

भारत हेवी इलेक्ट्रिकल्स लिमिटेड

BHARAT HEAVY ELECTRICALS LIMITED

HEAVY POWER EQUIPMENT PLANT

RAMACHANDRAPURAM



INFORMATICS CENTRE

TENDER DOCUMENT FOR

**SUPPLY OF SAP-HRMS & SAP-HPEP SERVERS AND OTHER EQUIPMENT ON FINANCIAL LEASE
FOR A PERIOD OF 5 YEARS**

PROCUREMENT OF SAP-HRMS & SAP-HPEP SERVERS AND OTHER EQUIPMENT – 2014

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1 REQUIREMENT AND PROCUREMENT PROCESS

1.1 INTRODUCTION

BHEL, Ramachandrapuram, Hyderabad (A Government of India Undertaking) invites tenders for the supply, installation and maintenance of Equipment to run SAP-HRMS & SAP-HPEP applications on 5 years lease basis from eligible bidders.

The equipment shall be installed in the **Primary site** in Informatics Centre and in the **Secondary site** in DR centre in BHEL, Ramachandrapuram premises.

The entire system is required on 5-year Financial Lease and if BHEL opts, the bidder shall undertake to provide maintenance support for two years after the expiry of the Financial Lease period.

1.2 DOCUMENTS ISSUED TO THE BIDDERS

Following are the tender documents issued to the bidders.

- 1.2.1 Requirement and the Procurement process
- 1.2.2 Eligibility Criteria for bidders
- 1.2.3 Technical Terms and conditions – SAP-HRMS
- 1.2.4 Technical Terms and conditions – SAP-HPEP
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- 1.2.8 Price Format – Equipment & Services
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- 1.2.14 Format for List of Enclosures.
- 1.2.15 Integrity Pact
- 1.2.16 Reverse Auction (RA) guidelines

1.3 AMENDMENT OF BIDDING DOCUMENTS

- 1.3.1 BHEL may at its sole discretion amend the Bidding Documents at any time prior to the deadline for submission of bids. However in case of such amendment, the bid submission date may be extended at the discretion of BHEL.
- 1.3.2 Amendments made prior to submission of bid will be provided in the form of Addenda/ Corrigendum to the Bidding Documents and will be posted on the BHEL website only (<http://www.bhel.com>).

1.4 BID SUBMISSION PROCESS

The Bidders shall submit the offer in **TWO INNER ENVELOPES** as indicated below which shall be sealed in one outer envelope.

Envelope I: This sealed envelope should contain all the copies of technical bid together with un-priced commercial bid (all documents indicated at clause 1.7). This should also contain EMD in the form of DD/ Pay order for an amount of INR 2,00,000 (INR Two Lakh Only) and non-refundable Tender Fee if any. The envelope

should be clearly marked "**Part I - Technical and Commercial Bid**", indicating Enquiry Number, Due Date and Address & Reference of the Bidder.

Envelope II: This sealed envelope should contain price details. This envelope should be clearly marked "**Part II - Price Bid**", indicating Enquiry Number, Due Date and Address & Reference of the Bidder.

Both the envelopes (Part I & II) shall be put in one cover, duly sealed, super scribing as Part I & Part II of Enquiry Number, Due Date of opening and the Address and Reference of the Bidder.

The above offer should reach this office on or before the due date by 11.00 hrs. (IST)

Tender should not be addressed to any Individual's name but only by designation to:

Tender Box

Vendor Complex

BHEL, Ramachandrapuram

Hyderabad – 502032

Tenders should be free from CORRECTION AND ERASURES, corrections if any must be attested. All amount shall be indicated both in words as well as in figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.

Offers should be in ENGLISH and accompanied by detailed technical literature, catalogue and detailed dimensional drawings in ENGLISH or otherwise, the offers will not be considered.

1.5 EARNEST MONEY DEPOSIT (EMD)

One time EMD of INR 2,00,000 (INR Two Lakh Only) is to be submitted by each bidder in the form of Pay order or Demand draft in favour of 'Bharat Heavy Electricals Limited' and be payable in Hyderabad. EMD may be forfeited under following conditions:

- 1) After opening of bid, the bidder revokes his bid within the validity period or increases his earlier quoted rates.
- 2) Non-faithful performance, including but not limited to delayed and inadequate response, in the opinion of the Owner in the bidding process until order is placed.
- 3) The Bidder not abiding by Section 7.5 w.r.t to failure to accept the issued PO within a maximum of 30 Calendar days along with the submission of Security Deposit.

EMD will be converted into Security Deposit for the successful bidder and balance security deposit shall be deposited by successful bidder before commencement of work.

EMD given by all unsuccessful bidders shall be refunded within 15 days of acceptance of award of work by the successful bidder on production of Original Cash receipt along with claim.

EMD shall not carry any interest. In case of any delay in refund due to any reason, BHEL shall not pay any interest on delayed refund.

1.6 OPENING OF TENDERS

- 1.6.1 The Part I – Technical & Commercial bid would be opened on the Tender opening date.
- 1.6.2 The Part II – Price bid of Technically & Commercially suitable Bidders alone would be opened. The Technically & Commercially suitable Bidders would be informed about the tender opening date.
- 1.6.3 Clarifications if any required by BHEL for Technical evaluation would be sought from Bidders before opening of Part II – Price bid.

BHEL reserves the right to go for a Reverse Auction (RA) instead of Opening the submitted sealed price bid, which will be decided after techno-commercial evaluation. Information and general terms and conditions governing RA are indicated at Annexure-7.

1.7 DOCUMENTS TO BE SUBMITTED ALONG WITH THE BID

Following documents shall be submitted in the bid. The Bidder shall bear all costs associated with the preparation and submission of their bid and BHEL will in no case be responsible or liable for those costs.

The bid, all correspondence and documents related to the bid shall be in English. It is a two part bid system (i) Techno-Commercial bid and (ii) Price bid

1.7.1 Documents to be submitted for Technical and Commercial bid

- 1.7.1.1 Check List of Enclosures format (Annexure-5) along with all enclosures indicated there in.
- 1.7.1.2 Price format copy (both Equipment& Services and AMC) with prices masked or without prices (PI note that % figures shall be indicated. Only the values shall be masked).
- 1.7.1.3 Technical offer including Brochures/literature for the equipment offered (Separate offers for SAP-HRMS and SAP-HPEP shall be provided)

1.7.2 Document to be submitted for the Price Bid

- 1.7.2.1 Price in the Price Format (both Equipment& Services and AMC).

1.8 LATE BIDS

Any bid received by BHEL after the deadline for submission of bids will be summarily rejected and returned unopened to the bidder.

1.9 EVALUATION OF BIDS

BHEL will evaluate the bids as follows;

Stage-I: Evaluation of Technical and Commercial Bid

The tender would be opened on the tender opening date.

Eligibility criteria are mandatory requirements to be met by the Bidder. Only those Bidders who meet all the requirements as per **Eligibility Criteria for Bidders** will be considered for further evaluation.

BHEL's Technical Committee will evaluate the Technical bid submitted by the Bidders. During the Technical Evaluation of the bid, BHEL may ask for additional information / resources to validate the bid. These may include technical documents / supporting papers from OEM or third party, references, demonstration of a proof of concept or solution, visit to OEM's lab or their clients reference site, etc.

Failure to furnish all information as required or to submit a bid not substantially responsive to the bidding documents may result in rejection of the bid. If there are any deviations in the technical solution offered, without affecting the functional requirement, they shall be filled-in the Deviation format issued with the tender document and submitted along with the bid. In case of no deviations, "**No Deviation Certificate**" shall be submitted. The deviations from the tender Specification shall be clearly indicated giving the reference of the specification, if any, as per format for declaring deviations. If deviation other than what is specified in the list is found, the bid will be liable for rejection.

Commercial conditions sought in the tender also will be evaluated by the BHEL's committee.

BHEL reserves the right to accept or reject any deviation.

Bids meeting BHEL's technical and commercial requirements only will be considered for Stage-II price evaluation.

Stage –II: Evaluation of the Price Bid

Bidders clearing the Technical and Commercial evaluation will have their Price Bids opened.

Equipment & Services required for SAP-HRMS and SAP-HPEP will be procured from a single vendor. Hence all the items for these two systems are combined in the Price Bid format and shall be evaluated together for arriving at Total Cost. However separate orders will be released for SAP-HRMS and SAP-HPEP equipment & services.

The total cost of the bid will be calculated as under:

- 1) Bidder shall quote the quarterly rental charges (including Principle repayment, tax, interest, Service Charges, etc.) for 5 years for Hardware and other items in the requirement, as per the Price Format issued with the tender document. L1 will be evaluated based on total lease charges for 5 years including taxes after deducting input credit available to BHEL on taxes (as per price format). Payment will be made only for the quarterly rental charge. No payment other than the quarterly rental charges will be made to the vendor. Prices of optional items, if any, shall not be considered for Price evaluation and ordering, unless specifically called for in the enquiry and built into the price bid.
- 2) The Lease Tax / RTU Tax shall be extra at actuals and will be considered for price evaluation and comparison.
- 3) BHEL will claim depreciation as per the provisions of the Income Tax Act/Companies Act-2013.
- 4) The evaluation will be on the basis of total Lease Charges for all the items including all applicable Taxes and Duties but after deducting all input credits available to BHEL so as to assign tender priority based on cost to BHEL.
- 5) The bid having the least "cost for BHEL" for 5 years will be considered for order placement.
- 6) BHEL reserves the right to retain the hardware, software and other items supplied in this procurement at the end of the lease period on payment of Re. 1/- (Rupee One only). If BHEL does not retain the equipment, the vendor shall dismantle all the equipment and move it away from BHEL's premises at vendor's cost.
- 7) The AMC charges of all equipment/systems (hardware/software) for the 6th and 7th year (after the lease period of five years) shall be quoted by all the bidders and it shall be percentage on the outright Purchase value of the unit price. The man power requirement & other conditions during 6th/7th year shall remain same as that of during lease period. If BHEL proposes AMC with the vendor after lease period, then separate order will be placed on yearly basis after the payment of the terminal charges, if any, to the vendor and obtaining ownership of the equipment by BHEL. The percentage of AMC charge quoted will not be considered for tender evaluation i.e. evaluation of L1 offer either through RA or opening of conventional price bid. However, BHEL reserves the right to negotiate with L1 vendor for AMC charges.

BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA. Successful bidder after RA has to furnish break up of RA closing price between all the line items tendered for and arrive at cash outflow and cost to company in line with multiplication factor communicated before RA.

In case BHEL decides to go for RA only those bidders who have given their acceptance to participate in RA will be allowed to participate in the RA. Those bidders who have given their acceptance to participate in RA will have to necessarily submit 'Online sealed bid' in the RA. Non submission of 'Online sealed bid' by the

bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guide lines in vogue.

Terms and conditions of RA are contained in Annexure-7.

1.10 BHEL'S RIGHT TO ACCEPT OR REJECT ANY OR ALL BIDS

BHEL reserves the full 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.

Offers with following conditions are liable for rejection.

- a) Demanding advance payment
- b) Demanding exemption of EMD
- c) With offer validity less than 4 months
- d) Non-Acceptance for participating in Reverse Auction

2 ELIGIBILITY CRITERIA FOR BIDDERS

2.1 GENERAL

- 2.1.1 This bidding process is open to the manufacturers of the RISC/EPIC Servers (OEM Supplier) directly. An Authorized Partner of the Server OEM can also quote on behalf of the OEM supplier as System Integrator. The bidder shall have authorisation from respective OEMs to quote for all products offered in this tender (servers, storage, tape library, VTL, backup software etc.).
- 2.1.2 The bidder must undertake the complete responsibility of supply and commissioning of all hardware, software & other equipment which may belong to different OEMs (i.e. the entire scope of work of this tender).
- 2.1.3 A list of reference sites with contact details shall be submitted where same product (servers, storage, tape library, VTL, backup software etc.) offered is to be provided as mentioned in the Technical Specification.
- 2.1.4 There can be only 1(one) bid from each Bidder.
- 2.1.5 Bidders are required to quote for all the items of the Tender Enquiry specified in the technical specification (Requirement) document and incomplete offers will be rejected.
- 2.1.6 Relevant portions, in the documents submitted in pursuance of eligibility criterion shall be highlighted. If the offer is not accompanied by all the documents, the same would be rejected.
- 2.1.7 Undertaking for subsequent submission of any of the documents, will not be entertained under any circumstances.
- 2.1.8 Must have annual turnover of minimum INR 35 Crores per annum for each of the last 3 (three) consecutive years commencing from 2010-11 or 2011-12. Attested copies of the Profit & Loss account of the last three years to be submitted as proof.
- 2.1.9 Must have registered office in India. Documentary proof shall be submitted.
- 2.1.10 The bidder must be having SAP practice and should have successfully undertaken at least one SAP landscape upgrade/ migration project or shall represent a SAP Services Partner who should have successfully undertaken at least one SAP landscape upgrade/ migration project in India. Authorization to quote for this tender shall be obtained from the SAP Services Partner. However the primary responsibility will be of the bidder.
- 2.1.11 BHEL reserves the right to verify/ confirm all original documentary evidence submitted by vendors in support of the eligibility criteria. Upon verification, evaluation/ assessment, if any information furnished by the bidder is found to be false/ incorrect, their total bid will be rejected and no correspondence on the same shall be entertained.

2.2 ELIGIBILITY CRITERIA:

2.2.1 For the OEM of the RISC / EPIC Servers as a System Integrator

- 2.2.1.1 Must be a manufacturer of UNIX based Server on RISC/EPIC architecture. Must submit self-certificate to this effect from the OEM's authorized signatory.
- 2.2.1.2 Must have supplied server of the similar make and model having the same or the higher capacity proposed in the bid in an order for single site of a company in India during the last 3 (Three) years. Bidder must submit documentary evidence in support of this.
- 2.2.1.3 The OEM of Server must have executed (either directly or through authorized partner) at least 2 such orders (at least 1 in India) in the last 5 years having total lease / outright value of minimum INR 5 crores in each order. OEM shall submit documentary evidence to support this.

- 2.2.1.4 Self-certified document-indicating details of customer (Name, Address, Contact person, Phone and Email) having been supplied the similar make and model server with details like the CPU, OS and the SAPS rating of the hardware delivered.

2.2.2 For the OEM's Authorized Partner as a System Integrator

- 2.2.2.1 Must be an Authorized partner of the Server OEMs and for the products quoted. Shall submit certificate from the OEMs to this effect.
- 2.2.2.2 Must have executed at least 2 orders on lease/ outright purchase in the last 5 years in India with a value of minimum INR 5 Crores in each order. Shall submit documentary evidence to support this.
- 2.2.2.3 All the Eligibility Criteria mentioned for the OEM of the RISC / EPIC Servers (clause 2.2.1) shall be met by the OEM here also, in case the bid is submitted by the authorized partner. The documents of OEM as per the above clauses shall also be submitted.

3 TECHNICAL TERMS AND CONDITIONS (SAP-HRMS)

3.1 SCOPE OF WORK

- 3.1.1 The vendor shall Supply, Install, Integrate, Carryout Tests, Commissioning of Servers, Storage, Backup Solution, other related items including Operating Systems and other software at Primary Site & Secondary Site of BHEL Hyderabad complex as per technical specifications & requirements of this tender. Movement inside factory, including lifting to requisite floor is responsibility of vendor. Vendor may visit the site, if required before quoting.
- 3.1.2 The vendor shall supply and install all cables, adapters, power cords and any other interconnects for power, fibre and network required by the systems to meet the specification. The power adapter will be as per the Indian standard. The vendor shall carry out all electrical and systems interfacing pertaining to equipment at Primary site and Secondary Site as per the best international standards and practices. Laying dark cable (dedicated fibre) between primary site and secondary site in two different routes, approximately in 1.5 KMs on each route, is also in the scope of the vendor.
- 3.1.3 Arranging requisite tools, measurement equipment and resources required for installation and commissioning of the hardware, software and other equipment is the responsibility of the vendor.
- 3.1.4 All software to be provided as part of the solution should be licensed to “Bharat Heavy Electricals Limited, Corporate office”. All documents, manuals, administration manuals and software CD/DVDs shall be submitted to BHEL before commissioning the systems. All software shall come with at least two sets of CDs/DVDs, etc.
- 3.1.5 Vendor shall supply and install two Precision Air Conditioners (PAC) of 20 Ton each, by replacing existing PACs in the Data Centre. The existing 2 nos. of working PACs in the Data centre needs to be dismantled and installed in a new location as decided by BHEL within the same campus
- 3.1.6 BHEL may shift the equipment in different site/location during the lease period. The vendor shall carryout the shifting activity at free of cost, at least once during the lease period. Vendor will continue to provide warranty, support and services for the shifted equipment during the lease period.
- 3.1.7 The vendor shall ensure that none of BHEL’s equipment/structure/setup gets damaged during commissioning and operations of the supplied equipment. Any damages, if caused to BHEL’s property due to Vendor’s activity/negligence or the operations of the equipment, shall be rectified, repaired by the vendor at their own cost.
- 3.1.8 Maintenance of the hardware, software and other equipment throughout the lease period shall be as per the service level agreement.
- 3.1.9 The products whose remaining end-of-support is less than 07 years need not to be offered.
- 3.1.10 Insurance including transit insurance of the hardware, software and other equipment during the duration of the contract and lease period shall be in the scope of the vendor.
- 3.1.11 Migration and re-installation of existing SAP landscape, from servers located at both Trichy and Delhi, to the new servers in Hyderabad. Oracle Database of the landscape will be upgraded to the latest available version from SAP. After migration, the whole landscape will be technically upgraded to the latest available “Enhancement package” from SAP.
- 3.1.12 Any travel, boarding and lodging incurred for installation, commissioning, migration, upgrade will be borne by the vendor.

3.2 INSTALLATION AND COMMISSIONING:

The Vendor shall install the hardware, software and other equipment supplied as per the BHEL requirement. The vendor shall demonstrate the following scenarios as part of the installation and commissioning.

- 3.2.1 Fail-over test of a Partition or a Server.

- 3.2.2 Failover of clustered partitions with SAP & Oracle applications and their automatic restoration.
- 3.2.3 Clustering, High availability features.
 - 3.2.3.1 The cluster solution should integrate both the server and storage. There should not be any manual intervention required during the fail-over process.
 - 3.2.3.2 The failover and failback should happen automatically.
 - 3.2.3.3 In the event of a single partition failure, only the corresponding resources of the failed partition including storage should failover to the secondary site. Other partitions should remain functional without any disruption to the service in the primary site.
- 3.2.4 Synchronous SAN based data replication between primary and secondary site.
- 3.2.5 Backup and Restore as defined in the technical specifications.
- 3.2.6 Backup and Restore features.
 - 3.2.6.1 Backup shall be both snapshot based and without snapshot based and shall integrate with the SAP BRTOOLS / RMAN.
 - 3.2.6.2 Backup software shall be integrated with storage (SAN) for snapshot based backups.
 - 3.2.6.3 It shall be possible to restore either to the backup server or to the source server from Tape / VTL and shall be integrated with the snapshot based backup.
- 3.2.7 Failure of each SAN switches and sustenance of service.
- 3.2.8 Fail-over of Storage.
- 3.2.9 VTL / Tape library Backup in case of failure.
- 3.2.10 Fail-over of entire Primary / Secondary site.
- 3.2.11 Successful running of SAP ERP system and sub-systems and applications in other partitions after installation of SAP ERP software on respective servers with acceptable performance.
- 3.2.12 Integration with the BHEL's existing Intranet with proper security.
 - 3.2.12.1 The communication between Application servers and DB servers should use the dedicated switches only and any disruption in public network should not hamper the dedicated network.
 - 3.2.12.2 Both dedicated and user network should be physically isolated.
- 3.2.13 Demonstration of RAS features.
- 3.2.14 Any other scenario not covered above but envisaged in the BCP plan.
- 3.2.15 Any hardware component, software and connectors required for the installation and commissioning as per BHEL requirement but not explicitly mentioned will have to be provided.

If the Vendor fails to demonstrate these scenarios, supplied equipment will be rejected without any cost implication to BHEL.

3.3 WORK / ACTIVITIES RELATED TO MAKING SYSTEM READY FOR INSTALLATION OF ERP (SAP)

APPLICATIONS:

As these new servers are bought for migrating the complete SAP-ERP applications running in old servers from Trichy and Delhi to Hyderabad, the vendor shall carry out the following activities required for before migrating BHEL's ERP applications from ECC 6.0 running on HP-UX platform to the new system.

- 3.3.1 Installation of OS in all the partitions.
- 3.3.2 Installation of required OS level Patches, software, updates and file systems as recommended by SAP, Oracle and BHEL.
- 3.3.3 Creation of required file-systems as per SAP/BHEL requirement.
- 3.3.4 Cluster testing after SAP migration for the SAP & Oracle instance.
- 3.3.5 OS hardening and tuning for better performance and security as per SAP/BHEL recommendation.

- 3.3.6 Integrating and testing BRTOOL backup of SAP with VTL & Tape Library using SAP BACKINIT.
- 3.3.7 Backup of Operating system, SAP and Oracle file system and restore testing.

3.4 MIGRATION OF SAP LANDSCAPE, INSTALLATION OF ADS, APPLICATION SERVER ETC., INSTALLATION OF LATEST ENHANCEMENT PACKAGE

Currently existing SAP landscape has only HRMS module of SAP implemented on R3 server having interface with legacy HR system. ESS and MSS module is implemented on SAP Enterprise portal and BI server with standard reporting along with Solution manager, IDES and SAP Router.

Following activities needs to be performed after installation of Hardware, OS, Software and patches.

3.4.1 Migration

- 3.4.1.1 Migration of SAP Application and oracle database from the old HP-UX/Linux environment running SAP ECC 6.0 EHP2 having database oracle 10g rel 2/ oracle 11g to the provided servers.
- 3.4.1.2 The migration can be heterogeneous or homogenous depending upon the new Servers operating systems.
- 3.4.1.3 The following existing Servers are to be migrated:
 - 1) SAP-HR R3 Production server running HRMS module
 - 2) SAP-HR R3 Development server running HRMS module
 - 3) SAP-HR R3 Quality server running HRMS module
 - 4) EP Production server running ESS & MSS
 - 5) EP Development server running ESS & MSS
 - 6) EP Quality server running ESS & MSS
 - 7) BI Production Server
 - 8) BI Development Server
 - 9) BI Quality server
 - 10) Solution Manager

Sl. No.	Server	Location	Oracle version	Operating system	SAP /EHP version
1	R3 Production server	Trichy	11g	HP-UX	ECC 6.0 / EHP2
2	R3 Development server	Trichy	11g	HP-UX	ECC 6.0 / EHP2
3	R3 Quality server	Trichy	11g	HP-UX	ECC 6.0 / EHP2
4	EP Production server	Trichy	11g	HP-UX	EP 7.0 / EHP2
5	EP Development server	Delhi	11g	Linux	EP 7.0 / EHP2
6	EP Quality server	Delhi	11g	Linux	EP 7.0 / EHP2
7	BI Production Server	Delhi/Trichy	10g	HP-UX/Linux	ECC 6.0 / EHP2
8	BI Development Server	Delhi	10g	Linux	ECC 6.0 / EHP2
9	BI Quality server	Delhi	10g	Linux	ECC 6.0 / EHP2
10	Solution Manager	Delhi	10g	Linux	7.0 / EHP1

- 3.4.1.4 Detail plan for approval will be submitted before the migration and installation work is started which should include project plan, no of days required, breakup of activity and man days required for each activity, manpower planned.
- 3.4.1.5 Brief scope of work for migration:
 - a. All necessary software, patches, keys will be downloaded by the vendor from the SAP service market place for which the access will be given by BHEL. OSS call to SAP if required will also be raised by the vendor.
 - b. All necessary database and file system backup will be taken before start of migration activity.
 - c. Documenting the existing configuration of the HRMS module implemented, reports including customized report, Technical configuration with the input taken from the BHEL

Core Team.

