System with media.	
Certification	Server should certify Windows.	
Warranty	3 years comprehensive Onsite (24*7)	
A1.2-(II)	HPC Compute Nodes (for windows Cluster)	16 Nos.
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670, 2.93Ghz or 2x AMD Opteron -6174, 2.2Ghz and higher with minimum 12MB L3 Cache and Minimum 6 Core/Processor.	
Memory	96 GB (DDR3 ECC 1333 MHz and minimum 4 GB module each or higher) Memory upgradeable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	Single 146GB 15K RPM SAS HDD.	
Ports	2x Gigabit Ethernet Ports and Dual QDR Infiniband 4X Port.	
Power supply	Maximum power consumption not more than 550Watts when fully populated. Configured with redundant power supply	
Node Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, SNMP based Manager, and etc.	
Others	Other ports as per the requirement of HPC should be supplied	
Operating System	64-bit windows Operating System must be compatible with Windows HPC server 2008 R2.	
Certification	Cluster should certified windows.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.3	GPU Cluster	

A1.3-(I)	Master Node	01 Nos.
(Blade)\Rack mountable server 1U or maximum 2U form factor): It is to be configured with HPC cluster with NFS/NIS/PFS/Monitoring/etc with Linux Operating System.		
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670 2.93Ghz, or 2x AMD Opteron-6174 2.2Ghz or higher with minimum 12MB L3 Cache and minimum 6 Core/Processor.	
Memory	96 GB Memory (DDR3 ECC SDRAM 1333 MHz or higher of 8GB module each) upgradable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	6x300GB 10k RPM, 6Gbps hot swappable SFF SAS HDDs with RAID 0, 1, 5 capabilities with hardware RAID controller.	
Ports	2x Gigabit Ethernet Port, 1x 10Gigabit Ethernet Port and QDR Infiniband 4X Port.	
USB	2x USB 2.0 or higher Ports	
PCI-E Slots	1x PCI-Express x16 slots free	
Power supply	Maximum power consumption not more than 550 Watts when fully populated. Redundant power supply with Hot-Swap Fan.	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	
Others	Other ports as per the requirement of HPC should be supplied. Internal DVD Writer, 1U 17" rack mounted TFT/LCD Colour Monitor with Keyboard, Mouse.	
Form Factor	1U/2U Rack model with Rail kit	
Operating System	64 bit licensed Red Hat Enterprise Linux/Suse Linux Operating System with unlimited users with media.	
Certification	Server should certify Linux.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	

A1.3-(II)	GPU Compute Nodes	16 Nos.
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16 nodes must be with GPUs. The GPU compute nodes in the cluster must be suitably accommodated in the Rack keeping in view the power & cooling requirements		
Description	Technical Specification	
Processor	2x Intel Xeon Processor X5670, 2.93Ghz or 2x AMD Opteron -6174, 2.2Ghz and higher with minimum 12MB L3 Cache and Minimum 6 Core/Processor.	
Co-Processor	2x NVIDIA Fermi GPU Tesla-M2070 or equivalent with 6GB or higher memory per GPU	
Memory	96 GB (DDR3 ECC 1333 MHz and minimum 4 GB module each or higher) Memory upgradeable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	Single 146GB 15K RPM SAS HDD.	
Ports	2x Gigabit Ethernet Ports and QDR Infiniband 4X Port.	
Power supply	Maximum power consumption not more than 1100 Watts when fully populated. Configured with redundant power supply with redundant fan.	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (iLOM) or equivalent, SNMP based Manager and etc.	
Others	Other ports as per the requirement of HPC should be supplied	
Operating System	64 bit licensed Red Hat Enterprise Linux/Suse Linux Operating System with unlimited users.	
Certification	Server should certified Linux.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.4	SMP Based Computing	
A1.4-(I)	Symmetrical Multi Processing (SMP) (LINUX Based) Server	01 Nos.
SMP based architecture server, with Rack form-factor to be proposed : Server must be capable of 1.5 TB capacity memory scalability based on the proposed latest available memory technology on the server.		
Processor	Minimum of Eight physical processor based SMP based architecture to reach to a total of minimum 64 cores. The system should be able to provide at least 500 Gigafllops of peak throughput with 80% of linpack efficiency.	
Memory	The server must be configured with 1.5 TB capacity memory and scalable upto 2.0 TB. Latest memory technology like DDR3 ECC or equivalent as applicable to the proposed model should be proposed.	

Internal Storage	8x Internal 300 GB, 10k RPM SAS hot Swap hard disk with hardware RAID controller.	
Ports	Infiniband 4X HCA with QDR speed ports.	
NIC	4x 10 GbE NIC in a multiple sets of channel-bonded configuration.	
Others	16x Internal DVD-ROM and Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	
OS and Certification	Red Hat/Suse Enterprise Linux OS/Unix OS, fully licensed, certified and supported by OEM	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.5	HPC Software	
A1.5 - (I)	Clustering Software Suite	As per req.
	1. All quoted software must be licensed, certified and fully supported versions.	
	2. 42U OEM Racks with adequate rack accessories and PDU to be quoted.	
	3. HPC Cluster Configuration software must have GUI as well as Web based UI access.	
	4. HPC Cluster Management software must have a proven clustering capability of at least 1024 compute servers and should be listed in the current edition of www.top500.org or India_Top_Supercomputers listings to demonstrate the above-said scalability.	
	5. HPC Cluster Management suite must have extensive cluster monitoring capability to drill down to a node-level performance parameters using intuitive GUI and with well-designed graphical reports.	
	6. HPC Cluster Management suite must permit only secure shell (ssh) based access and a robust parallel-execution shell (pdsh) implementation. It should be configured to disallow access to compute server to other users whose jobs are not currently being executed on those servers.	
	7. Software for Red Hat Enterprise/Suse Linux Operating system, HPC Cluster Configuration, Deployment, Resource Management and Monitoring, and Job scheduling must be quoted with all software updates during the contract period provided free-of-cost.	
	8. Compilers: Fortran, C/C++, (PGI or Intel Compilers) and MPI software, licensed and supported. Also GPU Computing SDK with C/C++ Compilers, Fortran and Matlab for GPUs.	
	9. All the quoted software's license must be perpetual.	

	10. The compilers and development environment must be licensed for 10 concurrent users in a floating-license mode.	
A1.5 - (II)	Workload Management Software	As per req.
	1. Integrated workload management solution with web based job submission and HPC performance analysis and Reporting.	
	2. OEM licensed job scheduler with complete support and integration for scheduler, Integrated Portal framework for job submission and HPC Grid performance analysis for the proposed cluster must be quoted.	
	3. During the support, vendor should integrate those applications with batch submission script with the portal to facilitate seamless usage of the HPC Grid	
	4. Licensing of scheduler should be perpetual and floating licensing based & no open source/freeware.	
	5. Licensing for Grid portal & Accounting module to be quoted on concurrent users, perpetual and floating user’s basis.	
	6. Integrated Advanced scheduling features should include cross-system scheduling, Peer to Peer scheduling, with advanced fair-share & Hierarchical fair share scheduling, multi-cluster scheduling.	
	7. Grid enablement / Meta scheduling with HPCBP (High Performance Computing Basic Profile) and Web services based Application Integration Framework should be provided.	
	8. Power Aware Job Scheduling to support auto shutdown and auto boot of nodes as per the workload to be supported.	
A1.6	Switches	
NETWORKING : All clusters, SMP, Workstations, Application Servers, Thin Client, Storage needs to be connected similar to the figure of drawing2,drawing3 and drawing5 given in tender drawing Section.		
A1.6-(I)	Cluster Interconnect Network (IB Switches 4X QDR)	As per req.
	1. Infiniband 4X QDR speed Interconnect Fabric. Fully 100% non-blocking.	
	2. Compatible with the latest OFED drivers and OpenMPI libraries.	
	3. Should be connected to all the Infiniband ports in all the proposed servers, nodes and storages.	
	4. The Infiniband 4X fabric operating at QDR speeds to be proposed in	

	2. Compatible with the latest OFED drivers and OpenMPI libraries.	
	3. Should be connected to all the Infiniband ports in all the proposed servers, nodes and storages.	
	4. The Infiniband 4X fabric operating at QDR speeds to be proposed in	

	an core chassis based switch.	
	5. The proposed chassis based QDR Infiniband switch to scale up to 512 port connectivity.	
	6. The best-case and worst-case switch hops between any possible two compute nodes should not be more than three, as well as when 512 compute node configuration scenario. Only Infiniband QDR speed Optical cables to be proposed.	
	7. Switch proposed should have inbuilt subnet manager and all other hardware components like Power supply, leaf board etc. to be redundant.	
	8. Between any two nodes full bandwidth needs to be realized (Ratio 1:1).	
	9. Vendor should quote 5% additional Ports and cables.	
A1.6-(II)	Cluster Administration Network (1 Gigabit and 10 Gigabit Cluster Core Switches) :	As per req.
	<u>Cluster Core Switch Specification</u>	
	1. 1G and 10G Ethernet based cluster administration network.	
	2. Gigabit and 10 Gigabit Manageable Switches and suitable cables as required for the proposed HPC systems and storage.	
	3. Vendor should quote 5% additional UTP Patch cord Cat-6 factory Crimped.	
	4. Chassis based switch cluster with minimum 2 Nos. switches each with 10 or more payload slots.	
	5. Chassis with Redundant Power supply and Fan trays with support for hot swappable modules.	
	6. Each chassis in a cluster should provide a minimum of 2.4 Tbps active backplane capacity.	
	7. Each Chassis should support forwarding rate of minimum 1400 mpps for IPV4 and 900 mpps for IPV6.	
	8. Switch cluster should provide 1152 number of 10/100/1000 Mbps ports.	
	9. Switch cluster should provide non-blocking 60x10G fiber ports.	
	10. The Switch should have Modular operating system for High	

	availability.
	11. Should have Supervisor/CPU module redundancy in each chassis.
	12. All switches in a cluster should work in active-active mode for providing above mention performance.
	13. Should support stateful failover and hitless software upgrade.
	14. Should provide a mechanism to manage the traffic flow of control plane packets to protect the control plane against reconnaissance and Denial of Service (DoS) attacks.
	15. Switch should provide a mechanism to detect connectivity issues with both fiber and copper cabling. Ensures that a partially failed link is shut down on both sides, to avoid L2/L3 protocol convergence issues.
	16. Should support a mechanism to provide security and isolation between switch ports, helping ensure that users cannot snoop on other users' traffic.
	17. The Security features should support port filtering, enabling of individual ports to access only selected nodes, IP permit lists to prevent unauthorized access to the switch, Access Control Lists (ACL) to secure networks from unauthorized users, strong authentication and secure communications over un-secure channels for access to the network.
	18. Switch should provide mechanism to prevent unauthorized switch from taking over as the Root bridge or causing the Spanning Tree to re-converge.
	19. Switch should provide a mechanism prevents unauthorized switch from affecting core spanning tree topology, by auto-disabling access port.
	20. Should Provide IPv6 in hardware and software from Day One.
	21. Should support remote port mirroring ie mirror ports from and to any other switch in the network.
	22. Should provide VRRP for high availability.
	23. L2, L3 and L4 access control filters.
	24. Ethernet, Fast Ethernet, Gigabit Ethernet and 10G Ethernet protocols support.
	25. TACACS+ / RADIUS, which allows centralized control of the switch and restrict unauthorized users from altering the configuration.

	26. Support for Standard and extended ACL, VLAN ACL, Port ACL.	
	27. Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.6-(III)	Wireless Controller for Wireless Network	01 Nos.
	1. The wireless controller should be a separate hardware Appliance	
	2. Controller should have support for administering, configuration and management of at least 6Access points initially. Scalable up to 256 AP	
	3. Adequate licensing shall be supported on controller for 64 AP support from day 1	
	4. The Wireless controller should be able to support 11a/b/g & 11a/b/g/n AP's.	
	5. Wireless Controller should be capable of delivering centralized security policies; RF management, QoS, and Layer 3 fast secure roaming for campus wide WLANs.	
	6. The controller Architecture should be Layer 3 based and the Architecture of controller should support Centralized and Distributed functionalities.	
	7. The controller shall support central configuration & management of AP's	
	8. Should support Wired Switching/Routing IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX	
	9. specification, IEEE 802.1Q VLAN tagging, and IEEE 802.1D Spanning Tree Protocol, 802.1w/s,	
	10. IEEE link Aggregation	
	11. VLAN Assignments & Mapping with WLAN	
	12. L2-L4 ACL's	
	13. Management	
	14. SNMP v1, v2c, v3	
	15. Telnet, SSH2	
	16. Management Information for TCP/IP-Based Internets	
	17. SNMP MIB II	
	18. TFTP, Syslog support	
	19. Web-based: HTTP/HTTPS Interface	
	20. Command-line interface: Telnet/SSH/Serial	
	21. Multiple partitions with image failover capability	
	22. Role based access	

	23. User Audit trial	
	24. Minimum 4* 10/100/1000 Base-T RJ45 ports, 2* 1G SFP ports.	
	25. Should provide for a 3 years onsite comprehensive warranty (24*7).	
A1.6-(IV)	Wireless Access Point	6 Nos.
	1. Should be centrally manageable through a wireless controller & WLAN NMS from which the AP will download all parameters like boot image, configurations etc.	
	2. Should be centrally managed, optimized and administered via Wireless NMS	
	3. Data Rates 802.11a radio 6, 9, 12, 18, 24, 36, 48, 54 ,	
	4. Data rates 802.11n and 802.11g 24, 36, 48, 54 and 300 Mbit/Sec	
	5. Uplink – Auto sensing 802.3 10/100BASE-T Ethernet & LED indication for status, activity and error condition.	
A1.6-(V)	Cluster Management Network (IPMI) (10/100 Mbps Chasses Switches)	As per req.
	1. 10/100 Mbps of manageable Chasses switches for IPMI network communication with 325 number of ports +10% additional (Ports and Cables) in a single Chassis. The Chassis should have redundant Management Module and power supply.	
	2. The IPMI switch should be SNMP enabled. It should be operable from remote locations.	
	3. It should support multiple operating systems.	
	4. The device should virtually discover all the under mentioned IPMI devices over the LAN: IPMI 1.5 (incl. non-standard SoL support) , IPMI 2.0 , HP integrated Lights Out (iLO, iLO2) , Dell Remote Access Cards (DRAC III, 4, 5) , Dell M1000e Blade Chassis Controller , Dell iDRAC (Blades) , FTS iRMC , IBM RSA (RSA II) , IBM BladeCenter , Sun ALOM , Sun ILOM.	

	5. The Device should support Intelligent Platform Management Interface (IPMI), Intelligent Platform Management Bus (IPMB), Intelligent Chassis Management Bus (ICMB).
	6. System should provide capability of automatic discovery of service processors connected and DHCP Server.
	7. The Centralized management Software should have compatibility with different flavours of Windows, Linux and Solaris so that it can be installed and configured on any operating system as per requirement. The software

	should also support WIN 2008 server.	
	8. This software should be available as a standalone software installer CD which can be installed either on Virtual Machine or any available server as required.	
	9. The Centralized Mgmt software should be able to map with Power over IP hardware as a scalability feature.	
	10. The solution should have the capability of integration with the following external authentication systems: AD, LDAP, RADIUS, TACACS+, RSA Secure ID.	
	11. Warranty should provide for a 3 years onsite comprehensive (24*7).	
A1.7	Racks, Cabling and Integration	As per req.
	Racks:	
	1. 42U OEM Racks with adequate rack accessories and PDU.	
	2. 1U Rack mounted TFT Monitor/Keyboard/Mouse along with IPMI switch to monitor in the proposal.	
	3. The 42U and units shall support a static load of 1200KG.	
	4. The unit shall provide adequate ventilation to provide airflow required by the major server manufacturers.	
	5. The unit shall be available with a vertical equipment mounting space of 42U or (1U=1.75" or 44.45mm).	
	6. The 42U Rack can take load of servers that can consumed the power up to 25KW.	
	Cabling:	
	1. Neatly structured Cat-6 cabling for networked connectivity and for all the Power up to the rack level in the Data Centre.	
	2. Dedicated raceways / cable-trays should be used for laying LAN and Power cables.	
	3. Along with LAN Cat-6 cabling, the Agency should also design and lay cable trays for Storage Area Network (SAN) up to the racks in the Data Centre.	
	4. Cat-6 Cabling for IPMI switches on the racks should also be done by the Agency.	
	5. Cat-6 Cabling for Access-Point on the first floor should also be done by the Agency.	
	6. Additional cabling requirements on an on-going basis will also be	

	catered to by the Agency.
	7. Agency should ensure that all the cable raceways are adequately grounded and fully concealed with covers.
	8. The cables should be appropriately marked and labeled.
	Integration:
	1. The HPC Clusters should be integrated at Customer location in front of customer including all the components.
	2. At customer location, a 120-hour (5 days) continuous diagnostic/burn-in testing to be done in the presence of IASRI constituted committee members.
	3. Successful completion of high performance linpack-parallel carried out at the customer location with at least 80% sustained performance to the peak (except GPU cluster).

A1.8**HPC Infrastructure System****Technical Specifications of HPC Infrastructure Items**

Summary of Technical Specifications. The Goods and Related Services for which rates are to be quoted shall comply with following Technical Specifications and Standards:

A1.8-(I)	Precision Air-conditioning System	01 Nos.
	<p>Cooling</p> <p>Air-conditioning units shall be designed to achieve the specific environmental operating requirements published by the OEMs. The design shall ensure that their devices will function properly by maintaining the minimum and maximum operating temperature at the server intake, and the quantity of airflow measured in CFM required at the server's intake.</p> <p>Bypass of airflow (conditioned air supplied from the precision air conditioning units is delivered directly back to the air conditioners intake) like penetrating of air through cable cut-outs, holes under enclosures, or misplaced perforated tiles etc shall be completely blocked.</p> <p>Air leakage through holes/windows in the computer room perimeter walls and non-sealed doors shall be avoided. Proper sealing of computer room shall be mandatory.</p> <p>Recirculation of air (hot air exhausted from the rack-mounted computing device is fed back in to its own intake) shall be competed avoided. The vendor shall submit the airflow analysis or CFD analysis to support their</p>	

	<p>layout being designed will avoid all kinds of recirculation of air from top of the rack or through the vacant U space inside the racks.</p> <p>Design shall be based on the latest design technologies like closed coupled cooling with in row based units to minimize the recirculation of air to avoid potential overheating and damage to computing equipment which may result in disruption to mission-critical services in the data center.</p> <p>Air stratification (layering effect of temperature from the bottom to the top of the enclosure) shall be completely avoided in proposed design, by means of horizontal airflow.</p> <p>Positions of Indoor units shall be done wisely to reduce the distance of return air path from hot aisle to hot-air in-take of cooling units. Cooling units shall be positioned as closer to the heat load, so that any kind of recirculation of air can be avoided.</p> <p>Servers located at the highest points of a high density enclosure shall receive the required amount CFM calculated based on Delta T (For required Temperature, humidity and Air Flow).</p> <p>Temperature available across the entire face of server enclosures shall maintain within minimum and maximum operating temperature & relative humidity range</p> <p>The proposed solution shall be tested in Delhi conditions & shall be proven operation credibility in Delhi / NCR environment. There shall be minimum twenty five installations of the proposed solution / equipment in India.</p> <p>The agency needs to design the cooling system by using Precision systems and meet the following specifications -</p> <ol style="list-style-type: none"> 1. Capacity, CFM value, redundancy, Air flow, CFD, etc of Cooling system being designed and offered by the vendors must take care of the cooling requirements of complete system they are offering. 2. To maintain the temperature at 21 +/- 1 degree C across the entire face server enclosure for effective functioning of the Servers and to provide a sufficient temperature buffer in case of power failure. 3. To maintain the humidity at 45% RH +/- 5 to prevent condensation and static build up. 4. To provide filtration 95 % down to 5 micron for high-level of dust removal – To have high sensible heat ratios of about 95% to 98% so as to match it with the heat load pattern of the data center. 5. To have High CFM to be delivered to the racks so as to quickly remove the high heat generated by the servers, vendor must indicate the designed CFM Per KW. 6. All the PAHU units, chiller secondary pumps shall be powered through N+2 redundant ups, cooling inside the Data Center shall be maintained within the specified parameters even in the event of 	
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	power blackout or brown out.	
	7. The bidder should submit air flow analysis/CFM analysis to prove CFM availability equally across all the server racks from 0U to 42U.	

Detailed specifications of the cooling system are appended below:

S. No.	Detailed Technical Specifications – In Row Rack Cooling solutions	Complied, Yes/No	Deviations if any.
A	SUMMARY		
1	Make (to be mention by the bidder):		
2	Model(to be mention by the bidder):		
3	System capacity(to be mention by the bidder):		
4	Type of redundancy. (to be mention by the bidder):		
B	General Specifications		
1	Units shall be 42 U, Half rack width & include casters and levelling feet to allow ease of installation in the row and provide a means to level the equipment with adjacent IT racks.		
2	The frame shall be constructed of 16 gauge formed steel welded for maximum strength. All units shall provide full service from the front and rear, allowing units to be placed within a row of racks.		
3	Exterior panels shall be 18 gauge metal with 5 lb/ft ³ (80 kg/m ³) density foam insulation. Insulation complies with UL94-5VA ASTM E84 flame spread and smoke developed rating of 25/50. Front and rear exterior panels shall be 18 gauge perforated steel with 69.5% open free area, and equipped with a keyed lock to provide a means of securing access to the internal components of the unit..		
C	FANS		
1	Fans: The unit shall be configured for draw-through air pattern to provide uniform air flow over the entire face of the coil. Each unit shall have mixed flow direct drive DC axial fans with built in redundancy. Each unit shall deliver minimum airflow of 2900 CFM (1368.6 l/s).		
2	Variable Speed Fans: Fans shall be variable speed capable of modulating from 30-100%. Fans shall soft start to minimize in-rush current when starting (VFD Based mandatory)		
3	Variable Speed Fans: Fans shall be variable speed capable of modulating from 30-100%. Fans shall soft start to minimize in-rush current when starting		
4	Operation and Service: The unit should be capable of operation in the event of a fan failure. Fans shall be replaceable while the unit is in operation.		

D	POWER SUPPLY		
1	Input Power Feeds: Dual inputs shall be provided		
2	Operation and Service: Power supply shall be user replaceable.		
E	MICROPROCESSOR Controller		
1	Monitoring and Configuration: The master display shall allow monitoring and configuration of the air conditioning unit through a menu-based control. Functions include status reporting, set-up, and temperature set points. Four LEDs/LCD report the operational status of the connected air conditioning unit.		
2	Controls: The microprocessor controller shall come equipped with control keys to allow the user to navigate between menus, select items, and input alpha numeric information.		
F	CABLE WATER DETECTOR		
	A leak detection sensing cable shall be shipped loose with the unit. If water or other conductive liquids contact the cable anywhere along its length, the main controller visually and audibly annunciates the leak.		
G	ALARMS		
1	Alarms: The microprocessor controller shall activate a visible and audible alarm in the occurrence of the following events:		
	a. Internal Communications Fault		
	b. Link Isolation Relay Fault		
	c. Cooling Failure		
	d. Rack Inlet High Temperature		
	e. Air Filter Clogged		
	f. Lower Return Air Sensor Fault		
	g. Upper Return Air Sensor Fault		
	h. Lower Supply Air Sensor Fault		
	i. Upper Supply Air Sensor Fault		
	j. Rack Inlet Temperature Sensor		
	k. Coil Fluid Valve Actuator Fault		
	l. Fan Fault		
	m. Water Detection Fault		
	n. Condensate Pump Fault		
	o. Fluid Flow Meter Failure		
	p. Entering Fluid High Temperature		
	q. Entering Fluid Temperature Sensor		
	r. Leaving Fluid Temperature Sensor		

	s. Condensate Pan Full Alarm		
	t. Power Feed Failure		
	u. Fan Power Supply Fault		
	v. Air Filter Run Hours Exceeded		
	w. RACS Air Pressure High		
	x. Supply Air High Temperature		
	y. Return Air High Temperature		
	z. Group Communications Lost aa. Filter Sensor Fault ab. RACS Pressure Sensor Fault		
H	NETWORK MANAGEMENT CARD.		
1	The unit shall include a network management card to provide management through a computer network through TCP/IP. Management through the network should include the ability to change set points as well as view and clear alarms.		
I	COOLING COIL AND CONDENSATE PAN		
1	Cooling coil shall be capable of delivering a minimum airflow of 29000CFM		
2	The unit shall consist of a primary and secondary drain pan. Secondary drain pan shall be piped to primary pan for removal of condensate. Primary drain pan shall include a condensate pump and dual floats for control and overflow protection. Condensate pans are V-0 thermal formed, anti-fungal, non-ferrous material for higher indoor air quality.		
J	2-WAY/3-WAY FLOATING POINT VALVE		
1	Chilled water system shall utilize a three-way valve to regulate the amount of chilled water to the cooling coil to maintain desired conditions. Unit shall be equipped with a manual shut-off to close the by-pass leg for field configuration of 2-way or 3-way operation. Valve shall be piped internally with unions to allow for easy replacement in the field. The standard valve pressure rating shall be 600 psig.		
2	Valve Actuator: Actuator shall be direct connect rotary floating point style actuator and should be capable of being replaced without disconnecting piping from the valve.		
K	CONDENSATE PUMP		
1	Factory Installed and wired condensate pump shall pump 1.3 gal/h (5.9 liters/hour) at 16 ft (4.9 m) of lift and a 50 ft (15.2 m) horizontal run.		
L	FILTERS		
1	Standard Air filter: <20% efficient per ASHRAE 52.1, MERV 1 per		

	ASHRAE 52.2, 1/2" washable mesh filter.																																																																										
2	Optional Air filter: High capacity 2" pleated, UL 900 Class 2, Moisture with average atmospheric dust spot efficiency of 30% per AHRAE Standard 52.1, MERV 8 per ASHRAE 52.2																																																																										
M	REMOTE TEMPERATURE SENSOR & FLOW METER																																																																										
N	FLOW METER																																																																										
	Flow meter shall be factory piped inside the unit and connected to microprocessor controls to provide water flow rate through the unit. The microprocessor controller shall also use this information to provide total unit capacity out of the unit while in operation.																																																																										
O	Chilled Water																																																																										
	The unit shall be piped in accordance with the highest commercial quality procedures. All pipes forming shall be tool bent with the proper bend radii to prevent flattening in the curve. The chilled water piping shall be insulated with closed neoprene thermal insulation. All piping connections should be made at the rear of the unit for top or bottom accessibility.																																																																										
P	Water-softener System																																																																										
	<p>Bidder should provide appropriate Water-Softener System of 500 litre Capacity to process raw water hardness. The product should be from an ISO certification organization with following specifications:</p> <table> <tr> <td>MOC</td><td>:</td><td>FRP</td><td></td></tr> <tr> <td>Max. flow Rate</td><td>:</td><td>m3/hr</td><td>3.0</td></tr> <tr> <td>Min flow Rate</td><td>:</td><td>m3/hr</td><td>0.3</td></tr> <tr> <td>Max. working pressure</td><td>:</td><td>kg/cm2g</td><td>3.5</td></tr> <tr> <td>Min working pressure</td><td>:</td><td>kg/cm2</td><td>2</td></tr> <tr> <td>Treated water hardness</td><td>:</td><td>ppm/CaCO3</td><td></td></tr> <tr> <td colspan="4">(Depend on Raw Water Hardness)</td></tr> <tr> <td>Salt per regeneration</td><td>:</td><td>kgs</td><td>16</td></tr> <tr> <td>Resin Quality</td><td>:</td><td>INDION 220 Na</td><td></td></tr> <tr> <td>Resin quantity</td><td>:</td><td>ltr.</td><td>100</td></tr> <tr> <td>Coarse Silex (Kgs)</td><td>:</td><td>kgs</td><td>40</td></tr> <tr> <td colspan="4"> </td></tr> <tr> <td>Regeneration tank capacity</td><td>:</td><td>100</td><td></td></tr> <tr> <td>Brine value 30% (liters)</td><td>:</td><td>53</td><td></td></tr> <tr> <td>Type of Multiport Valve used</td><td>:</td><td>40 NB T/M Soft./25 NB Soft.</td><td></td></tr> <tr> <td>Raw Water Hardness</td><td>:</td><td>ppm</td><td>600</td></tr> <tr> <td>Out Put per regeneration</td><td>:</td><td>m3</td><td>9</td></tr> <tr> <td>Pressure Vessel Size "D X H"</td><td>:</td><td>inch</td><td>13 X 54</td></tr> </table> <p>System should include following items :</p>	MOC	:	FRP		Max. flow Rate	:	m3/hr	3.0	Min flow Rate	:	m3/hr	0.3	Max. working pressure	:	kg/cm2g	3.5	Min working pressure	:	kg/cm2	2	Treated water hardness	:	ppm/CaCO3		(Depend on Raw Water Hardness)				Salt per regeneration	:	kgs	16	Resin Quality	:	INDION 220 Na		Resin quantity	:	ltr.	100	Coarse Silex (Kgs)	:	kgs	40					Regeneration tank capacity	:	100		Brine value 30% (liters)	:	53		Type of Multiport Valve used	:	40 NB T/M Soft./25 NB Soft.		Raw Water Hardness	:	ppm	600	Out Put per regeneration	:	m3	9	Pressure Vessel Size "D X H"	:	inch	13 X 54		
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	<ol style="list-style-type: none"> 1. One FRP pressure vessel fitted with plastic internal fitting. 2. One Manual lever operated multiport valve with brine ejector and plastic piping. 3. One Complete charge of INDION 220 cation exchange resin. 4. One combined salt tank of HDPE / FRP with fitting and brine filtering media. 5. All civil work including foundation, piping, plumbing with material Fittings & Labour drain and acid / alkalis lining and all Labour work wherever required . 6. All pumps and storage tanks for treated water 7. All laboratory chemicals and instruments as required for routine monitoring, 8. All electrical items / point including motor starter / Control Panel and cabling works. 9. Any other items required for proper functioning and operation of the plant in all respect. 		
Q	Chilled water distribution		
A	SUMMARY		
1	Make (to be mention by the bidder):		
2	Model (to be mention by the bidder):		
3	System capacity (to be mention by the bidder):		
B	General Specifications.		
1	These specifications describe requirements for a system designed for Chilled water distribution to modular In-Row rack cooling units. The system shall be designed to distribute and balance the chilled water / glycol in flexible joint less piping to the air conditioners. The manufacturer shall design and furnish all the piping and fittings required for cooling distribution from the distribution unit to the In-Row rack cooling units.		
C	DESIGN REQUIREMENTS		
1	The cooling distribution unit shall include a supply and return distribution manifold. Each manifold should include 12 pipe branches with shut-off and balancing valves. The unit shall be factory-assembled with isolation and balancing valves and shall be designed to be used with joint less flexible piping.		
D	Submittals		
1	Submittals shall be provided with the proposal and shall include: overall dimensions of the unit, total of circuits used, maximum chilled water/glycol flow per circuit, calculated run of flexible piping per circuit and piping connection drawings at the CDU and at the In-Row RC.		

E	Standard Components		
	A. Cabinet Construction		
	1. The frame shall be 16 gauge formed steel and bolted together.		
	2. The front and back exterior panels shall be 18 gauges steel and the side exterior panels shall be 20 gauges steel.		
	3. All exterior panels and corner posts on the frame shall be powder coated black. The unit shall include front removable panels for system balancing and service and side removable panels to allow for main piping connections.		
	4. The front panels shall have provisions to be locked with a key.		
	5. The unit shall include casters for easy installation and leveling feet at each corner.		
	6. All piping including headers and distribution lines shall be insulated with ½-inch (12.7 mm) closed cell insulation		
	B. Connections		
	1. The unit shall include either top connection to be piped overhead attached thru the ceiling structure or bottom connections to be piped thru the raised floor. The main supply and return connection shall be 3 inches (76.2 mm) NPT each		
	C. Valves		
	1. Each supply branch shall be 1 inch (25.2 mm) I.D. and shall include a balancing & shut-off valve to provide a single point of balancing at the distribution unit.		
	2. Each return branch shall be 1 inch (25.2 mm) I.D. and it shall include a ball valve for isolation.		
	3. A ¼" (6.35 mm) male flare port with Schrader valve shall be include in each supply and return branch for pressure test and drain.		
	D. Drain Pan		
	1. A drain pan with a ¼" (6.35 mm) plastic tube connection shall be included at the bottom of the unit.		
	E. Flexible Piping		
	1. Joint less flexible piping shall be used for chilled water/glycol distribution from the CDU to the In-row rack cooling units..		
	2. The piping shall be cross linked polyethylene/aluminum/cross linked polyethylene tubing (PEX-AL-PEX) manufactured by PEX-b method. Vendor has to guarantee the performance of these piping for at least 25 years. These piping has to have some type of residue protections coating on the inner side , to avoid all kinds of blockings inside.		

	3. The temperature and pressure ratings of the piping shall be: 200°F (93.3°C) at 100 psi (689.5 kPa), 180°F (82.2°C) at 125 psi (861.8 kPa), and 73°F (22.8°C) at 200 psi (1378.9 kPa).		
	4. Piping shall conform with ASTM Standard: ASTM E814, ASTM F1281 and NSF Standard: NSF-PW 14 and 61		
	5. Piping length shall not exceed 150 feet (45.72 m) from the CDU to the air conditioner and it shall only include fittings at the CDU and at the In row rack cooling units..		
	6. Pipe connections to the CDU and In-Row rack cooling shall be made with multipress couplings that are crimped at each connection to ensure no leakage in the system.		
	7. All piping shall be insulated in the field with ½-inch (12.7 mm) closed cell insulation.		
	F. Pipe Clamps		
	1. Pipe clamps shall be factory provided and field installed at least every 32 inches (812.8 mm) when piping is installed overhead to properly secure the PEX piping to the ceiling. (Refer to local codes for exact spacing requirements)		
	2. The clamps shall include a center hole that permits the use of a 3/8" (9.5 mm) threaded rod for anchoring.		
	G. Pipe Shroud		
	1. A pipe shroud constructed of the same material and finish than the CDU shall be shipped loose for installation at the top of the CDU.		
	H. Insulation		
	1. 1.38-inch x ½-inch (35.05 mm x 12.7 mm) closed cell insulation		
R	Environmental Monitoring Unit		
1	Monitors temperature and humidity at rack enclosure level at 3 levels for high density racks. 4 contact closures for control circuits 2nd probe available for monitoring at top and bottom of each rack enclosure Temperature and Humidity monitoring probes shall have SNMP capability (Get / Set) and made available on TCP/IP.		
S	Air- Conditioner in UPS Room		
1	UPS is a heat generating device and would be housed in a separate room outside data centre. The environmental controls in this room shall be provisioned by the agency.		
2	UPS room to be kept at around 24 degrees Celsius for optimum health of the Batteries. Chilled water PAHU (w/o precision Temp & humidity control) for this area shall be provided with N+1.		