- d. Oracle database of the servers in the landscape will be brought to the latest version of Oracle and release.
- e. Application of relevant patches and notes will be done.
- f. Adjustment and/or modification of reports if required will be done.
- g. All production servers will be migrated and released at the same time. For production servers initially test migration will be done on the test partition keeping the record of issues and solution at the time of migration before actual migration is done.
- h. All the server mentioned above are to be migrated to the new server which are in cluster mode having DB & CI running together on one node.
- i. After migration, the entire above migrated server needs to be tested for the entire functional and technical configuration and functionality which was prevailing earlier. Landscape and Transport route maintained earlier, needs to be restored/configured back. Necessary performance tuning at the SAP and OS level is to be done. Servers in the cluster need to be tested for automatic switching of SAP and Oracle services on node failure. There should be no loss of committed transaction on switching of the cluster.
- j. Any external interface with SAP servers in the landscape will be configured and restored back.
- k. Existing SAP-HR R3 servers are installed in ABAP+JAVA mode. After migration JAVA instance needs to be removed from all SAP-HR R3 development, quality and production server.
- l. Existing ADS server will not be migrated / installed on the SAP-HR R3 server and the same will be installed on the separate server provided in the cluster mode.
- m. Migration will be taken completed only after the acceptance of the system by the BHEL SAPHR functional and technical core team after comprehensive testing.

3.4.2 Reinstallation:

3.4.2.1 Following Latest version Servers compatible with the landscape needs to be reinstalled and configured as per BHEL requirement.

- a. SAP Router
- b. IDES server of SAP
- c. 02 nos. of application server for SAP-HR R3 production server at each site in load balancing.
- d. 03 nos. application server for SAP-HR EP production server at each site in load balancing
- e. 01 nos. application server for SAP-HR BI production server at each site in load balancing.
- f. SAP Web Dispatcher and load balancing for EP application server to be done
- g. ADS server in cluster.

3.4.2.2 Brief scope of work for reinstallation of above server:

- a. All necessary software, patches, keys will be downloaded by the vendor from the SAP service market place for which the access will be given by BHEL. OSS call to SAP if required will also be raised by the vendor.
- b. Installation of application server will be done immediately after the production server has been migrated.
- c. SAP Web Dispatcher will be installed and configured on the EP production server and all EP application servers will be configured with Web Dispatcher in load balancing and sharing mode as per the BHEL requirement.
- d. All application server of SAP-HR R3 production server will be installed and configured in load balancing and sharing mode as per the BHEL requirement.
- e. All application server of SAP-HR BI production server will be installed and configured in load balancing and sharing mode as per the BHEL requirement.
- f. SAP Router will be installed on the Solution Manager server and will be configured to have secured access to all the servers in SAP landscape by users and SAP OSS services and as per the BHEL requirement.
- g. ADS server is to be installed separately on the server which is in cluster and is to be configured with the SAP-HR R3 and EP production server for generation of Pdf documents

- as per the existing functionality.
- h. Reinstallation will be deemed to be completed only after the acceptance of the system by the BHEL SAPHR functional and technical core team after comprehensive testing.

3.4.3 Clustered server after migration needs to be tested for zero committed transactional loss and automatic failover and fallback for the SAP and Oracle services.

3.4.4 Application of latest EHP and patches

- 3.4.4.1 Detail plan for approval will be submitted before the application of latest EHP and patches work is started which should include project plan, no of days required, breakup of activity and man days required for each activity and the manpower planned.
- 3.4.4.2 All the SAP servers in the landscape will be upgraded to the latest possible EHP and patches provided by SAP at the time of installation. EHP upgrade and patching will be a technical upgrade which should support the existing HR functionality.
- 3.4.4.3 If technical upgrade is not possible without enhancing some of the HR functionality and custom reports then those functionality and reports will be enhanced after having approval.
- 3.4.4.4 Detail plan will be submitted before the migration and installation work is started which should include project plan, no of days required, breakup of activity and man days required for each activity, manpower planned.
- 3.4.4.5 Brief scope of work for EHP upgrade:
 - a. All necessary software, patches, keys will be downloaded by the vendor from the SAP service market place for which the access will be given by BHEL. OSS call to SAP if required will also be raised by the vendor.
 - b. EHP upgrade will be undertaken only after the complete BHEL SAP-HR landscape has been migrated and is running without any issue for at least 4 weeks.
 - c. All necessary database and file system backup will be taken before the start of upgrade activity.
 - d. All production servers with latest EHP will be released at the same time. For production servers initially test migration will be done on the test partition keeping the record of issues and solution at the time of applying EHP before actual EHP is applied.
 - e. Adjustment and/or modification of reports if required will be done.
 - f. EHP installation will be first tested on all the development servers.
 - g. After upgrade all the existing technical configuration and functionality of HR module implemented on R3, EP and BI servers and interfaces among each other will be maintained and tested before handing over.
- 3.4.4.6 Latest EHP and patches application will be taken completed only after the acceptance of the system by the BHEL SAPHR functional and technical core team after comprehensive testing.

3.5 DOCUMENTS TO BE SUBMITTED DURING COMMISSIONING

On successful installation of the equipment and configuration of individual components and the solution as a whole, the Vendor shall submit the following documents as part of the commissioning:

- 3.5.1 Newness certificate for all items.
- 3.5.2 Configuration detail for each server – name, IP address, OS version, details of Partitioning etc.
- 3.5.3 Network diagrams / cabling scheme, LUN / HOST mapping.
- 3.5.4 Security scheme for entire solution.
- 3.5.5 Clustering and failover details.
- 3.5.6 Details of SAN access, point in copy, replication, zoning, etc.
- 3.5.7 Details of Backup solution for Tape library and Virtual Tape Library (VTL) systems.
- 3.5.8 Comprehensive Insurance documents for all the items.

- 3.5.9 Back to back agreement copy with the primary OEM for providing onsite support, services, spares, replacement of the faulty component during the lease period for all equipment (Servers, Storage, SAN & LAN switches, Tape library, VTL etc.) including software. Agreement should clearly state it will be the OEM's responsibility to provide support and services, if its authorized partner fails to deliver.
- 3.5.10 Document for Basic Operating Manual for the Server, Storage, Tape library and VTL and the configuration done on these for BHEL environment.

On completion of the installation commissioning and submission of above documents, the Vendor shall carry out Performance Guarantee Tests of the supplied hardware & software as given below.

3.6 PERFORMANCE GUARANTEE TESTS (PG TESTS):

- 3.6.1 The Performance Guarantee Test shall start after installation and commissioning of all the Hardware & Software at primary and secondary sites.
- 3.6.2 The Performance Guarantee Tests (and repeats of such tests limited to a maximum of two) shall be the primary responsibility of the Vendor, but shall be conducted with the full cooperation of BHEL to ascertain whether the supplied System meets the standard of performance and complete functionality as specified by BHEL.
- 3.6.3 The performance test will be done simultaneously for all the servers with respective SAP software modules installed. After successful completion of installation and commissioning, PG test shall be conducted for ascertaining the availability for a minimum period of 14 days continuously. The Performance Acceptance Tests shall be conducted by Powering Up and continuous operation of all the systems on a 24x7 basis to ascertain that all components of the solution are working in the desired fashion individually and together.
- 3.6.4 All the systems together shall give an uptime of 97% during the test period. The test duration time shall be exclusive of external power failure time and any scheduled down time by BHEL. The system shall be considered as "available", if all the processors, total installed memory; all hard disks (internal & external), DAT, DVD, switches and all other supplied equipment are in service with network, SAN and Backup system. Any hardware component failure in RISC/EPIC servers and Storage/SAN has to be rectified / replaced without bringing down / restarting any partitions or servers.
- 3.6.5 If the system is found to be lacking in meeting Performance Guarantee Test, the test time will be extended by 7days. If the equipment/system does not provide the required uptime even after 2 extensions, the supplied equipment is liable to be rejected. Down time will not be counted, in case the failure is due to any other reasons not attributed to the Vendor.
- 3.6.6 All BCP tests shall be carried out as a part of PG test. It shall also be demonstrated that all the traffic between application servers and DB/CI servers goes through the dedicated network. In case of any disturbance in the user network, the server shall continue to run without any failover.
- 3.6.7 Beyond the acceptable limits of PG parameters, the supplied equipment is liable to be rejected.

3.7 BUSINESS CONTINUITY PLAN

Vendor shall submit a detailed BCP plan at the time of implementation. A detail restoration plan to startup a failed site shall be envisaged. All the necessary resources, software, program, etc. required to carry out the Business Continuity Plan shall be included in the scope of supply. The general guidelines are as follow:

Sl. No.	Disaster Recovery Management Solution
1	A detailed plan and procedure for business continuity in the event of failure of Primary / Secondary site.
2	A detailed restoration plan to restore to original configuration after the failed site is set right.
3	Two BCP drills to be performed during the entire Lease Period (after commissioning). The time and duration of BCP drills shall be mutually agreed.
4	One full BCP drill is to be performed during Performance Guarantee Test. (Before commissioning)

BCP Drill: Activities described in the BCP plan are to be carried out periodically to ensure preparedness to meet any risks.

3.8 COMMISSIONING CERTIFICATE

BHEL will issue a Commissioning Certificate on successful completion of Performance Guarantee Tests of all the Hardware & Software including migration and technical upgrade of SAP Landscape.

3.9 TRAINING

- 3.9.1 The vendor shall provide following training at BHEL Hyderabad premises on the procured servers. The training course shall be constructed and supported by programmed illustrations, video charts etc. Vendor shall provide extensive lecture notes and other training documentation.
- 3.9.1.1 User Level Training for a minimum period of 2 days for 10 persons in server operations, and ensure familiarity to enable them to provide and use the system efficiently.
- 3.9.1.2 User Level Training on System Administration for 10 persons for minimum period of 7 days in Servers, Storage, Backup Solution, Replication, DR Plan, Operating System etc. and daily operational Activities to use the system efficiently.
- 3.9.2 Boarding and lodging of the training faculty will be the responsibility of vendor.
- 3.9.3 Training at External Certified Training Centres / Labs:
- 3.9.3.1 Basic and Advanced System Administration Training for Operating system including certification for two BHEL personnel at the OEM's training centres located in India/abroad. In case of outstation training, travel, boarding and lodging of trainees will be the responsibility of BHEL.
- 3.9.3.2 Basic Administration Training for Storage and Backup software for two BHEL personnel at the OEM's training centres located in India/abroad. In case of outstation training, travel, boarding and lodging of trainees will be responsibility of BHEL.
- 3.9.3.3 Instructor led training for SAP Solution Manager as per SAP curriculum at SAP certified centres for two BHEL officials for the modules SM100+SM200+SM300 for the minimum 13 days per person.
- 3.9.3.4 Instructor led training for SAP Enterprise Portal with certification and SAP Business Intelligence with certification as per the SAP curriculum at SAP certified centres for BHEL officials; two for the EP and one for the BI. Modules for Enterprise portal will be decided by BHEL as per the availability but training days will not be less than 15 days per person. For BI, modules will be TBW10+TBW20+E-learning+TBW42+TBW45 for 25 days.

3.10 SERVICE LEVEL AGREEMENT

Vendor shall provide an uptime of **97%** on all hardware & software products on monthly basis. If the availability of the systems or part thereof is below 95% on monthly basis, continuously over a period of 2 months, BHEL reserves the right to terminate the contract in full, without any cost implication to BHEL.

Vendor should provide support with response time of 12 hours and resolution time of 24 hours.

3.11 PENALTY FOR SLA NON-CONFORMANCE

At the end of each quarter downtime will be calculated for all the hardware and software. Downtime will be calculated based on uptime on monthly basis.

The deductions will be made as per the following formula:

Deduction (D) = (downtime in minutes (d) X rental per minute (r) X multiplication factor (f))

Where Multiplication Factor is given below

For Uptime ≥ 97.00 Multiplication Factor is 0.00

For Uptime between 97.00 and ≥ 96.00 , Multiplication Factor is 2.00

For Uptime between 96.00 and ≥ 95.00 , Multiplication Factor is 5.00

For Uptime below 95.00, Multiplication Factor is 10.00

The downtime will be recorded at Purchase order item level. Even in case of failure of a component in an item, the deduction will apply to the whole item. If the failure of an item results in of major service outage or affects the services provided by other items also, then the deduction will apply to all items affected by the failure.

3.12 AVAILABILITY OF SPARES:

Sufficient stock of critical spares shall be maintained at the Primary and Secondary sites at all times to ensure the uptime.

3.13 WARRANTY & SUPPORT:

3.13.1 All the supplied equipment/systems (hardware/software) shall be covered under a Comprehensive On-Site Warranty & service support for 5 (Five) years. The period shall start from the date of successful commissioning of the Equipment /System. Warranty & Support shall be delivered directly by the OEM for Servers, Storage and Backup Systems. In case of authorized partner being the Vendor, back to back agreement from OEM should be attached stating that the OEM will provide on-site support directly during the warranty period, replacement of spares etc. for all the hardware supplied. The warranty & support from OEM shall ensure the uptime requirement of minimum 97%.

3.13.2 If any document/manual/CD supplied by the Vendor is found to be inadequate / incomplete within the period of the contract, the supplier shall replace / complete such document/manual/CD at their cost within 15 days' time. The document / manual / CD released with upgrades and updates shall be supplied free of cost as and when they are released.

3.13.3 Annual Maintenance contract

3.13.3.1 After the expiry of 5 year Warranty and the lease period, all the supplied equipment/systems (hardware/software) shall be covered under a Comprehensive On-Site AMC & service support for 2 (two) years along with back to back support agreement with OEM for all the supplied hardware. The AMC can be terminated with three months' notice without assigning

any reason and the payment of AMC will be done at the end of each quarter or on prorata basis if terminated.

3.13.3.2 During the AMC period the on-site engineers posting and its terms and condition will be same as that of the warranty period.

3.13.3.3 The AMC for 2 years will be binding on the successful bidder, at the charges agreed in the contract. However BHEL reserves the right not to continue with AMC after the expiry of lease period.

3.14 ON-SITE ENGINEERS

3.14.1 At least two qualified, trained and certified on-site engineer shall be posted as follows:

3.14.1.1 One for the provided RISC/EPIC Servers & UNIX platform and Network equipment's having at least three years' experience on UNIX servers and its system administration including networking (Fibre, Ethernet, Switches etc.) at both sites.

3.14.1.2 She/he shall be responsible for:

- a. Total Hardware and software management including operating system administration, trouble shooting of the Servers and its software.
- b. Installation, configuration, reinstallation and reconfiguration of Servers including patching and applying upgrades.
- c. Lodging complains with OEM including follow up under back to back support and services from OEM.
- d. Monitoring and providing daily reports of the Servers at both the location.
- e. Administration, troubleshooting and maintenance of the network part (both Fiber and Ethernet including switches) provided by the vendor.
- f. Monitoring, providing logs and lodge complaint for the Precision AC provided.
- g. Any work required by BHEL related to Servers, Racks and Network and its software provided by vendor.

3.14.1.3 One for the Storage, Tape library, VTL and backup software administration with at least three years of experience on Storage, Tape library and the software provided at both site.

3.14.1.4 She/he shall be responsible for:

- a. Total Hardware and software management including administration, trouble shooting of the provided Storage, Tape library, VTL and Backup software.
- b. Installation, configuration, reinstallation and reconfiguration of Storage, Tape library, VTL and Backup Software including patching and applying upgrades.
- c. Lodging complains with OEM including follow up under back to back support and services from OEM.
- d. Monitoring and providing daily reports of the Storage, Tape library, VTL and Backup software at both the location.
- e. Taking backup and providing daily report.
- f. Any work required by BHEL related to Storage, Tape library, VTL and Backup software provided by the vendor.

3.14.2 The Bio-data of the engineer(s) will be submitted to BHEL for approval before posting. The engineer(s) has to be OEM certified on Server, Storage & Backup, with minimum qualification of Degree in Engineering or Masters in Computer Application. Vendor will be responsible for background verification of experience and references mentioned in the Bio-data.

3.14.3 The normal working hours of the on-site engineers will be from 08:00 to 18:00 hrs. However in case of breakdown or urgent requirement as decided by BHEL, on-site engineer will be asked to come at any time, stay late and work till the breakdown/emergency is over.

3.14.4 On-site engineer will be replaced within 48 hours if BHEL is not satisfied with the engineer or the on-site engineer leaves the company.

3.14.5 In normal condition, only Sunday and national holiday will be the holiday for the on-site engineer.

3.14.6 Attendance of the on-site engineer will be maintained by BHEL and for every absenteeism there will be deduction of Rs. 2,500/- per day per person.

3.14.7 Vendor shall arrange for boarding, lodging and logistics for the onsite engineer(s).

3.15 WARRANTY SHALL COVER THE FOLLOWING

3.15.1 Repair / Replacement of faulty / defective Hardware and other supplied items inclusive of supply of all types of spare parts etc. (Including batteries)

3.15.2 All Software Patches, Upgrades, updates, Service Packs, etc. of the Operating System and all other Software supplied by the OEM must be made available free of cost during the entire warranty period (5 years). Software subscription and any other subscription required during entire lease period.

3.15.3 Installation / Re-Installation / Maintenance and update patches, upgrades, updates and fixes of OS, System software and other software supplied in the contract.

3.15.4 Licenses shall be perpetual and made current whenever the license policy of the Software changes during tenure of lease. Any software patches, upgrades or modules required to run the latest version of SAP package during entire lease period.

3.2. SUPPORT SHALL INCLUDE THE FOLLOWING

3.15.5 Monitoring, logging and reporting on Daily/ Weekly/ Monthly basis as required by BHEL in the specified formats the Performance and operations of the Servers, storages and the back-up system on 24x7x365 basis.

3.15.6 Periodic health checks of the systems using diagnostic tools and implementing proactive rectification measures.

3.15.7 Troubleshooting Servers, OS, SAN and backup related issues.

3.15.8 Analyzing and reporting all system related issues.

3.15.9 Managing users, roles and passwords of all the relevant subsystems of Servers, OS, Storage etc.

3.15.10 Liaison with various vendors, OEMs, agencies and service providers for equipment maintenance & related work.

3.15.11 All incidents must be documented and logged as per the format specified by BHEL.

3.15.12 Any change in the IP Scheme, if required, limited to all the equipment installed at Primary site & Secondary site shall be done in consultation with BHEL's Network Manager.

3.15.13 Server Administration Functions include following activities for the ERP Environment in consultation/permission with BHEL Personnel.

3.15.13.1 Operating System tuning.

3.15.13.2 OS and software re-installation in the event of system crash/failures.

3.15.13.3 Configuring file systems, volumes and apportioning disk space.

3.15.13.4 Ensure proper configuration of server parameters.

3.15.13.5 Periodic System performance tuning for optimizing the SAP performance.

3.15.13.6 Addition, deletion, re-configuration of devices, additional users and printers etc.

3.15.13.7 Implementing security patches on servers at all levels.

3.15.13.8 Orderly start-up and shutdown of servers as per laid down procedures.

3.15.13.9 Security management – Configuring account policy, access rights, password control as per BHEL's security policy.

3.15.13.10 Scheduling and optimizing all critical services run on the hardware.

3.15.13.11 Maintain lists of all system files, root directories and volumes.

3.15.13.12 Resolving all server related problems.

3.15.13.13 Escalating unresolved problems to ensure resolution as per the agreed SLA.

3.15.13.14 Any other server administration activity required by BHEL not limited to above.

- 3.15.14 Storage Administration functions include following activities for the ERP Environment in consultation with BHEL Personnel.
- 3.15.14.1 Management of storage environment to maintain performance at optimum levels
 - 3.15.14.2 Regular backups of Storage software.
 - 3.15.14.3 Management of the storage solution including, but not limited to, management of space, volume, RAID configuration, configuration and management of disk array, SAN fabric / switches, tape library etc. as per mutually agreed storage management policy.
 - 3.15.14.4 Any other storage administration activity required by BHEL not limited to above.
- 3.15.15 Backup and Restore functions include following activities for the ERP Environment in consultation with BHEL Personnel.
- 3.15.15.1 **24x7x365** support for file and volume restoration requests.
 - 3.15.15.2 Must take regular Backup of operating system, database and application as per stipulated policies and time schedule.
 - 3.15.15.3 Must conduct periodic restore operations of backed up data.
 - 3.15.15.4 Regular maintenance of all the media and the backup / storage devices.
 - 3.15.15.5 Any other Backup and Restore activity required by BHEL not limited to above.

3.16 THE OFFLINE SUPPORT SHALL HAVE

- 3.16.1 24x7 National telephonic supports.
- 3.16.2 There must be a single point of contact for any eventuality and an escalation matrix must be provided with the bid.
- 3.16.3 The bidder should clearly provide Escalation mechanism and the contacts/mobile phone number of OEM's technical resource.
- 3.16.4 Access to raise technical assistance request at hardware vendors / supplier website.

Confirm compliance for all clauses of - **"Technical Terms and Conditions (SAP-HRMS)"**

Date:

Bidder's Signature with Seal

4 TECHNICAL TERMS AND CONDITIONS (SAP-HPEP)

4.1 SCOPE OF WORK

- 4.1.1 The vendor shall Supply, Install, Integrate, Carryout Tests, Commissioning of Servers, Storage, Backup Solution, other related items including Operating Systems and other software at Primary Site & Secondary Site of BHEL Hyderabad complex as per technical specifications & requirements of this tender. Movement inside factory, including lifting to requisite floor is responsibility of vendor. Vendor may visit the site, if required before quoting.
- 4.1.2 The vendor shall supply and install all cables, adapters, power cords and any other interconnects for power, fibre and network required by the systems to meet the specification. The power adapter will be as per the Indian standard. The vendor shall carry out all electrical and systems interfacing pertaining to equipment at Primary site and Secondary Site as per the best international standards and practices.
- 4.1.3 Arranging requisite tools, measurement equipment and resources required for installation and commissioning of the hardware, software and other equipment is the responsibility of the vendor.
- 4.1.4 All software to be provided as part of the solution should be licensed to “Bharat Heavy Electricals Limited, Corporate office”. All documents, manuals, administration manuals and software CD/DVDs shall be submitted to BHEL before commissioning the systems. All software shall come with at least two sets of CDs/DVDs, etc.,
- 4.1.5 BHEL may shift the equipment in different site/location during the lease period. The vendor shall carryout the shifting activity at free of cost, at least once during the lease period. Vendor will continue to provide warranty, support and services for the shifted equipment during the lease period.
- 4.1.6 The vendor shall ensure that none of BHEL’s equipment/structure/setup gets damaged during commissioning and operations of the supplied equipment. Any damages, if caused to BHEL’s property due to Vendor’s activity/negligence or the operations of the equipment, shall be rectified, repaired by the vendor at their own cost.
- 4.1.7 Maintenance of the hardware, software and other equipment throughout the lease period shall be as per the Service Level Agreement (SLA).
- 4.1.8 The products whose remaining end-of-support is less than 07 years should not to be offered.
- 4.1.9 Insurance including transit insurance of the hardware, software and other equipment during the duration of the contract and lease period shall be in the scope of the vendor.
- 4.1.10 Migration and re-installation of existing SAP landscape, from the existing M9000 servers to the new procured servers in Hyderabad. Oracle Database of the landscape should be upgraded to the latest available version from SAP. After migration, the whole landscape should be technically upgraded to the latest available “Enhancement package” from SAP.
- 4.1.11 Any travel, boarding and lodging incurred for installation, commissioning, migration, upgrade will be borne by the vendor.

4.2 INSTALLATION AND COMMISSIONING:

The Vendor shall install the hardware, software and other equipment supplied as per the BHEL requirement. The vendor shall demonstrate the following scenarios as part of the installation and commissioning.

- 4.2.1 Fail-over test of a Partition or a Server.
- 4.2.2 Failover of clustered partitions with SAP & Oracle applications and their automatic restoration.
- 4.2.3 Clustering, High availability features.

- 4.2.3.1 The cluster solution should integrate both the server and storage. There should not be any manual intervention required during the fail-over process.
- 4.2.3.2 The failover and failback should happen automatically.
- 4.2.3.3 In the event of a single partition failure, only the corresponding resources of the failed partition including storage should failover to the secondary site. Other partitions should remain functional without any disruption to the service in the primary site.
- 4.2.4 Synchronous SAN based data replication between primary and secondary site.
- 4.2.5 Backup and Restore as defined in the technical specifications.
- 4.2.6 Backup and Restore features.
 - 4.2.6.1 Backup shall be both snapshot based and without snapshot based and shall integrate with the SAP BRTOOLS / RMAN.
 - 4.2.6.2 Backup software shall be integrated with storage (SAN) for snapshot based backups.
 - 4.2.6.3 It shall be possible to restore either to the backup server or to the source server from Tape / VTL and shall be integrated with the snapshot based backup.
- 4.2.7 Failure of each SAN switch and sustenance of service.
- 4.2.8 Fail-over of Storage.
- 4.2.9 VTL / Tape library Backup in case of failure.
- 4.2.10 Fail-over of entire Primary / Secondary site.
- 4.2.11 Successful running of SAP ERP system and sub-systems and applications in other partitions after installation of SAP ERP software on respective servers with acceptable performance.
- 4.2.12 Integration with the BHEL's existing Intranet with proper security.
 - 4.2.12.1 The communication between Application servers and DB servers should use the dedicated switches only and any disruption in public network should not hamper the dedicated network.
 - 4.2.12.2 Both dedicated and user network should be physically isolated.
- 4.2.13 Demonstration of RAS features.
- 4.2.14 Any other scenario not covered above but envisaged in the BCP plan.
- 4.2.15 Any hardware component, software and connectors required for the installation and commissioning as per BHEL requirement but not explicitly mentioned will have to be provided.

If the Vendor fails to demonstrate these scenarios, supplied equipment will be rejected without any cost implication to BHEL.

4.3 WORK / ACTIVITIES RELATED TO MAKING SYSTEM READY FOR INSTALLATION OF ERP (SAP)

APPLICATIONS:

As these new servers are bought for migrating the complete SAP-ERP applications running in old servers at Hyderabad, the vendor shall carry out the following activities required before migrating BHEL's ERP applications from ECC 6.0 running on Solaris platform to the new system.

- 4.3.1 Installation of OS in all the partitions.
- 4.3.2 Installation of required OS level Patches, software, updates and file systems as recommended by SAP, Oracle and BHEL.
- 4.3.3 Creation of required file-systems as per SAP/BHEL requirement.
- 4.3.4 Cluster testing after SAP migration for the SAP & Oracle instance.
- 4.3.5 OS hardening and tuning for better performance and security as per SAP/BHEL recommendation.
- 4.3.6 Integrating and testing BRTOOL backup of SAP with VTL & Tape Library using SAP BACKINIT.
- 4.3.7 Backup of Operating system, SAP and Oracle file system and restore testing.

4.4 MIGRATION OF SAP LANDSCAPE, APPLICATION SERVER ETC., INSTALLATION OF LATEST ENHANCEMENT PACKAGE.

Please refer to the clause 5.11(Technical Specification)

4.5 DOCUMENTS TO BE SUBMITTED DURING COMMISSIONING

On successful installation of the equipment and configuration of individual components and the solution as a whole, the Vendor shall submit the following documents as part of the commissioning:

- 4.5.1 Newness certificate for all items.
- 4.5.2 Configuration detail for each server – name, IP address, OS version, details of Partitioning etc.
- 4.5.3 Network diagrams / cabling scheme, LUN / HOST mapping.
- 4.5.4 Security scheme for entire solution.
- 4.5.5 Clustering and failover details.
- 4.5.6 Details of SAN access, point in copy, replication, zoning, etc.
- 4.5.7 Details of Backup solution for Tape library and Virtual Tape Library (VTL) systems.
- 4.5.8 Comprehensive Insurance documents for all the items.
- 4.5.9 Back to back agreement copy with the primary OEM for providing onsite support, services, spares, replacement of the faulty component during the lease period for all equipment (Servers, Storage, SAN & LAN switches, Tape library, VTL etc.) including software. Agreement should clearly state it will be the OEM's responsibility to provide support and services, if its authorized partner fails to deliver.
- 4.5.10 Document for Basic Operating Manual for the Server, Storage, Tape library and VTL and the configuration done on these for BHEL environment.

On completion of the installation commissioning and submission of above documents, the Vendor shall carry out Performance Guarantee Tests of the supplied hardware & software as given below.

4.6 PERFORMANCE GUARANTEE TESTS (PG TESTS):

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- 4.6.2 The Performance Guarantee Tests (and repeats of such tests limited to a maximum of two) shall be the primary responsibility of the Vendor, but shall be conducted with the full cooperation of BHEL to ascertain whether the supplied System meets the standard of performance and complete functionality as specified by BHEL.
- 4.6.3 The performance test will be done simultaneously for all the servers with respective SAP software modules installed. After successful completion of installation and commissioning, PG test shall be conducted for ascertaining the availability for a minimum period of 14 days continuously. The Performance Acceptance Tests shall be conducted by Powering Up and continuous operation of all the systems on a 24x7 basis to ascertain that all components of the solution are working in the desired fashion individually and together.
- 4.6.4 All the systems together shall give an uptime of 97% during the test period. The test duration time shall be exclusive of external power failure time and any scheduled down time by BHEL. The system shall be considered as "available", if all the processors, total installed memory; all hard disks (internal & external), DAT, DVD, switches and all other supplied equipment are in service with network, SAN and Backup system. Any hardware component failure in RISC/EPIC servers and Storage/SAN has to be rectified / replaced without bringing down / restarting any partitions or servers.
- 4.6.5 If the system is found to be lacking in meeting Performance Guarantee Test, the test time will be extended by 7days. If the equipment/system does not provide the required uptime even after 2

extensions, the supplied equipment is liable to be rejected. Down time will not be counted, in case the failure is due to any other reasons not attributed to the Vendor.

- 4.6.6 All BCP tests shall be carried out as a part of PG test. It shall also be demonstrated that all the traffic between application servers and DB/CI servers goes through the dedicated network. In case of any disturbance in the user network, the server shall continue to run without any failover.
- 4.6.7 Beyond the acceptable limits of PG parameters, the supplied equipment is liable to be rejected.

4.7 BUSINESS CONTINUITY PLAN

Vendor shall submit a detailed BCP plan at the time of implementation. A detail restoration plan to startup a failed site shall be envisaged. All the necessary resources, software, program, etc. required to carry out the Business Continuity Plan shall be included in the scope of supply. The general guidelines are as follow:

Sl. No.	Disaster Recovery Management Solution
1	A detailed plan and procedure for business continuity in the event of failure of Primary / Secondary site.
2	A detailed restoration plan to restore to original configuration after the failed site is set right.
3	Two BCP drills to be performed during the entire Lease Period (after commissioning). The time and duration of BCP drills shall be mutually agreed.
4	One full BCP drill is to be performed during Performance Guarantee Test. (Before commissioning)

BCP Drill: Activities described in the BCP plan are to be carried out periodically to ensure preparedness to meet any risks.

4.8 COMMISSIONING CERTIFICATE

BHEL will issue a Commissioning Certificate on successful completion of Performance Guarantee Tests of all the Hardware & Software.

4.9 SERVICE LEVEL AGREEMENT

Vendor shall provide an uptime of 99% on all hardware & software products on monthly basis. If the availability of the systems or part thereof is below 98% on monthly basis, continuously over a period of 2 months, BHEL reserves the right to terminate the contract in full, without any cost implication to BHEL.

The bidder should provide 24x7 support for the Servers, Storage, SAN & LAN switches, Tape library, VTL etc. Any component / equipment failed shall be replaced / replenished within 4 hours on all days of the week.

4.10 PENALTY FOR SLA NON-CONFORMANCE

At the end of each quarter downtime will be calculated for all the hardware and software. Downtime will be calculated based on uptime on monthly basis.

The deductions will be made as per the following formula:

Deduction (D) = (downtime in minutes (d) X rental per minute (r) X multiplication factor (f))

Where Multiplication Factor is given below

For Uptime ≥ 99.00 Multiplication Factor is 0.00

For Uptime between 99.00 and ≥ 98.00, Multiplication Factor is 2.00

For Uptime between 98.00 and ≥ 97.00 , Multiplication Factor is 5.00

For Uptime below 97.00, Multiplication Factor is 10.00

The downtime will be recorded at Purchase order item level. Even in case of failure of a component in an item, the deduction will apply to the whole item. If the failure of an item results in major service outage or affects the services provided by other items also, then the deduction will apply to all items affected by the failure.

4.11 AVAILABILITY OF SPARES:

Sufficient stock of critical spares shall be maintained at the Primary and Secondary sites at all times to ensure the uptime.

4.12 WARRANTY & SUPPORT:

4.12.1 All the supplied equipment/systems (hardware/software) shall be covered under a Comprehensive On-Site Warranty & service support for 5 (Five) years. The period shall start from the date of successful commissioning of the Equipment /System. Warranty & Support shall be delivered directly by the OEM for Servers, Storage, Backup Systems and SAN & LAN switches. In case of authorized partner being the Vendor, back to back agreement from OEM should be attached stating that the OEM will provide on-site support directly during the warranty & support period, replacement of spares etc. for all the hardware supplied. The warranty & support from OEM shall ensure the uptime requirement of minimum 99%.

4.12.2 If any document/manual/CD supplied by the Vendor is found to be inadequate / incomplete within the period of the contract, the supplier shall replace / complete such document/manual/CD at their cost within 15 days' time. The document / manual / CD released with upgrades and updates shall be supplied free of cost as and when they are released.

4.12.3 Annual Maintenance contract

4.12.3.1 After the expiry of 5 year Warranty and the lease period, all the supplied equipment/systems (hardware/software) shall be covered under a Comprehensive On-Site AMC & service support for 2 (two) years along with back to back support agreement with OEM for all the supplied hardware (if BHEL proposes for AMC after 5Year lease period). The AMC can be terminated with three months' notice without assigning any reason and the payment of AMC will be done at the end of each quarter or on prorata basis if terminated.

4.12.3.2 During the AMC period, the terms and condition and the posting of on-site engineers will be same as that of the lease period.

4.12.3.3 The AMC for 2 years will be binding on the successful bidder, at the charges agreed in the contract. However BHEL reserves the right not to enter into AMC after the expiry of lease period.

4.13 ON-SITE ENGINEERS

One Site Manager with 5 year of experience and OEM Certified, two qualified OEM certified engineers and three operators with ITI/Diploma in IT related area to monitor the servers on 24x7 basis, both at DC and DR site.

4.13.1 One site Manager with 5 years of experience shall be posted as follows (both for DR and DC):

4.13.1.1 Site manager having at least five years' experience on UNIX servers and its system administration including networking (Fibre, Ethernet, Switches etc.) at both sites.

- 4.13.1.2 Administration of day-to-day site activities and generation of reports as required by BHEL management.
- 4.13.1.3 Administration and monitoring the site engineers and operators.
- 4.13.1.4 Lodging complaints with OEM including follow up under back to back support and services from OEM.
- 4.13.2 Two qualified OEM certified Site Engineers shall be posted for DC and DR.
 - 4.13.2.1 She/he shall be responsible for:
 - a. Total Hardware and software management including operating system administration, trouble shooting of the Servers and its software.
 - b. Installation, configuration, reinstallation and reconfiguration of Servers including patching and applying upgrades.
 - c. Administration, troubleshooting and maintenance of the network part (both Fiber and Ethernet including switches) provided by the vendor.
 - d. Monitoring and providing daily reports of the Servers at both the locations.
 - e. Any work required by BHEL related to Servers, Racks and Network and its software provided by vendor.
- 4.13.3 Three Operators shall be posted for DC and DR.
 - 4.13.3.1 She/he shall be responsible for:
 - a. Daily backups and restoration operations.
 - b. Day-to-day Servers, Storage, Tape Library, VTL etc maintenance operations.
 - c. Generation daily reports on status of Servers, Storage, Tape Library, VTL etc.
 - d. Material movement and Infrastructure management of Servers, Storage, Tape Library, VTL etc
 - e. Monitoring and providing daily reports of the Servers at both the location.
 - f. Any work required by BHEL related to Servers, Racks and Network and its software provided by vendor.
- 4.13.4 The Bio-data of the engineer(s) will be submitted to BHEL for approval before posting. The engineer(s) has to be OEM certified on Server, Storage & Backup, with minimum qualification of Degree in Engineering or Masters in Computer Application. Vendor will be responsible for background verification of experience and references mentioned in the Bio-data.
- 4.13.5 On-site engineers (Site Manager, Site Engineers, and Operators) will be replaced within 48 hours, if BHEL is not satisfied with the engineers or the engineer leaves the company.
- 4.13.6 Attendance of the on-site engineer will be maintained by BHEL and for every absenteeism there will be deduction of Rs. 2,500/- per day per person.
- 4.13.7 Vendor shall arrange for boarding, lodging and logistics for the onsite engineer(s).

4.14 WARRANTY SHALL COVER THE FOLLOWING

- 4.14.1 Repair / Replacement of faulty / defective Hardware and other supplied items inclusive of supply of all types of spare parts etc. (Including batteries)
- 4.14.2 All Software Patches, Upgrades, updates, Service Packs, etc. of the Operating System and all other Software supplied by the OEM must be made available free of cost during the entire warranty period (5 years), including software subscription and any other subscription required during entire lease period.
- 4.14.3 Installation / Re-Installation / Maintenance and update patches, upgrades, updates and fixes of OS, System software and other software supplied in the contract.
- 4.14.4 Licenses shall be perpetual and made current whenever the license policy/version of the Software changes during tenure of lease. Any software patches, upgrades or modules required to run the latest version of SAP package during entire lease period.

4.15 SUPPORT SHALL INCLUDE THE FOLLOWING

- 4.15.1 Monitoring, logging and reporting the performance and operations of the Servers, storages and the back-up system on Daily/ Weekly/ Monthly basis as required by BHEL in the specified formats.
- 4.15.2 Periodic health checks of the systems using diagnostic tools and implementing proactive rectification measures.
- 4.15.3 Troubleshooting Servers, OS, SAN, network and backup related issues.
- 4.15.4 Analysing and reporting all system related issues.
- 4.15.5 Managing users, roles and passwords of all the relevant subsystems of Servers, OS, and Storage etc.
- 4.15.6 Liaison with various vendors, OEMs, agencies and service providers for equipment maintenance & related work.
- 4.15.7 All incidents must be documented and logged as per the format specified by BHEL.
- 4.15.8 Any change in the IP Scheme, if required, limited to all the equipment installed at Primary site & Secondary site shall be done in consultation with BHEL's Network Manager.
- 4.15.9 Server Administration Functions include following activities for the SAP Environment in consultation/permission with BHEL Personnel.
 - 4.15.9.1 Operating System tuning.
 - 4.15.9.2 OS and software re-installation in the event of system crash/failures.
 - 4.15.9.3 Configuring file systems, volumes and apportioning disk space.
 - 4.15.9.4 Ensure proper configuration of server parameters.
 - 4.15.9.5 Periodic System performance tuning for optimizing the SAP performance.
 - 4.15.9.6 Addition, deletion, re-configuration of devices, additional users and printers etc.
 - 4.15.9.7 Implementing security patches on servers at all levels.
 - 4.15.9.8 Orderly start-up and shutdown of servers as per laid down procedures.
 - 4.15.9.9 Security management – Configuring account policy, access rights, password control as per BHEL's security policy.
 - 4.15.9.10 Scheduling and optimizing all critical services run on the hardware.
 - 4.15.9.11 Maintain lists of all system files, root directories and volumes.
 - 4.15.9.12 Resolving all server related problems.
 - 4.15.9.13 Escalating unresolved problems to ensure resolution as per the agreed SLA.
 - 4.15.9.14 Any other server administration activity required by BHEL not limited to above.
- 4.15.10 Storage Administration functions include following activities for the SAP Environment in consultation with BHEL Personnel.
 - 4.15.10.1 Management of storage environment to maintain performance at optimum levels
 - 4.15.10.2 Regular backups of Storage.
 - 4.15.10.3 Management of the storage solution including, but not limited to, management of space, volume, RAID configuration, configuration and management of disk array, SAN fabric / switches, tape library etc. as per mutually agreed storage management policy.
 - 4.15.10.4 Any other storage administration activity required by BHEL not limited to above.
- 4.15.11 Backup and Restore functions include following activities for the SAP Environment in consultation with BHEL Personnel.
 - 4.15.11.1 24x7 support for file and volume restoration requests.
 - 4.15.11.2 Must take regular Backup of operating system, database and application as per stipulated policies and time schedule.
 - 4.15.11.3 Must conduct periodic restore operations of backed up data.
 - 4.15.11.4 Regular maintenance of all the media and the backup / storage devices.
 - 4.15.11.5 Any other Backup and Restore activity required by BHEL not limited to above.

4.16 THE OFFLINE SUPPORT SHALL HAVE

- 4.16.1 24x7 National telephonic supports.
- 4.16.2 There must be a single point of contact for any eventuality and an escalation matrix must be provided.
- 4.16.3 The bidder should clearly provide Escalation mechanism and the contacts/mobile phone number of OEM's technical resource.
- 4.16.4 Access to raise technical assistance request at hardware vendors / supplier website.

Confirm compliance for all clauses of - **“Technical Terms and Conditions (SAP-HPEP)”**

Date:

Bidder's Signature with Seal

5 TECHNICAL SPECIFICATION FOR SAP-HRMS HARDWARE

BHEL Hyderabad is having **Primary Site** in Main Data Centre and **Secondary Site** in DR building (approx. 1.5 km apart) within the same campus. SAPHR infrastructures are required as per the specification mentioned in this document. Secondary site will have identical setup as primary site and during normal operation they will be sharing load. (See attached diagram). It will be configured to have storage based synchronous data replication between primary site and secondary site in order to have a near zero data loss in case of failure. Secondary site will be connected to the primary site using dedicated, redundant optical fiber links through which data will be synchronously replicated. The RPO has to be zero and the RTO should not be more than 20 minutes.

The SAN storage should provide synchronous & asynchronous replication for the supplied capacity.

5.1 THE SPECIFICATION / CONFIGURATION OF THE SERVERS AT PRIMARY SITE AND SECONDARY SITE ARE AS FOLLOWS:

To provide resources to the Operating system, **the actual numbers of SAPS provided by the vendor will be 10% more** than the number of SAPS mentioned in **Table 1 & 2** for each partition.

Table -1: Primary Site Server

Partition No.	Partition (for running ERP (SAP) Applications)	Capacity required in SAPS	Minimum SAN Boot disk for OS	I/O Ports				HA Cluster
				FC	Ethernet			
					D-LAN	L-LAN	HB	
1	R3 Production (DB and Central Instance server)	16,850	300*2	4	2	2	2	Yes
2	R3 Application server 1	5,000	300*2		2	2		
3	R3 Application server 2	5,000	300*2		2	2		
4	R3 Development server	8,055	300*2	4	2	2	2	Yes
5	BI Production(DB and Central Instance server)	10,000	300*2	4	2	2	2	Yes
6	BI Application server 1	5,000	300*2		2	2		
7	BI Development server	4,500	300*2	4	2	2	2	Yes
8	Enterprise Portal (DB and Central Instance server)	13,980	300*2	4	2	2	2	Yes
9	EP Application server 1	5,000	300*2		2	2		
10	EP Application server 2	5,000	300*2		2	2		
11	EP Application server 3	5,000	300*2		2	2		
12	Enterprise Portal Quality server	5,796	300*2	4	2	2	2	Yes
13	Backup Server1	5,000	300*2	4	2	2	2	Yes
14	Adobe Directory Services	9,251	300*2	4	2	2	2	Yes
15	Solution Manager	10,480	300*2	4	2	2	2	Yes
16	ERP Test Server 1	10,000	300*2	4	2	2	2	Yes
17	Staging Server 1	5,000	300*2	4	2	2	2	Yes
	Total	128,912	34 Disks	44	34	34	22	

Table -2: Secondary Site Server

Partition No.	Partitions (for running ERP (SAP) applications)	Capacity required in SAPS	Minimum SAN Boot disk for OS	I/O Ports				HA Cluster
				FC	Ethernet			
					D-LAN	L-LAN	HB	
1	R3 Production (DB and Central Instance server)	16,850	300*2	4	2	2	2	Yes
2	R3 Application server 1	5,000	300*2		2	2		
3	R3 Application server 2	5,000	300*2		2	2		
4	R3 Quality server	8,055	300*2	4	2	2	2	Yes
5	BI Production(DB and Central Instance server)	10,000	300*2	4	2	2	2	Yes
6	BI Application server 1	5,000	300*2		2	2		
7	BI Quality server	4,500	300*2	4	2	2	2	Yes
8	Enterprise Portal (DB and Central Instance server)	13,980	300*2	4	2	2	2	Yes
9	EP Application server 1	5,000	300*2		2	2		
10	EP Application server 2	5,000	300*2		2	2		
11	EP Application server 3	5,000	300*2		2	2		
12	Enterprise Portal Development server	5,796	300*2	4	2	2	2	Yes
13	Backup Server1	5,000	300*2	4	2	2	2	Yes
14	Adobe Directory Services	9,251	300*2	4	2	2	2	Yes
15	Solution Manager	10,480	300*2	4	2	2	2	Yes
16	ERP Test Server 1	10,000	300*2	4	2	2	2	Yes
17	Staging Server 1	5,000	300*2	4	2	2	2	Yes
	Total	128,912	34 Disks	44	34	34	22	

Legend:

FC: Fibre Card, **D-LAN:** Dedicated LAN, **L-LAN:** Local LAN, **HB:** Heart Beat

The IO adapters required for operating system disks are in addition to the requirement mentioned as above.