T	Air Cooled Scroll Chiller:		
A	EQUIPMENT		
	The air Cooled Chilling plant shall be factory assembled & tested. The chilling units comprising of scroll compressor, direct driven with electric motor, air-cooled condenser, Shell & tube chiller, inter connecting refrigerant plumbing, microprocessor based control panel, all safeties and controls including first charge of refrigerant & compressor oil. The chiller should be EUROVENT Certified.		
B	SCREW/ SCROLL TYPE COMPRESSOR		
	<p>The screw/ scroll compressor shall have a rotary twin screw compressor having Semi-sealed compressor. It shall using refrigerant R-410a.</p> <p>Chiller with scroll compressor shall be Multiple compressor and circuit.</p> <p>Scroll Compressors: Shall be hermetic, scroll-type, including:</p> <ol style="list-style-type: none"> 1. Compliant design for axial and radial sealing 2. Refrigerant flow through the compressor with 100% suction cooled motor. 3. Large suction side free volume and oil sump to provide liquid handling capability. 4. Compressor crankcase heaters to provide extra liquid migration protection. 5. Annular discharge check valve and reverse vent assembly to provide low-pressure drop, silent shutdown and reverse rotation protection. 6. Initial Oil charge. 7. Oil Level sight glass. 8. Vibration isolator mounts for compressors. 9. Brazed-type connections for fully hermetic refrigerant circuits. 10. Compressor Motor overloads capable of monitoring compressor motor current. Provides extra protection against compressor reverse rotation, phase-loss and phase imbalance <p>The units shall be complete with automatic capacity control mechanism, to permit modulation between 15% to 100% of capacity range.</p> <p>Air Cooled Evaporator: Direct expansion type with refrigerant inside high efficiency copper tubes, chilled liquid forced over the tubes by galvanized steel baffles, Constructed, tested, and stamped in accordance with applicable sections of ASME/GB pressure vessel code.</p> <p>Shell covered with 3/4" (19mm), flexible, closed cell insulation, thermal conductivity of 0.26k ([BTU/HR-Ft²-°F]/in.) maximum. Water nozzles with grooves for mechanical couplings, and insulated by Contactor after pipe installation.</p> <p>Provide vent and drain fittings, and thermostatically controlled</p>		

	heaters to protect to -20°F (29°C) ambient in off-cycle.		
C	Air Cooled Condensers		
	<ol style="list-style-type: none"> 1. Coils: Condenser coils are made of a single material to avoid galvanic corrosion due to dissimilar metals. Coils and headers are brazed as one piece. Integral sub cooling is included. The design working pressure of the coil is 650 PSIG (45 bar). Condenser coils must be cleanable with the use of a standard (up to 1500 psi) pressure washer. 2. Condenser Coils must be protected from debris (i.e. Hail Stone) by a protective panel to ensure longer equipment life and better unit performance. 3. Low Sound Fans Shall be dynamically and statically balanced, direct drive, corrosion resistant glass fibre reinforced composite blades molded into a low noise, full-airfoil cross section, providing vertical air discharge and low sound. Each fan in its own compartment to prevent cross flow during fan cycling. Guards of heavy gauge, PVC (polyvinylchloride) coated or galvanized steel. 4. Fan Motors: High efficiency, direct drive, 6 pole, 3 phase, insulation class "F", current protected, Totally Enclosed Air-Over (TEAO), rigid mounted, with double sealed, permanently lubricated, ball bearings. 		
D	Other Features		
	<ol style="list-style-type: none"> 1. Microprocessor controlled, Factory installed Across the-Line type compressor motor starters as standard. 2. Outdoor Ambient Temperature Control 3. High Ambient Control (Factory Mounted): 4. Permits unit operation above 115°F ambient. 5. Power Supply Connections: 6. Single Point Power Supply: Single point Terminal Block for field connection and interconnecting wiring to the compressors. Separate external protection must be supplied, by others, in the incoming power wiring, which must comply with the National Electric Code and/or local codes. 7. Control Power Transformer: 8. Vibration Isolation (Field-mounted): 1 Inch Deflection Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails. 		
E	Refrigerant Piping		
	<ol style="list-style-type: none"> 1. Refrigerant shall be provided as detailed and scroll Chiller or as per manufacturer's designed. 		
F	Insulation:		
	<ol style="list-style-type: none"> 1. The chiller shall be provided with minimum 19 mm thick nitril insulation. 2. The chiller supplied should be skid mounted on robust MS frame 		

	<p>complete with all components i.e. compressor motor, chiller, inter connecting, control panel, refrigerant piping duly insulated, valves, control microprocessor control panel with isolator, ass safeties, sensors duly wired and gas & oil motor unit charged, vibration isolators should be provided below compressor.</p> <p>3. The chiller should be tested in factory for its satisfactory performance at all load capacities. Test certificate should be provided along with chillers for its performance confirmation at designed parameters. The chiller shall be paint finished as per manufacturer's standard. The chiller should be paint finished as per manufacturer's standard. The chiller should be supplied with Victaulic coupling at condenser & Chiller for water lines.</p> <p>4. The chiller shall be installed on RCC foundation with adequate isolators against transmission of vibration. Water plumbing and electric cabling should be provided as per tender specifications.</p>		
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A1.8 (II)	Power Distribution-Rack Mounted Metered PDU	As per req.
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UPS output Power Distribution

The Data centre power distribution unit shall reside inside the DC room, closer to server racks. Current (AMP) should be monitored for all the MCCBs connected on this power distribution unit (Digital Display). Output power cables from UPS output panels shall be routed through two different paths. Fully rated 3 phase four wire copper flexible cables shall be used for energizing power distribution units.

All the output MCCBs powering server racks & network racks shall be mounted in this floor mount power distribution units. An EPO - Emergency Power Off should be made available inside the Data Centre.(This can be put in UPS Room) This power distribution shall have digital metering for VOLTAGE AND CURRENT for ALL THREE PHASES, NEUTRAL & EARTH CURRENT. PDU should have option of bottom cabling or top cabling.

Power cabling from breakers mounted in Data Centre power distribution unit to the individual racks shall be routed through the power cable tray mounted on hot aisle.

Power Distribution Strips

PDU shall have power management capabilities through its basic, metered and managed power distribution offering. Power distribution strips has to have option to manage power-intensive servers in densely-packed enclosures remotely through power distribution trips.

Power Distribution Channels shall allow tool-less mount on zero U space to avoid cable conjunction inside the racks.

A single rack-mount PDU should be capable of providing up to 22kW minimum of power in server racks & 4kW of power for the network racks, eliminating multiple connector strips per rack. Universal IEC C -19 and/or C -13 should be the receptacles for PDU. Units should have a digital display and network connections in built in PDU. PDU to be monitored over TCP/IP.

The unit shall have digital display to show the current flow through it. Detailed specifications for PDU are given below:

S. No.	Specifications for Power Distribution Units	Complied Yes/No	Deviations if any.
A	Summary		
1	Make		
2	Model		
3	Capacity		
B	General Specifications		
1	Rack power distribution should have at least 15 C-13 outlets & 04 Nos. of C-19 outlets		
2	Rack power distribution offerings meet the needs a way to monitor the current draw at each rack		
3	The rack power distribution shall be a zero U mounting unit		
4	It shall Monitor the aggregate current draw; avoid overloaded circuits; balance loads		
C	User Interface & load indicator		
1	Units have a digital display and network connections in built in PDU		
2	PDU should Indicates overload and warning conditions based on the user-defined alarm thresholds.		
3	The PDU should provide alarms & alerts to user about potential problems.		
D	Power and Data Cable Routing		
	Adjustable power cable troughs and data partitions fit seamlessly into the roof of the server / Network rack No raised floor required and no suspended ceiling. Toolless cable ladders for row-to-row cable routing. Distance between power and data cable should be at least 800 mm away.		
E	STANDARDS & REGULATORY APPROVALS		
1	CCC,CE,VDE (TIA-942)		

A1.8 (III)	Gas Suppression System with accessories	01
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1. Capacity of gas suppression system being offered must be capable of suppressing any type of fire of the whole Data Centre.
2. Capacity and no. of Gas Cylinder must be mention by the bidder.

S. No.	Specifications	Complied, Yes/No	Deviations if any.
3.	This specification is for procurement of C-6, Fluro-keton Clean Agent Based Fire Suppression System. It shall be used as a standard for the system Equipment, System Installation and Acceptance testing.		
4.	Authorization from Indian Distributors of the certified OEM for NOVEC 1230 equipment, authorized and certified by parent companies i.e., 3M for NOVEC 1230, to manufacture and market their Fire Protection Systems.		
5.	The Indian Distributor should have executed at least Two (2) Projects involving NOVEC 1230 system designing, supply, erection, testing and commissioning of value at minimum Indian Rupees 25 lacs so as to qualify for this tender.		
6.	The OEM system should be approved by LPCB.		
7.	The Indian Distributor shall have in India, a Chief Controller of Explosives, Nagpur Certified NOVEC 1230 refilling station.		
	<u>Specific Technical Requirements:</u>		
1.	The Storage Container offered shall be of Seamless type meant for exclusive use in HFC systems, and should be approved by Chief Controller of Explosives, Nagpur. Welded cylinders are not permitted.		
2.	The storage pressure in the cylinders will be 42 bars.		
3.	The Valve operating actuators shall be of Electric (Solenoid) type. The actuators should be capable of being functionally tested for periodic servicing requirements		
4.	The individual cylinder bank shall also be fitted with a manual mechanism operating facility that should provide actuation in case of electric failure. This mechanism should be integrated as part of the actuator.		
	<u>GENERAL TECHNICAL REQUIREMENTS.</u>		
1.	The designer shall consider and address possible Fire hazards within the protected volume at the design stage. The delivery of the NOVEC 1230 system shall provide for the highest degree of protection and minimum extinguishing time. The design shall be strictly as per NFPA standard NFPA 2001.		
2.	The suppression system shall provide for high-speed release of NOVEC 1230 based on the concept of total Flooding protection for enclosed areas. A Uniform extinguishing concentration shall be 4.2% (v/v) of NOVEC 1230 for 70 deg		

S. No.	Specifications	Complied, Yes/No	Deviations if any.
	F, or higher as recommended by the system / agent manufacturer.		
3.	The system discharge time shall be 10 seconds or less, in accordance with NFPA standard 2001.		
4.	Sub floor and the ceiling void to be included in the protected volume.		
5.	The NOVEC 1230 Fire Suppression System shall include an addressable detection and control system provision for both pre-alarm and automatic agent release.		
6.	The detection and control system that shall be used to trigger the suppression shall employ cross zoning of photoelectric smoke detectors.		
7.	The bidder shall provide the Cylinder CCOE Certificates.		
8.	The NOVEC 1230 discharge shall be activated by an output directly from the Gas Release control panel, which will activate the solenoid valve. NOVEC 1230 agent is stored in the container as a liquid.		
9.	Brass discharge nozzles shall be used to disperse the gas. The nozzles shall be brass with female threads and available in sizes as advice by the OEM system manufacturer. Each size shall come in two styles: 180° and 360° dispersion patterns.		
10.	Manual Gas Discharge stations and Manual Abort Stations, in conformance to the requirements put forth in NFPA 2001 shall be provided.		
11.	Acceptance Tests: Acceptance for the System installation, inclusive of the piping and requisite cabling shall be strictly in accordance with the installation acceptance guidelines.		

A1.8 (IV)	Smoke Detection System	01
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1. Smoke Detection System being offered must meet the requirement prescribe by agencies and must be able to detect any type of smoke in the whole Data Centre and send alarm for the same.
2. No. of Smoke Detectors must be as per requirements and the same must be mentioned by the bidder.

Specifications	Complied, Yes/No	Deviations if any.
A. General		
A Very Early Smoke Detection System consisting of highly sensitive LASER-based Smoke Detectors with aspirators connected to networks of sampling pipes.		
B. System Description		
1. Design Requirements		
Shall consist of a highly sensitive LASER-based smoke detector, aspirator, and filter.		
The detection unit shall also include a scanning valve mechanism to identify which sampling pipe is carrying smoke.		
The system shall allow programming of: Four smoke threshold alarm levels per pipe (sector); time delays; faults including airflow, detector, power, filter and network as well as an indication of the urgency of the fault; seven or twelve configurable relay outputs for remote indication of alarm and fault conditions.		
C. Qualifications		
1. Manufacturer		
The manufacturer shall have a minimum of 5 years production experience in the manufacturer and design of high sensitivity aspiration-type smoke detection systems. The manufacturer shall be certified as meeting ISO 9002 for manufacturing.		
D. Technology		
Both Light Scattering and Particle Counting shall be utilized in this device as follows:		
The Laser Detection Chamber shall be of the mass Light Scattering type and capable of detecting a wide range of smoke particle types of varying size.		
E. Device Networking Requirements		
The devices in the smoke detection system shall be capable of communicating with each other via twisted pair RS485 cable. The network shall be able to support up to 250 devices (detectors, displays and programmers), of which at least 100 detectors can be supported.		

The network shall be capable of being configured in a fault tolerant loop for both short circuit and open circuit. Any communication faults shall be reported unambiguously and shall be clearly attributable to an individual device or wire link in the fault messages.		
PC based configuration tools shall be available to configure and manage the network of detectors.		
F. Digital Communication Port		
Shall comply with EIA RS485 Protocol		
G. Application		
1. Detection Alarm Levels		
The laser based aspirating detection system shall have four (4) alarm thresholds per pipe (sector). The four alarm levels may be used as follows:		
Alarm Level 1 (Alert) : Activate a visual and audible alarm in the fire risk area.		
Alarm Level 2 (Action) : Activate the electrical/electronic equipment shutdown relay and activate visual and audible alarms in the Security Office or other appropriate location.		
Alarm Level 3 (Fire 1) “ Activate an alarm condition in the Fire Alarm Control Panel to call the Fire Brigade and activate all warning systems.		
Alarm Level 4 (Fire 2) : Activate evacuation action or shut down of systems)		

A1.8 (V)	Burglar Alarm System	01
Specifications	Complied, Yes/No	Deviations if any.
1. To protect the data centre and other external restricted premises from unauthorized access or break-in, a burglar alarm system should be installed at the main entrances and all exits. 2. The alarm system may also provide "Door-Remains-Open" warnings to operators. 24 hours standby battery supply to the operation of the burglar alarm is necessary to cater for power outage. 3. The burglar alarm system needs to be wireless and should have door sensors, PIR sensors. 4. The burglar alarm system should be equipped with an auto-dialer facility to at least 2 mobile numbers for any unauthorized entry.		

A1.8 (VI)	Rodent Control System	01
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The entry of Rodents and other unwanted pests shall be controlled using non-chemical, non-toxic devices. Ultrasonic pest repellents shall be provided in the false ceiling to repel the pests without killing them. However periodic pest control using Chemical spray can be done once in 3 months as a contingency measure to effectively fight the pest menace. The rodent control system should comprise of an Ultrasonic Pest of Repellant System comprising of following: Ultrasonic Pest Repeller (VFHO Model), with 3 Master Console and 34 Satellites. Cable 2 Core x 1.5 mm² Cu. Are. Factor range shall be between 0.5 and 2.0 (where 2.0 doubles the normal) of an VFHO Model

- Configuration : Master console with necessary transducer
- Operating Frequency : Above 20 KHz (Variable)
- Sound Output : 50 dB to 110 dB (at 1 meter)
- Power output : 800 mW per transducer
- Power consumption : 15 W approximately
- Power Supply : 230 V AC 50 Hz
- Mounting : Wall / Table Mounting

A1.8 (VII)	Infrastructure Management System	01
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Datacenter infrastructure management software

A centralized physical infrastructure monitoring system which is capable to record historical data, events and send event details through email shall be provided to monitor & maintain the maximum up time for all the components inside the Data Center.

The device shall be SNMP compatible & can browser accessible which can monitor multiple parameters of all the IP based equipments in Data Center infrastructure, like uninterrupted power supply units, PACs, power distribution units, rack level PDUs, Environment monitoring units, DG sets, Cameras etc.

The proposed solution shall be capable of

Device Level Monitoring - Lowest level management at the device, access through Network Management Cards

Centralized Monitoring - Vendor-neutral SNMP enabled device support, with a live & unified view.

Inventory Management – providing an overview of the entire data center inventory & SNMP enabled assents in IASRI's LAN.

Predictive Simulation & Modeling – providing accurate simulation of live data and the capability to create what-if scenarios

This management solution, shall be an IT-ready, scalable monitoring system which should collect, organizes, and distributes critical alerts to selected modes anywhere in IASRI's s LAN / WAN.

This solution shall be capable of providing a centralized repository for critical power, cooling, environmental, and surveillance data and events.

This centralized software solution can be accessed by multiple users, from anywhere on the network. It shall be cable of real-time monitoring, generating user-defined reports and graphs, and instant fault notification and escalation, which shall enable quick assessment and resolution of critical issues by IASRI.

S. No.	Specifications for IMS	Complied Yes/No	Deviations, if any
1	This specification describes the operation and functionality of an Infrastructure Management System hereafter referred to as the IMS. The IMS shall be a centralized server appliance with a web accessible console. The system shall have an architecture that allows for increasing the number of devices it manages up to 1000 devices. The system shall have the ability to manage 1000 devices on the public Local Area Network (LAN) or have the ability to manage 1000 devices on a private Local Area Network (LAN). The System shall operate in a manner that allows for management of a total of 1000 devices which can reside on both the public LAN and the private LAN. The System shall also be of an architecture that allows for an automated update of the devices it manages as well as auto detection of updates for the server itself.		
	Specifications for Data Centre Infrastructure Manager	Complied Yes/No	Deviations, if any
A	SUMMARY		
1	Make		
2	Model		
B	General Specifications:		
	In addition, this specification shall provide the Infrastructure Management of the Uninterruptible Power System (UPS), Power Distribution Unit (PDU), Rack PDU (rPDU), Computer Room Air Conditioning (CRAC), Environmental Monitoring Unit (EMU), Environmental Management System (EMS),		
	The IMS and associated equipment shall operate in conjunction with an existing network infrastructure to provide system management of the systems described above. The IMS and associated equipment shall bear the UL60950 listing as a complete product solution or its Indian equivalent.		

C	Standards		
1	UL 60950 - Information Technology Equipment		
2	FCC Part 15, Sub-Part B, Class A		
3	CE EMC Directive, CTICK, Industry Canada		
4	CE Safety (Directives 73/23/EEC&93/68/EEC), VDE Safety Approval		
5	NFPA- National Fire Protection Associations		
6	NEMA - National Electrical Manufacturers Association		
7	OSHA - Occupational Safety and Health Administration		
8	ISO 9001		
9	ISO 14001		
D	REQUIREMENTS		
1	All material and equipment used shall be standard components, regularly manufactured and available and not custom designed especially for this project		
2	The IMS shall be a server based appliance, with only a specified web browser required to access the user interface.		
3	The manufacturer will supply a management system that will require no factory customization to meet customer requirements.		
4	The system architecture shall be scalable, allowing for future enhancements and allow for an increase in the number of devices managed up to 1000.		
5	The system shall manage devices both on a public network and on a private LAN.		
6	Real-Time Online PUE monitoring is required.		
7	The system shall be capable of managing a total of 1000 devices on a public or a private LAN.		
8	The system shall have the capability of being remotely monitored and managed 24 hours a day, 7 days a week by the manufacturer and this service shall be free for the first year of ownership.		
9	Network configuration settings (IP addresses, subnet mask) necessary for the IMS and any device to reside on the owner's public network.		
10	E-mail addresses and SMTP settings for e-mail notification.		

11	The Network Management Station IP address and community string for SNMP trap notification from the IMS.		
12	Contact Information for the Remote Monitoring Service.		
13	The contractor shall perform the following, if the listed equipment is not purchased by the owner from the IMS Vendor.		
14	Provide the Category 5, Category 6, or fiber network connection to IMS.		
15	Provide the Category 5, Category 6, or fiber network connection to the devices managed by IMS.		
16	Provide control wiring to optional Environmental Monitoring Units or Environmental Management Systems for monitoring of dry contact points.		
17	Provide termination of the RS-485 serial cable used for Building Management System monitoring, if specified by the owner.		
18	Provide the Network Management Station IP address and community string for SNMP trap notification, if specified by the customer.		
19	Provide system start-up, commissioning, and operator orientation by factory employed Field Service Engineer. This shall include discovery of devices and creation of the customer defined grouping structure for devices.		
20	Provide 7 x 24 service and technical support through a toll free number.		
21	Reports shall be provided and sorted by groups, for the Following:		
E	Display		
1	The user interface shall be capable of displaying real time power values based on the association of a Rack PDU and a rack. The user interface shall display the calculated power value (in kW) of the total power consumed by each Rack PDU in their defined rack. The user must be able to add and remove Rack PDU's from their defined Racks.		
2	The user shall have the ability to define the upper and lower kW thresholds as well as the ability to define the time duration for those thresholds.		
F	Device Grouping		

1	The user shall be able to define groups in a tree format. This shall allow a user to add groups and then sub groups below those groups. The user shall also have the ability to allow a device to reside in multiple groups.		
2	The user shall have the ability to click on a managed device in an alarm state and display the specific nature of the alarm in a “Recommended Actions” pane.		
3	The user shall have the ability to suppress notification of alarms from a device(s), which is undergoing preventative maintenance or relocation.		

A1.8 (VIII)	Public Address System	01
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1. To enable public announcements in minimum 2 different zones of the data centre, ceiling speakers, Booster amplifier, mixing amplifier, 2 microphones (1 wired ; 1 wireless).
2. The announcement should be selectable zone-wise. All the PA equipment should be housed in an equipment wall mounted rack.
3. It should be integrated with the fire alarm system.

A1.8 (IX)	Illuminated Signage	As per req.
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Illuminated signs with proper naming convention should be installed in the Data Centre as per the standard practices. Number and sizes of signage should be as per the site requirement of Data Centre and vender should indicate the same while quoting their rates.

A1.8 (X)		Data Centre Lighting		As per req.
S. No	Specifications for Electrical Lighting	Complied, Yes/No	Deviations if any.	
A	SUMMARY			
1	Make			
2	Model			
3	Lighting circuit wiring shall be laid in PVC conduit / Aluminum race ways concealed in brick wall / cleated on ceiling using 2 nos. 2.5 sq. mm. PVC copper wire & 1 no. 1.5 sq. mm PVC copper earth wire.			
4	The bidder shall carry out design, engineering, installation, wiring, connections, testing and commissioning of the lighting system			
5	Lighting fixtures & Point wiring shall be supplied, erected,			

	connected and tested as required in the entire Server/Datacenter Facility		
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6	Illumination level shall be maintained between 400 Lux in all Server/Datacenter Area		
7	2X36 W CFL Mirror Optics reflector, anti-glare ceiling/recessed mounted light fixtures with CFL shall be used		

A1.8 (XI)		Electrical & Earthing	As per req.	
S. No.	Specifications for Electrical & Earthing		Complied, Yes/No	Deviations if any.
A	SUMMARY			
1	Make			
2	Model			
3	IASRI Data Center Power distribution system shall have redundancy at two levels			
4	The electrical system shall be designed to incorporate spare capacity (Minimum 20%) at each distribution level			
5	All wiring shall be laid in powder coated MS conduits / Aluminum raceway			
6	All power cables shall be PVC insulated type. All cables shall be armored cable type except where flexibility required does not permit use of armored cable			
7	Earthing system shall be as per IS – 3043/UL Listed or chemical based/			
8	Electrical should have adequate provision for utility powerpoints in each and every area of the Server/Datacenter			
9	Bidder shall design and implement anti- static EMI / RFI protection arrangement, wherever necessary			
10	The bidder shall design, engineer, supply/manufacture, test, erect, install, connect, commission and site test the Electrical Distribution System for any and all power requirements within the Server/Datacenter Facility.			
11	This shall include, but not be limited to UPS, Lighting system, ACDB system and input power to various sub systems of the Server/Datacenter. The bidder to ensure proper Earthing has been done inside the Data Centre for the			

	entire power system and Provisioning should be there to earth UPS systems, Power distribution units, and AC units etc. so as to avoid a ground differential.		
12	Design, engineering, supply, section, wiring, commissioning and testing of server racks are in the Bidder's scope.		
13	Bidder shall design the electrical system considering the various loads it has to cater to.		
14	The technical specifications and the scope for various items provided herein need to be verified by the Bidder.		
15	Bidder's scope shall include end to end system that is designed and implemented according to various applicable standards / regulations and meets total requirement for the Server/Datacenter Facility		
16	Final quantities for cables, wires, casing and capping shall be based on actual consumption measured at the time of commissioning and acceptance		
17	Copper earth pit station as per IS – 3043/UL Listed using 600 X 600 X 3 mm copper earth plate complete with accessories and hinged cover		
18	Another earthing system shall be extended for equipment body earthing of Data Centre, using 25 X 3 mm GI strip. Racks shall be earthed using copper flexible cable to the GI Pipe.		
19	Two Earthing pits will be provided for UPS Earthing, which will be interconnected, and same shall be connected to the K rated Isolation Transformer output		
20	Earthing System shall be designed & maintained considering personnel safety and noise-resistant electronic environments by providing equi-potential bonding with earth resistance of less than 2 ohm		
21	Bidder shall design, supply and implement the most efficient and safe earthing system considering the types of load, fault conditions, cross current circulation, spikes, circulating current due to potential differences, etc.		
22	The earthing system implemented shall ensure safety of people and systems under all conditions		
23	Earth fault protection shall be designed and implemented by the Bidder for all loads		
24	IASRI shall provide input power upto the main electrical panel designed for data center. Rest of the cabling shall be the responsibility of the bidder.		

25	Ground Enhancement Material should be RoHS certified & RDSO approved		
26	Ground Enhancement Material should be Environment friendly		
	GI Earthing for Txfr and DG sets as per IS 3043/UL Listed Txfr – 1 number, DG set – 2 number		
27	GI Tube should have minimum ID of 2", wall thickness 4.03 mm and 10 ft length		
28	GI Tube should have welded Terminal Plate for load termination		
29	GI Tube should be filled with chemical		
30	Ground Enhancement Material should be RoHS certified & RDSO approved		
31	Ground Enhancement Material should be Environment friendly		
32	Minimum of 75 Kg Ground Enhancement Material should be used for 10 ft length of Earth Electrode		
33	Each Earth Electrode should be covered with Poly Plastic Pit Cover having open able lid for maintenance and measurement purpose		
34	GI strip of 25x6 mm or 50x3 mm should be used to extend the earth to equipment		
35	Resistance value for individual GI electrode should be less than 3 Ohm		
36	Resistance value for the overall Earth System should be less than 2 Ohms		

A1.8 (XII)	Electro Static Discharge (ESD) Control	As per req.
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The Data Centre shall be provided with appropriate methods & equipment to effectively reduce ESD. It is required that the personnel handling sensitive equipment shall use wrist straps, heel grounders, etc to reduce the likelihood of human instigation of ESD. Cabinets, Racks, cages shall be properly grounded & operated by trained officials during inspection, maintenance and repairs. Usage of room ionisers is preferred to attract charged objects for neutralization.

A1.8 (XIII)	Fire Rated Door	As per req.	
1	Providing, supplying and fixing 120 minutes fire rated steel Fire door and frame of approved make conforming to IS 3614 Part 2 & BS 476 part 22.		
2	Door frame should be made of with minimum 1.6mm thick steel sheet pressed to double rebate profile. Door shutter should be made with minimum 1.2mm thick steel pressed formed to provide minimum 46mm thick fully flush double skin door shell with lock seam joints at stile edges		
3	The internal construction or in fill material of the door to meet desired fire rating with reinforcement at top, bottom and stile all around.		
4	The item also include provision for required hardware in brush finish, making provision for access control Electro Magnetic lock and its magnetic contact etc complete. The door should be provisioned with door closers, locks, handles, etc..		
5	Bidder to ascertain the Size of the door during site survey or from the DC drawings.		

A1.8 -(XIV)	Partition with Bison Board	As per req.
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GI Partition with Bison Board (fire rated board with GI frame in 2 ' x 2' with 12 mm Bison with all hardware and finished of POP including glass wool filling between the two sides - other of gypsum one of bison board)

Double Gypboard partition with same specifications above with Glass wool Insulation inside shall be provided as required. For the critical areas all the exposed walls shall have such partitioning from inside.

Partitions frame for the store area must be done fire retardant.

Semi glazed

The partition shall be powder coated Aluminum framed sections as per specifications and as per the layout drawings, same as above but with a horizontal dividing member and top panel having a single skin of 6 mm 1 hour fire rated glass inserts with a gap in between as directed and having necessary glazing clips, 'U' clips, PVC gaskets, anchoring devices between the false flooring below and beam above, etc. complete as per design approved by the site in charge.

Fully louvered full height partitions:

The partition shall be of powder coated Aluminum framed louvered partitions of approved make and as per the layout drawing, having powder-coated aluminum profiled louvers factory fitted horizontally by the proprietary patented method and shall have necessary anchoring devices between the false flooring below and the RCC ceiling above, etc. complete as per design approved by the site in charge.

A1.8 (XV)	Partition with GI Frame	As per req.
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Partition with GI frame of proper gauge of 2'x2' with 12 mm gypsum board partition with all hardware and finished with punning of POP.

A1.8 (XVI)	Double Gyp Board Partition	As per req.
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Double gypboard partition with GI frame (2' x 2') with all hardware and finished of POP including glasswool between the two sides.

A1.8 - (XVII)	Normal 12mm plane glass:	As per req.
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A1.8 -(XVIII)	Antistatic Flooring	As per req.
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Entire DC area has to be covered by antistatic sheet & racks have to be placed on top of this sheet. Laying of antistatic floor shall be done after taking prior permission from the client.

A1.8 -(XIX)	Water leakage Detection system	As per req.
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The water leak detector should be installed to detect any seepage of water into the critical area and provide alerts for the same. It shall consist of water leak detection cable and an alarm module. The cable shall be installed in the ceiling & floor areas around the periphery. Water Leak Detection system should be for the Server and Network room. Water Leak Detection System should be wire based solution with alarm. It will be preferred to typically divide a visible area into several zones and monitor each zone using a multi-zone control panel.

Single zone water leak detection module having a response time of less than 1 second after exposure with sensing cable to be installed along room perimeter especially along the glass, wall area, and under air-conditioning units in order to sense liquid leakage. Water leak detection panel with power supply and electronic hooter with complete installation and supply and laying of 2c x 1.0 sq mm copper conductor PVC insulated cable in 20 mm dia PVC conduit.

A1.8 - (XX)	Civil Works	As per req.
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Specification of Civil Works:

Antistatic covering for existing floor:

Entire DC area has to be covered by antistatic sheet & racks have to be placed on top of this sheet. Laying of antistatic floor shall be done after taking prior permission from the client.

Removal of Debris:

The material shall be packed in gunny sacks/plastic bags and taken down by the service staircase after taking prior permission from the client on a daily basis carting away of Debris: Trucks shall clear the debris from premises after taking the permission from the client.

Line Out:

Site dimensions to be checked as per the drawings & any discrepancy in the same to be identified. Discrepancy to be immediately conveyed to IASRI for the rectification. For the line out white paint or lime or be used & marking of all walls, partitions, doors, fix storage units, to be done in right angle. Layout of Raceways to be done as per the electrical & Furniture layout along with the junction box.

PLASTERING:

The bidder shall furnish all materials labor scaffolding equipments tools plant and incidentals necessary and required for the completion of all plaster and wall finishes, subject to the approval by IASRI. All plaster work and other wall finished shall be executed by skilled workmen in a workman like manner and shall be of the best workmanship and in strict accordance with the dimensions on drawings subject to the approval of the IASRI.

The primary requirement of plaster work shall be to provide absolutely water tight enclosure (vapor barrier coating), dense, smooth and hard and devoid of any cracks on the interior or exterior. Masonry and concrete surfaces, which call for applications of plaster, shall be clean, free from efflorescence, damp and sufficiently rough and keyed to ensure proper bond, subject to the approval of the IASRI.

JOINERY IN WOOD WORK:

Joinery is to be prepared immediately after the placing of the contact framed up, bonded and wedged up. Any portions that are wrapped or found with other defects are to be replaced before wedging up. The whole of the work is to be framed and finished in a proper workman like manner in accordance with the detailed drawings, wrought and whenever required fitted with all necessary metal ties, straps, belts, screws, glue etc. running beaded joints are to be cross tongued. Jointers work generally to be finished with fine sand/glass paper. All joints will be standard mortise and tenon, dowel, dovetail, and cross-halved. Nailed or glued butt joints will not be permitted. Screws, nail etc. will be stated, from or wire of oxidized 'Nettle Fold' make unless specified where mortise and tenon joints are used, tenons should fit the mortises exactly. Nailed or glued butt joints will not be permitted, except in exceptional cases with approval of IASRI.

Where screws shown on a finished surface, these will be sunk and the hole plugged with wood plug of the same wood and grains of the finished surfaces unless detailed otherwise.

Nail on finished surfaces will be neatly punched and the hole filled with wood filler to match the color.

Should joints in joiner's work open, or other defects arise within the period stated for defect liability in the contract and the cause thereof be deemed by IASRI to be due to such defective joinery shall be taken down, and refilled, redecorated and/or replaced if necessary and any work disturbed shall be made good at I the Bidder's expense.

Nails, spikes and bolts shall be of lengths and weights approved by the IASRI. Nails shall comply with IS 1959-1960 or approved equivalent quality sample. Brass headed nails are to comply with B.S. 1210. Wire staples shall comply with B.S. 1994 or equivalent.

The contact surfaces of dowel, tennons, wedges, etc. shall be glued with an approved adhesive. Where glued, joinery and carpentry work is likely to come into contact with moisture, the glue shall be waterproof. All dovetail joints shall be further strengthened with M.S. cleats for cabinet furniture like tables, storage units, etc.

GLAZING:

All glass should be toughened glass (clear/opaque of 5.5 mm thick) of approved manufacturer as per approved quality and sample to be of the selective qualities specified and free from bubbles, smoke, wanes, waviness, air holes and any other defects. The compound for glazing to metal is to be a special non-hardening compound manufactured for the purpose and of a brand and quality approved by the IASRI While cutting glass, proper allowance be made for expansion. Each square of glazing to be on whole sheet. On completion of work clean all glass inside and outside, replace all cracked scratched and broken panes and leave in good condition.

PAINT:

All material required for the works shall be of specified and approved manufacturer, delivered to the site in the manufacture's containers with the seals, etc., unbroken and clearly marked with the manufacture's name or trade mark with a description of the contents and colour. All materials are to be stored on the site of work.

Spray painting with approved machines will be permitted only if written approval has been obtained from the IASRI prior to painting. No spraying will permitted in the case of priming coats where the soiling of adjacent surfaces is likely to occur. The nozzle and pressure to be so operated as to give an even coating throughout to the satisfaction of the IASRI. The paint used for sprayings is to comply generally with the specifications concerned and is to be specially prepared by the manufacturer for spraying. Thinning of paint made for brushing will not be allowed Wood preservative shall be Solignum, Termiseal or other equal and approved impregnating wood preservative and all concealed woodwork shall be treated with wood preservative.

All brushes, tools, pots, kettles, etc. used in carrying out the work shall be clean and free from foreign matter and are to be thoroughly cleaned out before being used with a different type of class of material.

All iron or steel surfaces shall be thoroughly scraped and rubbed with wire brushes and shall be entirely free from rust, mill scale, etc. before applying the priming coat. Surfaces of new woodwork which are to be painted are to be rubbed down, cleaned down to the approval of the IASRI. Surfaces of previously painted wood work which are to be painted are to be cleaned down with soap and water detergent solution or approved solvent to remove dirt, grease, etc. Whilst wet the surface shall be flattened down with a suitable abrasive and then rinsed down and allowed to dry. Minor areas of defective paint shall be removed by scraping back to a firm edge and the exposed surface touched in with the primer as described and stopped with putty. Where woodwork has been previously painted or polished and is to be newly polished, scraping, burning off or rubbing down, should be carried out properly.

Surfaces of previously painted metal which shall be painted are to be leaned down and flattened down as described in surfaces of any rust and loose scale shall be removed completely by chipping, scraping and wire brushing back to the bare metal touched in with primer as described. All painting on masonry or concrete surface shall preferably be applied by roller. If applied by brush then same shall be finished off with roller.

All paints shall be of approved make. Minimum two finishing coats of paint shall be applied over a coat of primer. The thinner shall not be used with textured paint (Sandtex Matt or equivalent) finish. Acrylic emulsion paint shall be as per IS: 5411 (Part-I). Oil bound distemper shall be as per IS: 428. Cement paint shall conform to IS: 5410, white wash/color wash shall conform to IS: 627. Fire resistant transparent paint as per IS: 162 shall be provided on all wood work over French polish of flat oil paint. French polish shall conform to IS: 348. Flat oil paint shall conform to IS: 137.