5.2 SPECIFICATIONS OF ENTERPRISE UNIX SERVERS: 2 NOS.

Table -3: Specifications of UNIX servers are defined below:

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
1	Servers	Enterprise & Monolithic server per site shall be offered. (It shall be possible to configure the system in each site as a single partition).		
		All servers shall be capable of being partitioned; Each partition shall have its own operating system instance, host name and IP address.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		Both servers at Primary and secondary site shall be of the same Make and Model.		
		Specify the Make and Model.		
		All servers quoted must have the same RISC / EPIC Processor.		
		The support for the Servers and all its components from OEM should be of at least 07years from the date of submission of bid. Document in support from OEM to be submitted.		
		All the servers shall be capable of running all versions of 64-bit SAP R/3 ERP 6.0 (Unicode) under 64-bit Unix OS with Oracle 10g RDBMS, Oracle 11g and later versions. Supporting document needs to be submitted in the regard.		
		Servers shall be allocated with all resources as per sizing sheet. However higher capacity is acceptable.		
2	Processors	Latest generation CPUs of 64 Bit RISC / EPIC Architecture with SMP will be offered.		
		The support of the CPU should be of at least 07 years from the date of submission of bid.		
3	Processor Performance	Minimum SAP ECC 6.0 Unicode EHP4 or higher (Sales & Distribution) SD 2 Tier SAPS Benchmark for the offered server/processor will be taken for evaluation. 1. The OEM should support their SAPS/Core claim based with published results in the SAP benchmarking Website or by providing SAPOEM Competency Center certificate. 2. The SAP OEM Competency Center certificate should be accompanied by the calculation and data used to arrive at the claimed performance. 3. BHEL may moderate the SAPS claimed by vendor using its own methodology from the available data to arrive SAPS per core, which will be binding on the vendor.		
4	Per core performance	No. of SAPS offered per core.		
	Core per partition	There shall be at least two dedicated cores per partition in both the server as in Table 1 & 2 . The numbers of cores in each server shall be scalable to minimum 128 cores .		
5	Main Memory	At least 24 GB per core DDR3 ECC memory shall be offered.		
		Specify the maximum RAM scalability for the server offered.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
6	Partitions	Each SAP instance in the production system should run in an independent partition having its own Operating system instance with resources dedicated to it as per specified in Table-1& 2 . All server partition must contain dedicated integral processor core.		
		It should be possible to assign processors and memory logically to any partition or switch processors and memory between partitions without reboot of source or target partitions or applications.		
		Each partition shall have at least the resources allocated as per the sizing specified in Table-1&2 . At any point of time, the partition should not run with lesser resources than the minimum condition specified for all partition.		
		Each partition shall be able to run same or different versions of OS, kernel, patch levels, etc., independently.		
		Each Partition shall have its own dedicated Adapters / controllers.		
		Any configuration change in one partition shall not affect any other partition.		
		Any fault in one partition shall not bring the entire System or other partitions down.		
		The OS of each partition shall be upgradeable separately and independently without affecting the other partitions.		
		Each partition shall have the capability to start-up and shutdown independently without affecting any other partition on the same server.		
		It should be possible to create at least 24 partitions in the offered server when required using virtualized I/O (if no. of partition is above 17no's). BHEL will provide reconfiguration details with the available resources if required. Necessary licenses required for this are to be provided.		
7	I/O Adapters	All adapters should be PCI/E and should not have single point of failure.		
		All FC ports shall be of min. 8 Gbps speed with multipath I/O trunking and automatic load balancing (as per Table-1&2) for each server/partition.		
		All Ethernet Adapters for DLAN, LLAN& HB LAN shall be of 1 Gbps Auto sensing (as per Table-1& 2) for each server/ partition in automatic Fail-over / Redundant / trunking / Link aggregation and auto switching mode.		
		Separate Adapters for Management of LAN, SAN boot, etc, shall be provided.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		Functional (Ethernet, Fiber Channel) redundancy at an adapter level shall be provided for each server.		
		Multi-functional adapters should not be provided and all the provided I/O adapters should also be able to be configured in virtual I/O mode. However number of I/O adapters mentioned in the Table 1&2 must be provided.		
		The server will be connected to SAN storage system using fiber channel links. Required compatible Fiber Channel Host Bus Adapters (minimum 8Gbps) with multi-path and automatic load balancing on the server side shall be provided to connect the storage system with 100% redundancy. All the hardware and software required for this shall be provided. Multiple fiber cards with multi-pathing capability and automatic load balancing at HBAs on servers shall be supplied.		
		USB/Serial Ports shall be supplied as per the standard availability in the model offered		
8	Disk and Media drives	All partitions as mentioned in Table 1&2 shall be booted through the SAN using SAS-II (2½") Disk minimum 2 x 300GB min. 15K RPM. At least additionally two FC ports on each partition are to be provided for SAN boot.		
		SAN disks used for OS shall be mirrored.		
		There shall be at least one shared DVDROM drive across all partitions in the server. There should not be reboot of partition or server when DVDROM is moved across partition.		
9	Operating System	Latest version of 64-bit OEM Unix Operating System with latest patch level must be provided. It should include:		
		- Logical Volume Management (without any reboot of the partition)		
		- Latest Online JFS or equivalent available to be offered		
		- Mirroring Software		
		- Should be capable of running any Unicode version of 64-bit ERP6.0 and all higher versions.		
		- Should be capable of running 64-bit Oracle 10g, Oracle 11g RDBMS and higher version		
		- The Unix Operating Systems shall be licensed to support unlimited users. Enterprise edition of the latest 64 bit UNIX from OEM for each server may be provided with upgrades and support during the entire lease period.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		- Partition management software having dynamic configuration feature with GUI / Web interface. Management Consoles for the same to be provided.		
		- Software to be provided for capacity planning & logs maintaining, trend analysis and reporting.		
		- Software to be provided for intelligent workload & partition replacement across a virtualized environment.		
		- Software and licenses to be provided for resource allocation / de-allocation to partitions		
10	Cluster/High availability	The cluster solution must be able to provide automatic fail-over to the other system for any failure arising in one of the system due to: <ul style="list-style-type: none"> - Hardware - Operating System - Server failure - Partition Failure - Storage Failure - Site Failure 		
		Any other failure which causes the server /partition to fail.		
		All necessary software, SAP agents, oracle agents & hardware components for automatic high availability and seamless failover and failback to be provided.		
		Redundant Heartbeat paths shall be provided as per the diagram.		
		Cluster solution shall be OEM or SAP certified solution and shall be supported by both Server and Storage OEMs.		
		There should be automatic switching of SAP and Oracle Instance in case of node failure using OEM or SAP certified software for all the clustered partition in the server. No committed transactions in SAP should be lost in case of failure of clustered component in all the clustered partition of the server.		
		Once the failed system comes up they should revert back to the original configuration automatically. Option for reverting back manually should also be available.		
		The proposed solution of implementing the fail-over must be explained in detail in the technical proposal along with logical diagrams.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		All clustered server mention in table 1 & 2 shall be clustered using high availability clustering technology and there should not be any single point of failure in the offered solution. All necessary software agents must be provided for clustering. Support for the clustering of software and all software agents must be provided. Each of the production components shall have dedicated failover mechanism. The Clustering Solution shall be as per the diagram enclosed and table mentioned. All software and licenses should be maintained and upgraded in the entire lease period.		
11	RAS Features	Each of the offered servers shall have an inbuilt service processor.		
		Processors shall be capable of dynamic CPU de-allocation.		
		Memory shall be protected through Advanced ECC/ Chip kill, bit-steering, chip redundancy, error correction or equivalent. Specify the technology used.		
		Pre failure Alert capabilities shall be available.		
		All adapters shall be hot-swappable.		
		All the following components shall be hot swappable– Disks, Power Supplies, Fans, PCI etc.		
		PCI buses shall have error handling capability or the Server should have end to end retry path for I/O.		
		Shall have indicators to identify failed components.		
		Shall have redundant Power Supplies for input from at least two sources.		
		Shall have redundant cooling fans.		
		Shall have redundant system clock.		
12	Others	System management shall be through dedicated ports and shall not use the adapters identified for partitions.		
		Rack to house the server shall be from the server OEMs as per the Rack specification.		
		All cables & accessories to implement connectivity between Server, SAN switches, LAN switches, Storage Tape library and VTL shall be provided and done.		
		All power cables shall be supplied and should confirm to Indian industry standard.		
		Specify power consumption of proposed configuration.		
		Specify heat dissipation of proposed configuration in BTU/hour		
13	Additional Cores	Four additional cores needs to be provided per server for the future additional partition requirement along with memory.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
14	Documentation	All the documents like datasheets, architecture, line diagrams, etc., shall be submitted.		
15	Software & Licenses	All software and its licenses to meet the requirement from point No. 1 to 10 in the table are to be provided for each server even if not specifically mentioned. Software and licenses provided will be supported along with upgrades during the entire lease period.		
16	Reference	A list of reference sites with contact details must be submitted where same model of the server is being used in SAP/Oracle ERP landscape. At least one of these sites shall be from India. BHEL may contact/Visit the reference sites for verification.		

5.3 SPECIFICATIONS FOR SERVER MANAGEMENT SYSTEM – 2 NOS.

The OEM of Server management system and Servers will be the same.

Table -4: Specifications for Server Management System:

Sl. No.	Item/ Parameter	Specification for Server Management System	Compliance (Yes/No)	Bidder's Response
1	Hardware/ Software	All Hardware and Software modules along with licenses required to support the following activities shall be included in the scope of supply. Software and its licenses provided will be supported and upgraded in the entire lease period.		
		Server Management System at each site shall be single unified console for following activities:		
		- GUI Console to create, remove and manage partitions.		
		- GUI based Management and performance monitoring of all systems/sub-systems of servers/partitions such as CPU, Memory, Swap Files and File systems.		
		- Log file monitoring including monitoring for specified error strings to provide real-time alerts.		
		- Isolation of performance related issues.		
		- MIS reporting of Historical utilization details for capacity planning.		
		- Customized Reports.		

5.4 SPECIFICATION FOR ENTERPRISE SAN STORAGE: - 2 NOS

Table - 5: Storage sizing for each site

Disk Type	Minimum storage capacity requirement
Solid state Disk (SSD) 400 GB (2½" disk) or higher	2 TB of usable capacity after RAID 1+0 with minimum 12 drives plus additional 2 drives as hot spares.
Minimum 300 GB of 15k rpm 6 Gbps SAS II (2½" disk)	Minimum 192 drives with additional 4 drives as hot spares.

- Raid 5 & Raid 10 configurations will be in multiples of 4 or 8 with parity (e.g. 7d+1p or 3d+ 1p or 2d+2p or 4d+4p)
- Capacity calculation should be of Base 2 (Binary) accuracy.
- Disks for operating system (required for SAN boot) of each partition shall be supplied in addition to the number of disk drives shown in the table above.
- There should be provision for adding 20 additional drives for SSD (2½" disks) and 100 additional drives for SAS II (2½" disk). "Provision" means all the necessary infrastructure should be in place (at the time of delivery) so that whenever new disks are added to these additional drives (20 for SSD & 100 for SAS II), the new disks are to be available for storage configuration. Provide all the necessary storage software licenses for the entire capacity supported by the proposed model.
- Vendor has to provide certificate from OEM of the storage for the minimum 1,00,000 IOPS performance under the following parameters. Minimum 45,000 IOPS should be for SSD disk type, minimum 20,000 IOPS for 300 GB SAS disks.

1	Read/Write	70%/30%
2	Block size	8 k
3	Random	100%
4	Cache hit	50%
5	File Size	Total storage capacity
6	Raid level	5 with parity

Table – 6: Specification for Enterprise class SAN Storage

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
1	Architecture	There shall be enterprise class architecture with no single point of failure. The storages in both sites shall be of the same make and model and should be configured with same SW in below lines.		
		The storage system must provide connectivity to multiple host platforms simultaneously.		
		The Storage System shall provide Intelligent RAID controllers to implement hardware mirroring at storage controller level. Raid controller should not put any load on the servers.		
		Should provide RAID levels 5, 6 and 1+0		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
		<p>The storage system shall be supplied with minimum 32 numbers of 8 Gbps front-end ports for connecting to redundant SAN switch equally distributed. The storage should be scalable to 128 FC ports if needed in future.</p> <p>The storage system shall be supplied with minimum 32 numbers of FC/SAS backend ports for disk connectivity.</p> <p>Addition of any host ports should not lead to any downtime.</p>		
2	Cache	256 GB configured as usable-available data cache excluding over heads. In similar lines, Usable cache should be scalable to atleast 512 GB [like 256 GB definition].		
		The data in cache shall not be lost in case of power failure. Specify the mechanism used. In case of battery backup, a minimum of 72 hours of backup shall be provided. Cache provided in the form of ECC, DIMMs. Flash/SSDs for are not permitted.		
		Any microcode upgrade on the storage should not require any downtime of the controller or storage.		
3	Disks	Disks are to be provided as per Table-5 for each site.		
		In case of hard disk failure, the system should be able to do dynamic reallocation of spare disk automatically without manual intervention. Any drive replacement process shall not bring down other online drives.		
		All disks shall be min 6 Gbps for requested SSD & SAS and SAS disk should be in the 2.5 inch form factor mounted in 2.5 inch canisters.		
		All disks shall be hot swappable. Drives required for vaulting or any other overheads should be configured additionally.		
		Storage should be scalable to at least 1500 Drives		
4	Copy Services	Storage System shall provide the creation of Snapshot / Point-in-Time copy for the supplied capacity.		
5	Replication	Storages at each site shall provide synchronous and asynchronous replication.		
		Storage must be configured with CLI and GUI based bidirectional Data Replication between Storage Systems at primary site and secondary without any server intervention.		
		The storage should support three way Zero Data loss storage based replication if required.		
6	Software	SAN software modules shall be GUI/Web based		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
		Software for creating SAP/Oracle aware snapshot (integration of storage snapshot with SAP BRTOOLS / RMAN) for the provided capacity should be provided.		
		Thin/ Dynamic provisioning should be configured for the entire requested capacity.		
		Single console management for allowing centralized control of physical storages arrays through dedicated server.		
		Secure web based GUI software to monitor storage Hardware performance, Status, configuration, Utilization and provide management of the complete storage system.		
		Should define, configure, add, delete, expand, and reassign Logical Unit (LUNs) to specific paths non-disruptively and without having to reboot the system.		
		The Storage Management Software shall be GUI based and Shall be able to discover and monitor storage systems.		
		The bidder must submit a complete list of all disk system related software and their functionality. All software which is supplied (at no charges) also needs to be mentioned in the list.		
7	I/O	Automatic rerouting of I/O traffic from the host in case of primary path failure.		
		The I/O interfaces from the servers shall be load balanced.		
		Load balancing shall be provided for every SAN attached partition.		
8	Volume / LUN Management	The Storage System shall provide Creation of volumes that stripe across multiple backend disk ports for load distribution and prevention of hot spots.		
		Allocating and revoking disk space.		
		Dynamic Volume Expansion with thin provisioning is to be provided.		
		Non-disruptive online microcode upgrades without impact on any application connected to storage system.		
9	Software Licenses	Licenses have to be provided for the supplied capacity quoted at Primary and Secondary site as mentioned below:		
		Point-In-Time Copy / snapshot for the supplied capacity.		
		Synchronous & Asynchronous Replication for the supplied capacity.		

TECHNICAL SPECIFICATION FOR SAP-HRMS HARDWARE

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
10	IOPS	IOPS rating of the components of storage offered shall be specified as follows <ul style="list-style-type: none"> - SSD - SAS - Entire SAN storage 		
11	RAS	Non-disruptive component replacement/upgrade of interfaces, disk controllers, disk drives, power supply & battery systems, cooling fans and microcode updates.		
		There shall be redundant power supplies for connecting to power inputs from different sources.		
		Shall have redundant cooling fans.		
		Pro-active maintenance, self-monitoring, self-diagnosing and wherever possible, self-repairing features wherever possible.		
		Automatic isolation of failed components.		
		Recovery from unscheduled power failure /Interruption without any data loss irrespective of the number or frequency of outages.		
		The Storage System shall provide multi-path Automatic load balancing with no single point-of-failure between Servers and Storage System.		
12	Others	There shall not be any single point of failure in the entire SAN.		
		The storage system shall support the latest OS releases (supported by SAP) of the following mentioned Server/OS: <ul style="list-style-type: none"> - RISC servers running AIX - RISC servers running Solaris - EPIC server running HP-UX - Intel based servers running Windows Enterprise 64 bit edition - Linux (RHEL/SUSE) 		
		The storage system shall be guaranteed to be fully compatible for Host Bus Adapters, Clustering Solution and OS offered with the Servers.		
		End-of-support for SAN storage and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		
13	Information	Make		
		Model		
		Number of disk drives offered		
		Maximum number of disk drives that can be installed in the offered storage.		
		Port Types		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
		Specify disk drives that are supported in the storage system		
		Power consumption of the storage for the proposed configuration		
		Heat Dissipation in BTU/Hour		
		Uptime guarantee of the storage system should be provided.		
		Rack space occupied by the proposed storage for the requested configuration		
14	Reference	A list of reference sites with contact details shall be submitted where same storage is being used in SAP landscape. One of these reference sites shall be from India. BHEL may contact the reference sites directly for any feedback.		
15	License	All necessary software and its licenses required to meet the functionalities mentioned from points 1 to 12 is to be provided for each SAN storage for the provided capacity even if not explicitly mentioned along with support and upgrades during the lease. Any software and its license required for resolving inter-operability issues with Server, Tape and VTL shall also be provided. The software and licenses along with upgrades, support will be provided during the entire lease period.		

5.5 COMMON SPECIFICATIONS FOR SAN SWITCHES: - 4 NOS. (THE SWITCHES HAVE TO BE IN PAIR AT EACH SITE)

Fiber channel switches of same configuration shall be provided and configured, two at each of the sites (Primary and Secondary sites) having ports to connect all the servers, storage, Tape library, PBBA/VTL and other equipment. After interconnecting all equipment in failover mode, additional 20% of active spare ports shall be provided in each SAN switch. All active pots shall be licensed and populated with necessary Fiber Adapters. The switches shall be rack mountable. The offered SAN Switches shall be of Brocade /Cisco / SAN OEM make only. All the switches shall be of same make and model.

Table - 7: Specifications for SAN Switches

Sl. No.	SAN Switch Specification	Compliance (Yes/No)	Bidder's Response
1.	Fiber channel ports shall be 2/4/8/16 autosensing full duplex.		
2.	At least 8 Nos of the ports in each switch should be Long Wave ports to support up to 4 KM direct storage circuit and shall be provided with suitable Fiber Adapters.		
3.	All the ports should operate at min 8Gbps in a non-blocking backplane and auto-negotiate to 16GB/8Gb/4Gb/2Gb FC speeds.		
4.	Setting of the port speed to 4Gbps or 8Gbps from the lower speed should not impact or disable the other ports in the same port group.		
5.	Should provide non-disruptive Microcode/Firmware upgrades and hot code activation. There should be no downtime on account of this.		
6.	It should be possible to isolate the high bandwidth data flows traffic to specific ISLs/trunks by simply using Zoning.		
7.	Switch should provide advanced zoning capabilities and allow health and performance monitoring capabilities.		
8.	Should provide web based management and also CLI (Command Level Interface) based management.		
9.	Should have proactive fault detection and alerting capability to avoid any hot-spots in the fabric.		
10.	The switch should be rack mountable.		
11.	It shall be possible to configure the switches with alerts based on threshold values for temperature, fan status, Power supply status, port status.		
12.	The SAN switch should have redundant hot-swappable power and cooling subsystems. Power supply and fan assembly should have different FRU (Field Replaceable Units).		
13.	The Switch should provide Fiber Channel Ping and trace-route		
14.	The SAN Switch should provide LUN/Soft Zoning and Port Zoning		

Sl. No.	SAN Switch Specification	Compliance (Yes/No)	Bidder's Response
15.	The Switch shall be guaranteed to be fully compatible for HBAs, Clustering Solution and OS offered with the Servers and the SAN storage.		
16.	All software & licenses required to meet the complete functionality of BHEL shall be supplied along with support and upgrade for the lease period.		
17.	Switch management software with all licenses shall be provided for all device management. Specify the software.		
18.	Trunk Licenses for each switch shall be included for interoperability.		
19.	End-of-support for SAN switches and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		
20.	Make & Model		
	No. of ports		

5.6 COMMON SPECIFICATIONS FOR LAN SWITCHES AND CABLES: (NUMBER OF PORTS SHALL BE AS GIVEN BELOW)

LAN Switches of same configuration shall be provided and configured at each of the sites (Primary and Secondary sites) to connect all the servers. The offered LAN Switches should be of **Cisco/HP/Brocade** make only. All the switches shall be of same make and model. All switches should be rack mountable.

All necessary Ethernet and Fiber patch cord needs to be provided to connect/interconnect the complete infrastructure to the Ethernet switches, SAN switches and to the BHEL network. All Ethernet and fiber patch cord should of Systimax / Digilink / Legrand make. Mention the mode of the switch and make of the patch cord being provided. Necessary software to manage the switch is to be provided.

- 5.6.1** LAN switches **with specification as per table 8.** **-10 Nos.**
- 5.6.2** 03 mtr Fiber patch cords single mode SC-SC, duplex **-10 Nos.**
- 5.6.3** 03 mtr Fiber patch cords single mode SC-LC, duplex **-10 Nos.**
- 5.6.4** 50 mtr Fiber patch cords single mode SC-LC, duplex **-20 Nos.**

Requirement of Fibre Patch Cords as per 5.6.2 to 5.6.4 are additional to the solution being provided by the bidder.

Table - 8: Specifications for LAN Switches

Sl.No.	LAN Switch Specification (10 nos.)	Compliance (Yes/No)	Bidder's Response
1.	The offered switch should have following ports: 48 ports of 10/100/1000 Mbps Ethernet port + 4 ports of 10G fiber port Switch populated with fiber adapters.		
2.	The switch should be provided with dual power supplies.		
3.	The switch should provide Forwarding Bandwidth of 84 Gbps or more and Throughput of 72 Mpps or more.		
4.	It should support stacking of up to 4 Switches		
5.	It should provide Jumbo Frames up to 9K Bytes		
6.	The switch should provide following security & performance features: 1) Support for fast convergence features like PortFast/ UplinkFast or equivalent 2) Support for broadcast/multicast storm control to prevent degradation of switch performance from faulty end stations 3) Minimum no. of MAC Addresses 8000 4) Should Support MAC Address Filtering based on source and destination address 5) Switch should support rate limiting (bandwidth control). Rate limiting should be supported on the Ingress or Egress of any port without sacrificing additional ports. 6) Should support multicasting 7) Should support port mirroring		
7.	Following VLAN features should be provided: 1) Port Based VLAN 2) Voice VLAN for separating and prioritizing VoIP traffic 3) Should provide minimum 250 active VLANs		

Sl.No.	LAN Switch Specification (10 nos.)	Compliance (Yes/No)	Bidder's Response
8.	The switch should provide following standards & protocols: 1) 802.1Q VLAN 2) 802.1p Priority & DSCP 3) 802.1D Spanning Tree Protocol 4) 802.1w (Rapid Spanning Tree Protocol) 5) 802.1s (Multiple Spanning Tree protocol) 6) 802.3x Flow Control 7) 802.1x Authentication 8) VLAN Trunking Protocol or Equivalent to reduce administrative burden of configuring VLANs on multiple switches 9) IGMP 10) Dynamic Trunking Protocol (DTP) or Equivalent 11) RADIUS 12) 802.3ad Port/Link Aggregation for All Ports 13) DHCP Server & DHCP Relay 14) DHCP Snooping to filter untrusted DHCP messages 15) Simple Network Time Protocol (SNTP) 16) SPAN 17) SSH & SCP 18) SNMP v1, SNMP v2c & SNMP v3 19) Telnet & TFTP 20) IPv6 21) IEEE 802.1ab (LLDP)		
9.	The offered switch should have the latest operating system supporting all the above features, standards & protocols.		
10.	It should be possible to move switch ports to low power state when not in use.		
11.	Should be manageable through a standard web browser & Command Line Interface.		
12.	The offered switches should be integrated with existing switches installed in BHEL Hyderabad Campus network.		
13.	End-of-support for LAN switches and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		
14.	Make & Model		

5.7 COMMON SPECIFICATIONS FOR PURPOSE BUILT BACKUP APPLIANCE (VTL): -1 NO.

One VTL shall be provided at Primary site for Disk to Disk to Tape backup. All necessary software and license for this will be provided along with support and upgrade in the entire lease period.

Table - 9: Specifications for VTL

Sl. No.	PBBA / VTL Specification	Compliance (Yes/No)	Bidder's Response
1	Should be able to interface with different server platforms and operating systems simultaneously via NFS v3, CIFS and FC.		
2	Should provide LAN, SAN & NDMP backup solutions simultaneously		
3	Must provide inline data duplication technology at block level using variable block length technology		
4	Must provide VLAN tagging.		
5	Must provide both LAN D2D backup and VTL backup at the same time.		
6	Must provide single management pane for multiple storage arrays for ease of management		
7	Must have the ability to perform different backup or restore jobs simultaneously.		
8	Must provide de-duplicated replication of data over Local or Wide Area Networks		
9	Must provide 10Gb Ethernet connectivity		
10	Must provide communications and data transfers through 4 nos. of 8Gbps SAN, 2 nos. of 10 Gb & 2 nos. of 1 Gb Ethernet LAN. Solution should ensure auto failover / redundancy.		
11	Should provide capacity on demand feature that allows the storage allocation associated with a virtual tape cartridge to be consumed upon write, and not creation		
12	Should provide auto support remote health check for OEM to monitor the system health.		
13	Should provide minimum 9TB/hr of throughput (read/write/ingest).		
14	Should provide single storage pool and load balancing across multiple storage controllers if multiple controller are offered.		
15	The appliance must provide deduplication for VTL, NAS Share, CIFS share etc., in order to significantly improve storage utilization and help retain data longer.		
16	Must provide target based deduplication.		
17	Must protect against lost data in power fail and software crashes.		
18	The appliance should provide compression features along with De-duplication.		