All fire exits shall be painted in post office red/signal red color shade, which shall not be used anywhere else except to indicate emergency or safety measure.

For painting on concrete, masonry and plastered surface IS: 2395 shall be followed. For painting on wood work IS: 2338 shall be followed. For painting on steel work and ferrous metals, IS: 1477 shall be followed. The type of surface preparation, thickness and type of primer, intermediate and finishing paint shall be according to the painting system adopted. Bitumen primer used in acid/alkali resistant treatment shall conform to IS: 158. All plastered areas above false ceiling shall be provided with two or more coats of white wash.

SPECIFICATIONS FOR FLAME RETARDANT FABRICS:

The fabric (in case any) should be made of 100 % permanently inherent Flame Retardant Polyester Fiber modified with Methylphospholane whose Flame Retardancy does not diminish either with ageing or repeated washing. The fabric should be no allergenic and should have easy stain cleansibility. It should also not nourish bacteria.

Weight : 330 to 390 gms/sq.m

Weave: Plain/Dobby or Jacquard as required

Shrinkage: Less than 1 %

Toxicity: Less than 1

(Test report of Flammability test to be submitted within seven days of supplies.)

POLISH

French polish:

The basic material shall be shellac dissolved in methylated spirit. Preparation: The timber must be well sanded and cleaned and the grain filled with grain filler. Any staining must be done before applying the polish.

Equipment: The polishing rubber, the most important implement in French polish shall consist of a pad of cotton wool, which acts as a reservoir for the polish, and a cover of a soft white linen or cotton fabric similar to a well worn handkerchief, which acts as filler. The rubber must never be dipped into the polish on to the pad with the cover removed.

Application: Work evenly over the surface with a slow figure-of-eight motion until the timber is coated with a thin layer of polish. The object is to apply a series of thin coats, allowing only a few minutes for drying between the coats. When a level and even bodied surface is obtained the work is ready for the second stage i.e. spiriting off.

Allowing the work to stand for at least eight hours, then take a fresh rubber with double thickness of cover materials and charge it with methylated spirit. The object of spiriting off is to and remove the rubber marks and to give the brilliance of finish.

Finally, work in the direction of the grain and continue until the surface is free from smears and rubber marks then leave to harden off.

Wax polish

Wax polish shall contain silicons and driers. A good silicon wax is to be used, not a creamy or spray. The timber shall be sealed first with another finish such as Ronseal, before applying the wax.

APPLICATION

Apply a light coat of the sealer by brush or cloth direct to the unfilled timber, working it well in and finishing evenly with the grain. Allow to dry thoroughly then sand lightly with fine abrasive paper. Apply a heavy coat of wax by cloth or on flat surfaces, with a stiff brush. Work well into the timber and finish off by stroking with the grain before leaving to harden. Leave for several hours before rubbing up with a soft brush. Finally, buff the grain with a soft doth. Transparent Coloured Polyurethane (Melamine): This shall be applied where natural grain of the wood is required to be shown. Polyurethane gives tough surface, which resists chipping, scratching and boiling water.

Application: Clean off all grease and wax with an abrasive and white spirit, this should not be applied in humid conditions. Apply the same coat, preferably of clear hard glaze with a cloth pad. Leave this is to dry for at least six hours, then applied for the coat with paint brush-off you wait for longer than 24 hours between coats, rubbed down the previous coats with fine glass paper or medium grade of steel wool. Obtain a matt finish, if required, by giving a final coat of clear Ronseal Matt Coat.

TIMBER

All internal frame works shall be of Central Province Teak Wood (C.P.T.W) unless otherwise specified. All exposed woodwork shall be of first quality B.T.C. grade teak only or as specified. All the wood shall be properly seasoned, natural growth and shall be free from worm holes, loose or dead knots or other defects, saw die square and shall not suffer warping, splitting or other defects. The moisture content shall not exceed 12%. All B.T.C, C.P teak wood and must be approved by Consultants before using. All internal frame work shall be treated with approved wood preservative. All wood brought to site shall be clean, should not have any preservative or other coating/covering. All rejected, decayed bad quality wood shall be immediately removed from site. All wood brought to site must be stacked stored properly as per instruction.

PLYWOOD / MDF BOARDS ETC.

Plywood / medium density fiberboard / blackboard / teak particleboard / veneered board, etc. As specified in the approved list of manufacturers shall only be used. Only B.W.P grade phenol formaldehyde bonded hot pressed plywood generally conforming to I.S.I 303 of approved make shall only to be used. Marine plywood shall generally confirm to I.S. 710-1980 and also to Defense/Navy specification, bonded with phenol formaldehyde treated with Wood preservative. Only teak wood particle board shall be used, particle board shall be phenol formaldehyde and generally confirm to I.S. 3087-1965. Only 3mm to 4mm thick straight grained group matching approved veneers shall be used. Only veneers laminated from species like teak, maple white cedar, rosewood, White cedar, walnut, and mahogany shall be considered for approval and use. Blockboard shall be equal or superior quality to that laid down in B.S. 3444 with one of the following I.S Specifications or such approved adhesives: I.S.I 851-1957: Synthetic resin adhesive for construction works in wood. I.S.I 849-1957: Cold setting case in glue for wood. Blockboard shall be generally conforming to I.S.I. 1959-1960 or as per approved sample.

Medium Density Fiber (MDF) Boards shall generally confirm to or Exterior quality than that laid down in B.S. 1142-1989 and I.S: 12406 - 1988.

LAMINATES

Laminates where specified shall be of approved brand, type, texture and thickness and manufactured as per IS: 2046 -1969. Fixing of laminates shall be done as per best trade practices and strictly as per printed instructions of the manufacturers using Phenol Formaldehyde Synthetic Resin Adhesive of approved make. Unless otherwise indicated laminates shall be 1.5 mm thick for horizontal surfaces and 1.0 mm thick for vertical surfaces.

IRON MONGERY

All finish hardware shall be well made, reasonably smooth and free from sharp edges and corners flaws and other defects and shall be as per relevant Indian Standard Code. Unless otherwise required, all finish hardware shall be polished brass. All hardware shall be of approved make and shall be specifically got approved by the IASRI before ordering. No fittings and fixtures shall be fixed before all major work is over. While fixing correct handling of fixtures shall be ensured. All finish hardware shall be fixed by skilled Carpenters experienced in this work. Work shall be done as per manufacturers printed instructions and to the satisfaction of the IASRI. All hardware fixed to respective locations shall be adequately protected from damage and splashes of mortars and paints by covering suitable with Jute

Cloths / Black PVC sheet till handing over of the work to the to his satisfaction. The finished hardware shall be absolutely clean without any foreign materials and fully showing the original finish in its best condition.

Paneling shall be done in Server Farm area, fabric fixed with foam backing over pin-up board with teak beading.

Skirting: 12mm thk. 150mm high waterproof ply on Gypboard Partitions & water pipelines for precision A.C. M/cs sealed with silicon sealant at the bottom edges shall be provided.

Skirting: Powder Coated Aluminum Skirting on walls consisting of pressure plate & Cover plate.

Privacy Film: Providing & fixing Dusted film of 3M Make on glazed partitions/doors made to approve design with Room Names plotted in it.

Writing Boards: Providing & placing in positions as instructed, Magnetic Writing Boards having glossy surface made from steel framed with elegant natural anodized aluminum profiles and rounded plastic corners of approved type and makes.

POP punning: Providing and applying average 12mm thick P.O.P. punning on all exposed portions of beams, columns and walls as directed by the consultants including mixing, scraping, and leveling the surface, cleaning and complete in all respects to receive the paints & finishes

False Ceiling system: False ceiling already exists in the DC area. In case of any additional requirement, the same shall be provided and fixed with 600mm x 600mm manufactured out of 0.50 mm thick rolled coil coated on continuous paint line. The same shall include several leveling stages. These tiles shall have a flange on each end, which shall be laid on the exposed 'T' grid. The tiles can be laid and easily removed without the aid of special tools. All tiles shall have Tegular / Beveled edges.

Paint Finish:

Galvanized tiles shall be achromatized for maximum bond between metal and paint, enameled twice under high temperature; one side with full primer and finish coat, the other side (inner side) with a full primer coating and a skin coat on a continuous paint line.

Suspension:

The suspension system shall be the standard 24mm table exposed metal grid, the grid shall feature 38mm high Main Runners and Cross Tees, rolled formed from galvanized steel to BS2989 Z-18 Zinc coating. The main runners feature bayonet ends and the cross-tees stabbed ends for quick and easy coupling. The runners shall be pre-slotted to allow freedom to construct a variety of layouts. The main and cross runners shall be provided with coil coated steel capping on the exposed surface in off-white color. The grid shall be suspended from the roof with 2.5mm GI wires and quick adjustment suspension hangers along the runners.

Edge Profile: The edge profile shall be V Shaped roll formed, out of 0.5 mm Galvanized steel strips with coil coated in standard colors.

Gypboard Ceiling & Column Encasing

The Gypsum board in ceilings & encasing of columns shall be provided to ensure their alignment by the method laid down by the manufacturers, i.e. by fixing G.I. 'L' & 'C' section on the floor and ceiling and fixing gypboard onto them and fastening them to the walls / columns with the help of screws by the standard prescribed method, complete with sections from India Gypsum finishing with tape & gypsum compound as specified by manufacturers.

Doors

Solid Fire doors with view panel: Providing, making & fixing in position, Size = 1200 x 2100 mm (Single Leaf) solid flushed doors with 1'x3' fire rated view panel having minimum One hour fire rating for the Data Centre main entrance & entrance from the staging area, including laminate finish on both sides, door frame, fixing of hydraulic door closer, handles, cleaning and complete in all respects. The fire retardant enamel paint required for finishing the door frames is to be painted as per specifications. Vision Panel to be incorporated in the doors. Note: Only water soluble adhesives such as 'Fevicol' SR or equivalent shall be used. Thinner based quick drying rubberized adhesives shall not be permitted. The size of the door frames shall be 100 mm x 53 mm with single rebate frame.

A2.0	Standalone Servers	
A2.0 (I)	Database and Application Servers windows based	04 Nos.
Description	Technical Specification	
Processor	Intel® Xeon Processor 7560(8 core, 2.26 GHz, 24 MB L3 cache)	
Number of processors	4	
Memory	256 GB Memory (32*8) DDR3 with 1333 MHz upgradable to 512 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	8 No. SFF SAS (8x 450GB SAS), Hot plug 10K RPM SFF SAS with storage controller 2No. Smart Array RAID	
Network Controller	4No. 10GbE NIC Multifunction(Server Adapter)	
DVD Drive	Internal DVD WRITER Drive	
USB	2x USB 2.0 or higher Ports	
Expansion slots	6 No.	

Power supply	Maximum power consumption not more than 1200 Watts when fully populated. Redundant power supply with Hot-Swap Fan.
Infrastructure management	Remote Management Port with IPMI 2.0 Support. Insight Control with iLO Advanced (iLO 3)) or equivalent, Service processor with GUI, SNMP based Manager, Onboard Administration and Virtual Connect etc.
RAID support	Support SAS RAID 0, 1,5 and HBA mode configuration option
Others ports	2x Single Port Fibre Channel Card for redundant SAN connection and QDR Infiniband 4X Port
Form Factor	4U Rack model with Rail kit
Antivirus	Norton Internet Security 2011 or higher five users' license for three years with Media.
Operating System	64 bit licensed Microsoft Windows Server 2008.
Certification	Server should certify Linux, Windows.
Warranty - year(s) (parts/labor/onsite)	Should provide for a 3 years onsite comprehensive warranty (24*7).

A2.0 (II)	Database and Application Servers Linux based	06 Nos.
Database and Application Server - 6 Nos. (Linux based)		
Description	Technical Specification	
Processor	Intel® Xeon Processor 7560(8 core, 2.26 GHz, 24 MB L3 cache)	
Number of processors	4	
Memory	256 GB Memory (32*8) DDR3 with 1333 MHz upgradable to 512 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	8 No. SFF SAS (8x 450GB SAS), Hot plug 10K RPM SFF SAS with storage controller 2No. Smart Array RAID	
Network Controller	4No. 10GbE NIC Multifunction(Server Adapter)	
DVD Drive	Internal DVD WRITER Drive	
USB	2x USB 2.0 or higher Ports	

Expansion slots	6 No.
Power supply	Maximum power consumption not more than 1200 Watts when fully populated. Redundant power supply with Hot-Swap Fan.
Infrastructure management	Remote Management Port with IPMI 2.0 Support. Insight Control with iLO Advanced (iLO 3)) or equivalent, Service processor with GUI, SNMP based Manager, Onboard Administration and Virtual Connect etc.
RAID support	Support SAS RAID 0, 1,5 and HBA mode configuration option
Others ports	2x Single Port Fibre Channel Card for redundant SAN connection and QDR Infiniband 4X Port
Form Factor	4U Rack model with Rail kit
Operating System	64 bit Red Hat Enterprise/Suse Linux Operating System or Equivalent O/s.
Certification	Server should certify Linux, Windows.
Warranty - year(s) (parts/labor/onsite)	Should provide for a 3 years onsite comprehensive warranty (24*7).

A3.0	Attached Storage System-I	
A3.0 (I)	Network Attached Storage (NFS server) 200TB	01 Nos.
	<ol style="list-style-type: none"> 200 TB usable capacity network attached storage to be configured for NFS services to all the proposed servers. Storage NAS heads/servers/Controllers must be adequately configured to sustain a performance of 4 GB/Sec write in HA mode, when simultaneous Read and Write operations at 50%:50% are applied using standard I/O performance benchmarks like IOzone or IOR. Storage NAS heads/servers must transfer data over the Infiniband 4X QDR fabric/ 4 X 10 Gigabits channel. RAID-6 or equivalent or better HPC Storage RAID configuration is required. Only 600GB (10K RPM SFF SAS or 15000 RPM SAS) based disks are allowed. The NAS heads/servers must be connected to dual redundant array controller based dedicated storage configured with adequate SAS disks. 	

	6. NAS Servers have IPMI MANAGEMENT (Integrated IPMI2.0) and Quad-GbE LAN Port.	
	7. NAS servers must be connected through 4X QDR infiniband switch through fibre optics cable.	
	8. Proposed solution should support all the Protocol like NFS, CIFS, FTP, http, SSH etc.	
	9. NAS should be supplied with softwares for unlimited licenses of snap shots, data replication, and with Policy based file archival software so that on the basis of designed policies, Files can be moved from one disk tier (NAS/Home Directory,PFS) to another disk tier (PFS/Archival) etc.	
	10. The storage solution proposed should be supplied with all storage management software which will enable GUI and CLI remote management of the same.	
	11. Offered NAS GUI shall show online performance in MB/sec for both Network communications for clients as well as for Disk drives.	
	12. Adding Nodes in the cluster shall increase the performance of NAS subsystem linearly by extending the file system to additional nodes in load balancing fashion.	
	13. Offered NAS shall be Disaster Recovery Ready and shall be supplied with License for replication from one location to another location. Solution shall be designed in such a way that addition of capacity shall not warrant any additional license.	
	14. Offered solution shall support load balancing of each and every created file system across multiple number of NAS nodes for optimized performance.	
	15. The NAS software supplied must be licensed, commercial with upgrades/updates.	
	16. Vendor should quote 3% additional Hard disk as spare parts.	
A3.0 (II)	High Performance Parallel File System based Storage 100TB	01 Nos.
	1. 100 TB usable capacity Parallel file system based high performance storage services to be available to all the proposed servers.	
	2. Parallel File System must transfer I/O data over Infiniband 4X QDR fabric using low latency protocols / 4 X 10 Gigabits channel.	
	3. PFS must deliver a sustained aggregate performance of 4 GB/sec write when simultaneous Read and Write operations at 50%:50% are applied using standard I/O performance benchmarks like IOzone or IOR.	
	4. The disks should in RAID-6 or better HPC Storage configuration. Only 600GB	

	(10K RPM SFF SAS or 15K RPM SAS) based disks are allowed.	
	5. The solution must be based on No Single Point of Failure (NSPF).	
	6. The required parallel file system software supplied must be licensed, commercial with upgrades/updates.	
	7. The storage solution proposed should be supplied with all storage management software which will enable GUI and CLI remote management of the same.	
	8. Vendor should quote 3% additional Hard disk as spare parts.	
A3.0 (III)	Archival Storage 200TB	01 Nos.
	1. 200 TB usable capacity Parallel file system based or equivalent technology storage, services to be available to all the proposed servers, same system shall be scalable to at least 400TB.	
	2. Archival Storage must transfer I/O data over Infiniband 4X QDR fabric using low latency protocols / 4 X 10 Gigabits channel.	
	3. Fully populated storage must deliver a sustained aggregate performance of 2 Gigabyte/sec write when simultaneous Read and Write operations at 50%:50% are applied using standard I/O performance benchmarks like IOzone or IOR.	
	4. The disks should be configured using SATA/SAS disk in RAID-6 or equivalent configuration.	
	5. The solution must be based on multiple I/O servers connected to its multiple storage array configurations.	
	6. Storage shall be supplied and licensed with Policy based file archival software so that on the basis of designed policies, Files can be moved from one disk tier (NAS/Home Directory) to another disk tier (Archival)	
	7. Solution shall be sized in such a way that addition of any capacity shall not warrant any additional license.	
	8. Vendor should quote 3% additional Hard disk as spare parts.	

A 4.0	Desktop Workstations-I	35 Nos.
Workstation (Tower Cabinet base)		
Description	Technical Specification	Compliance
Processor	Intel(R) Xeon(R) W3530 2.80GHz, 8M cache, 4.8 GT/s QPI, Turbo, HT, 4C	
Memory	16 GB, DDR3 ECC SDRAM Memory1333MHz or higher	

Motherboard	Intel® X58 chipset	
Hard Disk	1TB SATA (minimum 7200RPM) Hard Disk.	
Optical Drive	16X max SATA DVD+/-RW with Dual Layer Write Capabilities.	
Graphic Card	1GB PCI-Exp-16 GPU based Nvidia/ATI Makes.	
Monitor	22" Professional Widescreen Flat Panel LCD Monitor.	
Keyboard, Mouse	USB Keyboard and USB Mouse with Scroll.	
NIC	Gigabit Ethernet Ports	
USB	6x USB 2.0\3.0 Ports	
Bays	Two external 5.25" optical bays	
PCI-E Slots	1 PCI-E free slot	
Operating system	Genuine Windows(R) 7 Professional 64bit (English)	
Antivirus	Norton Internet Security 2011 or higher 35 user Bundled license for three year with media.	
Certification	Workstation should certify Windows, Linux.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	

A5.0	Thin Clients	20 Nos.
General	Ultra Thin Stateless Devices with Multi-Platform Access Must be RoHS Compliant	
Graphics	2D acceleration with 24-bit graphics	
Peripheral Interface	Four USB powered ports, one RGB project port(1280 x 1024 or 1024 x 768resolution) @60 Hz, video-in connector, external display supported	
Networking	10/100/1000 Base-T network interface with an Option to encrypt the communication between server and thin client	
Input Devices	USB keyboard; USB mouse with integrated smart card reader	
Audio	CD-quality audio in/out; microphone; headphone jacks	
Monitor	Integrated 19" LCD (preferred)	
Smart Card Reader	Built in Smart Card Reader with smart card	
Operating	Should be able to work and integrate in heterogeneous Linux or Windows	

Environment	environment
Features	Must not have any local disk, Memory, local data and local OS in any form. Should support session mobility and hot-desking to ensure that user session remains intact in case of power failure in the client end User sessions should be maintained in the server. Vendor need to provide the requisite software for enabling above mentioned features and implementation cost.
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).

A6.0	UPS SYSTEM	
A6.0 (I)	Modular UPS 350 KVA, N+2 (Modules each of 25KW or 30 KW of UPS adding upto 350 KW or equivalent and 2 extra modules of 25KW or 30KW)	01Nos.
Modular UPS System with accessories		

This specification describes the operation and functionality of a continuous duty, true online double conversion three-phase, static Uninterruptible Power System (UPS) hereafter referred to as the UPS. The UPS shall utilize a N+2 redundant, scalable architecture. The system power train shall be comprised of hot swappable and/ user replaceable UPS and battery modules of the same make , which shall operate in parallel, and be configured for N+2 redundant operation at rated load 350kW. Each UPS module contains a full rated input rectifier / boost converter (hereafter referred to as Input Converter), full rated output inverter, and 10% battery charging circuit. The system shall also comprise of a user-replaceable continuous duty bypass static switch module, hot swappable and / user replaceable battery modules, redundant control modules, redundant logic power supplies, and LCD interface display. System static switch shall be capable of being fed from the same input as the rectifier or a separate input. All of the above system components are housed in standard 42 U Racks. 3 phase, 400 V power modules of 25 KVA = 25 KW or 30KVA=30KW each with self testing capability. Active Power Factor Correction shall be built in to the power modules.

Detailed Specification of modular UPS System for which rates are to be quoted:

S. No.	Technical Specifications	Complied Yes/No	Deviations if any
1	System capacity – 350KVA / 350KW		
2	Type of redundancy – N+2 (2 extra modules of 25KW or 30KW)		
3	Backup time- 15 Min on 350kW load		
A	GENERAL SPECIFICATIONS of UPS system		
1	This specification describes the operation and functionality of a continuous duty, three-phase, solid-state, on-line double		

	conversion static Uninterruptible Power System (UPS) hereafter referred to as the UPS. The UPS shall utilize a rack-mounted N+2 redundant, scalable array architecture.		
2	Each ups modules contains a full rated input rectifier full rated output inverter (KVA=KW), and battery charging circuit.		
3	UPS shall be comprised of hot swappable and/ user replaceable ups modules, which shall operate in parallel, and be configured for N+2 redundant operation at rated load of 350KW.		
4	The system shall comprise of a user-replaceable hot swappable battery modules, connected in parallel as well as in series, which can be swapped without switching of the ups modules when required.		
5	The system shall comprise of a user-replaceable continuous duty single bypass static switch module		
6	The UPS units & the batteries shall be scalable with out shutting down the mission critical Data Centre load.		
7	The UPS manufacturer shall provide an output distribution system to distribute quality uninterrupted power for mission critical, data centre load. This distribution system should be installed outside the ups modules along with input, output & manual bypass switches in a metal enclosure which is in a rack form factor. Output distribution shall happen through 3phase & neutral bus-duct.		
8	The distribution system, which is closer to the load shall occupy with a K-13 rated isolation transformer.		
B	MODES OF OPERATIONS		
1	Normal: The input converter and output inverter shall operate in an on-line manner to continuously regulate power to the critical load. The input and output converters shall be capable of full battery recharge while simultaneously providing regulated power to the load.		
2	Battery: Upon failure of the AC input source, the critical load shall continue being supplied by the output inverter, which shall derive its power from the battery system. There shall be no interruption in power to the critical load during both transfers to battery operation and retransfers from battery to normal operation.		
3	Recharge: Upon restoration of the AC input source, the input converter and output inverter shall simultaneously recharge the battery and provide regulated power to the critical load.		
4	Static Bypass: The static bypass shall be used to provide transfer of critical load from the Inverter output to the bypass		

	source. This transfer, along with its retransfer, shall take place with no power interruption to the critical load. In the event of an emergency, this transfer shall be an automatic function.		
5	Maintenance Bypass: The system shall be equipped with an external make before- break Maintenance Bypass to electrically isolate the UPS during routine maintenance and service of the UPS. The MBC shall completely isolate both the UPS input and output connections.		
C	SYSTEM CHARACTERISTICS		
1	System Capacity: The system shall be rated for full kW output.		
2	AC Input Nominal Voltage: 400 V, 3 Phase, 4 wire + G, 50 Hz.		
3	AC Input Voltage Window: 340Volts to 460Volts. (While providing nominal charging to the battery system).		
4	Frequency Range: 40-60Hz		
5	Input Power Factor: > .96 at 50% load & > .99 at 100% load		
6	Input Current Distortion: The input current THDI shall be held to 6% or less at full system, while providing conditioned power to the critical load bus, and charging the batteries under steady-state operating conditions. This shall be true while supporting loads of both a linear or non-linear type. This shall be accomplished with no additional filters, magnetic devices, or other components.		
7	Soft-Start: As a standard feature, the UPS shall contain soft-start functionality, capable of limiting the input current from 0-100% of the nominal input over a default 15 second period, when returning to the AC utility source from battery operation.		
8	AC Output Nominal Output: 400V, 3 Phase, 4 wire + G, 50 Hz.		
9	AC Output Voltage Distortion: Max. 3% @ 100% Linear Load.		
10	AC Output Voltage Regulation: +/- 1% For 100 % Linear or Nonlinear Load		
11	Voltage Transient Response: +/- 5% maximum for 100% load step		
12	Voltage Transient Recovery within <60 milliseconds		
13	Output Voltage Harmonic Distortion: a. <2% THD maximum and 1% single harmonic for a 100% linear load. b. <5% THD maximum for a 100% non-linear load		
14	Overload Rating : Normal Operation:		

	1) 150% for 30 seconds 2) 105% continuous Bypass operation: 1) 125% continuous 2) 1000% for 500 milliseconds		
15	Output Power Factor Rating: The UPS output shall not require derating for purely resistive loads (PF of 1). The potential kW and kVA ratings of the UPS output shall be equal. For loads exhibiting a power factor of .9 leading to .8 lagging, no derating of the UPS shall be required.		
16	Battery Protection: The inverter shall be provided with monitoring and control circuits to limit the level of discharge on the battery system.		
17	CHARGING: The battery charging shall keep the DC bus float voltage at +/- 1% of tolerance		
18	The battery charging circuit shall contain a temperature compensation circuit, which will regulate the battery charging to optimize battery life.		
19	The battery charging circuit shall remain active when in Static Bypass and in Normal Operation		
D	BATTERIES		
1	The UPS battery shall be of modular construction made up of user replaceable, hot swappable, fused, battery modules. Each battery module shall be monitored for voltage and temperature for use by the UPS battery diagnostic, and temperature compensated charger circuitry.		
2	The battery jars housed within each removable battery module shall be of the Valve Regulated Lead Acid (VRLA) type.		
3	The UPS shall incorporate a battery management system to continuously monitor the health of each removable battery module. This system shall notify the user in the event that a failed or weak battery module is found.		
4	The Batteries shall be long life batteries (5-8years) and the battery casing shall be flame retardant type.		
5	Battery bank is to be house in 42U rack and battery racks are too placed in separate enclosure outside the main data center room.		
E	UNATTENDED SHUT DOWN		
1	The UPS, in conjunction with a network interface card, shall be capable of gracefully shutting down one or more operating		

	systems during when the UPS is on low battery condition.		
2	The UPS shall also be capable of using an RS232 port to communicate by means of serial communications to gracefully shut down one or more operating systems during a low battery situation.		
F	DISPLAY UNITS		
1	A microprocessor controlled single display unit shall be located on the door in front of the ups system & output power distribution unit. The display shall consist of an alphanumeric display and a keypad.		
2	Metered Data: Data of all the input ,output & battery parameters shall be available on the alphanumeric display:		
3	Event log: The display unit shall allow the user to display a time and date stamped logs.		
4	Controls: All the UPS controls or programming functions shall be accomplished by use of the display unit. Pushbutton membrane switches shall facilitate these operations.		
G	REMOTE MONITORING		
1	Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.		
2	RS232 Monitoring: Remote UPS monitoring shall be possible via either RS232 or contact closure signals from the UPS.		
3	Simple Network Management Protocol (SNMP): Remote UPS Monitoring shall be possible through a standard MIB II compliant platform.		
4	The UPS manufacturer shall have available software to support graceful shutdown and remote monitoring.		
H	ENVIRONMENTAL		
1	Operating Ambient Temperature: 0°C to 40°C		
2	Relative Humidity: 0 to 95% Non-condensing		
3	Altitude: Maximum installation with no derating of the UPS output shall be 10,000 feet (3000m) above sea level.		
I	On-Site Operational Training: During the factory assisted start-up, operational training for site personnel shall include key pad operation, LED indicators, start-up and shutdown procedures, maintenance bypass and AC disconnect operation, and alarm information.		
J	The service organization shall offer 24 hours a day, 7 days a week, 365 days a year service support		

K	Replacement parts: Parts shall be available with service organization 365 days a year. The service organization shall be capable of shipping parts / modules to IASRI at any time during the day / night. IASRI will not allow any kind of component level repairs in Data Center ups systems inside the DC / Equipment room / UPS room.		
L	STANDARDS		
	Essential		
1	ISO 9001		
2	ISO 14001		
3	OEM should have fully equipped service centre in Delhi.		
	Desirable		
1	A.UL 1778 – Uninterruptible Power Supply Equipment		
2	B. UL 891 - Dead-Front Switchboards		
3	C.UL 1558 - Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear		
4	D. UL60950 - Information Technology Equipment		
5	The UPS shall also be designed in accordance with publications from the following organizations and committees.		
6	NFPA- National Fire Protection Associations		
7	NEMA - National Electrical Manufacturers Association		
8	OSHA - Occupational Safety and Health Administration		
9	IEEE 519-1992 Standard Practices and Requirements for Harmonic Control in Electrical Power Systems.		
M	PROPOSAL SUBMITTALS		
1	Detailed bill of materials duly certified by OEM.		
2	Product catalog sheets or equipment brochures.		
3	Product guide specifications.		
4	System single-line operation diagram.		
5	Installation information, including weights and dimensions.		
6	Information about terminal locations for power and control connections.		
7	Installation manual, which includes instructions for storage, handling, examination, preparation, installation, and start-up of UPS.		
8	User manual, which includes operating instructions.		

A6.0 (II)	Online UPS, 40KVA, N+1	01 Nos.
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Details of Design Guidance

A6.0 (II) UPS with accessories

Uninterrupted power supply units shall be designed on the latest technology with best in class components to provide reliable operation for continuous 7x24x365 days. The ups shall be **true on-line double conversion UPS system using IGBT based technology** i.e. the IGBT based Rectifier of the UPS system converts the input AC power to DC and then the IGBT based inverter converts the DC into clean AC power. UPS solution shall be N+1.

A	Detailed Technical Specifications : UPS (Uninterrupted Power Supply)with accessories	Complied, Yes/No	Vender offering (Strictly need to specify)
1	Make-		
2	Model -		
3	System capacity- 40kW N+1		
4	Type of redundancy- N+1		
5	Backup time- 10 Min on 40kW load		
B	GENERAL SPECIFICATIONS		
1	This specification describes the operation and functionality of a continuous duty, three-phase, solid-state, on-line double conversion static Uninterruptible Power System (UPS) hereafter referred to as the UPS. The UPS shall utilize a rack-mounted N+1 redundant, scalable array architecture.		
2	Each ups modules contains a full rated input rectifier / boost converter (hereafter referred to as Input Converter), full rated output inverter (Kva =KW), and battery charging circuit.		
3	The system shall also comprise of a user-replaceable continuous duty bypass static switch module		
4	The system shall also comprise of a user-replaceable hot swappable battery modules, which can be swapped without switching of the ups modules when required.		
5	The system shall also comprise of redundant main controller modules, redundant logic power supplies, which can be swapped without switching off any ups modules		

	when required.		
6	The UPS manufacturer should provide an output distribution system to distribute quality uninterrupted power for mission critical, data centre load. This distribution system should be installed inside the ups modules along with input, output & manual bypass switches in a metal enclosure which is in side UPS rack. Output distribution should happen through 3phase & neutral bus-duct.		
7	The ups units & the batteries shall be scalable without shutting down the mission critical Data Centre load.		
C	MODES OF OPERATIONS		
1	A. Normal: The input converter and output inverter shall operate in an on-line manner to continuously regulate power to the critical load. The input and output converters shall be capable of full battery recharge while simultaneously providing regulated power to the load for all line and load conditions within the range of the UPS specifications.		
2	B. Battery: Upon failure of the AC input source, the critical load shall continue being supplied by the output inverter, which shall derive its power from the battery system. There shall be no interruption in power to the critical load during both transfers to battery operation and retransfers from battery to normal operation.		
3	C. Recharge: Upon restoration of the AC input source, the input converter and output inverter shall simultaneously recharge the battery and provide regulated power to the critical load.		
4	D. Static Bypass: The static bypass shall be used to provide controller transfer of critical load from the inverter output to the bypass source. This transfer, along with its retransfer, shall take place with no power interruption to the critical load. In the event of a UPS output fault or significant output overload emergency, this transfer shall be an automatic function. Manual transfer to Static Bypass (called "Requested bypass") shall be available in order to facilitate a controlled transfer to Maintenance Bypass		
5	E. Maintenance Bypass: The system can be equipped with an optional integrated, bus connected external make-before-break Maintenance Bypass Cabinet		

	to electrically isolate the UPS during routine maintenance and service of the UPS. The make-before-break Maintenance Bypass Cabinet shall allow for the completely electrical isolation of the UPS. An option for an external make-before-break external maintenance bypass panel shall be available		
D	SYSTEM CHARACTERISTICS.		
1	System Capacity: The system shall be rated for full kW output.		
2	UPS Input		
	A. AC Input Nominal Voltage: 230 V, 3 Phase, 4 wire + G, 50 Hz.		
	B. AC Input Voltage Window: 340 – 475VAC (while providing nominal charging to the battery system).		
	C. Maximum Frequency Range: 40-70Hz		
	D. Input Power Factor:		
	a. Greater than 0.99 with load at 100%		
	b. Greater than 0.99 with loads above 50%		
	E. Input Current Distortion:		
	Input current Distortion with no additional filters: less than 5%		
	F. Soft-Start:		
	Shall be linear from 0-100% input current and shall not exhibit inrush. This shall take place over a user selectable 1- 60 second time period with a factory default of 10 seconds.		
3	UPS OUTPUT		
	A. AC Output Nominal Output: 230V, 3 Phase, 4 wire + G, 50 Hz.		
	B. AC Output Voltage Distortion: Less than. 2% @ 100% Linear Load. Less than 6% for SMPS load as defined by EN50091-3/IEC 62040-3.		
	C. AC Output Voltage Regulation: +/- 1% For 100 % Linear or Nonlinear Load		
	D. Voltage Transient Recovery within <50 milliseconds		
	E. Overload Rating : Normal Operation:		
	1) 150% for 30 seconds before transfer to Bypass		

	2) 125% for 10 minutes before transfer to bypass		
	F. Overload Rating : Bypass operation		
	1) 125% continuous		
	2) 1000% for 500 milliseconds		
	G. System AC-AC Efficiency:		
	Normal operation > 96% at 40% - 100% load Battery operation > 96% at 40% to 100% load		
	H. Output Power Factor Rating:		
	0.5 leading to 0.5 lagging without any derating		
	I. Battery Protection:		
	The inverter shall be provided with monitoring and control circuits to limit the level of discharge on the battery system.		
4	CHARGING		
	A. The battery charging shall keep the DC bus float voltage at +/-1% of tolerance		
	B. The battery charging circuit shall contain a temperature compensation circuit, which will regulate the battery charging to optimize battery life.		
	C. The battery charging circuit shall remain active when in Static Bypass and in Normal Operation		
5	BATTERIES		
	A. The UPS battery shall support an optional battery plant of modular construction made up of user replaceable, hot swappable, fused, battery modules. Each battery module shall be monitored for voltage and temperature for use by the UPS battery diagnostic. Battery charging current shall be temperature compensated.		
	B. The battery jars housed within each removable battery module shall be of the Valve Regulated Lead Acid (VRLA) type.		
	C. The UPS shall incorporate a battery management system to continuously monitor the health of each removable battery module. This system shall notify the user in the event that a failed or weak battery module is found.		
	D. The Batteries shall be long life batteries (5-8year) and the battery casing shall be flame retardant type.		