Sl. No.	PBBA / VTL Specification	Compliance (Yes/No)	Bidder's Response
19	Must provide share level replication, must support schedule throttle of network bandwidth depending on the utilization of the WAN bandwidth.		
20	Must provide simultaneous replication process while backup is running.		
21	Replication should support bi-directional, many-to-one, and one-to-one replication.		
22	Regular Maintenance activities like System housekeeping/Garbage Cleaning etc. must happen simultaneously along with regular backup and restore operations without having the need for a dedicated window.		
23	Must provide min. 48 virtual tape libraries, min. 200 virtual drives, & min. 100,000 virtual tapes.		
24	Should provide Link Aggregation Control Protocol (LACP)		
25	Should have SNMP and command line support.		
26	Should have min 48 TB usable capacities with Hot Swap drive. There should be provisions of scalability up to 80 TB of usable space in future with in the same VTL model.		
27	Should provide IP Aliasing.		
28	Should provide 256 bit AES encryption at rest/replication. The same must be offered along with the library		
29	Different replication topologies must be provided like One-One, Bi-Directional, Many to One. Replication network throttling must be offered along with scheduling capabilities.		
30	The Disk Library must provide RAID 6 technology for protection		
31	Solution should ensure the Data and System integrity.		
32	The VTL should be offered with minimum dual hot pluggable power supply in redundant configuration.		
33	All necessary software and license for each VTL is to be provided to meet the functionality mentioned from point 1 to 32 along with support and upgrade for the entire lease period.		
34	A list of reference sites with contact details shall be submitted where PBBA/VTL of the same model is being used. One of these reference sites shall be from India. BHEL may contact the reference sites directly for any feedback.		
35	End-of-support for VTL and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary document needs to be submitted.		

5.8 COMMON SPECIFICATIONS FOR TAPE LIBRARY: - 2 NOS.

One tape Library is to be provided at provide at Primary site and the other at secondary site. Both the tape library will be of the same make and model.

Table –10: Specifications for Tape Library

Sl. No.	Tape Library Specification	Compliance (Yes/No)	Bidder's Response
1	8 nos. of latest generation native fiber LTO drives to be offered.		
	Shall have minimum 200 slots.		
2	Tape identification shall be using Bar code		
3	The tape library offered shall have robotic arm to identify media, load tape media into drives and put them back into corresponding shelves automatically. Loading and unloading of tapes from the library shall also be supported by the robotic arm.		
4	All the slots of the tape library shall be accessible by the robotic arm.		
5	Host Platform support: HP-UX, IBM, AIX, Sun Solaris, Windows 2003/2008, Linux		
6	Shall supply 350 labeled, blank new latest generation LTO tape media with each tape library; each with 2.5 TB or higher uncompressed storage capacity.		
7	Shall supply 25 cleaning cartridges with each Tape Library.		
8	The tape library shall be configured with its management Software to monitor the entire backup infrastructure–drives, library assets centrally from a single console.		
9	The Tape Library solution should have redundant hot Swappable power supplies and cooling fans.		
10	Specify actual time taken for taking backup of 5 TB data using a single drive with the offered solution.		
11	All the cables -- Fiber, Ethernet, SAS, etc. required for connecting the Tape library with SAN Switch and other servers shall be supplied by the bidder.		
12	There shall be end to end fiber connection between SAN and Tape drive. All the offered drives should be connected to SAN with redundant path across two SAN switches.		
13	5(five) numbers of special turtle case for transporting at least 10(ten) LTO tape media to offsite shall be provided.		
14	Each tape drives should have dual fiber port of 8 Gbps.		
15	Tape library should have redundant power supply and should provide redundant path failover of control and data path.		
16	A list of reference sites with contact details shall be submitted where Tape Library of the same model is being used. One of these reference sites shall be from India. BHEL may contact these reference sites for any feedback.		
17	End-of-support for Tape library and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		

5.9 BACKUP SOFTWARE FOR USING BOTH TAPE LIBRARY AND VTL: - 2 COPIES

Backup Management Software must be provided as per the specifications listed below to use both Tape and VTL simultaneously at both primary and secondary site.

Table -11: Minimum Specifications For the required backup software

Sl. No.	Backup Software Specification	Compliance (Yes/No)	Bidder's Response
1	Backup software shall be a single solution for supporting multiple operating systems and application using a single product which would take care of data growth in future.		
2	The proposed Backup Software Solution shall be available on64 bit UNIX OS platforms. The solution shall provide backup/ restore from various client platforms such as HPUX,IBM AIX, SUN Solaris, Linux, Windows 2008/2012, etc.		
3	Backup management software that helps monitoring of both tape and VTL library shall be GUI/ web based.		
4	The offer shall cover licenses required for taking backup to Tape and VTL for the entire data residing in all the partitions and new partitions if created in future. All required license for VTL to Tape copy shall be provided (D2D2T – Disk to Disk to Tape) for the supplied capacity of VTL.		
5	Back-up software shall be a single solution for Supporting multiple operating systems and applications using a single product.		
	Back-up software shall provide tape mirroring.		
	Back-up software shall provide deduplication for VTL.		
	Back-up software shall provide scheduled and policy based back-ups.		
	Back-up software shall provide multiple simultaneous client sessions for back-up and restore.		
	The Backup software shall maintain catalog of all the backups for efficient management of data and for better performance.		
	The back-up software shall provide features like Point-in-Time backup / Restore and Archive / Retrieve		
	The Back-up software shall provide back-up over LAN, SAN and Server free backup for both Tape and VTL		
	The back-up software shall support integration with Enterprise Management software such as Tivoli, UnicenterTNG and HP-Open view.		
	Should provide Full, incremental and Point in Time Copy / Snapshot based backup.		
Should have provision for generating backup-sets from existing backup tapes, for moving to off-site location for tapes.			
6	Full back-up of database systems shall be possible to be taken without bringing the production system down, with full data base consistency and without affecting the performance to the users in anyway.		

Sl. No.	Backup Software Specification	Compliance (Yes/No)	Bidder's Response
7	The backup software must be capable of running in a clustered environment. Cluster licenses of the backup software should be provided for both the Client and the Server components.		
8	The backup software must use an RDBMS as the backup catalog for efficient management and scalability of the solution.		
9	The solution should be licensed for Server Free (Zero Downtime), SAN based and LAN based backups of the SAN attached servers.		
10	Backup client software shall be licensed for provided capacity of the Storage used.		
11	12 agents for SAP to be provided at each site or SAP aware backup needs to be provided for the all servers in HA cluster. Support and upgrades for the same shall be provided during the entire period of the contract.		
12	It shall be possible to use all the eight drives simultaneously for tape library.		
13	The backup software shall be licensed to provide disk staging. The disk staging units used for the Production and QA/ Development systems will be different and thus any additional licenses, if required, shall be included in the scope of supply.		
14	The backup software should provide (Role Based Access) different levels of User access, Administrator, User, Operator, so that only the authorized personnel can make changes or view the status based on the rights they have.		
15	Online backup agents and its license for ERP and Database application shall be provided. The same shall support the versions of ECC 6.0 and Oracle10g and any upgrade required for supporting the latest and future version of SAP/Oracle shall also be provided till the expiry of the contract.		
16	The software must have the capability for monitoring and controlling the tape sent off site for the tape library		
17	The Software must also provide for creating a Business Continuity Plan in case of the Backup server and all other servers in the backup network being destroyed in a possible disaster. This should be a scheduled and Automated activity on the backup server. The software shall also provide for restoring data at each site during complete non-availability of the other site due to disaster.		
18	Restore feature: System shall be configured for full restoration of the backed up data to the respective storage.		
19	Backup software shall be configured to perform periodic restore drills.		
20	BHEL may increase/ decrease the number of CPU/RAM in backup server or any of the partitions at any point during the contract period. Additional licenses, if required shall be provided.		

Sl. No.	Backup Software Specification	Compliance (Yes/No)	Bidder's Response
21	Extensive reporting capabilities to monitor the health of Backups, support HTML, TEXT and CSV outputs, support for scheduled automated generation of reports.		
22	Software should provide event notification to notify backup administrator about events like Job Failed or Job aborted, etc.		
23	Software should provide Scanning of Tape/VTL media to rebuild catalogs and indexes in case of disaster.		
24	Software should provide centralized management console to remotely monitor backups.		
25	Software should provide Raw device backup of Windows/Linux/UNIX based system		
26	Software should provide online backup of oracle & shall provide both Online and RMAN to perform online backup.		
27	Backup software shall be compatible to SAPBACKINIT. Details to be provided by the bidder.		
28	It shall be possible to take backup through both backup servers to VTL and Tape independently and simultaneously (Active-Active mode) from both sites.		
29	Automatic media management shall be taken care by the backup software.		
30	All necessary licenses are to be provided to meet the requirement mentioned from point 1 to 29 even if not explicitly mentioned. The backup software and its licenses will be supported and upgraded in the entire lease period.		

5.10 RACKS

Table – 12: Specifications for the required Racks:

Sl. No.	Item/Parameter	Rack Specification	Compliance (Yes/No)	Bidder's Response
1	Rack	<p>OEM Heavy Duty Racks (at least 42U) for installation of all the hardware shall be supplied, with necessary power distribution unit, cable manager, Fan, front & rear perforated doors and rack kits.</p> <p>Power distribution unit should have at least 20% spare PDU after the full installation in each rack. Each rack should have PDU in two separate groups so as to have provision of power supply from different source.</p> <p>Earthing kit also should be supplied with all the racks.</p>		

5.11 PRECISION AIR CONDITIONERS -2 NOS. OF MIN. 20 TON / 70 KW RATING TON PAC

The Bidder shall offer 2 precision Air-conditioner units to be installed at BHEL Hyderabad at the site identified by BHEL. The Data Center identified will have false flooring and false ceiling.

All the Precision Air-Conditioners shall be Floor Mounted, Bottom discharge with high CFM units& should work at part load (from 20% to 100%) with Variable Capacity compressor without varying the frequency.

The unit supplied shall have redundancy. An adjustable sequential timer facility should be available for the alternate use of the units.

These new PACs are to be installed by replacing existing PACs in the Data Centre. The existing 2 nos. of working PACs in the Data center needs to be dismantled and installed in a new location as decided by BHEL within the same campus.

Vendor may visit BHEL Hyderabad, with prior intimation, to see the actual scope of work before submitting the bid.

The minimum requirements for the AC are mentioned below. Bidder has to comply with these specifications.

Table – 13: Specifications for 2 nos. of 20 ton PAC

Sl. No.	Technical Requirements	Compliance (Yes/No)	Bidder's Response
1	20 Ton/ 70 KW Precision Air Conditioner with Variable Capacity Scroll Compressor, complete with all controls, indoor and outside units, monitoring units and complete installation and commissioning for server room.		
2	The vendor is to include, provide, execute all auxiliary works like ducting, inlet and drains piping, piping between indoor and outdoor, cabling, acoustic and thermal insulation (Duct and floor for server room), volume control dampers, supply and returns air grills, stands for indoor and outdoor units with related civil works etc. as per the site requirements.		
3	Automatic monitoring and control of cooling, heating, humidification, dehumidification, air-filtration, etc. should be installed		
4	These equipment should be compliant to the following :		
5	Cabinet conforming to Class 1 BS 476Part 6&7 Standards		
6	Air filtration conforming to EU3 standards		
7	Electric Re-heater should be operating at black heat Temperature		
8	Humidifier should have an adjustable capacity control ranging from40%-100%		
9	Visual and audible alarm indication		
10	Graphical display of temperature and humidity curves over the last24-hour		
	Humidity, Ventilation, Air Conditioning (HVAC)		
11	Air conditioning for direct expansion air conditioning is used then condensers should be located outside the building.		

Sl. No.	Technical Requirements	Compliance (Yes/No)	Bidder's Response
12	Optimal temperature of 21 deg C + or - 1 shall be maintained.		
13	45 - 50% Relative Humidity shall be maintained.		
14	Relative humidity variation shall not exceed +/- 3%.		
15	Microprocessor controller Panel		
	The display panel should be located on the front of the unit with LCD display for monitoring and alarm indication. The panel should be used for :		
16	Status detection (whether on or off)		
	Temperature controller		
	Humidity controller		
17	The panel should make an audio visual alarm in case of:		
	Power failure		
	Fan overload		
	Humidifier power fault		
	Humidifier control fault		
	Heater fault		
	Airflow failure		
	Change filter		
	Control circuit trip		
	Return air temperature / RH out of range		
	Supply air temperature out of range		
	Return air humidity sensor alarm		
	Return air temperature sensor alarm		
	Data Error		
	Service alarm		
	Electric heater alarm		
	Microprocessor fault		
	Humidifier flood		
	Water leakage alarm		
	Smoke alarm		
18	Other functions of the control panel		
	Graphical display of temperature and humidity curves over the last24-hour.		
	Self-diagnostic functionality		
	Supply air fan surge to let fan continue on operation for a period of 180 second before total shutdown.		
	An automatic change over for duty / standby unit based on time interval setting and any failure of duty unit.		

Sl. No.	Technical Requirements	Compliance (Yes/No)	Bidder's Response
	An automatic restart functions with sequence start program to prevent power surge during start-up on multi-system installation.		
	A graphic display to review the return air temperature and humidity condition.		
	Comprehensive event storage system by date and time of occurrence.		
	Simply user-friendly operating guidance.		
	Web enabled Remote monitoring of the Precision AC unit using desktop PC.		
19	Vendor has to integrate all Precision A/C with the existing BMS installed in the building. Necessary hardware interface if required needs to be provided.		
20	End-of-support for PAC and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		

5.12 LAYING OF FIBER CABLE BETWEEN PRIMARY AND SECONDARY SITE

Supply and laying of the optic fiber cables between the Primary and Secondary site, which are ~1500 meters apart, is also part of the contract. The cable will be used for interconnecting the SAN, dedicated LAN and heart beat communication across the two sites. There will be two routes between the primary and secondary sites along which the fiber cables shall be laid. One route is approximately 1200 meters and the other is approximately 1500 meters. Three numbers of 24 core single mode fiber cable each shall be laid along the two routes between the primary and secondary sites (i.e. there will be total 6 numbers of 24 core cable).

The following procedure has to be followed for laying the fiber cable.

The cable shall be laid underground in HDPE pipe, by excavating the earth to a depth of 1 meter. The pipe shall be covered with half round concrete trough of 4" dia. Cable route markers shall be installed at intervals of 50meters and at turning points. Warning tape shall be laid at a depth of 25cms above the trough. The excavated portion shall be refilled with the excavated earth.

In case of road crossing the cable shall be laid at a depth of 0.5 meter in GI pipe of suitable diameter. The excavated portion shall be refilled fully with the excavated earth, shall be compacted and shall be finished by cementing.

In some places the fiber cable shall be laid along pre-formed trenches. This involves removal of cement slabs at few locations, laying of HDPE pipe, laying of fiber cable inside HDPE pipe and replacing of cement slabs.

Wherever the cable is required to be laid on wall, the cable shall be laid in GI pipe of suitable diameter and the pipe shall be securely fixed to the wall.

All the fiber cores shall be spliced with pigtails and shall be neatly dressed inside the fiber patch panel using couplers.

The bidder shall test Fiber optic cable cores spliced by them using OTDR and submit a test report.

5.12.1 General conditions for laying of cables

Supply of the fiber cable and its accessories like LIU, pigtail and coupler are in vendor's scope. Supply of materials required for laying, like HDPE pipe, trough, GI pipe, route marker and warning tape etc. are also in vendor's scope.

The Vendor shall fulfill the welfare requirements of their work man (i.e. ESI, PF etc.) as per BHEL policy.

It is the responsibility of the Vendor to move the materials from IT Centre to the respective work places.

Vendor may visit BHEL Hyderabad, with prior intimation, to see the actual route of cabling and its length before submitting the bid.

The Cable and its accessories will be maintained during the entire lease period including cable damage and fault due to any reason.

5.13 MIGRATION OF EXISTING SAP LANDSCAPE TO NEW SERVERS ALONG WITH REINSTALLATION OF IDES, ADS, APP SERVERS ETC. AND UPGRADE TO LATEST ENHANCEMENT PACKAGE

5.13.1 Following existing servers of current SAP Landscape need to be migrated from the old HPUX/Linux environment running SAP ECC 6.0 ehp2 having database Oracle 10g rel 2/ Oracle 11g to the new servers. The migration can be heterogeneous or homogenous depending upon the new Servers operating systems.

- 1) SAP-HR R3 Production server running HRMS module
- 2) SAP-HR R3 Development server running HRMS module
- 3) SAP-HR R3 Quality server running HRMS module
- 4) EP Production server running ESS & MSS
- 5) EP Development server running ESS & MSS
- 6) EP Quality server running ESS & MSS
- 7) BI Production Server
- 8) BI Development Server
- 9) BI Quality server
- 10) Solution Manager

Sl. No.	Server	Location	Oracle version	Operating system	SAP /EHP version
1	R3 Production server	Trichy	11g	HP-UX	ECC 6.0 / ehp2
2	R3 Development server	Trichy	11g	HP-UX	ECC 6.0 / ehp2
3	R3 Quality server	Trichy	11g	HP-UX	ECC 6.0 / ehp2
4	EP Production server	Trichy	11g	HP-UX	EP 7.0 / ehp2
5	EP Development server	Delhi	11g	Linux	EP 7.0 / ehp2
6	EP Quality server	Delhi	11g	Linux	EP 7.0 / ehp2
7	BI Production Server	Delhi/Trichy	10g	HP-UX/Linux	ECC 6.0 / ehp2
8	BI Development Server	Delhi	10g	Linux	ECC 6.0 / ehp2
9	BI Quality server	Delhi	10g	Linux	ECC 6.0 / ehp2
10	Solution Manager	Delhi	10g	Linux	7.0 / ehp1

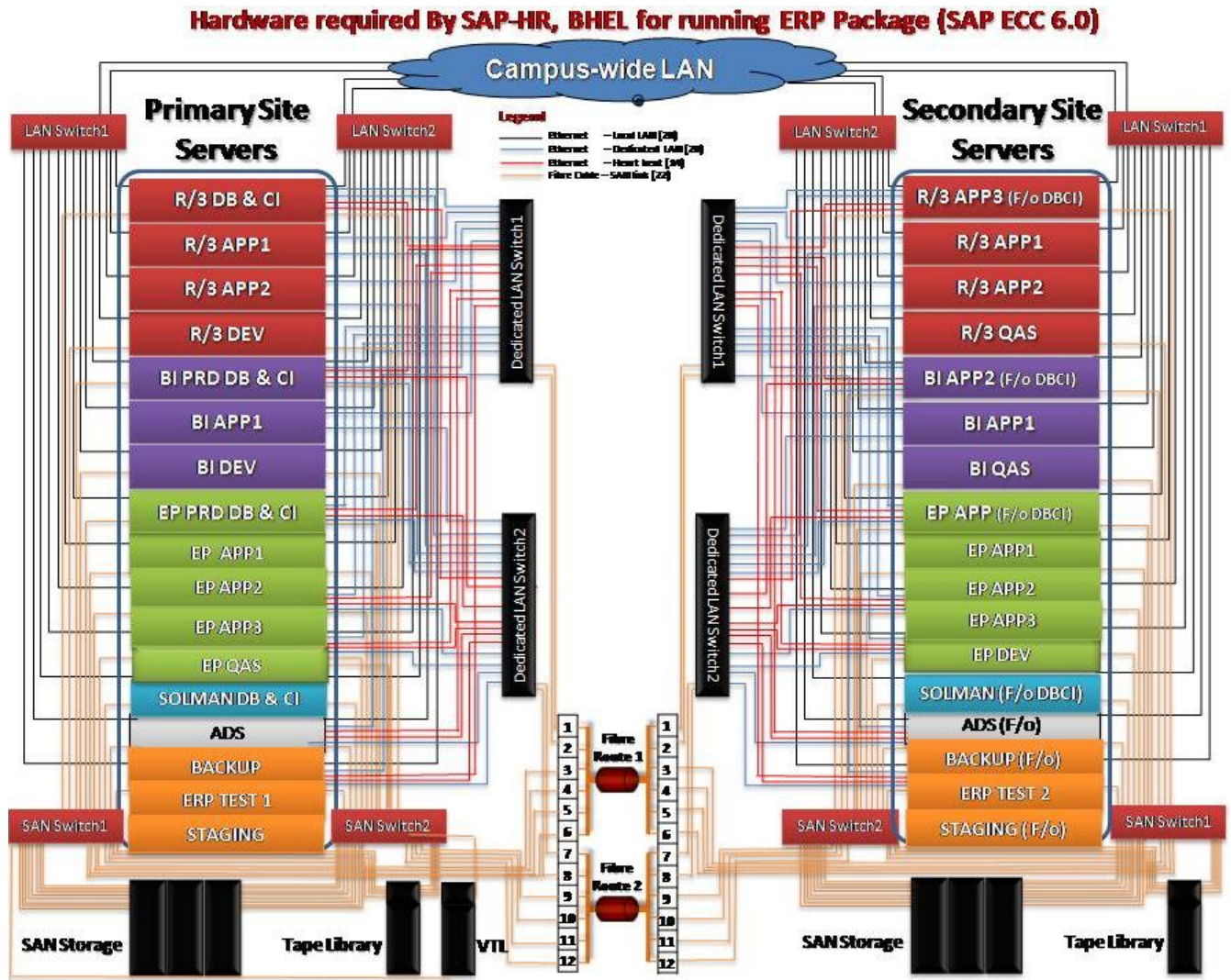
5.13.2 All databases of above complete landscape need to be upgraded to the latest possible release and version of Oracle as provided by SAP.

5.13.3 Following servers needs to be reinstalled and configured as per BHEL requirement.

- 1) SAP Router
- 2) IDES server of SAP
- 3) 02 nos. of application server of SAP-HR R3 production server at each site
- 4) 03 nos. application server of SAP-HR EP production server at each site
- 5) 01 nos. application server of SAP-HR BI production server at each site
- 6) SAP Web Dispatcher and load balancing to be done
- 7) ADS server in cluster.

5.13.4 All the SAP servers in the landscape will be upgraded to the latest possible EHP and patches provided by SAP at the time of installation. EHP upgrade will be a technical upgrade and the existing HR functionality will not be disturbed or upgraded.

5.14 SCHEMATIC DIAGRAM OF PROPOSED NEW SAP-HR INFRASTRUCTURE



Confirm compliance for all clauses of -
 "Technical Specification of SAP-HRMS Hardware (Requirement)"

Date:

Bidder's Signature with Seal

6 TECHNICAL SPECIFICATION FOR SAP-HPEP HARDWARE

BHEL Hyderabad is having **Primary Site** in Main Data Centre and **Secondary Site** in DR building (approx. 1.5 km apart) within the same campus. SAP infrastructures are required as per the specification mentioned in this document. Secondary site will have identical setup as primary site and during normal operation they will be sharing load. (See attached diagram). It will be configured to have storage based synchronous data replication between primary site and secondary site in order to have a near zero data loss in case of failure. Secondary site will be connected to the primary site using dedicated, redundant optical fiber links through which data will be synchronously replicated. The RPO has to be zero and the RTO should not be more than 20 minutes.

The SAN storage should provide synchronous & asynchronous replication for the supplied capacity.

6.1 THE SPECIFICATION / CONFIGURATION OF THE SERVERS AT PRIMARY SITE AND SECONDARY SITE ARE AS FOLLOWS:

To provide resources to the Operating system, **the actual numbers of SAPS provided by the vendor will be 10% more** than the number of SAPS mentioned in **Table 14 & 15** for each partition.