6	SOFTWARE AND CONNECTIVITY		
	A. Network Adaptor: The Ethernet Web/SNMP Adaptor shall allow one or more network management systems (NMS) to monitor and manage the UPS in TCP/IP network environments. The management information base (MIB) shall be provided in DOS and UNIX "tar" formats.		
	B. Unattended Shutdown -The UPS, in conjunction with a network interface card, shall be capable of gracefully shutting down one or more servers when the UPS is operating from the battery and available runtime has reached a user defined level.		
	C. Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.		
	D. Simple Network Management Protocol (SNMP): Remote UPS Monitoring shall be possible through a standard MIB II compliant platform		
7	DISPLAY AND CONTROLS		
	A. Control Logic: The UPS shall be controlled by two fully redundant, user replaceable / hot-swappable Intelligence modules (IM). These modules shall have separate, optically isolated, communication paths to the power and static switch modules. Logic power for the control modules shall be derived from redundant power supplies, each having a separate AC and DC input and output. The communication of the control modules shall be of Controller Area Network (CAN Bus) and EIA485		
	B. Graphical User Interface: A single microprocessor controlled user interface/display unit shall be located on the front of the system.		
	Metered Data: the following data shall be available on the Graphical User Interface/display: Input\Output Voltages, Currents, Frequencies, Breaker & Switch Status, Battery Status, Event Log		
	C. Event log: The display unit shall allow the user to display a time and date stamped log.		
	D. Controls: All the ups controls or programming functions shall be accomplished by use of the display unit. The touch screen display shall facilitate these operations		

8	REMOTE MONITORING		
	A. Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.		
	B. RS232 Monitoring: Remote UPS monitoring shall be possible via either RS232 or contact closure signals from the UPS.		
	C. Simple Network Management Protocol (SNMP): Remote UPS Monitoring shall be possible through a standard MIB II compliant platform.		
	D. The UPS manufacturer shall have available software to support graceful shutdown and remote monitoring		
9	ENVIRONMENTAL		
	A. Storage Ambient Temperature: -15 to 40C		
	B. Operating Ambient Temperature: 0°C to 40°C		
	C. Relative Humidity: 0 to 95% Non-condensing		
	D. Altitude: Maximum installation with no derating of the UPS output shall be 3,000 feet (1000m) above sea level		
10	FACTORY ASSISTED START-UP & MAINTENANCE		
	A. If a factory assisted UPS start-up is requested, factory trained service personnel shall perform the following inspections, test procedures, and on-site training:		
	B. On-Site Operational Training: During the factory assisted start-up, operational training for site personnel shall include touch screen operation, LED indicators, startup and shutdown procedures, maintenance bypass and AC disconnect operation, and alarm information.		
	C. The UPS manufacturer shall have a nationwide service organization Available, consisting of manufacturer trained field service personnel to perform start-up, preventative maintenance, and service of the UPS system and power equipment. The service organization shall offer 24 hours a day, 7 days a week, 365 days a year service support in all class A cities & next day business in all class B & C cities		
	D. Replacement parts: Parts shall be available through the nationwide service organization 365 days a year. The nationwide service organization shall be capable		

	of shipping parts / modules anywhere in India with in stipulated time required by NIC. NIC will not allow any component level repairs in Data Center ups systems inside the DC / Equipment room / ups room.		
11	STANDARDS		
	ISO 9001		
	ISO 140001		
12	DELIVERY SUBMITTALS		
	1. Installation manual, which includes instructions for storage, handling, examination, preparation, installation, and start-up of UPS.		
	2. User manual, which includes operating instructions.		

A7.0	Secured Entry System and Electronic Surveillance System		
A7.0 (I)	Access Control System	02 Nos.	
S. No.	Specifications for Access Control System	Complied Yes/No	Deviations if any.
1	The Access Control System shall be used to serve the objective of allowing entry and exit to and from the premises / restricted areas within the facility to authorized personnel only User defined reporting and log formats. Fail safe operation in case of no-power condition and abnormal condition such as fire, theft, intrusion, loss of access control, etc. Day, Date, Time and duration based access rights shall be user.		
2	Configurable for each access point and for each user. One user can have different policy / access rights for different access points. It should be possible to use the access devices like biometrics, proximity card readers, push buttons, manual switches, etc. in user defined combination for any and all of the access points.		
3	The system employed shall be based on combination of Proxy card Readers (with PIN and without PIN) for the critical areas, and Proximity Reader for less critical areas System shall be compatible to the Proximity cards to be provided by the Bidder. The application software shall mean the access & time management software that shall be supplied together with the system in order to provide a Graphical User Interface (GUI) for human – machine interface. It shall be same for both biometric and Proximity		

4	Suitable Door Controller system shall be provided.		
5	The door controller system must be intelligent and capable of controlling one doors having IN and OUT interface or 2 doors having only IN interface. The door controller system shall store in its memory all the system parameters & card databases and shall be virtually independent of the network server for its regular operations. The card reader shall only read the card data & pass it on to the door controller system for validation. The card reader, on its own may not take any decisions for granting / denying the access. Card reader shall have keypad for PIN facility. Two-factor authentication is envisaged for entry to the access points. The card reader shall only read the card data & pass it on to the door controller system for validation. The card reader, on its own may not take any decisions for granting / denying the access. The Card Reader shall have a RED/GREEN Led Indication to highlight the User Access. The card Reader must be slim and capable of directly mounting on the provided surface. The card reader must be able to communicate with the controller employing a RS232 Format. The Electro Magnetic Lock (EML) shall mean a locking mechanism that works on the principle of electromagnetic attraction. The EML shall be installed on single swing flush doors. The door controller system shall control the EML. The type and specification of the locks shall be in accordance with the door design and specification and also door controller system. The locks should be of sufficient strength to withstand forced attack to open the door		

A7.0-(II)	Electronic Surveillance System	01 Nos.
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Data Centre surveillance offerings meet the needs of preventative monitoring solution that provides the advance warning necessary to prevent small issues from becoming big disasters, while increasing uptime, product lifespan, and resource efficiency. Data Centre surveillance offerings meet the needs of Active monitoring of unsupervised, mission critical IASRI data Centre and the systems working there, to provide continuous business availability, Data Centre surveillance offerings meet the needs of Protections of IASRI Data Centre and its valuable contents, like IT equipment, from damage due to water leaks, high or low temperatures, smoke or dust, humidity, vandalism, theft, and many more dangerous environmental and physical factors Data Centre surveillance offerings meet the needs of monitoring all the human movement area , racks aisle , emergency exit etc.

A	SUMMARY		
1	Make		
2	Model		

B	General Specifications		
1	It should acts as the centralized host for all connected pods and add-on software applications.		
2	It should provide threshold types such as rate-of-increase, rate-of decrease, above-maximum-too long, and below-minimum-too-long for numeric sensors, and error-value-too-long for door and dry contact sensors.		
3	The device installing in this area houses the processor, memory, I/O, and network connections.		
4	Each sensor can have more than one threshold, and each threshold can be assigned different severities, allowing for custom crafted responses to different levels of problems.		
5	Alerts and sensor data can be posted to web servers using built-in HTTP post support, or can be forwarded to other systems using FTP data delivery		
6	Alerts are sent using e-mail, SNMP traps, or SMS/GSM		
7	Web-accessible. View data using a web browser or the client Advanced View application		
8	Integrated 10/100 Mbps Ethernet network interface		
9	Need to be a wall mounting equipment with mount bracket enables 360° positioning		
10	Indicators: Device status, alert, network speed, and network activity LEDs.		
11	Protocols: SSL, TCP/IP, HTTP, SMTP, SNMP, DHCP, DNS, Socks V4 or V5 Proxy server, GSM/SMS/GPRS.		
12	Network Interfaces: Ethernet 10/100 Mbps standard, optional 802.11a/b/g, GSM/SMS, PPP modem.		
13	Management Interface: Internet Explorer v 5.5 or later; Netscape Navigator v 4.79, 6.0 or later; Mesilla 1.3 or later.		
14	Operational Environment : Temperature: 2° to 50° C , Relative Humidity: 10% to 90% (no condensing)		
15	Regulatory Certification: FCC Class A, CE, VCCI on system, UL on power supply.		
16	A professional-quality audio/video monitoring solution, which provides digital video and audio monitoring capabilities, combined with the builtin imager, provides high-resolution 24-bit color video, while the integrated microphone enables audio monitoring.		

17	It should Integrated with a microphone plus a microphone jack, which provides the ability to monitor and capture audio from either the location in which the pod is installed or (using an external microphone) at another point of interest		
18	Speaker/headphone jack that can be used with powered speakers to provide audio alert output		
19	It should have Door Switch Sensor jack & Camera-based motion detection		
20	Need to be a wall mounting equipment with mount bracket enables 360° positioning		
C	Environmental monitoring devices		
1	This device shall have integrated sensors for temperature, humidity, dew point, airflow.		
2	LEDs on the pod provide a visual indicator of the sensor status		
3	Powered via USB: No additional power required for this device at its installed point		
D	Environmental monitoring devices- Should measure		
1	Temperature: Range: 2° to 50°C. Accuracy: +/- 1°C typical.		
2	Relative Humidity: Range: 10% to 90% (non-condensing). Accuracy: +/-5%RH.		
3	Air Flow Rate: 0-1,000 Meters Per Minute (0-3,281 Feet Per Minute).		
4	Audio: Built-in acoustic sensor detects audio above set level.		
5	Indicators: Temperature out-of-limit, humidity out-of-limit, airflow outof- limit, sound detected, external sensor violation detected.		
E	Display		
1	Display should consist of visual display unit, display controller, and the wall management software from single manufacturer .		
2	The Minimum Diagonal Size of each Visual Display Unit / Rear Projection Module should be 50” nominal WXGA with a native resolution of 1360 X 768 pixels (HD Ready) or higher and should have wide screen, 16:9 aspect ratio		
3	The Visual Display Unit / Rear Projection Modules should have in-built redundancy in LEDs and ensures redundancy at the light source level. Each cube shall have its own IP address to have the access from a standard web page from any PC over the Ethernet		

	and shall communicate to a viewer via ethernet and it's IP address in star architecture to prevent communication loss.		
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A 8.0	Fire Security and Alarm System	01 Nos.
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Fire Detection and Alarm System:

1. Fire Detection and Alarm System being offered must meet the requirement prescribe by agencies and must be able to detect any type of fire of the whole Data Centre and send alarm for the same.
2. No. of fire Detectors and alarm hooters must be as per requirements and the same must be mentioned by the bidder.

Specifications	Complied, Yes/No	Deviations if any.
GENERAL DESCRIPTION:		
1.0 Includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, coordinated system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, Fire Alarm Control Panel (FACP), auxiliary control devices, enunciators and wiring.		
1.1 The fire alarm system shall comply with requirements of NFPA Standard 72 for Protected Premises Signaling Systems except as modified and supplemented by this specification. The system shall be electrically supervised and monitor the integrity of all conductors.		
1.2 The FACP and peripheral devices shall be manufactured 100% by a single U.S. manufacturer (or division thereof).		
1.3 BASIC SYSTEM FUNCTIONAL OPERATION		
When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur: <ol style="list-style-type: none"> 1. The system alarm LED on the system display shall flash. 2. A local piezo electric signal in the control panel shall sound 3. A backlit LCD display to indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises. 		
4. Logs of all events .		

1.4. GUARANTY:		
All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.		
1.5. APPROVALS:		
The system shall have proper listing and/or approval from the following nationally recognized agencies: UL Underwriters Laboratories Inc or Indian equivalents FM Factory Mutual		
The fire alarm control panel shall meet UL Standard 864 (Control Units) and UL Standard 1076 (Proprietary Burglar Alarm Systems).		
PART 2.0 PRODUCTS		
2.1. <u>EQUIPMENT AND MATERIAL, GENERAL:</u>		
2.2. A. <u>MAIN FIRE ALARM CONTROL PANEL OR NETWORK NODE:</u>		
Microprocessor based CPU in Main FACP or network node. The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, and other system controlled devices.		
B. Operator Control		
Acknowledge Switch, Alarm Silence Switch		
System Reset Switch, Alarm Activate(Drill) Switch		
C. System Capacity and General Operation		
The system shall include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color coded system status LEDs, and an alphanumeric keypad with easy touch rubber keys for the field programming and control of the fire alarm system.		
The system shall be programmable, configurable, and expandable, and should allow the programming of any input to activate any output .		
Nine sensitivity levels for alarm, selected by detector.		
The ability to display or print system reports.		

Periodic detector test, conducted automatically by the software.		
D. Central Microprocessor		
The microprocessor shall be a state-of-the-art, high speed, and shall monitor and control events with history logs.		
2.3 System Display		
The system shall support the following display mode options: The Display shall provide all the controls and indicators used by the system operator		
Display shall indicate the status of the following system parameters: AC POWER, FIRE ALARM, PREALARM WARNING, SECURITY ALARM, SUPERVISORY SIGNAL, SYSTEM TROUBLE, DISABLED POINTS, and ALARM SILENCED.		
2.4. SYSTEM COMPONENTS:		
Programmable Electronic Sounders:		
Electronic sounders shall operate on 24 VDC nominal. Electronic sounders shall be field programmable without the use of special tools, at a sound level of at least 90 dBA measured at 10 feet from the device. Shall be flush or surface mounted as shown on plans.		
2.5. SYSTEM COMPONENTS - ADDRESSABLE DEVICES		
<u>Addressable Devices – General</u>		
Detectors shall be intelligent (analog) and addressable.		
Addressable smoke and thermal detectors shall provide dual alarm and power/polling LEDs.		
<u>Addressable Control Module</u>		
Addressable control modules shall be provided to supervise and control the operation.		
<u>Addressable Relay Module</u>		
Addressable Relay Modules shall be available for HVAC control and other building functions.		
2.6. <u>BATTERIES:</u>		
The SMF battery shall have sufficient capacity to power the fire alarm system for not less than twenty-four hours plus 5 minutes of alarm upon a normal AC power failure.		

A9.0	Standby Power Supply Units(DG Set) 500KVA	02 Nos.
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DG Sets

Agency should give provision for Backup Diesel Generators sets to support the UPS and the air-conditioning equipments in providing emergency power supply to the computer equipment in a prolonged power outage. The need of diesel generator depends on the service requirements of the computer system. However, the generator should also be able to support other essential facilities and equipment such as the air-conditioning system, security and access control system and lighting. The DG set shall come on-line automatically within 30 seconds of AC mains failure.

Technical Specification: Diesel Generating Sets

Scope

Work covered by this contract shall conform to latest CPCB norms effective from July 1, 2004 include design, manufacture, supply, transportation, delivery, installation, testing and commissioning of automatic start direct coupled Diesel Generator Sets suitable for continuous round the clock operation at up to rated output with permissible overload along with associated works. Items included (but not limited to) in the contract are abstracted as below:

1. Diesel engines directly coupled with alternators mounted on a rigid fabricated steel base frame with resilient ant vibration mountings.
2. AMF cum Auto Synchronizing cum load sharing panels.
3. DG cooling system. Radiator cooled.
4. Exhaust piping with Silencer to provide 25 dBA insertion loss
5. Electric starting equipment including batteries and battery chargers.
6. Fuel supply system including Oil Storage and automatically operated Fuel Transmission System.
7. Acoustic treatment of DG set as per prevailing norms.
8. Statutory approvals including permission from Electric Supply Authority for operation of DG sets, approval from EB power authority, clearance from Electrical Inspector, approval from Pollution Control Board.
9. Coordination with DG Auto Synchronization, Auto Load Control & AMF Panel Vendor.

PROPOSED OPERATIONAL SCHEME

The standby power should have 2 numbers of 500 KVA DG Sets for entire loads which work in parallel fashion with auto synchronizing facility.

The Synchronizing power bus has been split into two different sections by two bus coupler. This has been done to ensure that, in case, the synchronizing feature does not work for any reason, the bus coupler can be switched off and the DG sets can be operated individually. All DG sets shall start immediately on sensing loss of EB power after an adjustable time gap from 0 to 10 seconds. This shall be controlled based on the time run by each of the DG sets and shall be field settable. Provision shall also be made to manually select the

sequence of starting of the DG sets. Once all the DGs are in running condition, the intelligent micro controller will switch off the DGs one by one based on the load condition. In case the load is less than 80% of 500 KVA, DG-2 will switch off. The DG-1 will be running and the load will be fed. At any point of time the load increases beyond 80% of 500 KVA, DG-2 will start.

Upon restoration of board Power, the changeover from DG power to Board Power will be automatically done by the AMF cum synchronizing panel by switching off the DG set after a specified period of time. The AMF cum synchronizing panel is given total manual override to take care of unexpected failure of auto start.

The Integrated microprocessor based controller on the DG set shall have auto synchronizing, auto load balancing and auto load management features.

GENERAL SPECIFICATION

The DG set shall be capable of safe, prime power continuous running at variable load for unlimited number of hours and shall also be able to run for one hour period in every 12 hours run period at 110% of the rated power. Noise, mechanical and thermal stresses shall be within permissible limits.

The equipment shall be designed with regard to ease of maintenance, cleaning and inspection. All parts subjected to substantial temperature changes shall be designed and supported to permit free expansion and contraction without resulting in leakage, harmful distortion. The DG sets and associated auxiliary equipments shall be manufactured as per relevant Indian standards and the lists of Indian standards are:

1. IS: 4722 - Specification for rotating machinery
2. BS: 649 - Performance and testing of diesel engines for general purposes.
3. IS 4729 - Measurement and evaluation of vibration of rotating electrical machines.
4. IEC 34 - Rotating electrical machines
5. BS 5000 - PART 3 Reciprocating IC engines: Performance
6. IS10002 - Performance requirements of Diesel Engines
7. BS 4999 (IEC 34-1) - Rotating electrical machines
8. IS 10000 (OR) Equivalent BS code - Method of tests for IC engines
9. BS 5514 / (ISP 3046) - ENGINE

The DG set shall comply with latest guidelines, regulations and Central Pollution Control board norms.

1. ENGINE

1. The diesel engine shall be indoor-type, four stroke, multi-cylinder, 1500RPM with 2% speed variation for operation between 10% and 100% load, Turbo charged inner cooled, compression ignition with Electronic Fuel Injection system complete with its self contained lubricating system.
2. Engine mounted radiator designed to dissipate the generated heat effectively shall be used.
3. High-speed diesel oil shall be used as fuel for the engine.
4. The engine shall be de-rated in accordance with the tables given in BS649 to suit site conditions.

5. The engine shall be directly coupled to the generator.
6. The noise level limitations shall be as per CPCB norms.
7. The engine shall be capable of taking 10% overload for one hour in every 12 hours.
8. The engine shall be capable of producing the desired nominal output at site referred to the generator terminals and with machine operating under ambient conditions as specified in the specific requirements.
9. The lube oil system shall be provided with engine driven lube oil pump and lube oil-priming facility for use when the engine is not in operation
10. The Engine to be fitted with silencer to provide min 25 dBA insertion loss.

1. Fuel Consumption

The engine shall be suitable for satisfactory operation on H.S.D. as locally available. The bidders shall declare the guaranteed fuel consumption in liters per litres/hr, in accordance with relevant I.S. or B.S. at 50%, 75% and 100% of rated load at 0.8 pf. Fuel consumption shall be low so as to deliver minimum 4 units per liter at 75% load. Such guaranteed fuel consumption is also to be expressed in liters per unit (after supplying the requirements of auxiliaries) at 50%, 75% and 100% of rated load at 0.8 pf. If guaranteed fuel consumption is exceeded, the bidder shall make such modifications or alterations as are necessary to bring the consumption to within the guaranteed figures. Tolerance of + 5% as defined in BSS-649-1958 shall be allowed.

2. Lubricating Oil Consumption

The bidders shall state the guaranteed lubricating oil consumption in liters per hour.

3. Air Filters

The engine air intake shall be fitted with a substantial air cleaner of oil bath/ paper element type. The filter shall be suitable for operation under dusty conditions.

4. Crank Case Breather

The crankcase breather outlet of the engine shall be fitted with a filter cap capable of preventing entry of dust.

5. Fuel and Lubricating Oil Filters

Filter for fuel and lubricating oil systems shall be of simplex type. Lubricating oil filters shall be of an efficient full flow type of ample capacity and suitable for use with detergent oils. They shall be capable of removing all foreign matter above a particle size of 5 microns.

6. Lubricating Oil System

The engine shall be of the totally enclosed type and fitted with a positive pressure system of lubrication to all working parts. Lubricating oil shall be circulated in the engine by an engine driven pump. There shall be no moving part requiring lubrication by hand prior to the starting of the engine or while in operation.

7. Safety Controls

The engine shall be complete with all controls to render the operation of the engine reliable and totally safe including but not restricted to the following:

1. Low Lubricating Oil Pressure

Pressure sensors shall be fitted such that in the event of a fall in the lubricating oil pressure, an alarm and indication shall be actuated. In addition, the engine shall be automatically shut down in the event of lubricating oil pressure dropping to a predetermined low value. Potential free contacts for conveying the signal to BMS shall be provided

2. High Water Temperature

An alarm shall be given if the close loop engine jacket cooling water temperature exceeds safe limits stipulated by the engine manufacturer due to any reason. The engine shall be shut down when a pre-determined set water temperature is reached. Potential free contacts for conveying the signal to BMS shall be provided

3. Over Speed

Speed control shall be so arranged that a 12-1/2% increase over normal rated speed shall cut off fuel supply, thus stopping the engine. Potential free contacts for conveying the signal to BMS shall be provided.

4. Overload Protection

The engine shall be adequately protected against operating under overload conditions. The requirements shall be met by the provision of a fixed overload limit stop on the fuel pump rack control rod to prevent the set being subject to a load exceeding the site rating plus 10%. Potential free contacts for conveying the signal to BMS shall be provided.

2. ACCESSORIES, INSTRUMENTS AND SAFETY CONTROLS FOR ENGINE

Accessories:

1. Flywheel
2. Coupling with guard.
3. Mechanical guarding of all moving parts
4. Air cleaner oil bath/paper element type.
5. Corrosion resistor.
6. Governor - electronic.
7. Fuel injection
8. Fuel filter
9. Lubrication oil filter.
10. SMF batteries with leads and float cum boost battery charger along with battery stand.
11. Flexible Bellows
12. Exhaust Silencer
13. Interconnection wiring, cabling and piping as required
14. Set of standard tools
15. Anti-vibration mounting pads.
- 16.

3. INSTRUMENTS AND GAUGES:

1. Lubrication oil pressure gauge.
2. Water temperature gauge.
3. Battery charging ammeter.
4. Hour meter (mechanical) to show total engine hours run 10,000 hr capacity
5. R.P.M. indicator of the tachometer type.
6. Starting switch with key

Safety controls for

1. Low lubricating oil pressure
2. High water temperature
3. Over speed

4. AUXILIARIES

Governor System:

The governor characteristic shall comply with the requirements of AIEE standard 606. The governors shall be suitable for operation without external power supply and shall provide adequate speed control in the event of failure of electrical governor circuitry. A mechanical over speed trip device shall be provided to automatically shut off fuel in case the speed exceeds 110% of the rated value.

ALTERNATOR WITH ACCESSORIES:

The Alternator shall have the following characteristics:

Type - Brushless, rotating field design alternator rated for 660 volt / 50 Hz complying to IS 4722-1992, BS 5000 Part-III and IEC 34.

Excitation system - Permanent magnet generator (PMG) powered excitation system

Speed -1500 RPM

Net Site Output - Rated continuous at ambient conditions and as per schedule of quantities.

Voltage Regulation - Within 0.5% of the rated voltage

Overload - More than 10% of the nominal for 1 hour every 12 hours without exceeding permissible temperature rise.

Harmonics - Maximum 1% between phase and neutral and total maximum 3%

1. The Alternator shall be capable of delivering the rated output at rated power factor as spelt out in specific requirement sheet
2. The Alternator shall be capable of withstanding without damage a three-phase short circuit at its terminals when operating at rated KVA and PF and at 5% over voltage with fixed excitation for 3 seconds.
3. The Alternator shall be capable of withstanding without damage
4. 50% overload for 15 seconds.
5. 10% overload for one hour every twelve hours.
6. The line and neutral leads of phase windings of the alternators shall be in suitable

terminal boxes with flexible rubber bellows wherever the outgoing is Busduct.

7. The neutral shall be taken to a neutral earthing cubicle cum DG control panel, where 1 No of CT shall be provided in the neutral before connecting it to ground point. The CT shall be connected to an E/F relay for generator protection. The neutral shall be taken to the ground through a removable link. The relays and motors shall also be housed in the control panel.
8. Thermistors shall be provided in the Alternators windings and connected to Thermistors relay at the cubicle, which shall have contacts for alarm and trip.
9. The neutral earthing cubicle/control panel shall all be integrated into one vertical housing all the switches, lamps, annunciators, relays, etc.
10. The Alternator winding shall have class of insulation H class with temperature rise limited to Class B.

1. Construction

The alternator shall be of air ventilated screen protected drip proof design with IP 23 protection having adequate air intake / outlet areas to enable designed air quantity to flow within permissible pressure drop. The dynamic balancing of the rotor assembly shall be carried out as per IS 12075 1987 and BS 6861 Part-I Grade-II to ensure vibration limit to be within as per IS 12075 or BS 4999. Double bearing alternator shall be provided with substantial bedplate with engine / generator mounting pads to ensure a good base for accurate alignment. A flexible coupling, designed to suit the specific engine – generator combination shall be provided to minimize torsion effects. The alternator shaft and coupling shall be designed to withstand torsion vibrations even at certain critical speed. The terminal arrangement of the alternator of 400 kVA DG sets shall be suitable for receiving a bus duct with flexible interconnection with rubber bellows. The termination details shall be finalized in coordination with the electrical contractor and got approved from customer before execution. All alternators neutral shall be solidly earthed and each neutral shall be connected to 2 numbers copper plate earth stations by means of 50 mm x 6 mm copper strip. The body earthing shall be with GI strips and GI plate earth stations. Earthing scheme will be as per site condition.

The Combined Engine Alternator unit shall be mounted on a common rigid fabricated base frame. The alternator shall have its windings star connected with the neutral connection brought out to a separate terminal.

The alternator shall fully comply with the latest Standard BS 2613 and BS 269 in respect of winding insulation and fast response to maintain steady voltage.

2. Temperature Rise

The maximum temperature rises of the various components of the alternator shall not exceed those permitted under I.S. with full output and under the ambient temperature conditions specified in Special conditions of contract.

3. Rating

The alternator shall be continuously rated to deliver the rated output at 0.8 pf lagging, on a 3 phase 4 wire 415 volts 50 cycle system with neutral solidly earthed and the earthing system conforming to Indian TNS.

4. Alternator Insulation

The Alternator winding shall have class of insulation as H class with temperature rise limited to Class B.

5. EXCITATION :

The excitation system shall be a brushless system with all accessories, and shall be capable of supplying the excitation current of the generator under all conditions of output from no load to full load and capable of maintaining voltage of the generator constant. The exciter shall have class F insulation with temperature rise limited to class B. The exciter shall be capable of forcing the field for 3 seconds (or duration as specified in the data sheet) in the event of short circuit fault at generator terminal. The exciter should be capable of building up voltage from residual magnetism, protection against low speed operation and high motor starting capability. The rectifier shall have in built protection for over voltage and rate of rise of voltage.

Automatic Voltage Regulators

The AVR shall regulate the output voltage from generator current/voltage signals. The automatic voltage regulator (AVR) shall be high-speed dead band type with automatic and manual control and mounted on control panel or on alternator as specified in the data sheet. If mounted on panel it shall be flush with door, accessible on front door. The manual control shall change in excitation system while AVR is in service so that when there is a failure of AVR the generators excitation control is transferred immediately to manual control without any change in excitation current. Necessary motorized potentiometer for manual control raise / lower PBs shall be provided. Necessary equipment for field suppression and surge protection shall be provided. The response time of the exciter and the generator shall be matched to avoid hunting. All routine tests shall be carried out as per the various Indian standards for engine, alternator and the coupled DG system. The vendor shall give 2 weeks notice for the inspection. Suitable measures shall be taken for field failure protection. The manufacture should specify the method adopted for the same with proper equipment specification and schemes. Alternate method for achieving field failure protection can also be included as an optional item with all required diagrams and component specification.

Governing

The governor shall be of electronic type with governing class A direct. The governor shall be capable of regulating the speed of the engine within the limits approx. 10% of the rated speed within 4 sec due to the sudden application or removal of full load.

Starting

The DG set shall be automatically started, once the Grid Supply has failed and there should be provision given for manual starting in case the AMF system has failed.

The starting of the DG set shall be through a starting switch for manual start.

Batteries of suitable AH capacity with a suitable Battery Charger shall be provided for starting the DG sets. The battery shall be Maintenance free, **VRLA type**, and heavy-duty motive power/traction battery sufficient for three consecutive starts without recharging. Battery charger shall have boost and trickles charging features. Battery shall be confirming to IS: 1651.

6. STARTING BATTERY AND BATTERY CHARGER

24 Volt DC Batteries

24 volt batteries for each set shall comprise of Maintenance free VRLA batteries consisting of required no. of cells, each of 2 volts, to build up AH capacity as required for satisfactory Starting of diesel engines. One hour rate of discharge to attain voltage of 1.85 volt per cell to 2 volts shall be provided. Battery cells shall conform to IS 1651 with up to date amendments. The electric start battery shall be of adequate capacity for 10 successive starts. Time delay relay shall be incorporated to provide a rest period of 1 – 5 sec (adjustable) before each successive start and a time by period of 19 -100 sec. (adjustable) before the system lock out due to failure of the 5th start to crank up the engine. The battery bank shall be provided with the following accessories:

1. Battery stand
2. Set of connectors with ends take off suitable for connections.
3. Cell insulator and stand insulators
4. Spring type hydrometer
5. Thermometer with specific gravity correction scale
6. Cell testing voltmeter
7. Set of tools consisting of spanners, rubber syringe, acid resisting funnel and acid resisting tube of 2 litres capacity – one set
8. Potential free contacts for conveying signals to BMS.
9. Battery Charging Equipment (Trickle and Boost Charging)
10. Battery trickle and boost charge required capacity designed to operate on single phase 230 volts and suitable for charging current as required by the DG and shall be IGBT/THYRISTOR type. The battery charger shall be provided with the following accessories.

AC and DC “ON” and “OFF” switches with HRC fuses

1. Indicating lamps for indicating mains “ON” and battery charging
2. Ballast to give charging
3. Single phase double wound (copper conductor) impregnated natural air cooled mains transformer for rectifier stack.
4. Rotary switch to give step control.
5. Single phase full wave bridge connected silicon rectifier stack
6. Moving coil ammeter to indicate charging current
7. Moving coil voltmeters with a selector switch to measure the battery/charger voltage.
8. Silicon blocking diodes connected to a suitable tap to maintain continuity of DC supply.
9. AC and DC contactors of suitable rating as required.

All the components for battery charger shall be adequately rated and housed in a well ventilated sheet steel cubicle with input and output terminals. Proper cable glands shall be provided for incoming and outgoing cables.

Mounting and Foundations

The engine and direct-coupled alternator shall be rigidly secured to a common rigid base frame fabricated from MS sections factory assembled with acoustic chamber (outdoor/indoor). Foundation details to be provided for site placement. The design of mounting arrangements with antivibration mountings shall be as recommended by the DG manufacturers and shall be such that a maximum of 5% vibrations are transmitted to the building structure. The bidder shall confirm the type and make of mountings offered and the vibration isolation efficiency in the tender.

All rigid pipe / bus bar connections to the DG set shall be made through flexible couplings.

7. AUTO-SYNCHRONISING CUM AMF CUM AUTO LOAD MANAGEMENT PANEL

The control and power panel shall comprise of components as specified in the BOQ including meters, protection relays, switchgears, control components, control and power wiring etc. The panel manufacturer must have a CPRI or ERDA certification for a panel of equivalent rating or more. The panels shall be fabricated from 2mm thick CRCA sheet and load bearing members with 2.5 mm thick. This shall be of compartmentalized and sectionalized design. The main supporting framework shall be of angle iron or of heavier gauge sheet metal. The panel shall be self-supporting design, dust and vermin proof, dead front and fully inter locked with isolating switches. The panel should meet IP54 or better requirements.

The panel shall be designed so as to facilitate inspection, cleaning and repairs. The clearance between phase to phase and phase to earth or metal parts shall be as per relevant IS standards. The metering instruments like voltmeter, ammeter etc. shall be (as per B.O.Q) flush mounted and shall be of 0.5 class accuracy and of standard design. All indication lamps shall be of LED lamp type.

The panel shall be treated for rust protection comprising of de-greasing and de-scaling in Sulphuric acid, baked and powder coated for smooth finish. The color of paint shall be Siemens grey. The Panel shall be tested at site before commissioning. The Panel drawings shall be first got approved from consultants before taking up for fabrication. The panel shall have separate cable alley and a bus bar chamber. The bus bars shall be rigid hard drawn Aluminum and insulated with color coded heat shrinkable sleeves. The neutral bus shall be rated for capacity of half the size of phase bus unless otherwise stated in schedule of quantities/ drawings. The bus bars sizes shall be as per mentioned in the drawing only.

All busbars, cables, wires, lugs etc. adequately rated and temperature de-rated. All control cabling/ wiring inside the panel shall be done with FRLS copper conductor wires/ cables rated for 1100 V and of adequate current carrying capacity but in any case the current drawn by the conductor shall not exceed 80% of the total current carrying capacity of the cable/ wire. The cables/ wires shall be a minimum of 2.5 sq. mm cross-section.

All the control / power cabling and bus bars must be color coded as follows only:

1. Red for red phase
2. Yellow for yellow phase
3. Blue for blue phase
4. Black for neutral
5. Green for earthing.

The insulation of the cable / wires shall be PVC FRLS. The minimum size of cable / wires shall be: < 25 Amps - 6.0 sq. mm, >25 Amps < 32 Amps - 10 Sq.mm, > 32 Amps < 45 Amps - 16 sq. mm, >45 Amps < 55 Amps - 25 sq. mm, > 55 Amps < 72 Amps - 35 Sq.mm, > 72 Amps < 95 Amps - 50 sq. mm, > 95 Amps < 125 Amps - 70 sq. mm, > 125 < 160 Amps - 95 sq. mm, > 160 Amps < 180 Amps - 120 sq. mm. For higher current ratings bus bars shall be preferably used. The specifications stated under Cabling and termination shall apply.

The insulators for supporting the Bus-Bars shall be SMC / DMC type. All the power components/ frames installed in the panel shall be earthed from the main bus with adequate size of bus bar. The doors shall be fitted with concealed hinges and shall be earthed with flexible braided copper earth, to be connected to the earth bus. An earth bus of copper 100 mm x 5 mm shall be fixed along the length of the panel at the lower section. Adequate ventilation for the panel shall be provided. Logic diagram of operation of switches shall be with LED mimic. The nameplates for each feeder shall be of engraved design and screwed to the respective switchgear.

The letters shall not be less than 10 mm size for individual feeders and not less than 15 mm for the main feeders. All switchgear to be mounted in the panel shall be as per schedule of quantities. The minimum depth of the panel shall be 1 meter. All connections shall be accessible from the back. For ease of cable terminations the outgoing links of all feeders shall be extended by 0.5 meter at the back duly supported on insulators.

The panel may be connected to a Building management system and the contractor shall take into account the requirements and shall provide potential free contacts brought out to the gateway terminal blocks rated minimum 10 A at 230 V. All CT secondary connections shall be routed through linked terminal block. A separate dedicated cubicle / compartment shall be provided with terminal blocks for connections to and from the BMS to the feeders for remote monitoring.

Type: Cubical, front operated with detachable cable gland plates 2mm thick for top/ bottom cable entry.

Enclosure: 2MM CRCA suitably rust inhibited and baked enamel painted and provided with square section neoprene gaskets. Load bearing members shall have a thickness of 2.5 mm with IP54 protection.

Mounting: Floor mounted with channel framework of 100mm height.

The panel shall have space heaters, ventilation fans, earthing, and sheet steel treatment as Described in the LV Switchgear panel.

For all equipment's (components) installed in the panel, certificates issued by the manufacturer shall be provided.

AMF FEATURE

1. While the GRID supply is healthy, the Diesel Generating set is at rest and load is supplied directly by the grid through grid circuit breaker.
2. The 415V 3Ph, 4wire supply, tapped from line the side of incomer, will be fed as input to the AMF panel. The status of the supply has to be monitored by the U/V relay provided in the AMF panel.
3. When the Grid voltage fails or drops below a certain pre-set value, the automatic

control system gives a starting signal to the diesel generator set after ensuring the grid CB at 415v MAIN PANEL is off.

4. As soon as the alternator set reaches its operating speed & rated voltage, then a signal shall be generated by the D.G control panel to close the DG incomer CB at 415V MAIN PANEL.
5. A maximum of three attempts of starting facility for the DG set shall be provided and in case the diesel engine fails to start & reach its operating speed within stipulated time, as per DG set characteristic, the feature should automatically lock out the operation of DG set and further operation of DG set should be prevented in both auto & manual condition. This lockout signal shall be given to a hooter, indication lamp with reset button and two potential free contacts.
6. When the main supply restored to normal value for at least one minute then a suitable signal shall be generated and close the Main supply ACB automatically and open the DG supply ACB.
7. The set has thus reverted to its standby condition and will only start when the mains fail again.
8. After restoring back to its normal operation (i.e. the grid feeding the loads while DG is off), if the grid supply fails once again within ONE hour of restoration, then the grid breaker (415v) shall be tripped off and the AMF circuit shall be triggered by the DG control panel. Then the system should remain in D.G operation and the feature of automatic switching over from DG to GRID shall be locked-out. This feature shall be put in to function only after operating personnel's intervention. This shall be suitably annunciated in the control panel.
9. Selector switch shall be provided to select the following feature:
 1. Auto/ Manual
 2. While it is "Auto" mode, the functions described shall be done automatically. But while in manual mode the same will be done manually by operating personnel.

The DG Synchronizing panel will have all necessary relays, devices etc. for operating the DG in Auto Synchronizing mode with necessary facility for sharing the loads automatically in each DG and performing the synchronizing through relays. This shall also have facility such that in case Auto Synchronizing fails, manual synchronizing can be done.

The sensing to start the DG under EB source failure shall be with Auto Mains failure feature. The load sharing shall be done with load controllers, which should be settable for each DG independently and give the command to start the DG after one DG reaches particular set load. The microprocessor should be a complete integrated, automatically synchronizing load controller with protection relays and engine and alternator management features having the following essentials:

1. Engine control

Engine pre-glow, Fuel solenoid control, engine starter control, KVA controlled cool down timer, Oil pressure monitoring, water temperature monitoring, battery voltage monitoring, speed monitoring and over speed protection.

2. Synchronizing

Digital signal processing to eliminate harmonic contents induced in system, adjustable phase voltage windows, windows as small as 2 deg. phase errors and 1% voltage matching,

safe dead bus closing, multiple re closing with adjustable time delay, auto and check synchronizing relay, manual voltage and speed adjustments for manual synchronizing (synchro check must be active during manual synchronizing),

3. Load controller

True RMS power for load control, iso synchronous auto load sharing of KVAR & KW equally with a tolerance of 5%, KW and KVAR droop for manual load control, VAR sharing, VAR & PF control.

4. Automatic generator sequencing

Auto starts generator when load exceeds a preset % load, controlled unloads for engines, engine priority sequence. The Sequencing of DG sets shall be done using selector switch, timer, Micro processor based relay and necessary control circuiting such that normally the DG, which has been given the priority, shall start. When the load exceeds preset % of the DG capacity the other DG shall start and the load shall be shared equally.

5. Generator protective features

Over & under voltage, Over & under frequency, Reverse power, loss of excitation, loss of main detection, speed / frequency mismatch, load surge, KVA load switch, inverse and definite time over current and earth fault, restricted earth fault, differential protection.

6. Engine protective features

High / Low coolant temp, High / Low oil pressure, Over speed, Start failure, Over crank.

7. PC interface

Easy upload and download of configuration set points

Communication with third party devices / BMS through RS 232 C and Backnet protocol.

TESTING OF THE PANEL

Skeleton testing: On approval of the drawing the bidder shall inform at least three days in advance for inspection of the skeleton fabricated and painted and ready for mounting the switch gear.

The panel shall be assembled in factory and tested for the following:

1. Insulation resistance
2. HV test.
3. Operational test with all functional inter locks.
4. CT secondary injections for protection and metering circuits. The bidder shall keep all the test equipments ready at site.

8. DRAWING SUBMISSION:

The following shall be submitted for approval for DG set:

- | | | | | |
|--|---|-----|----|-----|
| 1. Foundation drawing with loading data | : | --- | DO | --- |
| 2. Schematic drawings | : | --- | DO | --- |
| 3. All control & Indication circuit drawings | : | --- | DO | --- |
| 4. Schematic P&I drawing for Lube oil | : | --- | DO | --- |

5. Component list with ratings & ranges of all items. : --- DO ---
6. Design/Engineering of DG exhaust system including BOQ : --- DO ---
7. Design/Engineering of DG cooling system Radiator type cooling with BOQ : --- DO ---
8. Design / Engineering of automatic Fuelling system including the BOQ. : --- DO ---

The final drawings with erection/operation & maintenance manual and literature, write ups and description of DG set excitation system, voltage regulator governor and other auxiliaries shall be submitted.

9. TOOLS

Bidder shall submit a list of the tools to be used for installation and operation.

10. PRE-COMMISSIONING CHECKS

All standards checks including the ones elaborated in the specifications to ensure that the installation of the DG sets and associated systems has been carried out satisfactorily shall be done on completion of installation. These shall include.

DG sets

1. Checking of piping interconnections
2. Checking electrical interconnections
3. Checking of insulation resistance
4. Checking of earthing
5. Checking of instruments and controls.
6. Checking of alignment
7. Checking of vibration transmission to building a structure.
8. Checking of expansion joints.

Fuel system

1. Checking of automatic operation of fuel transfer pumps. If separate bulk storage tank is provided.

Exhaust system

2. Checking of Surface Temperature of Exhaust Piping.
3. Checking of Silencer operation.

PERFORMANCE TESTING AND TYPE TESTS

1. Performance Testing

DG sets shall be tested at varying loads at manufacturers works prior to dispatch of the sets to site. The performance tests at the works shall be carried out in presence of authorized representative from the Engineer-in-Charge. Due notice for the program of performance testing at works shall be given to the Engineer-in-Charge to enable them to arrange for

their representatives for this inspection to be at manufacturers works for this inspection and testing. The costs for the arrangement shall be borne by the bidder. The performance test on each DG sets shall be of minimum 8 hours duration. All instruments, materials, consumables (fuel oil, lube oil etc.) load and labor required for carrying out of the test shall be provided by the Bidder.

Following test acceptance criteria shall be applicable.

Fuel consumption at 50%, 75%, and 100% load.	+ 5% of guaranteed performance. Actual alternator efficiencies as determined in the manufacturer's works tests shall be used as the basis of calculation of specific fuel consumption ratio.
Voltage regulation from no load to full load	+ 0.5%
Frequency regulation from no load to full load	+ 0.5%
Maximum water temperature	+ 5% of guaranteed performance
Maximum lubrication oil temperature	+ 5% of guaranteed performance
Minimum lubrication oil pressure	+ 5% of guaranteed performance

2. Test Certificates

Copies of all documents of routine and type test certificates of the equipments shall be furnished to the department along with the supply of equipments and these are as below:

1. Routine Test Certificates.
 1. Engine separately
 2. Alternator Separately
1. Type Test Certificates
 3. Engine
 4. Alternator
 5. All major components

PERFORMANCE GUARANTEE:

The performance figures quoted in the technical particular sheets shall be guaranteed within the tolerance permitted by relevant; standards. In case of failure of equipment to meet the guaranteed figures, the purchaser reserves the right to reject the equipment. The rejected equipment may be used by the purchaser till the new equipment meeting the guaranteed requirements is supplied by the vendor.

1. Daily Service fuel Tank/ Buffer Tank

Day fuel tanks / Buffer tank 990 litres capacity shall be provided. The tank shall be fabricated from not less than 3 mm M.S. Sheet. A removable cover of ample size with lock shall be provided to permit access to the tank interior. The tank shall be provided with all required appurtenances like inlet and outlet connections drain connection, overflow connection etc. Fuel level indicator with low and high level visual shall be provided. The day tanks shall be floor/wall supported on steel support 300 mm above FFL. Outlet valves from all storage tanks shall be located at easily accessible points so as to facilitate

immediate shutting off of the fuel supply in case of emergency. Each tank shall also be provided with measuring scale to check the level of oil manually.

2. Pipes and pipe fittings

The MS pipes shall be of minimum class C (Heavy gauge) type. Makes of pipes and pipe fittings shall be as approved by project manager(s) / KSITM.

TESTING

Hydrostatic test to be carried out at manufacturer's works.

3. Examination of welds shall be done by visual means. However, non-destructive testing such as spot radiography shall be carried out at manufacturer's works.
4. All gauges and templates necessary for inspection, to the satisfaction of the inspector shall be supplied by the manufacturer.
5. All tanks shall be subjected to hydraulic test at a pressure of 0.05 Mpa and checked for leaks. Test shall be carried out at manufacturer's works.

The Bidder/Vendor shall obtain Explosive Certification & Other Statutory approvals if applicable.

SPECIFIC REQUIREMENT:

General

Quantity	Refer BOQ.
Type	Radiator cooled
Rated voltage	415V 3 Phase
Frequency	50 Hz
Rated output of alternator	Refer BOQ
Rated power factor	0.8 lagging
Degree of protection	IP-23.Type of enclosure Screen Protected Drip Proof
Ambient temperature	50 deg C
DG Auto mains failure cum Synchronizing cum load sharing Control panel	included in scope of Panel vendor but correlation should be made with DG manufacturer

1. List of annunciations required on the DG Auto mains failure cum Synchronizing cum load sharing control panel:
 1. Safety control trip for low lube oil pressure.
 2. Safety control trip for high water temperature.
 3. Safety trip for over speed.
 4. DG fails to start.
2. List of meters/reading required on the control panel on engine:
 1. Lube oil temperature gauge.
 2. Lube oil pressure gauge.
 3. Water temperature Gauge.
 4. Hour meter and RPM indicator.

Protection system:

THERMISTORS	: As per spec. for winding
CT-Neutral Side	: 1 no. (One on each lead)
Protection Core Ratio	
Burden	: 10VA
Class of accuracy	: 5P10
Relays	: THERMISTOR Relay
	On neutral side 51N element, range setting 10% to 40%, relay shall be provided
Indication lamps	: Red, Yellow, Blue indication lamps for
Voltage indication.	

1. “Load on” indication Lamp.
 2. “Engine ON” indication lamp.
 3. “Grid supply healthy” indication lamp.
- Switches / PB’s :
4. Starting Switch with key
 5. Auto/Manual selection switches for “AVR”.
 6. Raise/Lower PBs for speed & voltage.
 7. Emergency stop PB (for Tripping DG breaker at PCC panel).

Annunciator: 12 window solid state annunciator with Test / Accept / Reset PBs.

BMS requirement: There will be integration of the DG system status, fuel tank level, fuel pump Operation, Panel with the BMS system. Necessary provisions to be made in respective areas.

EXHAUST SYSTEM FOR DIESEL GENERATING SETS**1. SCOPE**

The scope of this section is to design, supply, erection, testing and commissioning of D.G exhaust system in accordance with the prevailing Indian standards and Central Pollution Control Board norms. The vendor shall study the location of DG set placement & shall provide the exhaust piping as per the norms & prevailing condition. The scope should cover design of system, all necessary calculations, and piping, piping supports, foundations and necessary steel cladding as required. The vendor should submit all necessary drawings and calculations for approval. Provision of testing port shall be provided on exhaust pipe line.

2. TESTING

Vendor shall carry out the tests as per codal requirements and CPCB requirement. The following testing is to be done.

1. Checking of silencer operation
2. Checking of surface temperature of exhaust piping

3. MISCELLANEOUS

All allied and implied equipments and accessories required for complete operation of the

system shall be supplied and installed by the vendor, whether specifically mentioned or not.

Acoustic System for Diesel Generator room

1. Introduction

The intent of this particular specification is to describe the requirements of Acoustic system for Diesel Generator Room in the said project.

2. Scope of Work

The scope of work includes design, manufacture, supply, installation and testing of soundproof system for the D.G Room.

Scope covers the following but not limited to:

- | | | | |
|----|--|---|--------|
| 1. | Construction of brick / concrete block walls | - | State |
| 2. | Designing the sound proof system | - | Vendor |
| 3. | Approval of vendor's design | - | State |
| 4. | Supply of all the material required for acoustics | - | Vendor |
| 5. | Installation of above | - | Vendor |
| 6. | Testing and demonstrating to Purchaser / Owner | - | Vendor |
| 7. | Instruments required for Pre/Post treatment testing shall be arranged by | - | Vendor |
| 8. | Any other work required for completion of work | - | Vendor |

The bidder/supplier shall be responsible for engineering and functioning of complete system, fully meeting the intent and requirements of the specifications, attached data sheets/drawings. Necessary acoustic doors, acoustic Louvered doors, Ventilation hood for taking hot air from radiator, all other implied and allied items required for completely making the room sound proof as per CPCB norms.

Optional to provide factory made acoustic enclosure with the prevailing norms.

Applicable Standards

The acoustic treatment system / sound proof system shall be in accordance with the standards given below and any other Indian Standards prevailing at the time of execution:

1. IS 1950 (1962) – Code of Practice for Sound insulation of Non-Industrial Buildings.
2. Central Pollution control Board norms with Latest amendments.

Noise and Vibration Control in Diesel Generator Room

The scope of this section consists of noise control measures for the DG set rooms and ventilation system include sound absorbing treatment to DG room, provision of sound reducing doors, provision of silencers in the ventilation system and provision of primary and secondary exhaust mufflers in the engine exhaust piping.

ACOUSTIC TREATMENT

Maximum permissible sound pressure level for the DG sets shall be 60 dBA at 1 m from the DG room with doors closed. The acoustic treatment shall achieve minimum 25 dBA insertion loss or meeting the ambient noise standards whichever is higher. If the ambient

noise is higher, the performance of acoustic treatment shall be checked for noise reduction upto actual ambient noise level, preferably at night times. The measurement of insertion loss shall be done at different points at 0.5 m from the DG room and then averaged.

Walls and ceiling of DG room shall be acoustically treated by means of minimum 75 mm thick mineral wool of 64 kg/m³ density to achieve an insertion loss of minimum 25 dBA and a sound level of max. 60 dBA at 1 m from DG room. In case the desired reduction in sound level to achieve max 60 dBA outside DG room at 1 m distance (with doors closed) is not achieved with the above treatment, the Bidder shall provide additional thickness of acoustic insulation of the same or modified density to achieve the required reduction in sound level without any extra cost. DG contractor shall also coordinate with DG room ventilation Contractor regarding acoustic treatment (if applicable) of fresh air inlets and exhaust outlets to achieve the desired reduction in sound level outside the DG room.

PERFORMANCE

The specification indicates the general layout and measures required for meeting the end noise and vibration requirements. The bidder shall include in his offer whatever other materials are required to be supplied for satisfactory installation and performance of the system so as to meet the end criteria.

Design Requirements

1. Noise Levels: Noise Level to be achieved outside the D.G room as per CPCB norms.
2. Layout: Room Size: As per site condition.
3. Testing: Vendor shall carry out the tests as per codal requirements and CPCB requirement.
4. Miscellaneous

All allied and implied equipments and accessories required for complete operation of the system shall be supplied and installed by the vendor, whether specifically mentioned or not. CPCB Certificate shall be attained by the vendor after successful completion of the complete DG installation including the acoustic works.

DG Set should have following components:

1. DG Set with sound proof canopy
2. Diesel Storage Tank (please specify the dimensions) in liters
3. Diesel for 7 days as per Tier III specifications in liters .
4. AMF Panel
5. Synchronization panel
6. LT Breaker/Distribution Panels
7. Required cabling
8. Any other components

Facility at Domain Centres- 5 Sites

(There are five domain centres i.e. NBPGR New Delhi, NBAGR Karnal, NBFGR Lucknow, NBAIM Mau and NBAII Bangalore. Quantity given below is required to be supplied at each domain centres)

S. No.	Brief description of equipments	Quantity (in Nos.)
B1.0	HPC Systems-II	
B1.1	Linux Cluster	
B1.1-(I)	Resource Management Nodes/Login Nodes	1 Nos.
(Blade/Rack mountable server 1U or maximum 2U form factor): It is to be configured with HPC cluster		
Description	Technical Specification	Compliance
Processor Type	2x Intel Xeon Processor X5670 2.93Ghz or 2x AMD Opteron-6174 2.2Ghz and higher	
Cache	Minimum of 12MB L3 Cache required	
Processor	Minimum of 6 cores/Processor	
Memory Scalability	Scalable to minimum of 128 GB DDR3 ECC 1333 Mhz or higher.	
Memory Size	96GB DDR3 ECC SDRAM 1333 MHz or higher of 8 GB Module Each, Memory expandable to 128 GB or more. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Internal Storage	3x300GB 10K RPM, 6Gbps hot swap SFF SAS HDD (with RAID 0, 1)	
Internal Media Drive	16X DVD Writer	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	
I/O Ports	4x Gigabit Ethernet Port, 1x 10Gigabit Ethernet Port and QDR Infiniband 4X Port.	
PCI-E Slots	1x PCI-Express x16 slots free	
Power supply	Maximum power consumption not more than 550 Watts when fully populated. Redundant power supply with Hot-Swap fan.	

Operating System	64 bit licensed Red Hat Enterprise Linux/Suse Linux Operating System with unlimited users.	
Certification	Server should certify Linux.	
Others	Highly Available load balanced Cluster configuration.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
B1.1-(II)	Master Node	1 Nos.
(Blade/Rack mountable server 1U or maximum 2U form factor): It is to be configured with HPC cluster with NFS/NIS/PFS/Monitoring/etc with Linux Operating System.		
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670 2.93Ghz, or 2x AMD Opteron-6174 2.2Ghz or higher with minimum 12MB L3 Cache and minimum 6 Core/Processor.	
Memory	96 GB Memory (DDR3 ECC SDRAM 1333 MHz or higher of 8GB module each) upgradable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	6x450GB 10k RPM, 6Gbps hot swappable SFF SAS HDDs with RAID 0, 1, 5 capabilities with hardware RAID controller.	
Ports	4x Gigabit Ethernet Port, 1x 10Gigabit Ethernet Port and QDR Infiniband 4X Port.	
USB	2x USB 2.0 or higher Ports	
PCI-E Slots	1x PCI-Express x16 slots free	
Power supply	Maximum power consumption not more than 550 Watts when fully populated. Redundant power supply with Hot-Swap Fan.	
Server Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, Service processor with GUI, SNMP based Manager, and etc.	
Others	Other ports as per the requirement of HPC should be supplied. Internal 16X DVD Writer, 1U 17" rack mounted TFT/LCD Colour Monitor with Keyboard, Mouse.	
Form Factor	Blade/1U/2U Rack model with Rail kit	

Operating System	64 bit licensed Red Hat Enterprise Linux/Suse Linux Operating System with unlimited users.	
Certification	Server should certify Linux.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
B1.1-(III)	HPC Compute Nodes (for Linux based Cluster)	16 Nos.
Description	Technical Specification	Compliance
Processor	2x Intel Xeon Processor X5670, 2.93Ghz or 2x AMD Opteron -6174, 2.2Ghz or higher with minimum 12MB L3 Cache and Minimum 6 Core/Processor.	
Memory	96 GB (DDR3 ECC 1333 MHz and minimum 8 GB module each or higher) Memory upgradeable to 128 GB. Balanced memory configuration should be provided to achieve optimal memory bandwidth.	
Hard Disk	Single 146GB 15K RPM SAS HDD or higher.	
Ports	2x Gigabit Ethernet Ports and QDR Infiniband 4X Port.	
Power supply	Maximum power consumption not more than 550Watts when fully populated. Configured with redundant power supply	
Node Management Port and Software	Remote Management Port with IPMI 2.0 Support. It should provide the Integrated Lights-Out Manager (ILOM) or equivalent, SNMP based Manager, and etc.	
Operating System	64 bit Red Hat Enterprise/Suse Linux Operating System with unlimited users.	
Certification	Server should certify Linux.	
Others	Other ports as per the requirement of HPC should be supplied	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	
B1.2	HPC Software	
B1.2-(I)	Clustering Software Suite	As per req.
	<ol style="list-style-type: none"> 1. All quoted software must be licensed, certified and fully supported versions. 2. 42U OEM Racks with adequate rack accessories and PDU to be quoted. 3. HPC Cluster Configuration software must have 	

	<p>GUI as well as Web based UI access.</p> <ol style="list-style-type: none"> 4. HPC Cluster Management software must have a proven clustering capability of at least 1024 compute servers and should be listed in the current edition of and India_Top_Supercomputers listings to demonstrate the above-said scalability. 5. HPC Cluster Management suite must have extensive cluster monitoring capability to drill down to a node-level performance parameters using intuitive GUI and with well-designed graphical reports. 6. HPC Cluster Management suite must permit only secure shell (ssh) based access and a robust parallel-execution shell (pdsh) implementation. It should be configured to disallow access to compute server to other users whose jobs are not currently being executed on those servers. 7. Software for Enterprise Linux Operating system, HPC Cluster Configuration, Deployment, Resource Management and Monitoring, and Job scheduling must be quoted with all software updates during the contract period provided free-of-cost. 8. Compilers: FORTRAN, C/C++, (GNU, PGI or Intel compilers) and MPI software, licensed and supported. 9. All the quoted software's license must be perpetual. 10. The compilers and development environment must be licensed for 10 concurrent users in a floating-license mode. 	
B1.2-(II)	Workload Management Software	As per req.
	<ol style="list-style-type: none"> 1. Integrated workload management solution with web based job submission and HPC performance analysis and Reporting. 2. OEM licensed job scheduler with complete support and integration for scheduler , Integrated Portal framework for job submission and HPC Grid performance analysis for the proposed cluster must be quoted. 3. During the support, vendor should integrate those applications with batch submission script with the portal to facilitate seamless usage of 	

	<p>the HPC Grid</p> <ol style="list-style-type: none"> Licensing of scheduler should be perpetual and floating licensing based & no open source/freewares. Licensing for Grid portal & Accounting module to be quoted on concurrent users , perpetual and floating users basis. Integrated Advanced scheduling features should include cross-system scheduling, peer to Peer scheduling, with Advanced fair-share & Hierarchical fair share scheduling, multi-cluster scheduling. Grid enablement / Meta scheduling with HPCBP (High Performance Computing Basic Profile) and Web services based Application Integration Framework should be provided. Power Aware Job Scheduling to support auto shutdown and auto boot of nodes as per the workload to be supported. 	
B1.3	Switches	
B1.3-(I)	Cluster Interconnect Network (IB Switches 4X QDR)	As per req.
	<ol style="list-style-type: none"> Infiniband 4X QDR speed Interconnect Fabric. Fully 100% non-blocking and standard fat-tree topology based. Compatible with the latest OFED drivers and Open MPI libraries. Should be connected to all the Infiniband 4X QDR ports in all the proposed servers, nodes and storage. The Infiniband 4X fabric operating at QDR speeds to be proposed Core based switch configuration. Only Infiniband 4X QDR speed Optical cables to be proposed. 4% Extra Ports and cable should be quoted. 	
B1.3-(II)	Cluster Administration Network (1 Gigabit Switch in High Availability Mode)	02Nos.
	<ol style="list-style-type: none"> 1 Gbps Ethernet based cluster administration network. Gigabit Manageable Switches and suitable cables as required for the proposed HPC systems and storage. <p>Switch Specification</p> <p>Description</p> <p>The switch should have minimum 48 x 10/100/1000 Ports and 2 x</p>	

	10Gigabit Ethernet uplinks with SR Interface.
	Form Factor of 1 RU and 19" Rack Mountable
	Support for Redundant Power supply
	Support for 1000BASE-T SFP-based ports: RJ-45 connectors, four-pair Category 5 UTP cabling
	Performance
	Minimum of 160 Gbps Switching Fabric with non blocking switch fabric capacity
	Forwarding rate - 101 Mpps
	128 MB DRAM
	32 MB Flash memory
	Configurable up to 12,000 MAC addresses
	Configurable up to 11,000 unicast routes
	Configurable up to 1000 IGMP groups and multicast routes
	Configurable maximum transmission unit (MTU) of up to 9000 bytes, with a maximum Ethernet frame size of 9016 bytes (Jumbo frames)
	Switch should have support for Dedicated stacking features so that multiple switch can be stacked together which behaves as a single unit.
	High Availability & Scalability Features
	Redundancy features for fault backup
	Uplink Fast and Backbone Fast technologies to help ensure quick failover recovery, enhancing overall network stability and reliability.
	IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) to provide rapid spanning-tree convergence independent of spanning-tree timers and the benefit of distributed processing.
	Per-VLAN Rapid Spanning Tree Plus (PVRST+) or its equivalent to allow rapid spanning-tree reconvergence on a per-VLAN spanning-tree basis, without requiring the implementation of spanning-tree instances.
	Hot Standby Router Protocol (HSRP) or its Equivalent support to create redundant, fail-safe routing topologies or equivalent.
	Unidirectional Link Detection Protocol (UDLD)/Equivalent and Aggressive UDLD/ Equivalent to allow unidirectional links to be detected and disabled to avoid problems such as spanning-tree loops.
	Equal cost routing (ECR) to provide load balancing and redundancy.
	Bandwidth aggregation LACP (IEEE open Standard) enhances fault tolerance and offers higher-speed aggregated bandwidth between switches and to routers and individual servers.

	The Switch should be able to discover the neighbouring switch of the same vendor giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems.
	The Switch should support Redundant Power supply.
	High-Performance IP Routing
	Basic IP unicast routing protocols (static, RIPv1, and RIPv2)
	Support for IPv4/IPv6 unicast routing capability (static, RIP, and OSPF protocols) to forward IPv4/IPv6 traffic through configured interfaces
	Support for Advanced IP unicast routing protocols (OSPF, and RIPv1/v2) for load balancing and constructing scalable LANs.
	Support for Policy-Based Routing (PBR) to allow superior control by enabling flow redirection regardless of the routing protocol configured.
	Inter-VLAN IP routing to provide for full Layer 3 routing between two or more VLANs.
	Support for Protocol Independent Multicast (PIM) for IP Multicast routing, including PIM sparse mode (PIM-SM)/PIM dense mode (PIM-DM)/ PIM sparse-dense mode.
	Support for Distance Vector Multicast Routing Protocol (DVMRP) or its Equivalent tunneling to interconnect two multicast-enabled networks across nonmulticast networks.
	Integrated Software features for bandwidth optimization
	Per-port broadcast, multicast, and unicast storm control to prevent faulty end stations from degrading overall systems performance.
	IEEE 802.1d Spanning Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance.
	PVST+ or it equivalent for Layer 2 load sharing on redundant links to efficiently use the extra capacity inherent in a redundant design.
	IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) to allows spanning-tree instance per VLAN, enabling Layer 2 load sharing on redundant links.
	Local Proxy Address Resolution Protocol (ARP) to work in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.
	VLAN1 minimization to allow VLAN1 to be disabled on any individual VLAN trunk link.
	VLAN Trunking Protocol(VTP) or its equivalent
	Any change in the VLAN configuration shall be propagated to all

	switches automatically using the central switch VLAN configuration
	IGMPv3 snooping to provide fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to only the requestors.
	IGMP filtering to provide multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.
	Multicast VLAN registration (MVR) to continuously send multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.
	QoS AND CONTROL
	Advanced QoS
	Standard 802.1p CoS and DSCP field classification should be supported, using marking and reclassification on a per-packet basis by source and destination IP address, source and destination MAC address, or Layer 4 TCP or UDP port number.
	Four egress queues per port to enable differentiated management of up to four traffic types across the stack.
	SRR scheduling to ensure differential prioritization of packet flows by intelligently servicing the ingress and egress queues.
	Weighted tail drop (WTD)/equivalent to provide congestion avoidance at the ingress and egress queues before a disruption occurs.
	Strict priority queuing to guarantee that the highest-priority packets are serviced ahead of all other traffic.
	Granular Rate Limiting
	Committed Information Rate (CIR) function to guarantees bandwidth in increments as low as 64 Kbps.
	Rate limiting support based on source and destination IP address, source and destination MAC address, Layer 4 TCP and UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps.
	Support for Asynchronous data flows upstream and downstream from the end station or on the uplink using ingress policing and egress shaping.
	Should support ACL.
	Network security features
	Support for Network Admission Control or it Equivalent for end-point security (PCs & Desktop Posture Assessment) and thereby controlling the spread of viruses & worms

	IEEE 802.1x to allow dynamic, port-based security, providing user authentication.
	IEEE 802.1x with VLAN assignment to allow a dynamic VLAN assignment for a specific user regardless of where the user is connected.
	IEEE 802.1x with voice VLAN to permit an IP phone to access the voice VLAN irrespective of the authorized or unauthorized state of the port.
	IEEE 802.1x and port security to authenticate the port and manage network access for all MAC addresses, including those of the client.
	IEEE 802.1x with an ACL assignment to allow for specific identity-based security policies regardless of where the user is connected.
	IEEE 802.1x with Guest VLAN to allow guests without 802.1x clients to have limited network access on the guest VLAN.
	VLAN ACLs (VACLs) on all VLANs to prevent unauthorized data flows from being bridged within VLANs.
	Port-based ACLs (PACLs) for Layer 2 interfaces to allow application of security policies on individual switch ports.
	Unicast MAC filtering to prevent the forwarding of any type of packet with a matching MAC address.
	Unknown unicast and multicast port blocking to allow tight control by filtering packets that the switch has not already learned how to forward.
	Support for SSHv2, and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.
	Private VLAN to provide security and isolation between switch ports, helping ensure that users cannot snoop on other users' traffic.
	Bidirectional data support on the Switched Port Analyzer (SPAN) or its equivalent port to allow the Intrusion Detection System (IDS) to take action when an intruder is detected.
	TACACS+ / RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.
	MAC address notification to allow administrators to be notified of users added to or removed from the network.
	DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses. This can be used to prevent attacks that attempt to poison the DHCP binding database, and to rate limit the amount of DHCP traffic that enters a switch port.
	DHCP Interface Tracker (Option 82) to augment a host IP address request with the switch port ID.
	Port security to secure the access to an access or trunk port based on MAC address. After a specific timeframe, the aging feature should remove the MAC address from the switch to allow another device to

	connect to the same port.
	Multilevel security on console access to prevent unauthorized users from altering the switch configuration.
	The user-selectable address-learning mode to simplify configuration and enhances security.
	BPDU Guard feature, which shuts down Spanning Tree Protocol PortFast-enabled interfaces when BPDUs are received to avoid accidental topology loops.
	Spanning-Tree Root Guard (STRG) or its equivalent to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.
	IGMP filtering provides multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.
	Dynamic VLAN assignment support
	Support ACL.
	Management
	Superior manageability Features
	CLI support to provide a common user interface and command set with all routers and switches of the same vendor
	Switch support to facilitate service level management throughout the LAN.
	Switching Database Manager templates for access, routing, and VLAN deployment scenarios to allow the administrator to easily maximize memory allocation to the desired features based on deployment-specific requirements.
	VLAN trunks support from any port, using either standards-based 802.1Q tagging or the Inter-Switch Link (ISL) VLAN architecture.
	Up to 1024 VLANs per switch or stack and up to 12 spanning-tree instances per switch
	Upto Four thousand VLAN Ids
	Voice VLAN feature to simplify telephony installations by keeping voice traffic on a separate VLAN for easier administration and troubleshooting.
	IGMPv3 snooping to provide fast client joins and leaves of multicast streams and limits bandwidth-intensive video traffic to only the requestors.
	Remote SPAN (RSPAN) or its equivalent to allow administrators to remotely monitor ports in a Layer 2 switch network from any other

	switch in the same network.
	For enhanced traffic management, monitoring, and analysis, the Embedded Remote Monitoring (RMON) software agent should support four RMON groups (history, statistics, alarms, and events).
	All nine RMON groups should be supported through a SPAN port, which permits traffic monitoring of a single port, a group of ports, or the entire stack from a single network analyzer or RMON probe.
	Domain Name System (DNS) to provide IP address resolution with user-defined device names.
	Trivial File Transfer Protocol (TFTP) to reduce the cost of administering software upgrades by downloading from a centralized location.
	Network Timing Protocol (NTP) to provide an accurate and consistent timestamp to all intranet switches.
	Multifunction LEDs per port for port status; half-duplex and full-duplex mode; and 10BASE-T, 100BASE-TX, and 1000BASE-T indication as well as switch-level status LEDs for system, redundant power supply, and bandwidth use to provide a comprehensive and convenient visual management system.
	Ease of use and ease of deployment
	Express Setup feature to simplify initial configuration of a switch via a Web browser, eliminating the need for more complex terminal emulation programs and CLI knowledge Reduces the cost of deployment by enabling less-skilled personnel to quickly and simply set up switches.
	DHCP auto configuration of multiple switches through a boot server eases switch deployment.
	Automatic QoS (Auto QoS) Feature to simplify QoS configuration in voice-over-IP (VoIP) networks by issuing interface and global switch commands to detect IP phones, classify traffic, and enable egress queue configuration.
	Autosensing on each 10/100/1000 port to detect the speed of the attached device and to automatically configure the port for 10- or 100 Mbps or 1000-Mbps operation, easing switch deployment in mixed 10- , 100-Mbps and 1000-Mbps environments.
	Auto negotiating on all ports to automatically select half- or full-duplex transmission mode to optimize bandwidth.
	Dynamic Trunking Protocol (DTP) or its equivalent to help enable dynamic trunk configuration across all switch ports.
	Port Aggregation Protocol (PAgP) or its equivalent to automate the creation of groups of Gigabit
	Link Aggregation Control Protocol (LACP) to allow the creation of

	Ethernet channeling with devices that conform to IEEE 802.3ad.
	DHCP Server to enable a convenient deployment option for the assignment of IP addresses in networks that do not have a dedicated DHCP server.
	DHCP Relay to allow a DHCP relay agent to broadcast DHCP requests to the network DHCP server.
	IEEE 802.3z-compliant 1000BASE-SX, 1000BASE-LX/LH, 1000BASE-ZX or its equivalent 1000BASE-T, and physical interface support through a field-replaceable SFP module to provide unprecedented flexibility in switch deployment.
	Default configuration should be stored in Flash and should help to ensure that the switch can be quickly connected to the network and can pass traffic with minimal user intervention.
	Automatic medium-dependent interface crossover (Auto-MDIX) to automatically adjust transmit and receive pairs if an incorrect cable type (crossover or straight-through) is installed on a 10/100 port.
	Standards
	IEEE 802.1s
	IEEE 802.1w
	IEEE 802.1x
	IEEE 802.3ad
	IEEE 802.3x full duplex on 10BASE-T,
	100BASE-TX, and 1000BASE-T ports
	IEEE 802.1D Spanning Tree Protocol
	IEEE 802.1p CoS Prioritization
	IEEE 802.1Q VLAN
	IEEE 802.3 10BASE-T specification
	IEEE 802.3u 100BASE-TX specification
	IEEE 802.3ab 1000BASE-T specification
	IEEE 802.3z 1000BASE-X specification
	SFP-10GB ER/LR/SR/LRM/LX4/CX4
	1000BASE-X (SFP)
	1000BASE-SX
	1000BASE-LX/LH
	1000BASE-ZX or its equivalent
	RMON I and II or its equivalent standards

	SNMPv1, SNMPv2c, and SNMPv3	
B1.3-(III)	Cluster Management Network (IPMI) (10/100 Mbps Switches)	01Nos.
	1. 10/100 Mbps of manageable switches for IPMI network communication with 30 number of ports +10% additional (Ports and Cables) in a single Switch. The Switch should have redundant Management Module and power supply.	
	2. It should support multiple operating systems.	
	3. The IPMI switch should be SNMP enabled. It should be operable from remote locations.	
	4. The device should virtually discover all the under mentioned IPMI devices over the LAN: IPMI 1.5 (incl. non-standard SoL support) , IPMI 2.0 , HP integrated Lights Out (iLO, iLO2) , Dell Remote Access Cards (DRAC III, 4, 5) , Dell M1000e Blade Chassis Controller , Dell iDRAC (Blades) , FTS iRMC , IBM RSA (RSA II) , IBM BladeCenter , Sun ALOM , Sun ILOM.	
	5. The Device should support Intelligent Platform Management Interface (IPMI), Intelligent Platform Management Bus (IPMB), Intelligent Chassis Management Bus (ICMB).	
	6. System should provide capability of automatic discovery of service processors connected and DHCP Server.	
	7. The Centralized management Software should have compatibility with different flavours of Windows, Linux and Solaris so that it can be installed and configured on any operating system as per requirement. The software should also support WIN 2008 server.	
	8. This software should be available as a standalone software installer CD which can be installed either on Virtual Machine or any available server as required.	
	9. The Centralized Mgmt software should be able to map with Power over IP hardware as a scalability feature.	
	10. The solution should have the capability of integration with the following external authentication systems: AD, LDAP, RADIUS, TACACS+, RSA Secure ID.	
	11. Warranty should provide for a 3 years onsite comprehensive (24*7).	
B1.4	Racks, Cabling and Integration	As per req.
	Racks: <ol style="list-style-type: none"> 42U OEM Racks with adequate rack accessories and PDU. 1U Rack mounted TFT Monitor/Keyboard/Mouse per rack along with IPMI switch to monitor all the rack servers in the proposal. The 42U and units shall support a static load of 1200KG. All racks shall have IP20 protection and shall be inherently earthed or grounded directly to the frame. 	