Table -14: Primary Site Server

Partition No	Partition (for running ERP (SAP) Applications)	Capacity required (SAPs)	Minimum SAN Boot in SAPS disk for OS	I/O Ports				HA Cluster
				Ethernet				
				FC	D-LAN	L-LAN	HB	
1	ERP Production (DB and Central Instance server)	21068	300*2	4	2	2	2	Yes
2	ERP Application server 1	10534	300*2		2	2		
3	ERP Application server 2	10534	300*2		2	2		
4	ERP Application server 3	10534	300*2		2	2		
5	ERP Pre Production/ Production DMS	5267	300*2	4	2	2	2	Yes
6	ERP Development server/ Quality Server	7374	300*2	4	2	2	2	Yes
7	BI Production (DB and Central Instance server)	7374	300*2	4	2	2	2	Yes
8	BI Application server 1	7374	300*2		2	2		
9	BI Application server 2	7374	300*2		2	2		
10	BI Development server/ BI Quality server	7374	300*2	4	2	2	2	Yes
11	Oracle DB PR	5267	300*2	4	2	2	2	Yes
12	Oracle APP1	4740	300*2		2	2		
13	XI Production (DB & CI server)	5267	300*2	4	2	2	2	Yes
14	XI Development server/ XI Quality Server	4214	300*2	4	2	2	2	Yes
15	Staging Server 1	4214	300*2	4	2	2	2	Yes
16	Staging Server 2	4214	300*2	4	2	2	2	Yes
17	Backup Server1	4214	300*2	4	2	2	2	Yes
		126937	34 Disks		34	34		

Table -15: Secondary Site Server

Partition No	Partition (for running ERP (SAP) Applications)	Capacity required (SAPs)	Minimum SAN Boot in SAPS disk for OS	I/O Ports				HA Cluster
				Ethernet				
				FC	D-LAN	L-LAN	HB	
1	ERP Production (DB and Central Instance server)	21068	300*2	4	2	2	2	Yes
2	ERP Application server 4	10534	300*2		2	2		
3	ERP Application server 5	10534	300*2		2	2		
4	ERP Application server 6	10534	300*2		2	2		
5	ERP Production DMS /Pre Production	5267	300*2	4	2	2	2	Yes
6	ERP Quality Server /Development server	7374	300*2	4	2	2	2	Yes
7	BI Production (DB and Central Instance server)	7374	300*2	4	2	2	2	Yes
8	BI Application server 3	7374	300*2		2	2		
9	BI Application server 4	7374	300*2		2	2		
10	BI Quality server/ BI Development server	7374	300*2	4	2	2	2	Yes
11	Oracle DB FO	5267	300*2	4	2	2	2	Yes
12	Oracle APP2	4740	300*2		2	2		
13	XI Production (DB & CI server)	5267	300*2	4	2	2	2	Yes
14	XI Quality Server/ XI Development server	4214	300*2	4	2	2	2	Yes
15	Staging Server 3	4214	300*2	4	2	2	2	Yes
16	Staging Server 4	4214	300*2	4	2	2	2	Yes
17	Backup Server2	4214	300*2	4	2	2	2	Yes
		126937	34 Disks		34	34		

Legend:

FC: Fibre Card, **D-LAN:** Dedicated LAN, **L-LAN:** Local LAN, **HB:** Heart Beat

The IO adapters required for operating system disks are in addition to the requirement mentioned as above.

6.2 SPECIFICATIONS OF ENTERPRISE UNIX SERVERS: 2 NOS.

Table -16: Specifications of UNIX servers are defined below:

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
1	Servers	Enterprise & Monolithic server per site shall be offered. (It shall be possible to configure the system in each site as a single partition).		
		All servers shall be capable of being partitioned; Each partition shall have its own operating system instance, host name and IP address.		
		Both servers at Primary and secondary site shall be of the same Make and Model.		
		Specify the Make and Model.		
		All servers quoted must have the same RISC / EPIC Processor.		
		The support for the Servers and all its components from OEM should be of at least 07 years from the date of submission of bid. Document in support from OEM to be submitted.		
		All the servers shall be capable of running all versions of 64-bit SAP R/3 ERP 6.0 (Unicode) under 64-bit Unix OS with Oracle 11g RDBMS and later versions. Supporting document needs to be submitted in the regard.		
		Servers shall be allocated with all resources as per sizing sheet. However higher capacity is acceptable.		
2	Processors	Latest generation CPUs of 64 Bit RISC / EPIC Architecture with SMP will be offered.		
		The support of the CPU should be of at least 07 years from the date of submission of bid.		
3	Processor Performance	<p>Minimum SAP ECC 6.0 Unicode EHP4 or higher (Sales & Distribution) SD 2 Tier SAPS Benchmark for the offered server/processor will be taken for evaluation.</p> <p>4. OEM to quote the same Processor & Core which was used in the SAP Benchmark for sizing the server</p> <p>5. The OEM should support their SAPS/Core claim based with published results in the SAP benchmarking Website or by providing SAPOEM Competency Center certificate.</p> <p>6. The SAP OEM Competency Center certificate should be accompanied by the calculation and data used to arrive at the claimed performance.</p> <p>7. BHEL may moderate the SAPS claimed by vendor using its own methodology from the available data to arrive SAPS per core, which will be binding on the vendor.</p>		
4	Per core performance	No. of SAPS offered per core.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
	Core per partition	There shall be at least two dedicated cores per partition in both the server as in Table 14 & 15 . The numbers of cores in each server shall be scalable to minimum 128 cores .		
5	Main Memory	At least 24 GB per core DDR3 ECC memory shall be offered.		
		Specify the maximum RAM scalability for the server offered.		
6	Partitions	Each SAP instance in the production system should run in an independent partition having its own Operating system instance with resources dedicated to it as per specified in Table-14 & 15 . All server partition must contain dedicated integral processor core.		
		It should be possible to assign processors and memory logically to any partition or switch processors and memory between partitions without reboot of source or target partitions or applications.		
		Each partition shall have at least the resources allocated as per the sizing specified in Table-14&15 . At any point of time, the partition should not run with lesser resources than the minimum condition specified for all partition.		
		Each partition shall be able to run same or different versions of OS, kernel, patch levels, etc., independently.		
		Each Partition shall have its own dedicated Adapters / controllers.		
		Any configuration change in one partition shall not affect any other partition.		
		Any fault in one partition shall not bring the entire System or other partitions down.		
		The OS of each partition shall be upgradeable separately and independently without affecting the other partitions.		
		Each partition shall have the capability to start-up and shutdown independently without affecting any other partition on the same server.		
		It should be possible to create at least 24 partitions in the offered server when required using virtualized I/O (if no. of partition is above 17no's). BHEL will provide reconfiguration details with the available resources if required. Necessary licenses required for this are to be provided.		
7	I/O Adapters	All adapters should be PCI/E and should not have single point of failure.		
		All FC ports shall be of min. 8 Gbps speed with multipath I/O trunking and automatic load balancing (as per Table-14&15) for each server/partition.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		All Ethernet Adapters for DLAN, LLAN& HB LAN shall be of 1 Gbps Auto sensing (as per Table-14& 15) for each server/ partition in automatic Fail-over / Redundant / trunking / Link aggregation and auto switching mode.		
		Separate Adapters for Management of LAN, SAN boot, etc, shall be provided.		
		Functional (Ethernet, Fiber Channel) redundancy at an adapter level shall be provided for each server.		
		Multi-functional adapters should not be provided and all the provided I/O adapters should also able to be configured in virtual I/O mode. However number of I/O adapters mentioned in the Table 14&15 must be provided.		
		The server will be connected to SAN storage system using fiber channel links. Required compatible Fiber Channel Host Bus Adapters (minimum 8Gbps) with multi-path and automatic load balancing on the server side shall be provided to connect the storage system with 100% redundancy. All the hardware and software required for this shall be provided. Multiple fiber cards with multi-pathing capability and automatic load balancing at HBAs on servers shall be supplied.		
		USB/Serial Ports shall be supplied as per the standard availability in the model offered		
8	Disk and Media drives	All partitions as mentioned in Table 14&15 shall be booted through the SAN using SAS-II (2½") Disk minimum 2 x 300GB min. 15K RPM. At least additionally two FC ports on each partition are to be provided for SAN boot.		
		SAN disks used for OS shall be mirrored.		
		There shall be at least one shared DVDROM drive across all partitions in the server. There should not be reboot of partition or server when DVDROM is moved across partition.		
9	Operating System	Latest version of 64-bit OEM Unix Operating System with latest patch level must be provided. It should include:		
		- Logical Volume Management (without any reboot of the partition)		
		- Latest Online JFS or equivalent available to be offered		
		- Mirroring Software		
		- Should be capable of running any Unicode version of 64-bit ERP6.0 and all higher versions.		
		- Should be capable of running 64-bit Oracle 11g RDBMS and higher version		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		- The Unix Operating Systems shall be licensed to support unlimited users. Enterprise edition of the latest 64 bit UNIX from OEM for each server may be provided with upgrades and support during the entire lease period.		
		- Partition management software having dynamic configuration feature with GUI / Web interface. Management Consoles for the same to be provided.		
		- Software to be provided for capacity planning & logs maintaining, trend analysis and reporting.		
		- Software to be provided for intelligent workload & partition replacement across a virtualized environment.		
		- Software and licenses to be provided for resource allocation / de-allocation to partitions		
10	Cluster/High availability	The cluster solution must be able to provide automatic fail-over to the other system for any failure arising in one of the system due to: <ul style="list-style-type: none"> - Hardware - Operating System - Server failure - Partition Failure - Storage Failure - Site Failure 		
		Any other failure which causes the server /partition to fail.		
		All necessary software, SAP agents, oracle agents & hardware components for automatic high availability and seamless failover and fallback to be provided.		
		Redundant Heartbeat paths shall be provided as per the diagram.		
		Cluster solution shall be OEM or SAP certified solution and shall be supported by both Server and Storage OEMs.		
		There should be automatic switching of SAP and Oracle Instance in case of node failure using OEM or SAP certified software for all the clustered partition in the server. No committed transactions in SAP should be lost in case of failure of clustered component in all the clustered partition of the server.		
		Once the failed system comes up they should revert back to the original configuration automatically. Option for reverting back manually should also be available.		
		The proposed solution of implementing the fail-over must be explained in detail in the technical proposal along with logical diagrams.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
		All clustered servers mentioned in table 14 & 15 shall be clustered using high availability clustering technology and there should not be any single point of failure in the offered solution. All necessary software agents must be provided for clustering. Support for the clustering of software and all software agents must be provided. Each of the production components shall have dedicated failover mechanism. The Clustering Solution shall be as per the diagram enclosed and table mentioned. All software and licenses should be maintained and upgraded in the entire lease period.		
11	RAS Features	Each of the offered servers shall have an inbuilt service processor.		
		Processors shall be capable of dynamic CPU de-allocation.		
		Memory shall be protected through Advanced ECC/ Chip kill, bit-steering, chip redundancy, error correction or equivalent. Specify the technology used.		
		Pre failure Alert capabilities shall be available.		
		All adapters shall be hot-swappable.		
		All the following components shall be hot swappable– Disks, Power Supplies, Fans, PCI etc.		
		PCI buses shall have error handling capability or the Server should have end to end retry path for I/O.		
		Shall have indicators to identify failed components.		
		Shall have redundant Power Supplies for input from at least two sources.		
		Shall have redundant cooling fans.		
		Shall have redundant system clock.		
12	Others	System management shall be through dedicated ports and shall not use the adapters identified for partitions.		
		Rack to house the server shall be from the server OEMs as per the Rack specification.		
		All cables & accessories to implement connectivity between Server, SAN switches, LAN switches, Storage Tape library and VTL shall be provided and done.		
		All power cables shall be supplied and should confirm to Indian industry standard.		
		Specify power consumption of proposed configuration.		
		Specify heat dissipation of proposed configuration in BTU/hour		
13	Additional Cores	Four additional cores needs to be provided per server for the future additional partition requirement along with memory.		
14	Documentation	All the documents like datasheets, architecture, line diagrams, etc., shall be submitted.		

Sl. No	Item or Parameter	Unix Server Specification	Compliance (Yes / No)	Document Reference / Remarks
15	Software & Licenses	All software and its licenses to meet the requirement from point No. 1 to 10 in the table are to be provided for each server even if not specifically mentioned. Software and licenses provided will be supported along with upgrades during the entire lease period.		
16	Reference	A list of reference sites with contact details must be submitted where same model of the server is being used in SAP/Oracle ERP landscape. At least one of these sites shall be from India. BHEL may contact/Visit the reference sites for verification.		

6.3 SPECIFICATIONS FOR SERVER MANAGEMENT SYSTEM – 2 Nos.

The OEM of Server management system and Servers will be the same.

Table -17: Specifications for Server Management System:

Sl. No.	Item/Parameter	Specification for Server Management System	Compliance (Yes/No)	Bidder's Response
1	Hardware/ Software	All Hardware and Software modules along with licenses required to support the following activities shall be included in the scope of supply. Software and its licenses provided will be supported and upgraded in the entire lease period.		
		Server Management System at each site shall be single unified console for following activities:		
		- GUI Console to create, remove and manage partitions.		
		- GUI based Management and performance monitoring of all systems/sub-systems of servers/partitions such as CPU, Memory, Swap Files and File systems.		
		- Log file monitoring including monitoring for specified error strings to provide real-time alerts.		
		- Isolation of performance related issues.		
		- MIS reporting of Historical utilization details for capacity planning.		
		- Customized Reports.		

6.4 SPECIFICATION FOR ENTERPRISE SAN STORAGE: - 2 NOS

Table - 18: Storage sizing for each site

Disk Type	Minimum storage capacity requirement
Solid state Disk (SSD) 400 GB (2½" disk) or higher	3TB of usable capacity after RAID 1+0 with minimum 16 drives plus additional 2 drives as hot spares.
Minimum 300 GB of 15k rpm 6 Gbps SAS II (2½" disk)	Minimum 100 drives with additional 4 drives as hot spares.
Minimum 600 GB of 10K/15K rpm 6 Gbps SAS II (2½" disk)	Minimum 92 drives with additional 3 drives as hot spares.

- RAID 5, RAID 6 & RAID 10 configurations will be in multiples of 4 or 8 with parity (e.g. 7d+1p or 3d+ 1p or 2d+2p or 4d+4p)
- Capacity calculation should be of Base 2 (Binary) accuracy.
- Disks for operating system (required for SAN boot) of each partition shall be supplied in addition to the number of disk drives shown in the table above.
- There should be provision for adding 20 additional drives for SSD (2½" disks) and 100 additional drives for SAS II (2½" disk). "Provision" means all the necessary infrastructure should be in place (at the time of delivery) so that whenever new disks are added to these additional drives (20 for SSD & 100 for SAS II), the new disks are to be available for storage configuration. Provide all the necessary storage software licenses for the entire capacity supported by the proposed model.
- Vendor has to provide certificate from OEM of the storage for the minimum 1,00,000 IOPS performance under the following parameters. Minimum 45,000 IOPS should be for SSD disk type, minimum 20,000 IOPS for 300 GB SAS disks.

1	Read/Write	70%/30%
2	Block size	8 k
3	Random	100%
4	Cache hit	50%
5	File Size	Total storage capacity
6	Raid level	5 with parity

Table – 19: Specification for Enterprise class SAN Storage

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
1	Architecture	There shall be enterprise class architecture with no single point of failure. The storages in both sites shall be of the same make and model and should be configured with same SW in below lines.		
		The storage system must provide connectivity to multiple host platforms simultaneously.		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
		The Storage System shall provide Intelligent RAID controllers to implement hardware mirroring at storage controller level. Raid controller should not put any load on the servers.		
		Should provide RAID levels 5, 6 and 1+0		
		The storage system shall be supplied with minimum 32 numbers of 8 Gbps front-end ports for connecting to redundant SAN switch equally distributed. The storage should be scalable to 128 FC ports if needed in future.		
		The storage system shall be supplied with minimum 32 numbers of FC/SAS backend ports for disk connectivity.		
		Addition of any host ports should not lead to any downtime.		
2	Cache	256 GB configured as usable-available data cache excluding over heads. In similar lines, Usable cache should be scalable to atleast 512 GB [like 256 GB definition].		
		The data in cache shall not be lost in case of power failure. Specify the mechanism used. In case of battery backup, a minimum of 72 hours of backup shall be provided. Cache provided in the form of ECC, DIMMs. Flash/SSDs for are not permitted.		
		Any microcode upgrade on the storage should not require any downtime of the controller or storage.		
3	Disks	Disks are to be provided as per Table-18 for each site.		
		In case of hard disk failure, the system should be able to do dynamic reallocation of spare disk automatically without manual intervention. Any drive replacement process shall not bring down other online drives.		
		All disks shall be min 6 Gbps for requested SSD & SAS and SAS disk should be in the 2.5 inch form factor mounted in 2.5 inch canisters.		
		All disks shall be hot swappable. Drives required for vaulting or any other overheads should be configured additionally.		
		Storage should be scalable to at least 1500 Drives		
4	Copy Services	Storage System shall provide the creation of Snapshot / Point-in-Time copy for the supplied capacity.		
5	Replication	Storages at each site shall provide synchronous and asynchronous replication.		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
		Storage must be configured with CLI and GUI based bidirectional Data Replication between Storage Systems at primary site and secondary without any server intervention. The storage should support three way Zero Data loss storage based replication if required.		
6	Software	SAN software modules shall be GUI/Web based		
		Software for creating SAP/Oracle aware snapshot (integration of storage snapshot with SAP BRTOOLS / RMAN) for the provided capacity should be provided.		
		Thin/ Dynamic provisioning should be configured for the entire requested capacity.		
		Single console management for allowing centralized control of physical storages arrays through dedicated server.		
		Secure web based GUI software to monitor storage Hardware performance, Status, configuration, Utilization and provide management of the complete storage system.		
		Should define, configure, add, delete, expand, and reassign Logical Unit (LUNs) to specific paths non-disruptively and without having to reboot the system.		
		The Storage Management Software shall be GUI based and Shall be able to discover and monitor storage systems.		
		The bidder must submit a complete list of all disk system related software and their functionality. All software which is supplied (at no charges) also needs to be mentioned in the list.		
7	I/O	Automatic rerouting of I/O traffic from the host in case of primary path failure.		
		The I/O interfaces from the servers shall be load balanced.		
		Load balancing shall be provided for every SAN attached partition.		
8	Volume / LUN Management	The Storage System shall provide Creation of volumes that stripe across multiple backend disk ports for load distribution and prevention of hot spots.		
		Allocating and revoking disk space.		
		Dynamic Volume Expansion with thin provisioning is to be provided.		
		Non-disruptive online microcode upgrades without impact on any application connected to storage system.		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
9	Software Licenses	Licenses have to be provided for the supplied capacity quoted at Primary and Secondary site as mentioned below:		
		Point-In-Time Copy / snapshot & Automated Data Tiering for the supplied capacity.		
		Synchronous & Asynchronous Replication for the supplied capacity.		
10	IOPS	IOPS rating of the components of storage offered shall be specified as follows <ul style="list-style-type: none"> - SSD - SAS - Entire SAN storage 		
11	RAS	Non-disruptive component replacement/upgrade of interfaces, disk controllers, disk drives, power supply & battery systems, cooling fans and microcode updates.		
		There shall be redundant power supplies for connecting to power inputs from different sources.		
		Shall have redundant cooling fans.		
		Pro-active maintenance, self-monitoring, self-diagnosing and wherever possible, self-repairing features wherever possible.		
		Automatic isolation of failed components.		
		Recovery from unscheduled power failure /Interruption without any data loss irrespective of the number or frequency of outages.		
		The Storage System shall provide multi-path Automatic load balancing with no single point-of-failure between Servers and Storage System.		
12	Others	There shall not be any single point of failure in the entire SAN.		
		The storage system shall support the latest OS releases (supported by SAP) of the following mentioned Server/OS: <ul style="list-style-type: none"> - RISC servers running AIX - RISC servers running Solaris - EPIC server running HP-UX - Intel based servers running Windows Enterprise 64 bit edition - Linux (RHEL/SUSE) 		
		The storage system shall be guaranteed to be fully compatible for Host Bus Adapters, Clustering Solution and OS offered with the Servers.		
		End-of-support for SAN storage and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		

Sl. No.	Item/ Parameter	SAN Storage Specification	Compliance (Yes/No)	Bidder's Response
13	Information	Make		
		Model		
		Number of disk drives offered		
		Maximum number of disk drives that can be installed in the offered storage.		
		Port Types		
		Specify disk drives that are supported in the storage system		
		Power consumption of the storage for the proposed configuration		
		Heat Dissipation in BTU/Hour		
		Uptime guarantee of the storage system should be provided.		
		Rack space occupied by the proposed storage for the requested configuration		
14	Reference	A list of reference sites with contact details shall be submitted where same storage is being used in SAP landscape. One of these reference sites shall be from India. BHEL may contact the reference sites directly for any feedback.		
15	License	All necessary software and its licenses required to meet the functionalities mentioned from points 1 to 12 is to be provided for each SAN storage as per Table 18 for the provided capacity even if not explicitly mentioned along with support and upgrades during the lease. Any software and its license required for resolving inter-operability issues with Server, Tape and VTL shall also be provided. The software and licenses along with upgrades, support will be provided during the entire lease period.		

6.5 COMMON SPECIFICATIONS FOR SAN SWITCHES: - 4 NOS. (THE SWITCHES HAVE TO BE IN PAIR AT EACH SITE)

Fiber channel switches of same configuration shall be provided and configured, two at each of the sites (Primary and Secondary sites) having ports to connect all the servers, storage, Tape library, PBBA/VTL and other equipment. After interconnecting all equipment in failover mode, additional 20% of active spare ports shall be provided in each SAN switch. All active pots shall be licensed and populated with necessary Fiber Adapters. The switches shall be rack mountable. The offered SAN Switches shall be of Brocade /Cisco / SAN OEM make only. All the switches shall be of same make and model.

Table - 20: Specifications for SAN Switches

Sl. No.	SAN Switch Specification	Compliance (Yes/No)	Bidder's Response
1.	Fiber channel ports shall be 2/4/8/16 autosensing full duplex.		
2.	At least 8 Nos of the ports in each switch should be Long Wave ports to support up to 4 KM direct storage circuit and shall be provided with suitable Fiber Adapters.		
3.	All the ports should operate at min 8Gbps in a non-blocking backplane and auto-negotiate to 16GB/8Gb/4Gb/2Gb FC speeds.		
4.	Setting of the port speed to 4Gbps or 8Gbps from the lower speed should not impact or disable the other ports in the same port group.		
5.	Should provide non-disruptive Microcode/Firmware upgrades and hot code activation. There should be no downtime on account of this.		
6.	It should be possible to isolate the high bandwidth data flows traffic to specific ISLs/trunks by simply using Zoning.		
7.	Switch should provide advanced zoning capabilities and allow health and performance monitoring capabilities.		
8.	Should provide web based management and also CLI (Command Level Interface) based management.		
9.	Should have proactive fault detection and alerting capability to avoid any hot-spots in the fabric.		
10.	The switch should be rack mountable.		
11.	It shall be possible to configure the switches with alerts based on threshold values for temperature, fan status, Power supply status, port status.		
12.	The SAN switch should have redundant hot-swappable power and cooling subsystems. Power supply and fan assembly should have different FRU (Field Replaceable Units).		
13.	The Switch should provide Fiber Channel Ping and trace-route		
14.	The SAN Switch should provide LUN/Soft Zoning and Port Zoning		

Sl. No.	SAN Switch Specification	Compliance (Yes/No)	Bidder's Response
15.	The Switch shall be guaranteed to be fully compatible for HBAs, Clustering Solution and OS offered with the Servers and the SAN storage.		
16.	All software & licenses required to meet the complete functionality of BHEL shall be supplied along with support and upgrade for the lease period.		
17.	Switch management software with all licenses shall be provided for all device management. Specify the software.		
18.	Trunk Licenses for each switch shall be included for interoperability.		
19.	End-of-support for SAN switches and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		
20.	Make & Model		
	No. of ports		

6.6 COMMON SPECIFICATIONS FOR CABLES: - 1 SET

All necessary Ethernet and Fiber patch cord needs to be provided to connect/interconnect the complete infrastructure to the Ethernet switches, SAN switches and to the BHEL network. All Ethernet and fiber patch cord should of Systemax / Panduit / Legrand make. Mention the model of the patch cord being provided. Set consisting of following quantities.

- | | | |
|--------------|--|-----------------|
| 6.6.1 | 05 mtr Fiber patch cords single mode SC-LC, duplex | -10 Nos. |
| 6.6.2 | 20 mtr Fiber patch cords single mode SC-LC, duplex | -20 Nos. |

Requirement of Fibre Patch Cords as per 6.6.1 to 6.6.2 are additional to the solution being provided by the bidder.

6.7 COMMON SPECIFICATIONS FOR TAPE LIBRARY: - 1 NOS.

Table –21: Specifications for Tape Library

Sl. No.	Tape Library Specification	Compliance (Yes/No)	Bidder's Response
1	8 nos. of latest generation native fiber LTO drives to be offered.		
	Shall have minimum 200 slots.		
2	Tape identification shall be using Bar code		
3	The tape library offered shall have robotic arm to identify media, load tape media into drives and put them back into corresponding shelves automatically. Loading and unloading of tapes from the library shall also be supported by the robotic arm.		
4	All the slots of the tape library shall be accessible by the robotic arm.		
5	Host Platform support: HP-UX, IBM, AIX, Sun Solaris, Windows 2003/2008, Linux		
6	Shall supply 350 labeled, blank new latest generation LTO tape media with each tape library; each with 2.5 TB or higher uncompressed storage capacity.		
7	Shall supply 25 cleaning cartridges with each Tape Library.		
8	The tape library shall be configured with its management Software to monitor the entire backup infrastructure–drives, library assets centrally from a single console.		
9	The Tape Library solution should have redundant hot Swappable power supplies and cooling fans.		
10	Specify actual time taken for taking backup of 5 TB data using a single drive with the offered solution.		
11	All the cables -- Fiber, Ethernet, SAS, etc. required for connecting the Tape library with SAN Switch and other servers shall be supplied by the bidder.		
12	There shall be end to end fiber connection between SAN and Tape drive. All the offered drives should be connected to SAN with redundant path across two SAN switches.		
13	5(five) numbers of special turtle case for transporting at least 10(ten) LTO tape media to offsite shall be provided.		
14	Each tape drives should have dual fiber port of 8 Gbps.		
15	Tape library should have redundant power supply and should provide redundant path failover of control and data path.		
16	A list of reference sites with contact details shall be submitted where Tape Library of the same model is being used. One of these reference sites shall be from India. BHEL may contact these reference sites for any feedback.		
17	End-of-support for Tape library and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary supporting document needs to be submitted.		

6.8 COMMON SPECIFICATIONS FOR PURPOSE BUILT BACKUP APPLIANCE (VTL): -1 No.

One VTL shall be provided at Primary site for Disk to Disk to Tape backup. All necessary software and license for this will be provided along with support and upgrade in the entire lease period.

Table - 22: Specifications for VTL

Sl. No.	PBBA / VTL Specification	Compliance (Yes/No)	Bidder's Response
1	Should be able to interface with different server platforms and operating systems simultaneously via NFS v3, CIFS and FC.		
2	Should provide LAN, SAN & NDMP backup solutions simultaneously		
3	Must provide inline data duplication technology at block level using variable block length technology		
4	Must provide VLAN tagging.		
5	Must provide both LAN D2D backup and VTL backup at the same time.		
6	Must provide single management pane for multiple storage arrays for ease of management		
7	Must have the ability to perform different backup or restore jobs simultaneously.		
8	Must provide de-duplicated replication of data over Local or Wide Area Networks		
9	Must provide 10Gb Ethernet connectivity		
10	Must provide communications and data transfers through 4 nos. of 8Gbps SAN, 2 nos. of 10 Gb & 2 nos. of 1 Gb Ethernet LAN. Solution should ensure auto failover / redundancy.		
11	Should provide capacity on demand feature that allows the storage allocation associated with a virtual tape cartridge to be consumed upon write, and not creation		
12	Should provide auto support remote health check for OEM to monitor the system health.		
13	Should provide minimum 9TB/hr of throughput (read/write/ingest).		
14	Should provide single storage pool and load balancing across multiple storage controllers if multiple controller are offered.		
15	The appliance must provide deduplication for VTL, NAS Share, CIFS share etc., in order to significantly improve storage utilization and help retain data longer.		
16	Must provide target based deduplication		
17	Must protect against lost data in power fail and software crashes.		
18	The appliance should provide compression features along with De-duplication.		

Sl. No.	PBBA / VTL Specification	Compliance (Yes/No)	Bidder's Response
19	Must provide share level replication, must support schedule throttle of network bandwidth depending on the utilization of the WAN bandwidth.		
20	Must provide simultaneous replication process while backup is running.		
21	Replication should support bi-directional, many-to-one, and one-to-one replication.		
22	Regular Maintenance activities like System housekeeping/Garbage Cleaning etc. must happen simultaneously along with regular backup and restore operations without having the need for a dedicated window.		
23	Must provide min. 48 virtual tape libraries, min. 200 virtual drives, & min. 100,000 virtual tapes.		
24	Should provide Link Aggregation Control Protocol (LACP)		
25	Should have SNMP and command line support.		
26	Should have min 48 TB usable capacities with Hot Swap drive. There should be provisions of scalability up to 80 TB of usable space in future with in the same VTL model.		
27	Should provide IP Aliasing.		
28	Should provide 256 bit AES encryption at rest/replication. The same must be offered along with the library		
29	Different replication topologies must be provided like One-One, Bi-Directional, Many to One. Replication network throttling must be offered along with scheduling capabilities.		
30	The Disk Library must provide RAID 6 technology for protection		
31	Solution should ensure the Data and System integrity.		
32	The VTL should be offered with minimum dual hot pluggable power supply in redundant configuration.		
33	All necessary software and license for each VTL is to be provided to meet the functionality mentioned from point 1 to 32 along with support and upgrade for the entire lease period.		
34	A list of reference sites with contact details shall be submitted where PBBA/VTL of the same model is being used. One of these reference sites shall be from India. BHEL may contact the reference sites directly for any feedback.		
35	End-of-support for VTL and all its components including software provided should be minimum 07 years from the date of submission of bid. Necessary document needs to be submitted.		

6.9 BACKUP SOFTWARE FOR USING BOTH TAPE LIBRARY AND VTL: - 2 COPIES

Backup Management Software must be provided as per the specifications listed below to use both Tape and VTL simultaneously at both primary and secondary site.

Table -23: Minimum Specifications For the required backup software

Sl. No.	Backup Software Specification	Compliance (Yes/No)	Bidder's Response
1	Backup software shall be a single solution for supporting multiple operating systems and application using a single product which would take care of data growth in future.		
2	The proposed Backup Software Solution shall be available on64 bit UNIX OS platforms. The solution shall provide backup/ restore from various client platforms such as HPUX,IBM AIX, SUN Solaris, Linux, Windows 2008/2012, etc.		
3	Backup management software that helps monitoring of both tape and VTL library shall be GUI/ web based.		
4	The offer shall cover licenses required for taking backup to Tape and VTL for the entire data residing in all the partitions and new partitions if created in future. All required license for VTL to Tape copy shall be provided (D2D2T – Disk to Disk to Tape) for the supplied capacity of VTL.		
5	Back-up software shall be a single solution for Supporting multiple operating systems and applications using a single product.		
	Back-up software shall provide tape mirroring.		
	Back-up software shall provide deduplication for VTL.		
	Back-up software shall provide scheduled and policy based back-ups.		
	Back-up software shall provide multiple simultaneous client sessions for back-up and restore.		
	The Backup software shall maintain catalog of all the backups for efficient management of data and for better performance.		
	The back-up software shall provide features like Point-in-Time backup / Restore and Archive / Retrieve		
	The Back-up software shall provide back-up over LAN, SAN and Server free backup for both Tape and VTL		
	The back-up software shall support integration with Enterprise Management software such as Tivoli, UnicenterTNG and HP-Open view.		
	Should provide Full, incremental and Point in Time Copy / Snapshot based backup.		
Should have provision for generating backup-sets from existing backup tapes, for moving to off-site location for tapes.			
6	Full back-up of database systems shall be possible to be taken without bringing the production system down, with full data base consistency and without affecting the performance to the users in anyway.		

Sl. No.	Backup Software Specification	Compliance (Yes/No)	Bidder's Response
7	The backup software must be capable of running in a clustered environment. Cluster licenses of the backup software should be provided for both the Client and the Server components.		
8	The backup software must use an RDBMS as the backup catalog for efficient management and scalability of the solution.		
9	The solution should be licensed for Server Free (Zero Downtime), SAN based and LAN based backups of the SAN attached servers.		
10	Backup client software shall be licensed for provided capacity of the Storage used.		
11	12 agents for SAP to be provided at each site or SAP aware backup needs to be provided for the all servers in HA cluster. Support and upgrades for the same shall be provided during the entire period of the contract.		
12	It shall be possible to use all the eight drives simultaneously for tape library.		
13	The backup software shall be licensed to provide disk staging. The disk staging units used for the Production and QA/ Development systems will be different and thus any additional licenses, if required, shall be included in the scope of supply.		
14	The backup software should provide (Role Based Access) different levels of User access, Administrator, User, Operator, so that only the authorized personnel can make changes or view the status based on the rights they have.		
15	Online backup agents and its license for ERP and Database application shall be provided. The same shall support the versions of ECC 6.0 and Oracle10g and any upgrade required for supporting the latest and future version of SAP/Oracle shall also be provided till the expiry of the contract.		
16	The software must have the capability for monitoring and controlling the tape sent off site for the tape library		
17	The Software must also provide for creating a Business Continuity Plan in case of the Backup server and all other servers in the backup network being destroyed in a possible disaster. This should be a scheduled and Automated activity on the backup server. The software shall also provide for restoring data at each site during complete non-availability of the other site due to disaster.		
18	Restore feature: System shall be configured for full restoration of the backed up data to the respective storage.		
19	Backup software shall be configured to perform periodic restore drills.		
20	BHEL may increase/ decrease the number of CPU/RAM in backup server or any of the partitions at any point during the contract period. Additional licenses, if required shall be provided.		

Sl. No.	Backup Software Specification	Compliance (Yes/No)	Bidder's Response
21	Extensive reporting capabilities to monitor the health of Backups, support HTML, TEXT and CSV outputs, support for scheduled automated generation of reports.		
22	Software should provide event notification to notify backup administrator about events like Job Failed or Job aborted, etc.		
23	Software should provide Scanning of Tape/VTL media to rebuild catalogs and indexes in case of disaster.		
24	Software should provide centralized management console to remotely monitor backups.		
25	Software should provide Raw device backup of Windows/Linux/UNIX based system		
26	Software should provide online backup of oracle & shall provide both Online and RMAN to perform online backup.		
27	Backup software shall be compatible to SAPBACKINIT. Details to be provided by the bidder.		
28	It shall be possible to take backup through both backup servers to VTL and Tape independently and simultaneously (Active-Active mode) from both sites.		
29	Automatic media management shall be taken care by the backup software.		
30	All necessary licenses are to be provided to meet the requirement mentioned from point 1 to 29 even if not explicitly mentioned. The backup software and its licenses will be supported and upgraded in the entire lease period.		

6.10 RACKS

Table – 24: Specifications for the required Racks:

Sl. No.	Item/ Parameter	Rack Specification	Compliance (Yes/No)	Bidder's Response
1	Rack	<p>OEM Heavy Duty Racks (at least 42U) for installation of all the hardware shall be supplied, with necessary power distribution unit, cable manager, Fan, front & rear perforated doors and rack kits.</p> <p>Power distribution unit should have at least 20% spare PDU after the full installation in each rack. Each rack should have PDU in two separate groups so as to have provision of power supply from different source.</p> <p>Earthing kit also should be supplied with all the racks.</p>		

6.11 MIGRATION OF SAP LANDSCAPE, APPLICATION SERVER ETC., INSTALLATION OF LATEST ENHANCEMENT PACKAGE

Currently existing SAP landscape consists of ECC, BI/ BO, PI, Content Server and Solution Manager Installations. Following activities needs to be performed after installation of Hardware, OS, Software and patches.

6.11.1 Migration

6.11.1.1 Migration of SAP Application and oracle database from the old SUN Solaris environment running SAP ECC 6.0 EHP5 having database oracle 11g to the provided servers.

6.11.1.2 The migration can be heterogeneous or homogenous depending upon the new Servers operating systems.

6.11.1.3 The following existing Servers are to be migrated:

Sl. No.	Server	Data Base version	Operating system	SAP /EHP version
1	R3 Production server	Oracle 11g	Sun-Solaris	ECC 6.0/eph5
2	R3 Development server	Oracle 11g	Sun-Solaris	ECC 6.0/eph5
3	R3 Quality server	Oracle 11g	Sun-Solaris	ECC 6.0/eph5
4	BI Production server	Oracle 11g	Sun-Solaris	BI7.0
5	BI Development server	Oracle 11g	Sun-Solaris	BI7.0
6	BI Quality server	Oracle 11g	Sun-Solaris	BI7.0
7	PI Production Server	Oracle 11g	Win2003srv	PI7.0
8	PI Development Server	Oracle 11g	Win2003srv	PI7.0
9	PI Quality server	Oracle 11g	Win2003srv	PI7.0
10	Content Server Development	MaxDB 7.6	Win2003srv	4.6
11	Content Server Production	MaxDB 7.6	Sun-Solaris	4.6

6.11.1.4 Detail plan for approval will be submitted before the migration and installation work is started which should include project plan, no of days required, breakup of activity and man days required for each activity, manpower planned.

6.11.1.5 Brief scope of work for migration:

- n. All necessary software, patches, keys will be downloaded by the vendor from the SAP service market place for which the access will be given by BHEL. OSS call to SAP if required will also be raised by the vendor.
- o. All necessary database and file system backup will be taken before start of migration activity.
- p. Oracle database/MaxDB of the servers in the landscape will be brought to the latest version and release.
- q. Application of relevant patches and notes will be done.
- r. Adjustment and/or modification of reports if required will be done.
- s. All production servers will be migrated and released at the same time. For production servers initially test migration will be done on the test partition keeping the record of issues

- and solution at the time of migration before actual migration is done.
- t. All the server mentioned above are to be migrated to the new server which are in cluster mode having DB & CI running together on one node.
 - u. After migration, the entire above migrated server needs to be tested for the entire functional and technical configuration and functionality which was prevailing earlier. Landscape and Transport route maintained earlier, needs to be restored/configured back. Necessary performance tuning at the SAP and OS level is to be done. Servers in the cluster need to be tested for automatic switching of SAP and Oracle services on node failure. There should be no loss of committed transaction on switching of the cluster.
 - v. Any external interface with SAP servers in the landscape will be configured and restored back.
 - w. Existing SAP-BI servers are installed in ABAP+JAVA mode. After migration JAVA instance needs to be separated from all SAP-BI development, quality and production server.
 - x. Existing Solution Manager and BO server will not be migrated and the same will be installed on the separate servers.
 - y. Migration will be taken completed only after the acceptance of the system by the BHEL SAP functional and technical core team after comprehensive testing.

6.11.2 Reinstallation:

6.11.2.1 Following Latest version Servers compatible with the landscape needs to be reinstalled and configured as per BHEL requirement.

- h. IDES server of SAP
- i. 06 nos. of application server for SAP R3 production server at each site in load balancing.
- j. 04 nos. application server for SAP-BI production server at each site in load balancing

6.11.2.2 Brief scope of work for reinstallation of above server:

- i. All necessary software, patches, keys will be downloaded by the vendor from the SAP service market place for which the access will be given by BHEL. OSS call to SAP if required will also be raised by the vendor.
- j. Installation of application server will be done immediately after the production server has been migrated.
- k. All application server of SAP R3 production server will be installed and configured in load balancing and sharing mode as per the BHEL requirement.
- l. All application server of SAP BI production server will be installed and configured in load balancing and sharing mode as per the BHEL requirement.
- m. Reinstallation will deemed to be completed only after the acceptance of the system by the BHEL SAP functional and technical core team after comprehensive testing.

6.11.3 Clustered server after migration needs to be tested for zero committed transactional loss and automatic failover and failback for the SAP and Oracle services.

6.11.4 Application of latest EHP and patches

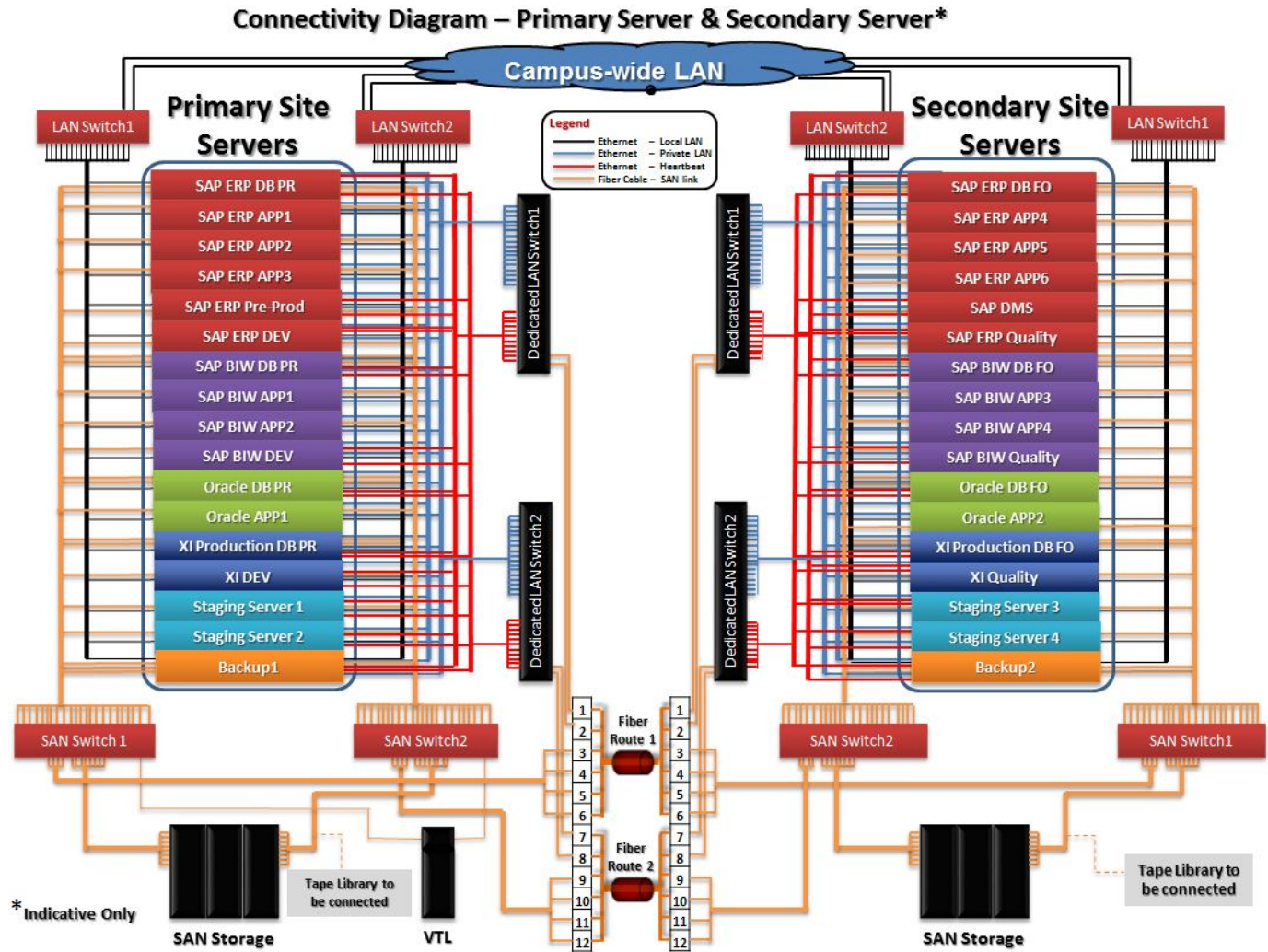
6.11.4.1 Detail plan for approval will be submitted before the application of latest EHP and patches work is started which should include project plan, no of days required, breakup of activity and man days required for each activity and the manpower planned.

6.11.4.2 All the SAP servers in the landscape will be upgraded to the latest possible EHP and patches provided by SAP at the time of installation. EHP upgrade and patching will be a technical upgrade which should support the existing functionality.

6.11.4.3 If technical upgrade is not possible without enhancing some of the application functionality and custom reports then those functionality and reports will be enhanced after having approval.

- 6.11.4.4 Detail plan will be submitted before the migration and installation work is started which should include project plan, no of days required, breakup of activity and man days required for each activity, manpower planned.
- 6.11.4.5 Brief scope of work for EHP upgrade:
- a. All necessary software, patches, keys will be downloaded by the vendor from the SAP service market place for which the access will be given by BHEL. OSS call to SAP if required will also be raised by the vendor.
 - b. EHP upgrade will be undertaken only after the complete BHEL SAP-HPEP landscape has been migrated and is running without any issue for more than one month.
 - c. All necessary database and file system backup will be taken before the start of upgrade activity.
 - d. All production servers with latest EHP will be released at the same time. For production servers initially test migration will be done on the test partition keeping the record of issues and solution at the time of applying EHP before actual EHP is applied.
 - e. Adjustment and/or modification of reports if required will be done.
 - f. EHP installation will be first tested on all the development servers.
 - g. After upgrade all the existing technical configuration and functionality of R3, BI and PI servers and interfaces among each other will be maintained and tested before handing over.
- 6.11.4.6 Latest EHP and patches application will be taken completed only after the acceptance of the system by the BHEL SAP functional and technical core team after comprehensive testing.

6.12 SCHEMATIC DIAGRAM OF PROPOSED NEW SAP-HPEP SERVER INFRASTRUCTURE



Confirm compliance for all clauses of -
 “Technical Specification of SAP-HPEP Hardware (Requirement)”

Date:

Bidder’s Signature with Seal

7 COMMERCIAL TERMS AND CONDITIONS

7.1 RATES

- 7.1.1 Rates to be quoted are net F.O.R. destination inclusive of freight, handling and packing charges, transit insurance, installation, regular insurance and on-site comprehensive maintenance including spares at stipulated locations during the entire lease period and shall remain FIRM without any variation till completion of the lease contract. However, the Lease Tax / RTU Tax will be payable as per actuals.
- 7.1.2 Rates are to be quoted as per Price Bid Format providing details of prevailing rates of taxes and duties. Bidders, in their own interest, are requested to check up the different tax tariff like "Right to use" etc. at stipulated locations. After opening of Price Bid, no request for any change in rates/tariff due to above will be entertained.

7.2 PAYMENT TERMS

Lease period will start only after successful installation and commissioning of all hardware and other items as per the requirement and the issue of the commissioning certificate. Quarterly lease rental charges (after deduction for any SLA non-conformance) become payable at the end of each quarter within 30 days of submission of verified documents as below.

Vendor shall submit following documents for processing the bills:

- a) Invoice in triplicate.
- b) SLA reports for the quarter (certified by BHEL)

7.3 VALIDITY OF THE OFFER

The offer shall be valid for 120 days from the date of Technical bid (Part I) opening.

7.4 NOTIFICATION OF AWARD

BHEL will notify the successful Bidder in writing by e-mail/ Letter/ Fax.

7.5 SIGNING OF CONTRACT/ LEASE AGREEMENT

After the notification of award, BHEL will issue Purchase Order / Service Order (PO). Within 15 (fifteen) Days from the date of issuance of PO, the Bidder shall submit:

- a) Bidder Signed copy of BHEL Order as an acceptance of the PO.
- b) Security Deposit (SD).

Thereafter, BHEL shall issue the draft contract/ lease agreement within 30 days of acceptance of Order along with submission of SD by the Bidder. The Contract/ Lease agreement between BHEL & Bidder shall be signed in the next 15 days from the date of issue of the Contract. Separate contract/ lease agreement shall be executed for each PO.

Bidder shall furnish the details regarding Address, Tax details, Bank details etc. for placement of Order.

Bill to party is BHEL Hyderabad. Bidder billing from within the State can quote with VAT (TIN) and those billing from outside the State can quote with CST (without TIN).

Input credit is available for VAT.

7.6 SECURITY DEPOSIT (SD)

Security deposit amount of INR 4,00,000 (INR Four Lakhs only) plus 5% of the amount by which the order value exceeds INR 50 Lakhs shall be submitted by the successful bidder before start of the work. Non-submission in time of SD for value stated herein shall lead to forfeiture of EMD and cancellation of Order.

Security deposit shall be furnished in any of the following forms:

- i. Pay order in favour of BHEL.
- ii. Demand draft in favour of BHEL.
- iii. Local cheques of scheduled banks, subject to its realization.
- iv. Bank Guarantee shall be from Nationalised Banks / Scheduled Bank / Public Financial Institutions as per the BHEL's Bank Guarantee Format.
- v. Original Fixed deposit receipt (FDR) issued by scheduled banks / public financial institutions as defined in the Companies Act. The FDR should be in the name of successful bidder, A/c BHEL, duly discharged on the back

Acceptance of security deposit against point *iv* and *v* above, will be subject to hypothecation or endorsement on the documents in favour of the Owner. However, Owner will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected there with. Security deposit shall not be refunded to the Successful bidder except in accordance with the terms of the Contract i.e. upon successful completion of the Contract.