	<ol style="list-style-type: none"> 5. The unit shall provide adequate ventilation to provide airflow required by the major server manufacturers. 6. The unit shall be available with a vertical equipment mounting space of 42U or (1U=1.75" or 44.45mm). <p>Cabling:</p> <ol style="list-style-type: none"> 1. Neatly structured Cat-6 cabling for networked connectivity and cabling for all the power unit up to the rack level in the Data Centre. 2. Dedicated raceways / cable-trays should be used for laying LAN and Power cables. 3. Along with LAN Cat-6 cabling, the Agency should also design and lay cable trays for Storage Area Network (SAN) upto the racks in the Data Centre. 4. Cat-6 Cabling for IPMI switches on the racks should also be done by the Agency. 5. Additional cabling requirements on an on-going basis will also be catered to by the Agency. 6. Agency should ensure that all the cable raceways are adequately grounded and fully concealed with covers. 7. The cables should be appropriately marked and labelled. <p>Integration:</p> <ol style="list-style-type: none"> 1. The HPC Clusters should be integrated at Customer location in front of customer including all the components. 2. At customer location, a 120-hour (5 days) continuous diagnostic/burn-in testing to be done in the presence of IASRI constituted committee members. 3. Successful completion of high performance linpack-parallel carried out at the customer location with at least 80% sustained performance to the peak.
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B1.5	UPS, 16KVA, N+1 for HPC	01
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Details of Design Guidance

B1.5 UPS with accessories

Uninterrupted power supply units shall be designed on the latest technology with best in class components to provide reliable operation for continuous 7x24x365 days. The ups shall be **true on-line double conversion UPS system using IGBT based technology** i.e. the IGBT based Rectifier of the UPS system converts the input AC power to DC and then the IGBT based inverter converts the DC into clean AC power. UPS solution shall be N+1.

S. No.	Detailed Technical Specifications :-	Complied, Yes/No	Vender offering (Strictly need to specify)
A	UPS (Uninterrupted Power Supply)with accessories		
1	Make-		
2	Model -		
3	System capacity- 16KW N+1		
4	Type of redundancy- N+1		
5	Backup time- 10 Min on 16KW load		
B	GENERAL SPECIFICATIONS		
1	This specification describes the operation and functionality of a continuous duty, three-phase, solid-state, on-line double conversion static Uninterruptible Power System (UPS) hereafter referred to as the UPS. The UPS shall utilize a rack-mounted N+1 redundant, scalable array architecture.		
2	Each ups modules contains a full rated input rectifier / boost converter (hereafter referred to as Input Converter), full rated output inverter (Kva =KW), and battery charging circuit.		
3	The system shall also comprise of a user-replaceable continuous duty bypass static switch module		
4	The system shall also comprise of a user-replaceable hot swappable battery modules, which can be swapped with out switching of the ups modules when required.		
5	The system shall also comprise of redundant main controller modules, redundant logic power supplies, which can be swapped with out switching off any ups modules when required.		
6	The UPS manufacturer should provide an output distribution system to distribute quality uninterrupted power for mission critical, data centre load. This distribution system should be installed in side the ups modules along with input, output & manual bypass switches in a metal enclosure which is in side UPS rack. Out put distribution should happen through 3phase & neutral bus-duct.		
7	The ups units & the batteries shall be scalable with out shutting down the mission critical Data Centre load.		
C	MODES OF OPERATIONS		
1	Normal: The input converter and output inverter shall operate in an on-line manner to continuously regulate power to the critical load. The input and output converters shall be capable of full battery recharge while simultaneously providing regulated power to the load for all line and load conditions within the range of the UPS specifications.		

2	Battery: Upon failure of the AC input source, the critical load shall continue being supplied by the output inverter, which shall derive its power from the battery system. There shall be no interruption in power to the critical load during both transfers to battery operation and retransfers from battery to normal operation.		
3	Recharge: Upon restoration of the AC input source, the input converter and output inverter shall simultaneously recharge the battery and provide regulated power to the critical load.		
4	Static Bypass: The static bypass shall be used to provide controller transfer of critical load from the inverter output to the bypass source. This transfer, along with its retransfer, shall take place with no power interruption to the critical load. In the event of a UPS output fault or significant output overload emergency, this transfer shall be an automatic function. Manual transfer to Static Bypass (called "Requested bypass") shall be available in order to facilitate a controlled transfer to Maintenance Bypass		
5	Maintenance Bypass: The system can be equipped with an optional integrated, bus connected external make-before-break Maintenance Bypass Cabinet to electrically isolate the UPS during routine maintenance and service of the UPS. The make-before-break Maintenance Bypass Cabinet shall allow for the completely electrical isolation of the UPS. An option for an external make-before-break external maintenance bypass panel shall be available		
D	SYSTEM CHARACTERISTICS.		
1	System Capacity: The system shall be rated for full kW output.		
2	UPS Input		
	A. AC Input Nominal Voltage: 230 V, 3 Phase, 4 wire + G, 50 Hz.		
	B. AC Input Voltage Window: 340 – 475VAC (while providing nominal charging to the battery system).		
	C. Maximum Frequency Range: 40-70Hz		
	D. Input Power Factor:		
	a. Greater than 0.99 with load at 100%		
	b. Greater than 0.99 with loads above 50%		
	E. Input Current Distortion:		
	Input current Distortion with no additional filters: less than 5%		

	F. Soft-Start:		
	Shall be linear from 0-100% input current and shall not exhibit inrush. This shall take place over a user selectable 1-60 second time period with a factory default of 10 seconds.		
3	UPS OUTPUT.		
	A. AC Output Nominal Output: 230V, 3 Phase, 4 wire + G, 50 Hz.		
	B. AC Output Voltage Distortion: Less than. 2% @ 100% Linear Load. Less than 6% for SMPS load as defined by EN50091-3/IEC 62040-3.		
	C. AC Output Voltage Regulation: +/- 1% For 100 % Linear or Nonlinear Load		
	D. Voltage Transient Recovery within <50 milliseconds		
	E. Overload Rating : Normal Operation:		
	1) 150% for 30 seconds before transfer to Bypass		
	2) 125% for 10 minutes before transfer to bypass		
	F. Overload Rating : Bypass operation		
	1) 125% continuous		
	2) 1000% for 500 milliseconds		
	G. System AC-AC Efficiency:		
	Normal operation > 96% at 40% - 100% load Battery operation > 96% at 40% to 100% load		
	H. Output Power Factor Rating:		
	0.5 leading to 0.5 lagging without any derating		
	I. Battery Protection:		
	The inverter shall be provided with monitoring and control circuits to limit the level of discharge on the battery system.		
4	CHARGING		
	A. The battery charging shall keep the DC bus float voltage at +/-1% of tolerance		
	B. The battery charging circuit shall contain a temperature compensation circuit, which will regulate the battery charging to optimize battery life.		
	C. The battery charging circuit shall remain active when in Static Bypass and in Normal Operation		
5	BATTERIES		
	A. The UPS battery shall support an optional battery plant of modular construction made up of user replaceable, hot swappable, fused, battery modules. Each battery module shall be monitored for voltage and temperature for use by the UPS battery diagnostic. Battery charging current shall be temperature compensated.		

	B. The battery jars housed within each removable battery module shall be of the Valve Regulated Lead Acid (VRLA) type.		
	C. The UPS shall incorporate a battery management system to continuously monitor the health of each removable battery module. This system shall notify the user in the event that a failed or weak battery module is found.		
	D. The Batteries shall be long life batteries (5-8year) and the battery casing shall be flame retardant type.		
6	SOFTWARE AND CONNECTIVITY		
	A. Network Adaptor: The Ethernet Web/SNMP Adaptor shall allow one or more network management systems (NMS) to monitor and manage the UPS in TCP/IP network environments. The management information base (MIB) shall be provided in DOS and UNIX "tar" formats.		
	B. Unattended Shutdown -The UPS, in conjunction with a network interface card, shall be capable of gracefully shutting down one or more servers when the UPS is operating from the battery and available runtime has reached a user defined level.		
	C. Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.		
	D. Simple Network Management Protocol (SNMP): Remote UPS Monitoring shall be possible through a standard MIB II compliant platform		
7	DISPLAY AND CONTROLS		
	A. Control Logic: The UPS shall be controlled by two fully redundant, user replaceable / hot-swappable Intelligence modules (IM). These modules shall have separate, optically isolated, communication paths to the power and static switch modules. Logic power for the control modules shall be derived from redundant power supplies, each having a separate AC and DC input and output. The communication of the control modules shall be of Controller Area Network (CAN Bus) and EIA485		
	B. Graphical User Interface: A single microprocessor controlled user interface/display unit shall be located on the front of the system.		
	C. Metered Data: the following data shall be available on the Graphical User Interface/display: Input\Output Voltages, Currents, Frequencies, Breaker & Switch Status, Battery Status, Event Log		
	D. Event log: The display unit shall allow the user to display a time and date stamped log.		
	E. Controls: All the ups controls or programming functions shall be accomplished by use of the display unit. The touch screen display shall facilitate these operations		

8	REMOTE MONITORING		
	A. Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.		
	B. RS232 Monitoring: Remote UPS monitoring shall be possible via either RS232 or contact closure signals from the UPS.		
	C. Simple Network Management Protocol (SNMP): Remote UPS Monitoring shall be possible through a standard MIB II compliant platform.		
	D. The UPS manufacturer shall have available software to support graceful shutdown and remote monitoring		
9	ENVIRONMENTAL		
	A. Storage Ambient Temperature: -15 to 40C		
	B. Operating Ambient Temperature: 0°C to 40°C		
	C. Relative Humidity: 0 to 95% Non-condensing		
	D. Altitude: Maximum installation with no derating of the UPS output shall be 3,000 feet (1000m) above sea level		
10	FACTORY ASSISTED START-UP & MAINTENANCE		
	A. If a factory assisted UPS start-up is requested, factory trained service personnel shall perform the following inspections, test procedures, and on-site training:		
	B. On-Site Operational Training: During the factory assisted start-up, operational training for site personnel shall include touch screen operation, LED indicators, startup and shutdown procedures, maintenance bypass and AC disconnect operation, and alarm information.		
	C. The UPS manufacturer shall have a nationwide service organization Available, consisting of manufacturer trained field service personnel to perform start-up, preventative maintenance, and service of the UPS system and power equipment. The service organization shall offer 24 hours a day, 7 days a week, 365 days a year service support in all class A cities & next day business in all class B & C cities		
	D. Replacement parts: Parts shall be available through the nationwide service organization 365 days a year. The nationwide service organization shall be capable of shipping parts / modules any where in India with in stipulated time required by NIC. NIC will not allow any component level repairs in Data Center ups systems inside the DC / Equipment room / ups room.		
11	STANDARDS		
	ISO 9001		
	ISO 140001		

12	DELIVERY SUBMITTALS		
	1. Installation manual, which includes instructions for storage, handling, examination, preparation, installation, and start-up of UPS.		
	2. User manual, which includes operating instructions.		

B1.6	Infrastructure for HPC	As per req.
	<ol style="list-style-type: none"> 1. Site preparation should be done in the area of at least 20Square Meter. 2. This will include wooden partition with glass panels for making dust free enclosure for the server. 3. Air-conditioning in server room will have to be provided through two numbers of split ACs of 1.5 Ton capacity each. 4. This will also include necessary wiring and power points for UPS, AC and server etc. 5. Adequate lighting arrangements are also required inside the server room and UPS enclosure. 6. UPS will be placed outside the server room. 	

B2.0	Attached Storage System-II	
B2.0-(I)	Network Attached Storage (NFS server) (20 TB)	1Nos.
	<ol style="list-style-type: none"> 1. 20 TB usable capacity network attached storage to be configured for NFS services to all the proposed servers. 2. Storage NAS head/server must be adequately configured to sustain a performance of 250 MB/sec in HA mode, simultaneously read and write which is to be demonstrated using tools like IOZ or IOR. 3. Storage NAS head/server must transfer data over the Infiniband 4X QDR fabric. An alternate provision to connect NFS services via the Gigabit 1GbE network also should be possible. 4. RAID-6 based configuration is required. Only 15K RPM SAS 300GB based disks are allowed. 5. The NAS head/server must be connected to dual redundant array controller based dedicated storage configured with adequate SAS disks. 6. Vendor should quote 5 additional Hard disk as spare parts . 	
B2.0-(II)	High Performance Parallel File system based Storage (20TB)	01 Nos.
	<ol style="list-style-type: none"> 1. 20 TB usable capacity Parallel file system based high performance storage services to be available to all the proposed servers. 2. Parallel File System must transfer I/O data over Infiniband 4X QDR fabric using low latency protocols. 3. PFS must deliver a sustained aggregate performance of 2 Gigabyte/sec write when simultaneous Read and Write operations at 50%:50% are applied using standard I/O performance benchmarks like IOzone or IOR. 	

	4.	The disks should in RAID-6 configuration. Only 15RPM 300GB SAS based disks are allowed.
	5.	The solution must be based NSPOF configuration.
	6.	The PFS software supplied must be licensed, commercial with upgrades/updates.
	7.	Vendor should quote five additional Hard disk as spare parts.

B3.0	Desktop Workstations-II	03 Nos.
Workstation - (Tower Cabinet base)		
Description	Technical Specification	Compliance
Processor	Intel(R) Xeon(R) W3530 2.80GHz, 8M cache, 4.8 GT/s QPI, Turbo, HT, 4C	
Memory	16 GB, DDR3 ECC SDRAM Memory1333MHz or higher	
Mother Board	Intel® X58 chipset	
Hard Disk	1TB SATA (7200RPM) Hard Disk.	
Optical Drive	16X max SATA DVD+/-RW with Dual Layer Write Capabilities.	
Graphic Card	1GB PCI-Exp-16 GPU based Nvidia/ATI Makes.	
Monitor	22" Professional Widescreen Flat Panel LCD Monitor.	
Keyboard, Mouse	USB Keyboard and USB Mouse with optical Scroll.	
NIC	Gigabit Ethernet Ports	
USB	6x USB 2.0\3.0 Ports	
Bays	Two external 5.25" optical bays	
PCI-E Slots	1 PCI-E free slot	
Operating system	Genuine Windows(R) 7 Professional 64bit (English)	
Antivirus	Preinstalled Norton Internet Security 2010 or higher with media for three years.	
Certification	Workstation should certify Windows, Linux.	
Warranty	Should provide for a 3 years onsite comprehensive warranty (24*7).	

D. TESTING AND QUALITY ASSURANCE REQUIREMENTS

3.1 Inspections

3.2 Pre-commissioning Tests

- 3.2.0 In addition to the Supplier's standard check-out and set-up tests, the Supplier (with the assistance of the Purchaser) must perform the following tests on the System and its Subsystems before Installation will be deemed to have occurred(pursuant to GCC Clause 26 and related SCC clauses).
- 3.2.1 This testing / inspection shall be performed after the completion of installation. The inspectors shall verify the component level details during this testing and shall sign the installation report after successful completion of the post installation testing. Defects / shortcomings brought out in this testing shall have to be attended as per the contract within the permitted time schedule.
- 3.2.2 The testing & inspection as per clause 3.2.1 of above in any way not relieve the Bidder from any Warranty or other obligations under this contract.

Inspection and tests prior to shipment of Goods and at final acceptance are as follows:

- (i) The inspection of the goods shall be carried out to check whether the goods are in conformity with the technical specifications attached to the purchase- order form and shall be in line with the inspection/test procedures laid down in the technical specifications and the General Conditions of contract. Following broad test procedure will generally be followed for inspection and testing of machine. The supplier will dispatch the goods to the ultimate consignee after internal inspection testing along with the supplier's inspection report, manufacturer's warranty certificate. The purchaser will test the equipment after completion of the installation and commissioning at the site of the installation. For site preparation, the supplier should furnish all details to the purchaser sufficiently in advance so as to get the works completed before receipt of the equipment. Complete hardware and software as specified in section VI should be supplied, installed and commissioned properly by the supplier prior to commencement of performance tests.
- (ii) The acceptance test will be conducted by the purchaser/their consultant or any other person nominated by the purchaser, at its option. The acceptance will involve trouble- free operation for seven consecutive days. There shall not be any additional charges for carrying out acceptance tests. No malfunction, partial or complete failure of any part of hardware or excessive heating of motors attached to printers, drivers etc. or bugs in the software should occur. All the software should be complete and no missing modules/sections will be allowed. The supplier shall maintain necessary log in respect of the results of the tests to establish to the entire satisfaction of the purchaser, the successful completion of the test specified. An average uptake efficiency of 98% *(to modify as considered appropriate for each case)* for the duration of test period shall be considered as satisfactory.
- (iii) In the event of the hardware and software failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing which the purchaser reserves the rights to get the equipment replaced by the supplier at no extra cost to the purchaser.
- (iv) The system integrator should list out all the benchmarks to test the performance of all clusters and SMP.
- (v) LINPACK ratings (peak & sustained) for 256, 512, 1024, 2048 cores and for entire cluster configuration must be provided. At least 80% efficiency should be sustained in the offered solution.
- (vi) HPC-Challenge benchmarks for the entire cluster configuration must be provided.
- (vii) LINPACK rating (peak & sustained) for the proposed SMP configuration must be provided. At least 80% efficiency should be sustained in the offered SMP servers.

- (viii) Vendors should provide bioinformatics application benchmark for AMBER, HMMER, MPI BLAST etc.

3.3 Operational Acceptance Tests

3.3.0 Pursuant to GCC Clause 27 and related SCC clauses, the Purchaser (with the assistance of the Supplier) will perform the following tests on the System and its Subsystems following Installation to determine whether the System and the Subsystems meet all the requirements mandated for Operational Acceptance.

3.3.1 The final acceptance shall cover 100% of the complete system, after successful testing by the Purchaser or its designated representatives; a Final Acceptance Test Certificate (FAT) shall be issued by Indian Agricultural Statistics Research Institute, New Delhi and related domain institutions to the Bidder. The date on which Final FAT certificate is issued shall be deemed to be the date of successful commissioning of the complete system.

The acceptance test will be conducted by CABin at IASRI or any other person nominated by the same. The ways and means are to be suggested and provided by OEM/ System integrator for verification of all the points written under ATP. The acceptance test will be completed on trouble free. Operation of all systems for five consecutive days. No malfunction, partial or complete failure of any part of hardware or excessive heating of parts etc. or bugs in the software should occur. All the software should be complete and no missing modules/sections will be allowed. ATP of data centre for its entire item will also be carried out.

In the event of the hardware and software failing to pass the acceptance test, A period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, Failing which CABin at IASRI. Reserves the rights to get the equipment replace by the supplier at no extra cost.

Physical verification of the all hardware Specifications and functional capability of all equipment supplied are to be checked as per technical specification.

Prerequisite for Carrying out FAT activity

Detailed test plan shall be defined by the Bidder. This shall be submitted by Bidder before FAT activity to be carried out.

- All documentation related to HPC systems and its related infrastructure and relevant acceptance test document (including IT Components, Non IT Components etc.) should be completed & submitted before the final acceptance test to IASRI New Delhi.
- The training requirements as mentioned should be completed before the final acceptance test.
- Successful hosting of all application/services being provided as a part of the project. .
- For both IT & Non-IT equipment's / software manuals / brochures / Data Sheets / CD / DVD / media for all the supplied components

The FAT shall include the following:

- All hardware and software items must be installed and tested functionally at all locations site as per the specification.
- Availability of all the defined services shall be verified. The Bidder shall be required to demonstrate all the features / facilities / functionalities as mentioned in the bidding Document.
- The Bidder will arrange all the test equipment required for performance verification. Successful bidder will also provide documented test results.
- The Bidder shall be responsible for the security audit of the network and IT Infrastructure to be carried out by a certified agency other than the successful bidder.

Acceptance Certificates:

- (a) On successful completion of acceptability test, receipt of deliverables etc, and after the purchaser is satisfied with the working on the system, the acceptance certificate signed by the supplier and the representative of the purchaser will be issued. The date on which such certificate is signed shall be deemed to be the date of successful commissioning of the systems.
- (b) The training as specified in Technical Specifications shall be conducted on the dates mutually agreed upon and within two months from the date of acceptance of supply.
- (c) The acceptance test will be conducted by CABin at IASRI or any other person nominated by the same. The ways and means are to be suggested and provided by OEM/ System integrator for verification of all the points written under ATP. The acceptance test will be completed on trouble free. Operation of all systems for five consecutive days. No malfunction, partial or complete failure of any part of hardware or excessive heating of parts etc. or bugs in the software should occur. All the software should be complete and no missing modules/sections will be allowed. ATP of data center for its entire item will also be carried out.
- (d) In the event of the hardware and software failing to pass the acceptance test, A period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, Failing which CABin at IASRI. Reserves the rights to get the equipment replace by the supplier at no extra cost.
- (e) Physical verification of the all hardware Specifications and functional capability of all equipment supplied are to be checked as per technical specification.

E. IMPLEMENTATION SCHEDULE

This project involves number of complex systems and their integration along with the requirement that all the system which is to be supplied by the Bidder should be compatible with each other. Therefore, Bidder is required to submit detail implementation schedule of the project at all locations. However, a comprehensive tentative project implementation schedule for each schedule is given below. The items as well time line of implementing the job is tentative and can be changed by the Bidder. The final implementation schedule will be decided on mutually agreed basis before awarding the contract. The penalties for delay in implementation will be according to respective GCC and SCC clauses.

Tentative implementation schedule of the project

Activity /Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31-186
Project management																															
Site requirement study and resource mobilization																															
Preparation of Hi-level test plan																															
Site clearance and its preparation																															
Re-furnishing of old interior																															
Delivery and testing of material of data centre																															
Civil and interior work																															
Electrical distribution system																															
Supply and testing of HPC system																															
UPS and battery system																															
HVAC system																															
IBMS system																															
Comfort AC system																															
Implementation of data centre infrastructure																															
Installation and testing of HPC system																															
Operational management of system																															

Tentative implementation schedule of the project

System Inventory Table

The following components is to be supplied by the Bidder as per the technical specification given for each component in respective schedule

Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance, Operations of the High Performance Computing Systems under “National Agricultural Bioinformatics Grid in ICAR” at IASRI New Delhi		
Reference Sr. No. of the technical specifications	Brief description of Component	Quantity (in Nos.)
A1.0	HPC Systems-I	
A1.1	Linux Cluster	
A1.1-(I)	Resource Management Nodes/Login Nodes	04
A1.1-(II)	Master Node	02
A1.1-(III)	HPC Compute Nodes (for Linux based Cluster)	256
A1.2	Windows Cluster	

A1.2-(I)	Master Node	01
A1.2-(II)	HPC Compute Nodes (for windows Cluster)	16
A1.3	GPU Cluster	
A1.3-(I)	Master Node	01
A1.3-(II)	GPU Compute Nodes	16
A1.4	SMP Based Computing	
A1.4-(I)	Symmetrical Multi Processing (SMP) (LINUX Based) Server	01
A1.5	HPC Software	
A1.5 - (I)	Clustering Software Suite	As per req.
A1.5 - (II)	Workload Management Software	As per req.
A1.6	Switches	

A1.6-(I)	Cluster Interconnect Network (IB Switches 4X QDR)	As per req.
A1.6-(II)	Cluster Administration Network (1 Gigabit and 10 Gigabit Cluster Core Switches) :	As per req.
A1.6-(III)	Wireless Controller for Wireless Network	01
A1.6-(IV)	Wireless Access Point	6
A1.6-(V)	Cluster Management Network (IPMI) (10/100 Mbps Chasses Switches)	As per req.
A1.7	Racks, Cabling and Integration	As per req.
A1.8	HPC Infrastructure System	
A1.8-(I)	Precision Air-conditioning System	01
A1.8 (II)	Power Distribution-Rack Mounted Metered PDU	As per req.
A1.8- (III)	Gas Suppression System with accessories	01
A1.8 (IV)	Smoke Detection System	01

A1.8 -(V)	Burglar Alarm System	01
A1.8 -(VI)	Rodent Control System	01
A1.8 (VII)	Infrastructure Management System	01
A1.8 (VIII)	Public Address System	01
A1.8- (IX)	Illuminated Signage	As per req.
A1.8 -(X)	Data Centre Lighting	As per req.
A1.8 -(XI)	Electrical & Earthing	As per req.
A1.8 -(XII)	Electro Static Discharge (ESD) Control	As per req.
A1.8 -(XIII)	Fire Rated Door	As per req.
A1.8 -(XIV)	Partition with Bison Board	As per req.
A1.8 - (XV)	Partition with GI Frame	As per req.

A1.8 - (XVI)	Double Gyp Board Partition	As per req.
A1.8 - (XVII)	Normal 12mm plane glass:	As per req.
A1.8 -(XVIII)	Antistatic Flooring	As per req.
A1.8 -(XIX)	Water leakage Detection system	As per req.
A1.8 - (XX)	Civil Works	As per req.
A2.0	Standalone Servers	
A2.0 -(I)	Database and Application Servers windows based	04
A2.0 -(II)	Database and Application Servers Linux based	06
A3.0	Attached Storage System-I	
A3.0 - (I)	Network Attached Storage (NFS server) 200TB	01
A3.0 - (II)	High Performance Parallel File System based Storage 100TB	01

A3.0- (III)	Archival Storage 200TB	01
A4.0	Desktop Workstations-I	35
A5.0	Thin Clients	20
A6.0	UPS SYSTEMS	
A6.0-(I)	Modular UPS 350 KVA, N+2	01
A6.0-(II)	Online UPS, 40KVA, N+1	01
A7.0	Secured Entry System and Electronic Surveillance System	
A7.0-(I)	Access Control System	02
A7.0-(II)	Electronic Surveillance System	01
A8.0	Fire Security and Alarm System	01
A9.0	Standby Power Supply Units(DG Set) 500KVA	02
Facility at Domain Centres- (5 Sites)		

B1.0	HPC Systems-II	
B1.1	Linux Cluster	
B1.1-(I)	Resource Management Nodes/Login Nodes	5
B1.1-(II)	Master Node	5
B1.1-(III)	HPC Compute Nodes (for Linux based Cluster)	80
B1.2	HPC Software	
B1.2-(I)	Clustering Software Suite	As per req.
B1.2-(II)	Workload Management Software	As per req.
B1.3	Switches	
B1.3-(I)	Cluster Interconnect Network (IB Switches 4X QDR)	As per req.
B1.3-(II)	Cluster Administration Network (1 Gigabit Switch in High Availability Mode)	10
B1.3-(III)	Cluster Management Network (IPMI) (10/100 Mbps Switches)	05

B1.4	Racks, Cabling and Integration	As per req.
B1.5	UPS, 16KVA, N+1 for HPC	05
B1.6	Infrastructure for HPC	As per req.
B2.0	Attached Storage System-II	
B2.0-(I)	Network Attached Storage (NFS server) (20 TB)	05
B2.0-(II)	High Performance Parallel File system based Storage (20TB)	05
B3.0	Desktop Workstations-II	15

Working Days

[specify: *the days for each month for each year that are non-working days, due to Holidays or other business reasons (other than weekends).*]

Month	20xy	20xy+1	20xy+2	20zz
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

F. REQUIRED FORMAT OF TECHNICAL BIDS

5.1 Description of Information Technologies, Materials, Other Goods, and Services

- 5.1.0 The Bidder must provide detailed descriptions of the essential technical, performance, or other relevant characteristics of all key Information Technologies, Materials, other Goods, and Services offered in the bid (e.g., version, release, and model numbers). Without providing sufficient clear detail, Bidders run the risk of their bids being declared non-responsive.
- 5.1.1 To assist in the bid evaluation, the detailed descriptions should be organized and cross referenced in the same manner as the Bidder's item-by-item commentary on the Technical Requirements described in Section 5.2 below. All information provided by cross reference must, at a minimum, include clear titles and page numbers.
- 5.1.2 The Bidder is required to describe the proposed Technical Solution in detail and clearly. Following should be captured in the explanation:
- Clear articulation and description of the design and technical solution and various components including make of equipment or sizing of infrastructure (including diagrams and calculations wherever applicable)
 - Extent of compliance to technical requirements specified in the Technical Specifications
 - Technical Design and clear articulation of benefits to IASRI, New Delhi and domain institutions related to the project, of various components of the solution vis-à-vis other options available.
 - Strength of the Bidder to provide services including examples or case-studies of similar solutions deployed for other clients
- 5.1.3 The Bidder should provide detailed design and sizing calculation for the following listing all assumptions that have been considered:
- a. Physical Components Design**
- i) Datacenter Space and Floor layout along with Number of Racks and their design in the Data Centre.
 - ii) Design and placement of HPC related components such as IT racks, cooling racks, network racks, storage racks, PDU, cabling etc.
 - iii) Data Centre overhead layout including: Cabling, Pipes and Ducting Plan
 - iv) Electrical Requirements
 - v) Silent DG- set requirements
 - vi) UPS requirements
 - vii) Cooling and Environmental Control requirements
 - viii) Fire Prevention and Suppression along with detailed layout of zone-wise fire sensors

- ix) Complete Surveillance and Security along with detailed layout of CCTV and access control devices.
- x) Civil, partitioning, mechanical works, etc.

b. IT Components design

- i) Approach & Methodology for Installation & Configuration of:
 - a. Computing (Servers, OS, etc.) infrastructure
 - b. Network infrastructure
 - c. Security infrastructure
 - d. Applications
 - e. Storage & backup infrastructure
 - f. Help Desk

c. Operations & Maintenance

- i) Help Desk Services
 - a. Escalation Plan
 - b. implementation of best practices of the respective components as specified in Technical Specifications
 - ii) System Maintenance & Management
 - iii) System / Storage / Database / Network / Security Administration
 - iv) Backup & Restoration
- d.** Approach & Methodology for Commissioning of complete solution at all locations.
- e.** Approach & Methodology for installation at all project locations
- f.** Adherence to Best practices
- g.** Training Plan
- h.** Services as Incident, change & Problem management Plan, Business Continuity Plan, Patch Management, release and Configuration Management.
- i.** SLA Implementation & Management Plan
- j.** Detailed Process and methodology for hosting of applications/ services
- k.** The Bidder should provide a detailed resource deployment plan to ensure that technically qualified staff is available to deliver the project. The Bidder would require qualified experts related to each sector/components like HPC systems data centre infrastructure, storage systems, networking, applications related to integration and management, Project Manager, etc. who have to be necessarily the employee of the Bidder. But the other resources like the civil works staff, etc. may either be employed directly by the Bidder or be subcontracted

personnel. However, the Bidder would have to monitor and manage the staff on a daily basis. The Bidder should provide the summary table of details of the manpower that will be deployed on this project for **implementation** along with detailed CVs

1. The Bidder should provide the summary table of details of the manpower resources that will be deployed on this project for **operations and maintenance** in conformity to the technical specification, Service Level Agreement and Related IT Issues and Initiatives sections in the bidding document

5.1.4 Bidder shall provide a detailed project plan with timelines, resource allocation, milestones etc. in for supply, installation and commissioning of the physical and IT components for the IASRI as well as all Project Sites in conformity with the time schedule/targets detailed in bidding document and Schedule of Requirements.

5.2 Item-by-Item Commentary on the Technical Requirements

- 5.2.0 The Bidder must provide an item-by-item commentary on the Purchaser's Technical Requirements, demonstrating the substantial responsiveness of the overall design of the System and the individual Information Technologies, Goods, and Services offered to those Requirements, see ITB Clause 16.2 (b).
- 5.2.1 In demonstrating the responsiveness of its bid, the Bidder is strongly urged to use the Technical Responsiveness Checklist provided in Section G of the Technical Requirements. Failure to do so, increases significantly the risk that the Bidder's Technical Bid will be declared technically non-responsive. Among other things, the checklist should contain explicit cross references to the relevant pages in the Bidder's Technical Bid.

5.3 Preliminary Project Plan

- 5.3.0 The Bidder must prepare a Preliminary Project Plan describing, among other things, the methods and human and material resources that the Bidder proposes to employ in the design, management, coordination, and execution of all its responsibilities, if awarded the Contract, as well as the estimated duration and completion date for each major activity. The Preliminary Project Plan must also address the topics and points of emphasis specified in [state: **"SCC Clause 19"** including any additional items stated in the Bid Data Sheet for ITB Clause 16.2 (c). The Preliminary Project Plan should also state the Bidder's assessment of the major responsibilities of the Purchaser and any other involved third parties in System supply and installation, as well as the Bidder's proposed means for coordinating activities by each of the involved parties to avoid delays or interference.
- 5.3.1 In addition to the topics and points of emphasis, the Preliminary Project Plan MUST address method of reporting of progress and smooth completion of the project.

5.3.2 [*It Must be submitted in suitable desired formats, in addition to hard copy, etc.*].

5.4 Confirmation of Responsibility for Integration and Interoperability of Information Technologies

5.4.0 The Bidder must submit a written confirmation that, if awarded the Contract, it shall accept responsibility for successful integration and interoperability of all the proposed Information Technologies included in the System, as further specified in the Bidding Document.

G. TECHNICAL RESPONSIVENESS CHECKLIST

Technical Responsiveness Checklist

Note to Bidders: The following Checklist is provided to help the Bidder organize and consistently present its Technical Bid. For each of the following Technical Requirements, the Bidder must describe how its Technical Bid responds to each Requirement. In addition, the Bidder must provide cross references to the relevant supporting information, if any, included in the bid. The cross reference should identify the relevant document(s), page number(s), and paragraph(s). The Technical Responsiveness Checklist does not supersede the rest of the Technical Requirements (or any other part of the Bidding Documents). If a requirement is not mentioned in the Checklist, that does not relieve the Bidder from the responsibility of including supporting evidence of compliance with that other requirement in its Technical Bid. One- or two-word responses (e.g. “Yes,” “No,” “Will comply,” etc.) are normally not sufficient to confirm technical responsiveness with Technical Requirements.

Tech. Require. No. 1	Technical Requirement: <i>[As in point B. Business Function and Performance Requirements of Section VI. Technical Requirements]</i>	<i>Mandatory</i>
Bidder's technical reasons supporting compliance:		
Bidder's cross references to supporting information in Technical Bid:		

Tech. Require. No. 2	Technical Requirement: <i>[As in point C. Technical Specifications Requirements of Section VI. Technical Requirements]</i>	<i>Mandatory</i>
Bidder's technical reasons supporting compliance:		
Bidder's cross references to supporting information in Technical Bid:		

Tech. Require. No. 3	Technical Requirement: <i>[As in point D. Testing and Quality Assurance Requirements of Section VI. Technical Requirements]</i>	<i>Mandatory</i>
Bidder's technical reasons supporting compliance:		
Bidder's cross references to supporting information in Technical Bid:		

Tech. Require. No. 4	Technical Requirement: <i>[As in point E. Implementation Schedule including all inventory and other tables Requirements of Section VI. Technical Requirements]</i>	<i>Mandatory</i>
Bidder's technical reasons supporting compliance:		
Bidder's cross references to supporting information in Technical Bid:		

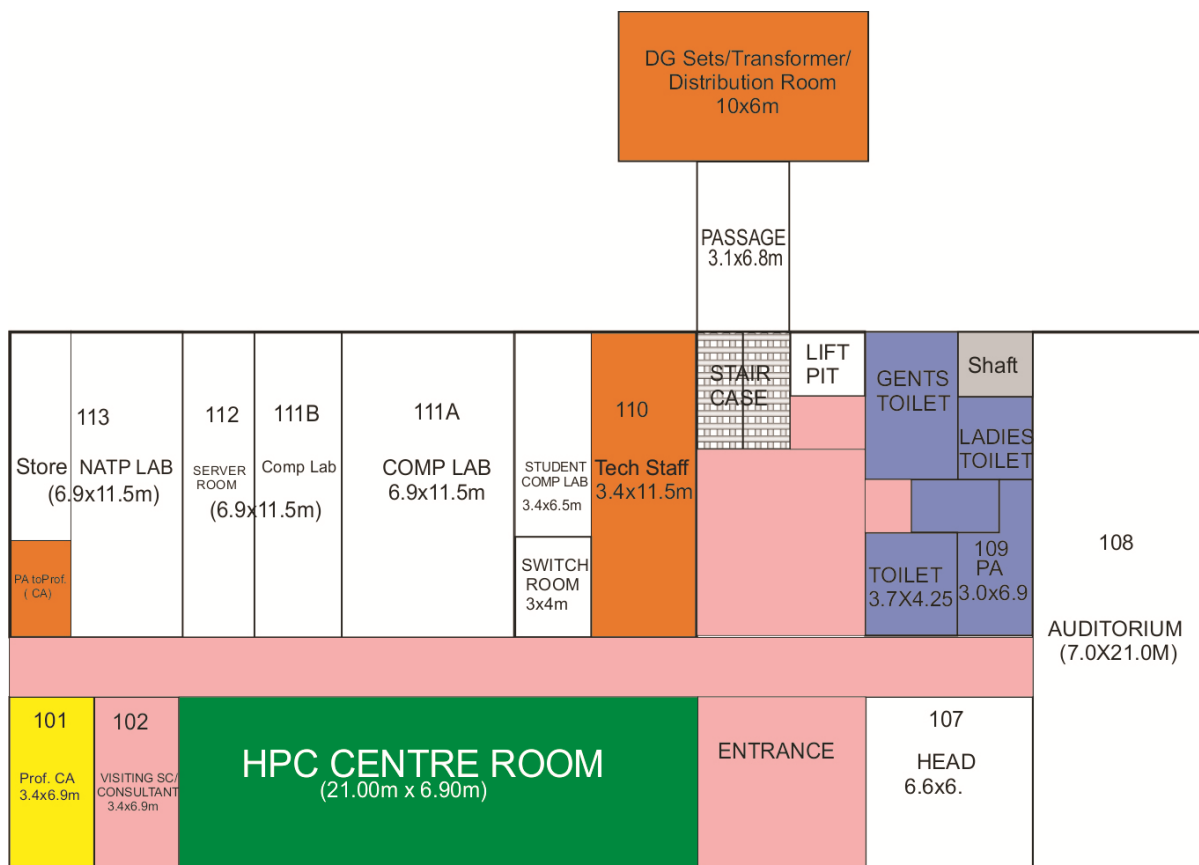
Tech. Require. No. 5	Technical Requirement: <i>[As in point F. Required Formats of Technical Bids Requirements of Section VI. Technical Requirements]</i>	<i>Mandatory</i>
Bidder's technical reasons supporting compliance:		
Bidder's cross references to supporting information in Technical Bid:		

Require. No.6	Qualifying Requirements: <i>[As at ITB 6.1 (a) of BDS and other parts of the document specified]</i>	<i>Mandatory</i>
Bidder's technical reasons supporting compliance:		
Bidder's cross references to supporting information in Technical Bid:		

H. ATTACHMENTS

Attachment 1. Proposed layout and Drawings

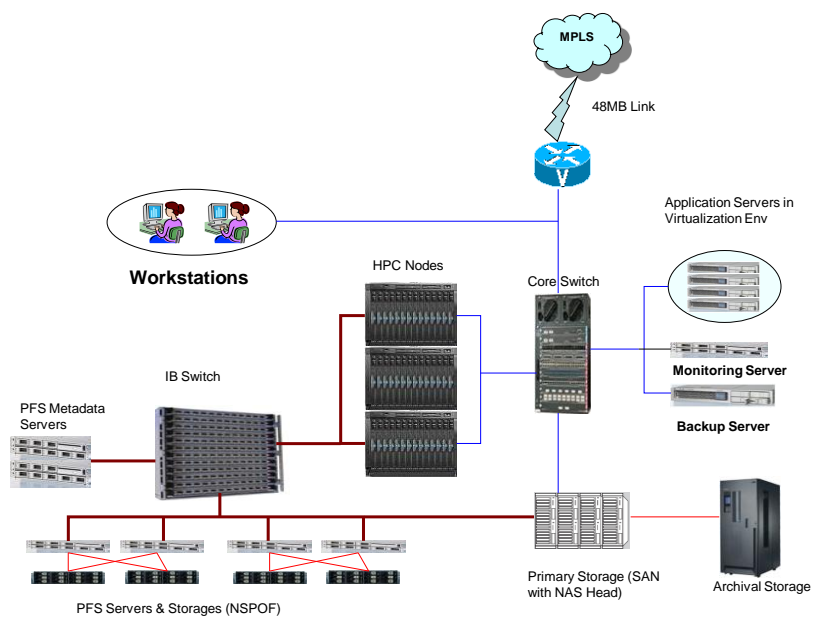
Drawing No.	Drawing Name	Purpose
1.	Data Centre Location	For Designing the Data Centre
2.	CABin Main Site Schematic	For HPC Design Purpose
3.	CABin Domain Site Schematic	For HPC Design Purpose
4.	Sample of CABin Main Site Data Centre Layout	This is only sample of layout not actual layout. Vendor has to provide actual layout in the project plan which is to be implemented.



COMPUTER BUILDING, IASRI GROUND FLOOR

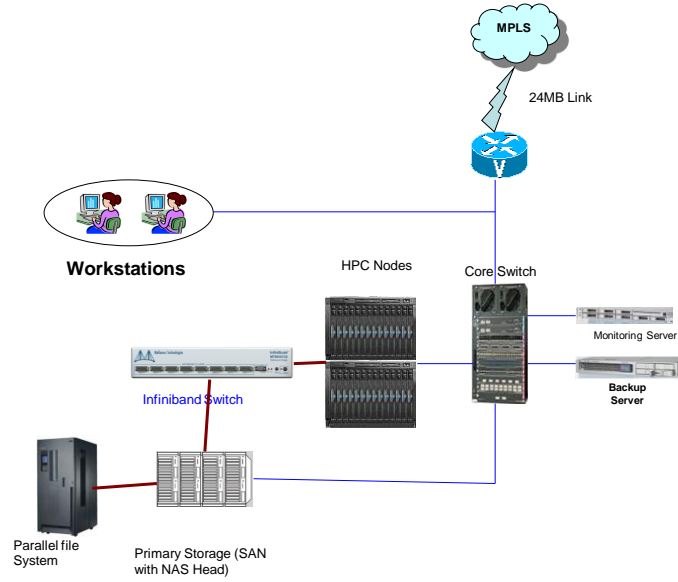
Drawing-1

CABin Main Site Schematic

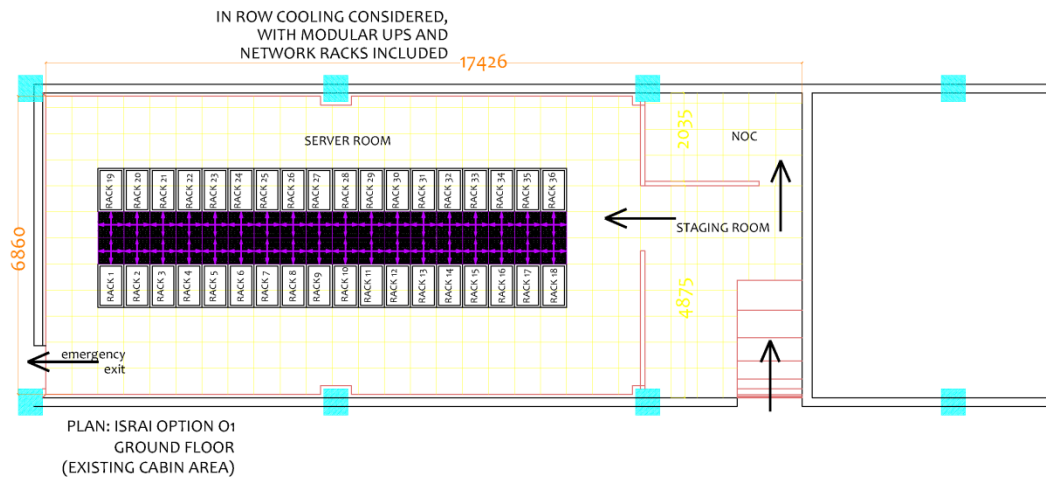


Drawing-2

CABin Domain Site Schematic



Drawing-3



Drawing-4

SECTION VII. SAMPLE FORMS

Notes to Bidders on working with the Sample Forms

The Purchaser has prepared the forms in this section of the Bidding Documents to suit the specific requirements of the System being procured. They are derived from the forms contained in the World Bank's Standard Bidding Documents for the Supply and Installation of Information Systems. In its bid, the Bidder must use these forms (or forms that present in the same sequence substantially the same information). Bidders should not introduce changes without the Purchaser's prior written consent (which may also require the clearance of the World Bank). If the Bidder has a question regarding the meaning or appropriateness of the contents or format of the forms and/or the instructions contained in them, these questions should be brought to the Purchaser's attention as soon as possible during the bid clarification process, either at the pre-bid meeting or by addressing them to the Purchaser in writing pursuant to ITB Clause 10.

The Purchaser has tried to provide explanatory text and instructions to help the Bidder prepare the forms accurately and completely. The instructions that appear directly on the forms themselves are indicated by use of typographical aides such as italicized text within square brackets as is shown in the following example taken from the Bid Submission Form:

Duly authorized to sign this bid for and on behalf of [*insert: **name of Bidder***]

In preparing its bid, the Bidder must ensure all such information is provided and that the typographical aides are removed.

The sample forms provide a standard set of documents that support the procurement process as it moves forward from the stage of bidding, through Contract formation and onto Contract performance. The first set of forms must be completed and submitted as part of the bid prior to the deadline for bid submission. These include: (i) the Bid Submission Form; (ii) the Price Schedules; (iii) the Manufacturer's Authorizations and key Subcontractor agreements; (iv) the List of Proposed Subcontractors; (v) the form(s) for securing the bid (if and as required); and other forms as found in sub-sections 1 through 4 of this Section VII of the Bidding Documents.

- **Bid Submission Form:** In addition to being the place where official confirmation of the bid price, the currency breakdown, the completion date(s), and other important Contract details are expressed, the Bid Submission Form is also used by the Bidder to confirm - in case adjudication applies in this Contract - its acceptance of the Purchaser's proposed Adjudicator, or to propose an alternative. If the bid is being submitted on behalf of a Joint Venture, it is essential that the Bid Submission Form be signed by the partner in charge and that it be supported by the authorizations and power of attorney required pursuant to ITB Clause 6.2. Given widespread concern about illegal use of licensed software, Bidders will be asked to certify in the Bid Submission Form that either the Software included in the bid was developed and is owned by the Bidder, or, if not, the Software is covered by valid licenses with the proprietor of the Software.

- **Price Schedules:** The prices quoted in the Price Schedules should constitute full and fair compensation for supply, installation, and achieving Operational Acceptance of the System as described in the Technical Requirements based on the Implementation Schedule, and the terms and conditions of the proposed Contract as set forth in the Bidding Documents. Prices should be given for each line item provided in the Schedules, with costs carefully aggregated first at the Subsystem level and then for the entire System. If the Price Schedules provide only a summary breakdown of items and components, or do not cover some items unique to the Bidder's specific technical solution, the Bidder may extend the Schedules to capture those items or components. If supporting price and cost tables are needed for a full understanding of the bid, they should be included.

Arithmetical errors should be avoided. If they occur, the Purchaser will correct them according to ITB Clause 26.2 (ITB Clause 38.2 in the two-stage SBD) without consulting the Bidder. Major omissions, inconsistencies, or lack of substantiating detail can lead to rejection of a bid for commercial non-responsiveness. Presenting prices according to the breakdown prescribed in the Price Schedules is also essential for another reason. If a bid does not separate prices in the prescribed way, and, as a result, the Purchaser cannot apply the domestic preference provision described in ITB Clause 29 (ITB Clause 41 in the two-stage SBD), if they are applicable in this bidding, the Bidder will lose the benefit of the preference. Once bids are opened, none of these problems can be rectified. At that stage, Bidders are not permitted to change their bid prices to overcome errors or omissions.

- **Manufacturer's Authorizations and written agreements by key Subcontractors:** In accordance with ITB Clauses 6.1 (b) and (c), a Bidder may be required to submit, as part of its bid, Manufacturer's Authorizations in the format provided in the Bidding Documents, and agreements by Subcontractors proposed for key services, for all items specified in the Bid Data Sheet. There is no particular format (or sample form) for Subcontractor agreements.
- **List of Proposed Subcontractors:** In accordance with ITB Clause 6.3, a Bidder must submit, as part of its bid, a list of proposed subcontracts for major items of Technologies, Goods, and/or Services. The list should also include the names and places of registration of the Subcontractors proposed for each item and a summary of their qualifications.
- **List of Software and Materials:** In accordance with ITB Clause 13.1 (e) (vi) (ITB Clauses 13.1 (c) (vi) and 25.1 (e) (vi) in the two-stage SBD), Bidders must submit, as part of their bids, lists of all the Software included in the bid assigned to one of the following categories: (A) System, General-Purpose, or Application Software; or (B) Standard or Custom Software. Bidders must also submit a list of all Custom Materials. If provided for in the Bid Data Sheet, the Purchaser may reserve the right to reassign certain key Software to a different category.

- **Qualification information forms:** In accordance with ITB Clause 6, the Purchaser will determine whether the Bidder is qualified to undertake the Contract. This entails financial, technical as well as performance history criteria which are specified in the BDS for ITB Clause 6. The Bidder must provide the necessary information for the Purchaser to make this assessment through the forms in this sub-section. The forms contain additional detailed instructions which the Bidder must follow.
- **Securing the bid:** If the BDS for ITB Clause 17 (ITB Clause 29 in the two-stage SBD) requires that bids be secured, the Bidder shall do so in accordance with the type and details specified in the same ITB/BDS Clause, either using the form(s) included in these Sample Forms or using another form acceptable to the Purchaser. If a Bidder wishes to use an alternative form, it should ensure that the revised format provides substantially the same protection as the standard format; failing that, the Bidder runs the risk of rejection for commercial non-responsiveness.

Bidders need not provide the Performance Security and Advance Payment Security with their bids. Only the Bidder selected for award by the Purchaser will be required to provide these securities.

The following forms are to be completed and submitted by the successful Bidder following notification of award: (i) Contract Agreement, with all Appendices; (ii) Performance Security; and (iii) Advance Payment Security.

- **Contract Agreement:** In addition to specifying the parties and the Contract Price, the Contract Agreement is where the: (i) Supplier Representative; (ii) if applicable, agreed Adjudicator and his/her compensation; and (iii) the List of Approved Subcontractors are specified. In addition, modifications to the successful Bidder's Bid Price Schedules are attached to the Agreement. These contain corrections and adjustments to the Supplier's bid prices to correct errors, adjust the Contract Price to reflect – if applicable - any extensions to bid validity beyond the last day of original bid validity plus 56 days, etc.
- **Performance Security:** Pursuant to GCC Clause 13.3, the successful Bidder is required to provide the Performance Security in the form contained in this section of these Bidding Documents and in the amount specified in accordance with the SCC.
- **Advance Payment Security:** Pursuant to GCC Clause 13.2, the successful Bidder is required to provide a bank guarantee for the full amount of the Advance Payment - if an Advance Payment is specified in the SCC for GCC 12.1 - in the form contained in this section of these Bidding Documents or another form acceptable to the Purchaser. If a Bidder wishes to propose a different Advance Payment Security form, it should submit a copy to the Purchaser promptly for review and confirmation of acceptability before the bid submission deadline.

The Purchaser and Supplier will use the following additional forms during Contract implementation to formalize or certify important Contract events: (i) the Installation and Operational Acceptance Certificates; and (ii) the various Change Order forms. These and the procedures for their use during performance of the Contract are included in the Bidding Documents for the information of Bidders.

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1. BID SUBMISSION FORM (SINGLE-STAGE BIDDING)

Date: [Bidder insert: *date of bid*]

Loan/Credit No.: [Credit 4161-IN / 4162-IN]

IFB: /Equipments / Goods/ Services for
**Designing, Site-Preparation, Supply, Installation, Commissioning, Maintenance and
 Operations of the High Performance Computing Systems of**
“National Agricultural Bioinformatics Grid in ICAR”
at IASRI New Delhi.

. Number of IFB: _____

Contract: [Purchaser insert: *name of Contract*]

To:

Director,
 Indian Agricultural Statistics Research Institute (IASRI),
 Library Avenue, Pusa,
 New Delhi - 110012, India.

Dear Sir or Madam:

Having examined the Bidding Documents, including Addenda Nos. [*insert numbers*], the receipt of which is hereby acknowledged, we, the undersigned, offer to supply, install, achieve Operational Acceptance of, and support the Information System under the above-named Contract in full conformity with the said Bidding Documents for the sum of:

[*insert: amount of local
 currency in words*]

([*insert: amount of local currency
 in figures from corresponding Grand
 Total entry of the Grand Summary
 Cost Table*])

plus [*insert: amount of foreign
 currency A in words*]

([*insert: amount of foreign
 currency A in figures from
 corresponding Grand Total entry of
 the Grand Summary Cost Table*])

[*as appropriate, add the following*]

plus	<i>[insert: amount of foreign currency B in words]</i>	<i>([insert: amount of foreign currency B in figures from corresponding Grand Total entry of the Grand Summary Cost Table])</i>
plus	<i>[insert: amount of foreign currency C in words]</i>	<i>([insert: amount of foreign currency C in figures from corresponding Grand Total entry of the Grand Summary Cost Table])</i>

or such other sums as may be determined in accordance with the terms and conditions of the Contract. The above amounts are in accordance with the Price Schedules attached herewith and made part of this bid.

We undertake, if our bid is accepted, to commence work on the Information System and to achieve Installation and Operational Acceptance within the respective times stated in the Bidding Documents.

If our bid is accepted, and if these Bidding Documents so require, we undertake to provide an advance payment security and a performance security in the form, in the amounts, and within the times specified in the Bidding Documents.

“We accept the appointment of Sh. S C Agnihotiri, Retired Controller of Stores, Indian Railways with expertise in Procurement, Contract Management and Information Technology., *as in the Bid Data Sheet*] as the Adjudicator.”

We hereby certify that the Software offered in this bid and to be supplied under the Contract (i) either is owned by us, or (ii) if not owned by us, is covered by a valid license from the proprietor of the Software.

We agree to abide by this bid, which, in accordance with ITB Clauses 13 and 16, consists of this letter (Bid Submission Form) and the enclosures listed below, for a period of 120 days from the date fixed for submission of bids as stipulated in the Bidding Documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to Contract execution if we are awarded the Contract, are listed below:

Name and Address of Agent	Amount and Currency	Purpose of Commission or Gratuity
------------------------------	------------------------	---

Etc. *[if none, state: “none”]*

Until the formal final Contract is prepared and executed between us, this bid, together with your written acceptance of the bid and your notification of award, shall constitute a binding contract between us. We understand that you are not bound to accept the lowest or any bid you may receive.

Dated this *[insert: **ordinal**]* day of *[insert: **month**], [insert: **year**]*.

Signed:

Date:

In the capacity of *[insert: **title or position**]*

Duly authorized to sign this bid for and on behalf of *[insert: **name of Bidder**]*

ENCLOSURES:

Price Schedules

Bid-Securing Declaration or Bid-Security (if and as required)

Signature Authorization *[plus, in the case of a Joint Venture Bidder, list all other authorizations pursuant to ITB Clause 6.2]*

Attachment 1. Bidder's Eligibility

Attachment 2. Bidder's Qualifications (including Manufacturer's Authorizations and Subcontractor agreements if and as required)

Attachment 3. Eligibility of Goods and Services

Attachment 4. Conformity of the Information System to the Bidding Documents

Attachment 5. Proposed Subcontractors

Attachment 6. Intellectual Property (Software and Materials Lists)

[if appropriate, specify further attachments or other enclosures]

Bid Table of Contents and Checklist

Note: Bidders should expand and (if appropriate) modify and complete the following table. The purpose of the table is to provide the Bidder with a summary checklist of items that must be included in the bid as described in ITB Clauses 13.1 and 16, in order for the bid to be considered for Contract award.

Item	present: y/n	page no.
Bid Submission Form.....		
Price Schedules		
Bid-Securing Declaration / Bid-Security (if and as required)		
Signature Authorization (for Joint Ventures additionally including the authorizations listed in ITB Clause 6.2)....		
Attachment 1		
Attachment 2		
Manufacturer's Authorizations		
Subcontractor agreements		
Attachment 3		
Attachment 4		
Attachment 5		
Attachment 6		
.....		

2. PRICE SCHEDULE FORMS

2.1 Preamble

General

1. The Price Schedules are divided into separate Schedules as follows:
 - 2.2 Grand Summary Cost Table
 - 2.3 Supply and Installation Cost Summary Table
 - 2.4 Recurrent Cost Summary Table
 - 2.5 Supply and Installation Cost Sub-Table(s)
 - 2.6 Recurrent Cost Sub-Tables(s)
 - 2.7 Country of Origin Code Table
2. The Schedules do not generally give a full description of the information technologies to be supplied, installed, and operationally accepted, or the Services to be performed under each item. However, it is assumed that Bidders shall have read the Technical Requirements and other sections of these Bidding Documents to ascertain the full scope of the requirements associated with each item prior to filling in the rates and prices. The quoted rates and prices shall be deemed to cover the full scope of these Technical Requirements, as well as overhead and profit.
3. If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with the Instructions to Bidders in the Bidding Documents prior to submitting their bid.

Pricing

4. Prices shall be filled in indelible ink, and any alterations necessary due to errors, etc., shall be initialed by the Bidder. As specified in the Bid Data Sheet, prices shall be fixed and firm for the duration of the Contract.
5. Bid prices shall be quoted in the manner indicated and in the currencies specified in ITB Clauses 14 and 15 (ITB Clauses 27 and 28 in the two-stage SBD). Prices must correspond to items of the scope and quality defined in the Technical Requirements or elsewhere in these Bidding Documents.
6. The Bidder must exercise great care in preparing its calculations, since there is no opportunity to correct errors once the deadline for submission of bids has passed. A single error in specifying a unit price can therefore change a Bidder's overall total bid price substantially, make the bid noncompetitive, or subject the Bidder to possible loss. The Purchaser will correct any arithmetic error in accordance with the provisions of ITB Clause 26.2 .

7. Payments will be made to the Supplier in the currency or currencies indicated under each respective item. As specified in ITB Clause 15.1 , no more than three foreign currencies may be used. The price of an item should be unique regardless of installation site.

2.2 Grand Summary Cost Table

		<i>[insert: Local Currency]</i> Price	<i>[insert: Foreign Currency A]</i> Price	<i>[insert: Foreign Currency B]</i> Price	<i>[insert: Foreign Currency C]</i> Price
1.	Supply and Installation Costs (from Supply and Installation Cost Summary Table)				
2.	Recurrent Costs (from Recurrent Cost Summary Table)				
3.	Grand Totals (to Bid Submission Form)				

Name of Bidder:		
Authorized Signature of Bidder:		

2.3 Supply and Installation Cost Summary Table

Entire System procurement

Costs MUST reflect prices and rates quoted in accordance with ITB Clauses 14 and 15 .

			Supply & Installation Prices				
			Locally supplied items	Items supplied from outside the Purchaser's Country			
Line Item No.	Subsystem / Item (As per System Inventory Table-A of Technical Requirements Section VI)	Supply and Installatio n Cost Sub- Table No.	<i>[insert: Local Currency]</i> Price	<i>[insert: Local Currency]</i> Price	<i>[insert: Foreign Currency A] Price</i>	<i>[insert: Foreign Currency B] Price</i>	<i>[insert: Foreign Currency C] Price</i>
1	Goods Manufactured Outside the Purchaser's Country, to be Imported	SIC-1
2	Goods Manufactured in the Purchaser's Country	SIC-2					
SUBTOTALS							
TOTAL (To Grand Summary Table)							

Note: - - indicates not applicable. “ indicates repetition of table entry above. Refer to the relevant Supply and Installation Cost Sub-Table for the specific components that constitute each Subsystem or line item in this summary table

Name of Bidder:		
Authorized Signature of Bidder:		

2.4 Recurrent Cost Summary Table

Entire System procurement

Line Item No.	Subsystem / Item	Recurrent Cost Sub-Table No.	[insert: Local Currency] Price	[insert: Foreign Currency A] Price	[insert: Foreign Currency B] Price	[insert: Foreign Currency C] Price
1	Recurrent Cost Sub Table	RC-1				
	Subtotals (to Grand Summary Table)					

Note: Refer to the relevant Recurrent Cost Sub-Tables for the specific components that constitute the Subsystem or line item in this summary table.

Name of Bidder:		
Authorized Signature of Bidder:		

2.5 Supply and Installation Cost Sub-Table: *SIC-1*

Entire System procurement

Line Item No.1 from the Supply and Installation Cost Summary Table

Prices, rates, and subtotals MUST be quoted in accordance with ITB Clauses 14 and 15 . Unit prices for the same item appearing several times in the table must be identical in amount and currency.

Goods Manufactured Outside the Purchaser's Country, to be Imported

(goods to be imported) Currencies in accordance with Bidding document					Date: _____ ICB No: _____ Alternative No: _____ Page N° _____ of _____	
1	2	3	4	5	6	7
Line Item N°	Description of Goods (As per System Inventory Table-A of Technical Requirements Section VI)	Country of Origin	Delivery Date as defined by Incoterms (as per Implementation Schedule Table of Technical Requirements Section VI)	Quantity and physical unit	Unit price CIP [insert place of destination] in accordance with ITB 14.4(a)(ii)	CIP Price per line item (Col. 5x6)
[insert number of the item]	[insert name of good]	[insert country of origin of the Good]	[insert quoted Delivery Date]	[insert number of units to be supplied and name of the physical unit]	[insert unit price CIP per unit]	[insert total CIP price per line item]
					Total Price	

- Note:
- (a) *In case of discrepancy between unit price and total price, the unit price shall prevail.*
 - (b) *Agent's commission shall be paid in local currency only No change due to exchange variation shall be allowed. Market exchange rate ruling on the date of award in accordance with Clause 15 of Instruction to Bidders will be applicable for this purpose.*
 - c) - - indicates not applicable. Insert wherever required.
- a) The bidder should ensure that the all components & quantities in the above table should be as specified in the bidding document

Name of Bidder:		
Authorized Signature of Bidder:		

2.5a Supply and Installation Cost Table: SIC-2

“Entire System procurement”

Line item number: **Line item number 2 from the Supply and Installation Cost Summary Table**

Prices, rates, and subtotals MUST be quoted in accordance with ITB Clauses 14 and 15 . Unit prices for the same item appearing several times in the table must be identical in amount and currency.

Goods Manufactured in the Purchaser's Country

Purchaser's Country _____							Date: _____	
							ICB No: _____	
Currencies in accordance with bidding document							Alternative No: _____	
							Page N° _____ of _____	
1	2	3	4	5	6	7	8	9
Line Item N°	Description of Goods (As per System Inventory Table-A of Technical Requirements Section VI)	Delivery Date as defined by Incoterms (as per Implementation Schedule Table of Technical Requirements Section VI)	Quantity and physical unit	Unit price EXW	Total EXW price per line item [including Excise Duty if any] (Col. 4x5)	Price per line item for inland transportation and other services required in the Purchaser's Country to convey the Goods to their final destination	Sales and other taxes payable per item if Contract is awarded (in accordance with ITB 14.4(b))	Total Price per line item (Col. 6+7)
[insert number of the item]	[insert name of Good]	[insert quoted Delivery Date]	[insert number of units to be supplied and name of the physical unit]	[insert EXW unit price]	[insert total EXW price per line item]	[insert the corresponding price per line item]	[insert sales and other taxes payable per line item if Contract is awarded]	[insert total price per item]
							Total Price	

Note: (a) In case of discrepancy between unit price and total price, the unit price shall prevail.

b) - - indicates not applicable. Insert wherever required.

c) The bidder should ensure that the all components & quantities in the above table should be same as specified in the bidding document.

Name of Bidder:		
Authorized Signature of Bidder:		

2.6 Recurrent Cost Sub-Table -RC-I

Lot number: *single lot procurement*

Line item number: *1 line item number from the Recurrent Cost Summary Table*

Currency: [specify: *the currency of the Recurrent Costs in which the costs expressed in this Sub-Table are expressed*]

Costs MUST reflect prices and rates quoted in accordance with ITB Clauses 14 and 15 . Unit prices for the same item appearing several times in the table must be identical in amount and currency.

Component No.	Component	Maximum all-inclusive costs (for costs in [insert: <i>currency</i>])				Sub-total for [insert: <i>currency</i>]
		Y1	Y2	Y3		
1.	Operation & Maintenance Services (for 1st, 2 nd , and 3 rd year)(On site manpower resources as per scope of the work in the bid for 3/4 shifts for 24X7 operations and one general shift)				----	
2	[Identify other recurrent costs as may apply]					
	Annual Subtotals:					--

Note: -- indicates not applicable. Insert wherever required.

The bidder should ensure that the all components & quantities in the above table should be same as in System Inventory Table(Recurrent Cost Items) -B of Technical Requirements Section VI.

Name of Bidder:		
Authorized Signature of Bidder:		

2.7 Country of Origin Code Table

[illegible]

3. OTHER BID FORMS AND LISTS

3.1 Manufacturer's Authorization

Invitation for Bids Title and No.:

[If applicable:] Lot, Slice, Subsystem No(s).:

To: _____

WHEREAS _____ who are official producers of
 _____ and having production facilities at
 _____ do hereby authorize
 _____ located at
 _____ (hereinafter, the "Bidder")
 to submit a bid and subsequently negotiate and sign a Contract with you for resale of the
 following Products produced by us:

We hereby confirm that, in case the bidding results in a Contract between you and the Bidder, the above-listed products will come with our full standard warranty.

Name _____ In the capacity of _____

Signed _____

Duly authorized to sign the authorization for and on behalf of : _____

Dated on _____ day of _____, _____.

Note: This authorization should be written on the letterhead of the Manufacturer and be signed by a person with the proper authority to sign documents that are binding on the Manufacturer.

3.2 List of Proposed Subcontractors

[illegible]

3.3 Software List

[illegible]

3.4 List of Custom Materials

[illegible]

3.5.1 General Information Form

All individual firms and each partner of a Joint Venture that are bidding must complete the information in this form. Nationality information should be provided for all owners or Bidders that are partnerships or individually owned firms.

Where the Bidder proposes to use named Subcontractors for highly specialized components of the Information System, the following information should also be supplied for the Subcontractor(s), together with the information in Forms 3.5.2, 3.5.3, 3.5.3a, 3.5.4, and 3.5.5. Joint Ventures must also fill out Form 3.5.2a.

1.	Name of firm	
2.	Head office address	
3.	Telephone	Contact
4.	Fax	Telex
5.	Place of incorporation / registration	Year of incorporation / registration

Nationality of owners ¹		
	Name	Nationality
1.		
2.		
3.		
4.		
5.		
^{1/} To be completed by all owners of partnerships or individually owned firms.		

3.5.2 General Information Systems Experience Record

Name of Bidder or partner of a Joint Venture
--

All individual firms and all partners of a Joint Venture must complete the information in this form with regard to the management of Information Systems contracts generally. The information supplied should be the annual turnover of the Bidder (or each member of a Joint Venture), in terms of the amounts billed to clients for each year for work in progress or completed, converted to U.S. dollars at the rate of exchange at the end of the period reported. The annual periods should be calendar years, with partial accounting for the year up to the date of submission of applications. This form may be included for Subcontractors only if the Bid Data Sheet for ITB Clause 6.1 (a) explicitly permits experience and resources of (certain) Subcontractors to contribute to the Bidder's qualifications.

A brief note on each contract should be appended, describing the nature of the Information System, duration and amount of contract, managerial arrangements, purchaser, and other relevant details.

Use a separate page for each partner of a Joint Venture, and number these pages.

Bidders should not enclose testimonials, certificates, and publicity material with their applications; they will not be taken into account in the evaluation of qualifications.

Annual turnover data (applicable activities only)		
Year ¹	Turnover	US\$ equivalent
1.		
2.		
3.		
4.		
5.		
¹ / Commencing with the partial year up to the date of submission of bids		

3.5.2a Joint Venture Summary

Names of all partners of a Joint Venture						
1. Partner in charge						
2. Partner						
3. Partner						
4. Partner						
5. Partner						
6. etc.						

Total value of annual turnover, in terms of Information System billed to clients, in US\$ equivalent, converted at the rate of exchange at the end of the period reported:

Annual turnover data (applicable activities only; US\$ equivalent)						
Partner	Form 3.5.2 page no.	Year 1	Year 2	Year 3	Year 4	Year 5
1. Partner in charge						
2. Partner						
3. Partner						
4. Partner						
5. Partner						
6. Etc.						
Totals						

3.5.3 Particular Information Systems Experience Record

Name of Bidder or partner of a Joint Venture
--

On separate pages, using the format of Form 3.5.3a, the Bidder is requested to list contracts of a similar nature, complexity, and requiring similar information technology and methodologies to the contract or contracts for which these Bidding Documents are issued, and which the Bidder has undertaken during the period, and of the number, specified in the BDS for ITB Clause 6.1 (a). Each partner of a Joint Venture should separately provide details of its own relevant contracts. The contract value should be based on the payment currencies of the contracts converted into U.S. dollars, at the date of substantial completion, or for ongoing contracts at the time of award.

3.5.3a Details of Contracts of Similar Nature and Complexity

Name of Bidder or partner of a Joint Venture

Use a separate sheet for each contract.

1.	Number of contract	
	Name of contract	
	Country	
2.	Name of Purchaser	
3.	Purchaser address	
4.	Nature of Information Systems and special features relevant to the contract for which the Bidding Documents are issued	
5.	Contract role (check one) <input type="checkbox"/> Prime Supplier <input type="checkbox"/> Management Contractor <input type="checkbox"/> Subcontractor <input type="checkbox"/> Partner in a Joint Venture	
6.	Amount of the total contract/subcontract/partner share (in specified currencies at completion, or at date of award for current contracts) Currency Currency Currency	
7.	Equivalent amount US\$ Total contract: \$_____; Subcontract: \$_____; Partner share: \$_____;	
8.	Date of award/completion	
9.	Contract was completed ____ months ahead/behind original schedule (if behind, provide explanation).	
10.	Contract was completed US\$ _____ equivalent under/over original contract amount (if over, provide explanation).	
11.	Special contractual/technical requirements.	
12.	Indicate the approximate percent of total contract value (and US\$ amount) of Information System undertaken by subcontract, if any, and the nature of such Information System.	

3.5.4 Summary Sheet: Current Contract Commitments / Work in Progress

Name of Bidder or partner of a Joint Venture
--

Bidders and each partner to an Joint Venture bid should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Name of contract	Purchaser, contact address/tel./fax	Value of outstanding Information System (current US\$ equivalent)	Estimated completion date	Average monthly invoicing over last six months (US\$/month)
1.				
2.				
3.				
4.				
5.				
etc.				

3.5.5 Financial Capabilities

Name of Bidder or partner of a Joint Venture
--

Bidders, including each partner of a Joint Venture, shall provide financial information to demonstrate that they meet the requirements stated in the BDS for ITB Clause 6.1 (a). Each Bidder or partner of a Joint Venture shall complete this form. If necessary, separate sheets shall be used to provide complete banker information. A copy of the audited balance sheets shall be attached.

Autonomous subdivisions of parent conglomerate businesses shall submit financial information related only to the particular activities of the subdivision.

Banker	Name of banker	
	Address of banker	
	Telephone	Contact name and title
	Fax	Telex

Summarize actual assets and liabilities in U.S. dollar equivalent (at the rates of exchange current at the end of each year) for the previous five calendar years. Based upon known commitments, summarize projected assets and liabilities in U.S. dollar equivalent for the next two calendar years, unless the withholding of such information by stock market listed public companies can be substantiated by the Bidder.

Financial information in US\$ equivalent	Actual: Previous five years					Projected: Next two years	
	5	4	3	2	1	1	2
1. Total assets							
2. Current assets							
3. Total liabilities							
4. Current liabilities							
5. Profits before taxes							
6. Profits after taxes							

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as indicated in the BDS for ITB Clause 6.1 (a).

Source of financing	Amount (US\$ equivalent)
1.	
2.	
3.	
4.	

Attach audited financial statements—including, as a minimum, profit and loss account, balance sheet, and explanatory notes—for the period stated in the BDS for ITB Clause 6.1 (a) (for the individual Bidder or each partner of a Joint Venture).

If audits are not required by the laws of Bidders' countries of origin, partnerships and firms owned by individuals may submit their balance sheets certified by a registered accountant, and supported by copies of tax returns,

3.5.6 Personnel Capabilities

Name of Bidder

For specific positions essential to contract management and implementation (and/or those specified in the Bidding Documents, if any), Bidders should provide the names of at least two candidates qualified to meet the specified requirements stated for each position. The data on their experience should be supplied on separate sheets using one Form 3.5.6a for each candidate.

Bidders may propose alternative management and implementation arrangements requiring different key personnel, whose experience records should be provided.

1.	Title of position
	Name of prime candidate
	Name of alternate candidate
2.	Title of position
	Name of prime candidate
	Name of alternate candidate
3.	Title of position
	Name of prime candidate
	Name of alternate candidate
4.	Title of position
	Name of prime candidate
	Name of alternate candidate

3.5.6a Candidate Summary

Name of Bidder

Position		Candidate <input type="checkbox"/> Prime <input type="checkbox"/> Alternate	
Candidate information	Name of candidate	Date of birth	
	Professional qualifications		
Present employment	Name of Employer		
	Address of Employer		
	Telephone	Contact (manager / personnel officer)	
	Fax	Telex	
	Job title of candidate	Years with present Employer	

Summarize professional experience over the last twenty years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

[illegible]

3.5.7 Technical Capabilities

Name of Bidder

The Bidder shall provide adequate information to demonstrate clearly that it has the technical capability to meet the requirements for the Information System. With this form, the Bidder should summarize important certifications, proprietary methodologies, and/or specialized technologies which the Bidder proposes to utilize in the execution of the Contract or Contracts.

3.5.8 Litigation History

Name of Bidder or partner of a Joint Venture
--

Bidders, including each of the partners of a Joint Venture, shall provide information on any history of litigation or arbitration resulting from contracts executed in the last five years or currently under execution. A separate sheet should be used for each partner of a Joint Venture.

Year	Award FOR or AGAINST Bidder	Name of client, cause of litigation, and matter in dispute	Disputed amount (current value, US\$ equivalent)

4. BID-SECURING DECLARATION- NOT APPLICABLE

IFB: *[insert: title and number of IFB]*

To: *[insert: name and address of Purchaser]*

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we, and in the case of a Joint Venture all partners to it, will automatically be suspended from being eligible for participating in bidding for any contract with you for the period of time of *[Purchaser insert: number of months or years]*, in case of, and starting from the date of, breaching our obligation(s) under the bidding conditions due to:

- (a) withdrawing our bid, or any part of our bid, during the period of bid validity specified in the Bid Submission Form or any extension of the period of bid validity which we subsequently agreed to; or
- (b) having been notified of the acceptance of our bid by you during the period of bid validity, (i) failing or refusing to execute the Contract Agreement, or (ii) failing or refusing to furnish the performance security, if required, in accordance with the Instructions to Bidders.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of the period of bid validity.

If the submission of alternative bids was permitted, and in case we did submit one or more alternative bids, this Bid-Securing Declaration applies to these parts of our bid as well.

Signed: *[insert: signature of person whose name and capacity are shown below]*

Name: *[insert: name of person signing the Bid-Securing Declaration]*, in the capacity of *[insert: legal capacity of person signing the Bid-Securing Declaration]*

Duly authorized to sign the bid for and on behalf of: *[insert: name of Bidder]*

Dated on _____ day of _____, 20__

[add Corporate Seal (where appropriate)]

[Note to Bidders: Joint Ventures need to ensure that, their Bid-Securing Declaration meets the requirements for Joint Ventures as stated in the ITB Clause on "Securing the Bid".]

4A. BID SECURITY (BANK GUARANTEE)

*[insert: **Bank's Name, and Address of Issuing Branch or Office**]*

Beneficiary: *[insert: **Name and Address of Purchaser**]*

Date: *[insert: **date**]*

BID GUARANTEE No.: *[insert: **Bid Guarantee Number**]*

We have been informed that *[insert: **name of the Bidder**]* (hereinafter called "the Bidder") has submitted to you its bid dated *[insert: **bid date**]* (hereinafter called "the Bid") for the execution of *[insert: **name of contract**]* under Invitation for Bids No. *[insert: **IFB number**]*.

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee, and that the bid guarantee automatically covers any alternative bids included in the Bid, if the Bidder is permitted to offer alternatives and does so.

At the request of the Bidder, we *[insert: **name of Bank**]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert: **amount in figures**]* (*[insert: **amount in words**]*) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn the Bid (or any parts of it) during the period of bid validity specified by the Bidder in the Bid Submission Form or any extension of the period of bid validity which the Bidder subsequently agreed to; or
- (b) having been notified of the acceptance of the Bid by you during the period of bid validity, (i) failed or refused to execute the Contract Agreement, or (ii) failed or refused to furnish the performance security, if required, in accordance with the Instructions to Bidders.

This guarantee will expire: (a) if the Bidder is the successful bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful bidder; or (ii) twenty-eight days after the expiration of the Bid's validity.

Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[Signature(s)]

[Note to Bidders: Instructions on amount and currency can be found in the ITB Clause and BDS for "Securing the Bid." Joint Ventures need to also ensure that their Bank Guarantee meets the requirements for Joint Ventures as provided in the same Clause.]

4B. BID SECURITY (BID BOND)- NOT APPLICABLE

BOND NO.: _____

BY THIS BOND, *[insert: name of Bidder]* as Principal (hereinafter called "the Principal"), and *[insert: name, legal title, and address of surety]*, authorized to transact business in *[insert: name of Purchaser's country]*, as Surety (hereinafter called "the Surety"), are held and firmly bound unto *[insert name of Purchaser]* as Obligee (hereinafter called "the Purchaser") in the sum of *[insert amount of Bond in currency, figures and words]*, for the payment of which sum, well and truly to be made, we, the said Principal and Surety, bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has submitted a written bid to the Purchaser dated the ____ day of _____, 20__, for the execution of *[insert: name of contract]* (hereinafter called "the Bid"). If the Principal was permitted by the bidding conditions to submit alternative bid(s) and did so, then these are deemed part of the Bid and thus covered by this Bond.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal:

- (a) withdraws the Bid (or any parts of it) during the period of the Bid's validity specified in the Bid Submission Form, or any extension of the period of the Bid's validity the Principal subsequently agreed to, notice of which to the Surety is hereby waived; or
- (b) having been notified of the acceptance of the Bid by the Purchaser during the period of the Bid's validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the performance security, if required, in accordance with the Instructions to Bidders;

then the Surety undertakes to immediately pay to the Purchaser up to the above amount upon receipt of the Purchaser's first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has/have occurred.

The Surety hereby agrees that its obligation will remain in full force and effect up to and including the date 28 days after the date of expiration of the Bid's validity.

IN TESTIMONY WHEREOF, the Principal and the Surety have caused these presents to be executed in their respective names this ____ day of _____ 20__.

Principal: _____ Surety: _____

[add Corporate Seal(s) (where appropriate)]

[Signature]

[Signature]

[state: printed name and title]

[state: printed name and title]

[Note to Bidders: Instructions on amount and currency can be found in the ITB Clause and BDS for "Securing the Bid." Joint Ventures need to also ensure that their Bid Bond meets the requirements for Joint Ventures as provided in the same Clause.]

5. CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT is made

the [*insert: ordinal*] day of [*insert: month*], [*insert: year*].

BETWEEN

- (1) [*insert: Name of Purchaser*], a [*insert: description of type of legal entity, for example, an agency of the Ministry of . . .*] of the Government of [*insert: country of Purchaser*], or corporation incorporated under the laws of [*insert: country of Purchaser*] and having its principal place of business at [*insert: address of Purchaser*] (hereinafter called “the Purchaser”), and
- (2) [*insert: name of Supplier*], a corporation incorporated under the laws of [*insert: country of Supplier*] and having its principal place of business at [*insert: address of Supplier*] (hereinafter called “the Supplier”).

WHEREAS the Purchaser desires to engage the Supplier to supply, install, achieve Operational Acceptance of, and support the following Information System [*insert: brief description of the Information System*] (“the System”), and the Supplier has agreed to such engagement upon and subject to the terms and conditions appearing below in this Contract Agreement.

NOW IT IS HEREBY AGREED as follows:

Article 1.

1.1 Contract Documents (Reference GCC Clause 1.1 (a) (ii))

Contract Documents

The following documents shall constitute the Contract between the Purchaser and the Supplier, and each shall be read and construed as an integral part of the Contract:

- (a) This Contract Agreement and the Appendices attached to the Contract Agreement
- (b) Special Conditions of Contract
- (c) General Conditions of Contract
- (d) Technical Requirements (including Implementation Schedule)
- (e) The Supplier’s bid and original Price Schedules
- (f) [*Add here: any other documents*]

1.2 Order of Precedence (Reference GCC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above, provided that Appendix 7 shall prevail over all provisions of the Contract Agreement and the other Appendices attached to the Contract Agreement and all the other Contract Documents listed in Article 1.1 above.

1.3 Definitions (Reference GCC Clause 1)

Capitalized words and phrases used in this Contract Agreement shall have the same meanings as are ascribed to them in the General Conditions of Contract.

Article 2.

Contract Price and Terms of Payment

2.1 Contract Price (Reference GCC Clause 1.1(a)(viii) and GCC Clause 11)

The Purchaser hereby agrees to pay to the Supplier the Contract Price in consideration of the performance by the Supplier of its obligations under the Contract. The Contract Price shall be the aggregate of: *[insert: amount of foreign currency A in words], [insert: amount in figures],* plus *[insert: amount of foreign currency B in words], [insert: amount in figures],* plus *[insert: amount of foreign currency C in words], [insert: amount in figures],* *[insert: amount of local currency in words], [insert: amount in figures],* as specified in the Grand Summary Price Schedule.

The Contract Price shall be understood to reflect the terms and conditions used in the specification of prices in the detailed price schedules, including the terms and conditions of the associated Incoterms, and the taxes, duties and related levies if and as identified.

Article 3.

Effective Date for Determining Time for Operational Acceptance

3.1 Effective Date (Reference GCC Clause 1.1 (e) (ix))

The time allowed for supply, installation, and achieving Operational Acceptance of the System shall be determined from the date when all of the following conditions have been fulfilled:

- (a) This Contract Agreement has been duly executed for and on behalf of the Purchaser and the Supplier;
- (b) The Supplier has submitted to the Purchaser the performance security and the advance payment security, in accordance with GCC Clause 13.2 and GCC Clause 13.3;
- (c) The Purchaser has paid the Supplier the advance payment, in accordance with GCC Clause 12;

- (d) *[specify here: any other conditions, for example, opening/confirmation of letter of credit]*.

Each party shall use its best efforts to fulfill the above conditions for which it is responsible as soon as practicable.

- 3.2 If the conditions listed under 3.1 are not fulfilled within two (2) months from the date of this Contract Agreement because of reasons not attributable to the Supplier, the parties shall discuss and agree on an equitable adjustment to the Contract Price and the Time for Achieving Operational Acceptance and/or other relevant conditions of the Contract.

Article 4.

Appendixes

- 4.1 The Appendixes listed below shall be deemed to form an integral part of this Contract Agreement.
- 4.2 Reference in the Contract to any Appendix shall mean the Appendixes listed below and attached to this Contract Agreement, and the Contract shall be read and construed accordingly.

APPENDIXES

- Appendix 1. Supplier's Representative
- Appendix 2. Adjudicator *[if there is no Adjudicator, state "not applicable"]*
- Appendix 3. List of Approved Subcontractors
- Appendix 4. Categories of Software
- Appendix 5. Custom Materials
- Appendix 6. Revised Price Schedules (if any)
- Appendix 7. Minutes of Contract Finalization Discussions and Agreed-to Contract Amendments

IN WITNESS WHEREOF the Purchaser and the Supplier have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

For and on behalf of the Purchaser

Signed:

in the capacity of [*insert: title or other appropriate designation*]

in the presence of

For and on behalf of the Supplier

Signed:

in the capacity of [*insert: title or other appropriate designation*]

in the presence of

CONTRACT AGREEMENT

dated the [*insert: number*] day of [*insert: month*], [*insert: year*]

BETWEEN

[*insert: name of Purchaser*], “the Purchaser”

and

[*insert: name of Supplier*], “the Supplier”

Appendix 1. Supplier's Representative

In accordance with GCC Clause 1.1 (b) (iv), the Supplier's Representative is:

Name: *[insert: **name** and provide title and address further below, or state “to be nominated within fourteen (14) days of the Effective Date”]*

Title: *[if appropriate, insert: **title**]*

In accordance with GCC Clause 4.3, the Supplier's addresses for notices under the Contract are:

Address of the Supplier's Representative: *[as appropriate, insert: **personal delivery, postal, cable, telegraph, telex, facsimile, electronic mail, and/or EDI addresses.**]*

Fallback address of the Supplier: *[as appropriate, insert: **personal delivery, postal, cable, telegraph, telex, facsimile, electronic mail, and/or EDI addresses.**]*

Appendix 2. Adjudicator

In accordance with GCC Clause 1.1 (b) (vi), the agreed-upon Adjudicator is:

Name: [Sh. S C Agnihotiri,./]

Title: [Retired Controller of Stores, Indian Railways with expertise in Procurement, Contract Management and Information Technology]

Address:

Telephone:

In accordance with GCC Clause 6.1.3, the agreed-upon fees and reimbursable expenses are:

Hourly Fees: [*INR 2000/- per hour + Service Tax*]

Reimbursable Expenses: [*Hiring of mediation room/chamber, secretarial work, clerkage and travel*]

Pursuant to GCC Clause 6.1.4, if at the time of Contract signing, agreement has not been reached between the Purchaser and the Supplier, an Adjudicator will be appointed by the Appointing Authority named in the SCC.

Appendix 3. List of Approved Subcontractors

The Purchaser has approved use of the following Subcontractors nominated by the Supplier for carrying out the item or component of the System indicated. Where more than one Subcontractor is listed, the Supplier is free to choose between them, but it must notify the Purchaser of its choice sufficiently in advance of the time when the subcontracted work needs to commence to give the Purchaser reasonable time for review. In accordance with GCC Clause 20.1, the Supplier is free to submit proposals for Subcontractors for additional items from time to time. No subcontracts shall be placed with any such Subcontractors for additional items until the Subcontractors have been approved in writing by the Purchaser and their names have been added to this list of Approved Subcontractors, subject to GCC Clause 20.3.

[specify: item, approved Subcontractors, and their place of registration that the Supplier proposed in the corresponding attachment to its bid and that the Purchaser approves that the Supplier engage during the performance of the Contract. Add additional pages as necessary.]

[illegible]

Appendix 4. Categories of Software

The following table assigns each item of Software supplied and installed under the Contract to one of the three categories: (i) System Software, (ii) General-Purpose Software, or (iii) Application Software; and to one of the two categories: (i) Standard Software or (ii) Custom Software.

[illegible]

Appendix 5. Custom Materials

The follow table specifies the Custom Materials the Supplier will provide under the Contract.

[illegible]

Appendix 6. Revised Price Schedules

The attached Revised Price Schedules (if any) shall form part of this Contract Agreement and, where differences exist, shall supersede the Price Schedules contained in the Supplier's Bid. These Revised Price Schedules reflect any corrections or adjustments to the Supplier's bid price, pursuant to the ITB Clauses 18.3, 26.2, and 33.1 (ITB Clauses 30.3, 38.2, and 45.1 in the two-stage SBD).

Appendix 7. Minutes of Contract Finalization Discussions and Agreed-to Contract Amendments

The attached Contract amendments (if any) shall form part of this Contract Agreement and, where differences exist, shall supersede the relevant clauses in the GCC, SCC, Technical Requirements, or other parts of this Contract as defined in GCC Clause 1.1 (a) (ii).

6. PERFORMANCE AND ADVANCE PAYMENT SECURITY FORMS

6.1 Performance Security Form (Bank Guarantee)

*[insert: **Bank's Name, and Address of Issuing Branch or Office**]*

Beneficiary: *[insert: **Name and Address of Purchaser**]*

Date: *[insert: **date**]*

PERFORMANCE GUARANTEE No.: *[insert: **Performance Guarantee Number**]*

We have been informed that on *[insert: **date of award**]* you awarded Contract No. *[insert: **Contract number**]* for *[insert: **title and/or brief description of the Contract**]* (hereinafter called "the Contract") to *[insert: **complete name of Supplier**]* (hereinafter called "the Supplier"). Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum(s) not exceeding *[insert: **amount(s)¹ in figures and words**]* upon receipt by us of your first demand in writing declaring the Supplier to be in default under the Contract, without cavil or argument, or your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

On the date of your issuing, to the Supplier, the Operational Acceptance Certificate for the System, the value of this guarantee will be reduced to any sum(s) not exceeding *[insert: **amount(s) in figures and words**]*. This remaining guarantee shall expire no later than *[insert: **number and select: of months/of years (of the Warranty Period that needs to be covered by the remaining guarantee)**]* from the date of the Operational Acceptance Certificate for the System,² and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20 (a) is hereby excluded.

[Signature(s)]

¹ The bank shall insert the amount(s) specified and denominated in the SCC for GCC Clauses 13.3.1 and 13.3.4 respectively, either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Purchaser.

² In this sample form, the formulation of this paragraph reflects the usual SCC provisions for GCC Clause 13.3. However, if the SCC for GCC Clauses 13.3.1 and 13.3.4 varies from the usual provisions, the paragraph, and possibly the previous paragraph, need to be adjusted to precisely reflect the provisions specified in the SCC.

6.2 Advance Payment Security Form (Bank Guarantee)

[insert: Bank's Name, and Address of Issuing Branch or Office]

Beneficiary: *[insert: Name and Address of Purchaser]*

Date: *[insert: date]*

ADVANCE PAYMENT GUARANTEE No.: *[insert: Advance Payment Guarantee Number]*

We have been informed that on *[insert: date of award]* you awarded Contract No. *[insert: Contract number]* for *[insert: title and/or brief description of the Contract]* (hereinafter called "the Contract") to *[insert: complete name of Supplier]* (hereinafter called "the Supplier"). Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum of *[insert: amount in numbers and words, for each currency of the advance payment]* is to be made to the Supplier against an advance payment guarantee.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum or sums not exceeding in total the amount of the advance payment referred to above, upon receipt by us of your first demand in writing declaring that the Supplier is in breach of its obligations under the Contract because the Supplier used the advance payment for purposes other than toward the proper execution of the Contract.

It is a condition for any claim and payment to be made under this guarantee that the advance payment referred to above must have been received by the Supplier on its account *[insert: number and domicile of the account]*.

For each payment after the advance payment, which you will make to the Supplier under this Contract, the maximum amount of this guarantee shall be reduced by the ninth part of such payment.¹ At the time at which the amount guaranteed becomes nil, this guarantee shall become null and void, whether the original is returned to us or not.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

[Signature(s)]

¹ This sample formulation assumes an Advance Payment of 10% of the Contract Price excluding Recurrent Costs, and implementation of the main option proposed by this SBD in the SCC for GCC Clause 13.2.2 for gradually reducing the value of the Advance Payment Security. If the Advance Payment is other than 10%, or if the reduction in amount of the security follows a different approach, this paragraph would need to be adjusted and edited accordingly.

7. INSTALLATION AND ACCEPTANCE CERTIFICATES

7.1 Installation Certificate

Date: [insert: **date**]

Loan/Credit Number: [insert: **loan or credit number from IFB**]

IFB: [insert: **title and number of IFB**]

Contract: [insert: **name and number of Contract**]

To: [insert: **name and address of Supplier**]

Dear Sir or Madam:

Pursuant to GCC Clause 26 (Installation of the System) of the Contract entered into between yourselves and the [insert: **name of Purchaser**] (hereinafter the “Purchaser”) dated [insert: **date of Contract**], relating to the [insert: **brief description of the Information System**], we hereby notify you that the System (or a Subsystem or major component thereof) was deemed to have been correctly installed on the date specified below.

1. Description of the System (or relevant Subsystem or major component: [insert: **description**]
2. Date of Installation: [insert: **date**]

Notwithstanding the above, you are required to complete the outstanding items listed in the attachment to this certificate as soon as practicable. This letter shall not relieve you of your obligation to achieve Operational Acceptance of the System in accordance with the Contract nor of your obligations during the Warranty Period.

For and on behalf of the Purchaser

Signed:

Date:

in the capacity of: [state: **“Project Manager”** or state **the title of a higher level authority in the Purchaser’s organization**]

7.2 Operational Acceptance Certificate

Date: [insert: **date**]

Loan/Credit Number: [insert: **loan or credit number from IFB**]

IFB: [insert: **title and number of IFB**]

Contract: [insert: **name of System or Subsystem and number of Contract**]

To: [insert: **name and address of Supplier**]

Dear Sir or Madam:

Pursuant to GCC Clause 27 (Commissioning and Operational Acceptance) of the Contract entered into between yourselves and the [insert: **name of Purchaser**] (hereinafter the “Purchaser”) dated [insert: **date of Contract**], relating to the [insert: **brief description of the Information System**], we hereby notify you the System (or the Subsystem or major component identified below) successfully completed the Operational Acceptance Tests specified in the Contract. In accordance with the terms of the Contract, the Purchaser hereby takes over the System (or the Subsystem or major component identified below), together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the System (or Subsystem or major component): [insert: **description**]
2. Date of Operational Acceptance: [insert: **date**]

This letter shall not relieve you of your remaining performance obligations under the Contract nor of your obligations during the Warranty Period.

For and on behalf of the Purchaser

Signed:

Date:

in the capacity of: [state: **“Project Manager” or higher level authority in the Purchaser’s organization**]

8. CHANGE ORDER PROCEDURES AND FORMS

Date: [*insert: date*]

Loan/Credit Number: [*insert: loan or credit number from IFB*]

IFB: [*insert: title and number of IFB*]

Contract: [*insert: name or System or Subsystem and number of Contract*]

General

This section provides samples of procedures and forms for carrying out changes to the System during the performance of the Contract in accordance with GCC Clause 39 (Changes to the System) of the Contract.

Change Order Log

The Supplier shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Change Orders authorized or pending. Changes shall be entered regularly in the Change Order Log to ensure that the log is kept up-to-date. The Supplier shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Purchaser.

References to Changes

- (1) Request for Change Proposals (including Application for Change Proposals) shall be serially numbered CR-nnn.
- (2) Change Estimate Proposals shall be numbered CN-nnn.
- (3) Estimate Acceptances shall be numbered CA-nnn.
- (4) Change Proposals shall be numbered CP-nnn.
- (5) Change Orders shall be numbered CO-nnn.

On all forms, the numbering shall be determined by the original CR-nnn.

Annexes

- 8.1 Request for Change Proposal Form
- 8.2 Change Estimate Proposal Form
- 8.3 Estimate Acceptance Form
- 8.4 Change Proposal Form
- 8.5 Change Order Form
- 8.6 Application for Change Proposal Form

8.1 Request for Change Proposal Form

(Purchaser's Letterhead)

Date: [insert: **date**]

Loan/Credit Number: [insert: **loan or credit number from IFB**]

IFB: [insert: **title and number of IFB**]

Contract: [insert: **name of System or Subsystem or number of Contract**]

To: [insert: **name of Supplier and address**]

Attention: [insert: **name and title**]

Dear Sir or Madam:

With reference to the above-referenced Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within [insert: **number**] days of the date of this letter.

1. Title of Change: [insert: **title**]
2. Request for Change No./Rev.: [insert: **number**]
3. Originator of Change: [select **Purchaser** / **Supplier** (by **Application for Change Proposal**), and add: **name of originator**]
4. Brief Description of Change: [insert: **description**]
5. System (or Subsystem or major component affected by requested Change): [insert: **description**]
6. Technical documents and/or drawings for the request of Change:

- | Document or Drawing No. | Description |
|-------------------------|---|
| 7. | Detailed conditions or special requirements of the requested Change: <i>[insert: description]</i> |
| 8. | Procedures to be followed: <ul style="list-style-type: none"> (a) Your Change Proposal will have to show what effect the requested Change will have on the Contract Price. (b) Your Change Proposal shall explain the time it will take to complete the requested Change and the impact, if any, it will have on the date when Operational Acceptance of the entire System agreed in the Contract. (c) If you believe implementation of the requested Change will have a negative impact on the quality, operability, or integrity of the System, please provide a detailed explanation, including other approaches that might achieve the same impact as the requested Change. (d) You should also indicate what impact the Change will have on the number and mix of staff needed by the Supplier to perform the Contract. (e) You shall not proceed with the execution of work related to the requested Change until we have accepted and confirmed the impact it will have on the Contract Price and the Implementation Schedule in writing. |
| 9. | As next step, please respond using the Change Estimate Proposal form, indicating how much it will cost you to prepare a concrete Change Proposal that will describe the proposed approach for implementing the Change, all its elements, and will also address the points in paragraph 8 above pursuant to GCC Clause 39.2.1. Your Change Estimate Proposal should contain a first approximation of the proposed approach, and implications for schedule and cost, of the Change. |

For and on behalf of the Purchaser

Signed:

Date:

in the capacity of: *[state: "Project Manager" or higher level authority in the Purchaser's organization]*

8.2 Change Estimate Proposal Form

(Supplier's Letterhead)

Date: [insert: **date**]

Loan/Credit Number: [insert: **loan or credit number from IFB**]

IFB: [insert: **title and number of IFB**]

Contract: [insert: **name of System or Subsystem and number of Contract**]

To: [insert: **name of Purchaser and address**]

Attention: [insert: **name and title**]

Dear Sir or Madam:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost of preparing the below-referenced Change in accordance with GCC Clause 39.2.1 of the Contract. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Clause 39.2.2, is required before we proceed to prepare the actual Change Proposal including a detailed estimate of the cost of implementing the Change itself.

1. Title of Change: [insert: **title**]
2. Request for Change No./Rev.: [insert: **number**]
3. Brief Description of Change (including proposed implementation approach): [insert: **description**]
4. Schedule Impact of Change (initial estimate): [insert: **description**]
5. Initial Cost Estimate for Implementing the Change: [insert: **initial cost estimate**]

6. Cost for Preparation of Change Proposal: [insert: ***cost in the currencies of the Contract***], as detailed below in the breakdown of prices, rates, and quantities.

For and on behalf of the Supplier

Signed:

Date:

in the capacity of: [state: ***“Supplier’s Representative” or other higher level authority in the Supplier’s organization***]

8.3 Estimate Acceptance Form

(Purchaser's Letterhead)

Date: [insert: *date*]

Loan/Credit Number: [insert: *loan or credit number from IFB*]

IFB: [insert: *title and number of IFB*]

Contract: [insert: *name of System or Subsystem and number of Contract*]

To: [insert: *name of Supplier and address*]

Attention: [insert: *name and title*]

Dear Sir or Madam:

We hereby accept your Change Estimate and agree that you should proceed with the preparation of a formal Change Proposal.

1. Title of Change: [insert: *title*]
2. Request for Change No./Rev.: [insert: *request number / revision*]
3. Change Estimate Proposal No./Rev.: [insert: *proposal number / revision*]
4. Estimate Acceptance No./Rev.: [insert: *estimate number / revision*]
5. Brief Description of Change: [insert: *description*]
6. Other Terms and Conditions:

In the event that we decide not to order the Change referenced above, you shall be entitled to compensation for the cost of preparing the Change Proposal up to the amount estimated for this purpose in the Change Estimate Proposal, in accordance with GCC Clause 39 of the General Conditions of Contract.

For and on behalf of the Purchaser

Signed:

Date:

in the capacity of: [state: ***“Project Manager” or higher level authority in the Purchaser’s organization***]

8.4 Change Proposal Form

(Supplier's Letterhead)

Date: [insert: **date**]

Loan/Credit Number: [insert: **loan or credit number from IFB**]

IFB: [insert: **title and number of IFB**]

Contract: [insert: **name of System or Subsystem and number of Contract**]

To: [insert: **name of Purchaser and address**]

Attention: [insert: **name and title**]

Dear Sir or Madam:

In response to your Request for Change Proposal No. [insert: **number**], we hereby submit our proposal as follows:

1. Title of Change: [insert: **name**]
2. Change Proposal No./Rev.: [insert: **proposal number/revision**]
3. Originator of Change: [select: **Purchaser / Supplier**; and add: **name**]
4. Brief Description of Change: [insert: **description**]
5. Reasons for Change: [insert: **reason**]
6. The System Subsystem, major component, or equipment that will be affected by the requested Change: [insert: **description**]

7. Technical documents and/or drawings for the requested Change:

Document or Drawing No.	Description
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8. Estimate of the increase/decrease to the Contract Price resulting from the proposed Change: *[insert: **amount in currencies of Contract**]*, as detailed below in the breakdown of prices, rates, and quantities.

Total lump sum cost of the Change:

Cost to prepare this Change Proposal (i.e., the amount payable if the Change is not accepted, limited as provided by GCC Clause 39.2.6):

9. Additional Time for Achieving Operational Acceptance required due to the Change: *[insert: **amount in days / weeks**]*

10. Effect on the Functional Guarantees: *[insert: **description**]*

11. Effect on the other terms and conditions of the Contract: *[insert: **description**]*

12. Validity of this Proposal: for a period of *[insert: **number**]* days after receipt of this Proposal by the Purchaser

13. Procedures to be followed:

- (a) You are requested to notify us of your acceptance, comments, or rejection of this detailed Change Proposal within *[insert: **number**]* days from your receipt of this Proposal.
- (b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.

For and on behalf of the Supplier

Signed:

Date:

in the capacity of: *[state: **“Supplier’s Representative” or other higher level authority in the Supplier’s organization**]*

8.5 Change Order Form

(Purchaser's Letterhead)

Date: [insert: *date*]

Loan/Credit Number: [insert: *loan or credit number from IFB*]

IFB: [insert: *title and number of IFB*]

Contract: [insert: *name of System or Subsystem and number of Contract*]

To: [insert: *name of Supplier and address*]

Attention: [insert: *name and title*]

Dear Sir or Madam:

We hereby approve the Change Order for the work specified in Change Proposal No. [insert: *number*], and agree to adjust the Contract Price, Time for Completion, and/or other conditions of the Contract in accordance with GCC Clause 39 of the Contract.

1. Title of Change: [insert: *name*]
2. Request for Change No./Rev.: [insert: *request number / revision*]
3. Change Order No./Rev.: [insert: *order number / revision*]
4. Originator of Change: [select: *Purchaser / Supplier*; and add: *name*]
5. Authorized Price for the Change:

Ref. No.: [insert: *number*]

Date: [insert: *date*]

[insert: *amount in foreign currency A*] plus [insert: *amount in foreign currency B*]
plus [insert: *amount in foreign currency C*] plus [insert: *amount in local currency*]

6. Adjustment of Time for Achieving Operational Acceptance: [insert: ***amount and description of adjustment***]
7. Other effects, if any: [state: ***“none”*** or insert ***description***]

For and on behalf of the Purchaser

Signed:

Date:

in the capacity of: [state: ***“Project Manager”*** or ***higher level authority in the Purchaser’s organization***]

For and on behalf of the Supplier

Signed:

Date:

in the capacity of: [state ***“Supplier’s Representative”*** or ***higher level authority in the Supplier’s organization***]

8.6 Application for Change Proposal Form

(Supplier's Letterhead)

Date: [insert: *date*]

Loan/Credit Number: [insert: *loan or credit number from IFB*]

IFB: [insert: *title and number of IFB*]

Contract: [insert: *name of System or Subsystem and number of Contract*]

To: [insert: *name of Purchaser and address*]

Attention: [insert: *name and title*]

Dear Sir or Madam:

We hereby propose that the below-mentioned work be treated as a Change to the System.

1. Title of Change: [insert: *name*]
2. Application for Change Proposal No./Rev.: [insert: *number / revision*] dated: [insert: *date*]
3. Brief Description of Change: [insert: *description*]
4. Reasons for Change: [insert: *description*]
5. Order of Magnitude Estimation: [insert: *amount in currencies of the Contract*]
6. Schedule Impact of Change: [insert: *description*]
7. Effect on Functional Guarantees, if any: [insert: *description*]
8. Appendix: [insert: *titles (if any); otherwise state "none"*]

For and on behalf of the Supplier

Signed:

Date:

in the capacity of: [state: ***“Supplier’s Representative” or higher level authority in the Supplier’s organization***]