EMD of the successful bidder may be converted and adjusted against the Security Deposit.

The Security Deposit shall not carry any interest.

The bidder shall forfeit the Security Deposit In the event bidder fails to execute the work as per terms and conditions of the contract.

7.7 DELIVERY SCHEDULE

The Bidder shall be responsible for timely delivery, installation & commissioning of all the hardware & software given in the scope of supply/work at the BHEL's premises. All the hardware & software shall be delivered and successfully installed and commissioned (including migration and technical upgrade of SAP Landscape) within 180 days from the date of placement of order.

Clearance for carrying out Technical upgrade will be provided by BHEL within a month of successful migration. (180 days includes time taken by BHEL for giving clearance) In case of delay from BHEL beyond 30 days , delivery will be suitably extended.

If the delivery is delayed due to reason not attributable to BHEL, penalty shall be deducted as per Penalty clause. BHEL also reserves the right to go for alternative procurement.

7.8 PENALTY FOR LATE DELIVERY (INCLUDING INSTALLATION, COMMISSIONING, MIGRATION & UPGRADE)

For the delay in delivery, penalty shall be levied at the rate of 0.5% per week (or part thereof) subject to maximum of 10% of the total lease rent for entire lease period for the equipment(s) not delivered in time (as per the scope, i.e. including installation, commissioning, migration and technical upgrade) as per delivery schedule. This penalty will be deducted from the first quarter rental charges. In case the penalty amount to be deducted is more than the first quarter rental charges, the same will be adjusted from the immediate next quarter consecutively until the entire penalty is adjusted.

7.9 FORCE MAJEURE

Bidder shall not be responsible for delay in delivery resulting from acts/events beyond his control, provided notice of the happening of any such act/event is given by the Bidder to the Purchaser/Lessee within 15 days from the date of its occurrence. Such acts/events shall include but not be limited to acts of God, war, floods, earthquakes, strikes, lockouts, epidemics, riots, fire or Governmental regulations superimposed after the date of order/contract.

7.10 RISK PURCHASE

Purchaser shall reserve the right to terminate the order/contract and purchase from elsewhere at the risk and cost of the Bidder, either the whole or part of the Systems/goods, which the Bidder has failed to deliver within the stipulated delivery period or if the same were not available, the best and the nearest available substitute(s) thereof which is not technically inferior to the undelivered System/Goods. The Bidder would be liable to compensate the Purchaser for any loss, which the Purchaser/Lessee may sustain by reason of such purchase. This clause will be operated only after completion of delivery period including extended period with penalty, if any.

7.11 LIMITATION OF LIABILITY

The Bidder's liability will be limited to the value of this contract only.

7.12 INSPECTION & TESTING

All goods shall be subject to inspection by BHEL or its authorized representatives at supplier's works or at BHEL stores or at any other place in India indicated by BHEL as the case may be. The supplier will not charge for the facilities provided for inspection of goods.

7.13 ARBITRATION

In all cases of disputes emanating from and in reference to this contract, the matter shall be referred to the arbitration. All disputes or differences between the parties will be resolved through arbitration governed by "The Arbitration and Conciliation Act, 1996" as amended from time to time. The venue of arbitration shall be in Hyderabad.

7.14 ETHICAL STANDARD & OTHER CONDITIONS

Bidders are expected to observe the highest standard of ethics during the procurement and execution of this Contract. In pursuit of this policy, BHEL will reject a proposal for award if it determines that the Bidder being considered for award has engaged in corrupt or fraudulent practices in competing for the Contract. For the purposes of this provision, the terms set forth below are defined as follows:

- a) "Corrupt Practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action in the procurement process or in Contract execution; and
- b) "Fraudulent Practice" means a misrepresentation of facts in order to influence a procurement process including collusive practices designed to establish bid prices at artificial, non-competitive levels to deprive the benefits of competition to BHEL.

By signing the Bid Forwarding Letter, the Bidder represents that for the software it supplies, it is the owner of the Intellectual Property Rights. Wilful misrepresentation of these facts shall be considered a fraudulent practice without prejudice to other remedies that BHEL take.

If the information provided by the bidder is found to be false at a later date, BHEL reserves the right to reject such a bid at any stage or to cancel order/ contract/ lease agreement if awarded. In such a case, bidder shall

also forfeit EMD/ Security Deposit. In addition, other rights are also available to BHEL such as Risk Purchase clause for breach of contract and suspension of business dealings as per extant guidelines of the company.

7.15 INTEGRITY PACT

The bidder shall sign an Integrity Pact, to comply with the requirements of the Transparency International Limited (TIL) and the Central Vigilance Commission (CVC) guidelines to ensure an ethical and corruption-free business environment. The format for the Integrity Pact is attached as Annexure-6.

Independent External Monitor (IEM) being appointed will be intimated separately.

7.16 NON-DISCLOSURE AGREEMENT

The bidder shall sign a Non-Disclosure Agreement (NDA) with BHEL. By signing the NDA, the bidder agrees not to disclose any confidential information, business or proprietary, as covered by the agreement. The format for the Non-Disclosure Agreement is attached as Annexure-4.

7.17 INCOME TAX DEPRECIATION

Income tax depreciation will be claimed by BHEL.

Confirm compliance for all clauses of - "**Commercial Terms and Conditions**"

Date: _____

Bidder's Signature with Seal

**Format for Submitting the Price details of Supply of Computer Systems on finance lease
for a period of 5 years for replacement of existing hardware running SAP-HRMS & SAP-HPEP Applications
BHEL, Ramachandrapuram, Hyderabad – 502032**

SI No	Spec Clause & Item Description	Qty	Per Quarter Lease Charges per UNIT Quantity(INR)										Per Quarter Lease Charges for Total Qty (INR) (Including Taxes)
			Equipment Cost	Lease/ VAT/ CST		Maintenance	Interest	Service Tax		Other Taxes (if any)		Lease Charge per Quarter (Including Taxes)	
				(%)	(Value)			(%)	(Value)	(%)	(Value)		
		A	B	C	D	E	F	G	H	I	J	K = B+D+E+F+H+J	L = A x K
1.	5.2 – Unix Servers (including racks)	2											
2.	5.3 – Server Management System	2											
3.	5.4 – SAN Storage (including racks)	2											
4.	5.5 – SAN Switches	4											
5.	5.6 – LAN Switches (including Cables)	10											
6.	5.7 – Purpose Built Backup Appliance / VTL (including racks)	1											
7.	5.8 – Tape Library (including racks)	2											
8.	5.9 – Backup Software for both Tape & VTL	2											
9.	5.11 – Precision Air Conditioners (including replacement & shifting of old PACs)	2											
10.	5.12 – Fibre Optic cable laying between sites in two routes	1											
11.	5.13 – Migration & Upgrade of existing SAP Landscape	1											
12.	6.2 – Unix Servers (including racks)	2											

SI No	Spec Clause & Item Description	Qty	Per Quarter Lease Charges per UNIT Quantity(INR)										Per Quarter Lease Charges for Total Qty (INR) (Including Taxes)
			Equipment Cost	Lease/ VAT/ CST		Maintenance	Interest	Service Tax		Other Taxes (if any)		Lease Charge per Quarter (Including Taxes)	
				(%)	(Value)			(%)	(Value)	(%)	(Value)		
A	B	C	D	E	F	G	H	I	J	K = B+D+E+F+H+J	L = A x K		
13.	6.3 – Server Management System	2											
14.	6.4 – SAN Storage (including racks)	2											
15.	6.5 – SAN Switches	4											
16.	6.6 – LAN Cables	1											
17.	6.7 - Tape Library (including racks)	1											
18.	6.8 – Purpose Built Backup Appliance / VTL (including racks)	1											
19.	6.9 – Backup Software for both Tape & VTL	2											
20.	6.11 – Migration & Upgrade of existing SAP Landscape	1											
	Total											T =	
Total Lease Charge for 5 Years = T x 5 x 4													

**Format for AMC percentage for 6th and 7th Year
BHEL, Ramachandrapuram, Hyderabad – 502032**

Sl No	Spec Clause & Item Description	Qty	AMC Charges per UNIT Quantity(INR)			Total AMC Charges
			Total Equipment Cost (Outright)	AMC Percentage (%)	AMC Value	
		A	B	C	D	E = A x D
1.	5.2 – Unix Servers (including racks)	2				
2.	5.3 – Server Management System	2				
3.	5.4 – SAN Storage (including racks)	2				
4.	5.5 – SAN Switches	4				
5.	5.6 – LAN Switches (including Cables)	10				
6.	5.7 – Purpose Built Backup Appliance / VTL (including racks)	1				
7.	5.8 – Tape Library (including racks)	2				
8.	5.9 – Backup Software for both Tape & VTL	2				
9.	5.11 – Precision Air Conditioners	2				
10.	5.12 – Fibre Optic cable maintenance	1				
11.	6.2 – Unix Servers (including racks)	2				
12.	6.3 – Server Management System	2				
13.	6.4 – SAN Storage (including racks)	2				

SI No	Spec Clause & Item Description	Qty	AMC Charges per UNIT Quantity(INR)			Total AMC Charges
			Total Equipment Cost (Outright)	AMC Percentage (%)	AMC Value	
		A	B	C	D	E = A x D
14.	6.5 – SAN Switches	4				
15.	6.6 – LAN Cables	1				
16.	6.7 – Tape Library (including racks)	1				
17.	6.8 – Purpose Built Backup Appliance / VTL (including racks)	1				
18.	6.9 – Backup Software for both Tape & VTL	2				
	Total					T =

Note: The AMC amount shall include manpower charges also apart from maintenance and spares cost. Other conditions of AMC shall be same as that of Lease Contract.

AUTHORIZATION & BACK TO BACK SUPPORT BY OEM

Date: _____

To,
BHEL,
Ramachandrapuram,
Hyderabad

Subject: Manufacturer's Authorization Form with Back to Back Support – Reg.

Tender Ref. No.: _____

Dear Sir,

We hereby authorize M/s _____ to quote / secure the order in their name / supply the equipment against the Tender Enquiry Ref. No.: _____.

It is confirmed that

1. The Authorized Partner will have back to back support for the following equipment for supply of spares, support and its services against this tender conditions for a minimum period of 7 years (5 Years Lease Period and 2 years AMC if ordered) from the date of commissioning.
2. The equipment will have 5 (Five) Years Warranty directly from the OEM during the Lease/ Contract Period.

This authorization is valid only for the following equipment for which we are the OEM:

1. _____
2. _____
3. _____
4. _____

In case of any default by the Authorized Partner, it will be our responsibility to provide spares, support and services on-site on the same terms and conditions as negotiated and finalized in this tender enquiry.

(Authorized Signatory)

For _____

Note: This '*Authorization & Back to Back Support Form*' should be issued on the letterhead of OEM.

NO DEVIATION CERTIFICATE

(To be given in bidder's letter head)

Ref: BHEL's Enquiry No. _____ Dated _____

It is Certified that the offered solution vide Enquiry No. _____

Dated _____ in response to BHEL's enquiry mentioned under reference has no Technical deviation from the requirement of BHEL, Ramachandrapuram given vide the Technical Specification (Requirement).

Date: _____

Bidder's Signature with Seal



Bharat Heavy Electricals Limited

ISMS – 04/HY/06/002

Rev: 02

Date: 14-05-2012

THIRD PARTY NON-DISCLOSURE AGREEMENT (NDA)

I, _____, on behalf of the _____ (Name of Company), acknowledge that the information received or generated, directly or indirectly, while working with BHEL on contract is confidential and that the nature of the business of the BHEL is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL. Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data.

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL all documents and property of BHEL, including but not necessarily limited to: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of BHEL and are reasonable given the nature of the business carried on by BHEL. I agree that this agreement shall be governed by and construed in accordance with the laws of country.

I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Dated at _____, this _____ day of _____, 20_____.

Name

Company

Signature

CHECKLIST OF ENCLOSURES

(TO BE ATTACHED WITH TECHNO-COMMERCIAL BID (PART-I) DULY FILLED BY THE BIDDER)

SI No	Documents with Tender	Format / Annexure	Whether Attached (Yes / No)
1.	Authorization letter from OEM of Server	Annexure - 1	
2.	Authorization letter from OEM of Storage unit	Annexure - 1	
3.	Authorization letter from OEM of Backup software	Annexure - 1	
4.	Authorization letter from OEM of Tape Library	Annexure - 1	
5.	Authorization letter from OEM of VTL	Annexure - 1	
6.	Authorization letter from OEM of PAC	Annexure - 1	
7.	Authorization letter from SAP Implementation partner	Annexure - 1	
8.	Authorization letter from OEM of (Pl specify)	Annexure - 1	
9.	Server OEM's self-certification as per clause 2.2.1.1		
10.	Server OEM's order reference as per clause 2.2.1.3		
11.	Server OEM's self-certified document for customer details as per clause 2.2.1.4		
12.	Bidder's undertaking for complete responsibility as per clause 2.1.2		
13.	Reference of sites as per clause 2.1.3		
14.	Attested balance sheets as per clause 2.1.8		
15.	Bidder's proof of registration in India as per clause 2.1.9		
16.	SAP practice document as per clause 2.1.10		
17.	Acceptance of Technical terms and conditions (Chapter 3) duly signed with stamp		
18.	Acceptance of Technical terms and conditions (Chapter 4) duly signed with stamp		
19.	Acceptance of Technical specification (Chapter 5) duly signed with stamp		
20.	Acceptance of Technical specification (Chapter 6) duly signed with stamp		
21.	Acceptance of Commercial terms and conditions (Chapter 7) duly signed with stamp		

SI No	Documents with Tender	Format / Annexure	Whether Attached (Yes / No)
22.	Deviations if any, as per BHEL format	Annexure - 2	
23.	No Deviation certificate	Annexure - 3	
24.	Non-Disclosure Agreement	Annexure - 4	
25.	Tender Fee of Rs. 20,000/- (Rupees Twenty Thousand only)		
26.	EMD of Rs.2,00,000/- (Rupees Two Lakhs only)		
27.	Unpriced commercial offer as per Price format (Equipment & Services)		
28.	Unpriced commercial offer as per Price format (AMC)		
29.	Integrity pact duly signed and stamped	Annexure -6	

Note: Tender documents shall not be modified and bidder shall fill in the information as required in the tender documents

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) herein after referred to as "The Principal", which expression unless repugnant to the context or meaning here of shall include its successors or assigns of the ONE PART

And

_____ (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1 – Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidders(s)/ Contractor(s) from the tender process or take action as per the separate “Guidelines on Banning of Business dealings with Suppliers/ Contractors” framed by the Principal.

Section 4 – Compensation for Damages

4.1 If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is

entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor Liquidated Damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit / Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from all sub-contractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20% of Bidder"s/ Contractor"s contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).

6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.

6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact.

The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word "Monitor" would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder

of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal
(Office Seal)

Place-----

Date-----

Witness:_____

(Name & Address)_____

For & On behalf of the Bidder / Contractor
(Office Seal)

Place-----

Date-----

Witness:_____

(Name & Address)_____

Terms & Conditions of Reverse Auction

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder for any of the eligible items for which techno- commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non- compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.
12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the 'Business Rules of Reverse Auction', which will be communicated before the Reverse Auction.
13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.
14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. In case BHEL decides to go for reverse auction, the H1 bidder(s) (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

Business Rules for Reverse Auction

This has reference to tender no {*tender number.....date.....*} BHEL shall finalise the Rates for the supply of {*item name*} through Reverse Auction mode. BHEL has made arrangement with M/s. {*Service provider*}, who shall be BHEL's authorized service provider for the same. Bidders should please go through the guidelines given below and submit acceptance of the same.

The technical & commercial terms are as per (a) BHEL Tender Enq. No. {...}, dated {...}; (b) Bidders technical & commercial bid (in case of two part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

1. Schedule for reverse auction: The Reverse Auction is tentatively scheduled on {*date*}:

- **Online Sealed Bid:-**
 - {*Start Time*:
 - {*Close Time*:}
- **Online Reverse Auction:-**
 - {*Start Time*:
 - {*Close Time*:}

2. Auction extension time: If a bidder places a bid in the last {...} minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another {...} minutes, for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last {...} minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last {...} minutes. In case, there is no bid in the last {...} minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc. The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {*Service provider*} with a copy to BHEL within 15 minutes from the initial closing time of Online Reverse Auction.

3. Bid price: The Bidder has to quote the F.O.R. destination Price inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, ED + cess, CST against C-form, Freight (bidder to provide original Freight paid receipt), insurance charges, etc. including loading (if indicated by BHEL due to deviations in commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of Landed cost.

Note: For the consideration of L1 bidder, the bid value shall be reduced by loading amount, if applicable.

- 4. Bidding currency and unit of measurement:** Bidding will be conducted in {*Indian Rupees per Unit*} of the material as per the specifications {...}

In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid in case of two part bid) shall be considered for conversion in Indian Rupees.

- 5. Validity of bids:** Price shall be valid for {... *days*} from the date of reverse auction. These shall not be subjected to any change whatsoever.
- 6. Lowest bid of a bidder:** In case the bidder submits more than one bid, the lowest bid at the end of Online Reverse Auction will be considered as the bidder's final offer to execute the work.
- 7. Post auction procedure:** BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.

8. Procedure of Reverse Auctioning

- i. **Online Sealed Bid:** This duration of online sealed bid will be {...} minutes. All bidders to submit their online sealed bids during this period.
 - ii. **Online Reverse Auction:** The 'opening price' i.e. start price for RA and 'bid decrement' will be decided by BHEL.
 - iii. If BHEL decides the lowest online sealed bid as the starting price, then the lowest bidder in online sealed bid shall be shown as current L1 automatically by the system and no acceptance of that price is required. System shall have the provision to indicate this bid as current L1.
 - iv. Bidders by offering a minimum bid decrement or the multiples thereof can displace a standing lowest bid and become "L1" and this continues as an iterative process.
 - v. After the completion of the online reverse auction, the Closing Price (CP) shall be available for further processing.
- 9.** If no bid is received in the auction system/ website within the specified time duration of the online RA, then BHEL will scrap the online reverse auction process and proceed with the conventional mode of tendering (opening of the envelope sealed bids earlier submitted by the bidders).

In cases where no bidder accepts the start price, the RA may be treated as failed and sealed envelope price bids of all the techno-commercially qualified bidders shall be opened and the tender processed accordingly. Wherever the techno-commercially acceptable bidder(s) had agreed to participate in the RA and had failed to submit the online sealed bid, the envelope sealed bids of such bidder(s) shall not be entertained.

Wherever, the evaluation is done for individual items of the package, and no bid is received for some of the item(s), RA will be considered as failed for these item(s), re-reverse auction/ retendering will be conducted for these items.

10. Only those bidders who have submitted the 'online sealed bid' within the scheduled time shall be eligible to participate further in RA process. However, the H1 bidder(s) (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.
11. Any commercial/ technical loading shall be intimated to bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during online sealed bid & Online Reverse Auction. Modalities of loading & de-loading shall be separately intimated to the bidders.
12. Computerized reverse auction shall be conducted by BHEL (through M/s *{Service Provider}*), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

During the RA if a bidder is not able to bid and requests for extension of time by fax/ e-mail/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained.

Despite this extension if bidder fails to upload his prices due to extreme case of failure of Internet connectivity, (due to any reason whatsoever may be) it is bidders' responsibility/ decision to send fax communication immediately to M/s. *{Service provider}*, furnishing the price the bidder wants to bid online with a request to the service provider to upload the faxed price on line so that the service provider will up load that price on line on behalf of the Bidder. It shall be noted clearly that the concerned bidder communicating this price to service provider has to solely ensure that the fax message is received by the service provider in a readable/ legible form and also the Bidder should simultaneously check up with service provider about the clear receipt of the price faxed. It shall also be clearly understood that the bidder shall be at liberty to send such fax communications of prices to be up loaded by the service provider only within the closure of Bid time and under no circumstance it shall be allowed beyond the closure of Bid time /reverse auction. It shall also be noted that the service provider

should be given a reasonable required time by the bidders, to upload such prices online and if such required time is not available at the disposal of the Service provider at the time of receipt of the fax message from the bidders, the service provider will not be uploading the prices and either BHEL or the service provider are not responsible for this unforeseen circumstances. In order to ward-off such contingent situation bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {Service provider} is responsible for such eventualities.

- 13.** Proxy bids: Proxy bidding feature is a pro-bidder feature to safe guard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid.

Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant.

In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price.

Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

14. Bidders are advised to get fully trained and clear all their doubts such as refreshing of Screen, quantity being auctioned, tender value being auctioned etc.
15. M/s. {*Service provider*}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {*Service provider*}, shall also explain the bidders, all the rules related to the Reverse Auction/ Business Rules Document to be adopted along with bid manual. Bidders are required to give their compliance on it before start of bid process.
16. Successful bidder shall be required to submit the final prices, quoted during the Online Reverse Auction in Annexure - VII after the completion of auction to M/s. *Service provider* besides BHEL, duly signed and stamped as token of acceptance without any new condition other than those already agreed to before start of auction.
17. Any variation between the final bid value and that in the confirmatory signed price breakup document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines in vogue.
18. Bidder's bid will be taken as an offer to execute the work/ supplies the item as per enquiry no. {...} dt. {...}. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines in vogue.
19. Bidders shall be assigned a **Unique User Name & Password** by BHEL or M/s. {*Service provider*}. Bidders are advised to change the Password and edit the information in the Registration Page after the receipt of initial Password from BHEL/ M/s. {*Service provider*} to ensure confidentiality. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.
20. Bidders shall be able to view the following on their screen along with the necessary fields during Online Reverse Auction:
 - a. Leading (Running Lowest) Bid in the Auction (only total price of package)
 - b. Bid Placed by the bidder
 - c. Start Price
 - d. Decrement value
21. After receipt of the system report from the Service Provider after completion of the Online Reverse Auction, BHEL will decide upon the winner. BHEL's decision on award of contract shall be final and binding on all the Bidders.

Annexure – II
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22. BHEL reserves the right to cancel the Reverse Auction process/ tender at any time, before ordering, without assigning any reason.
23. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.
24. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.
25. Bidders are required to submit their acceptance to the terms/ conditions/ modalities before participating in the Reverse Auction in the process compliance Form as per Annexure-IV.
26. BHEL can decide to extend, reschedule or cancel any Auction with prior intimation to all bidders.
27. If there is any clash between this business document and the FAQ available, if any, in the web site of M/s. {*Service provider*} the terms & conditions given in this business document will supercede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time.

Process Compliance Form

(The bidders are required to print this on their company's letterhead and sign, stamp before faxing)

To

- M/s. {Service provider}
- Postal address}

Sub: Agreement to the Process related Terms and Conditions

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no. { } dt. { }

This letter is to confirm that:

- 1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.
- 2) We have studied the Reverse Auction Terms & Conditions and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.
- 3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
- 4) We also confirm that, in case we become L1 bidder, we will email/ fax the price confirmation & break up of our quoted price (including that of line items) as per Annexure - VII within **two** working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {Service provider.}

We, hereby confirm that we will honor the Bids placed by us during the auction process.

With regards

Signature with company seal

Name –

Company / Organization

Designation within Company / Organization

Address of Company / Organization

- Sign this document and Fax it to M/s {Service provider} at { } prior to start of the Event.
- Attach a signed copy of the RFQ document along with the Agreement Form/ Process Compliance form and send to M/s. {Service provider}

RA price confirmation and breakup**To**

- **M/s. Service provider**
- **Postal address**

CC: M/s BHEL

{Unit-
Address-}

Sub: **Final price quoted during Reverse Auction and price breakup**

Dear Sir,

We confirm that we have quoted.

Rs. {_____} for item covered under tender enquiry No. { . . . } dt. { . . . }

Total price of _____ the items covered under above cited enquiries is inclusive of {Packing & forwarding, E.D., C.S.T., freight and insurance charges upto { } District, { } State and Type Test Charges etc., (exclusive of service tax), other as per NIT}

as our final landed prices as quoted during the Reverse Auction conducted today {date} which will be valid for a period of {_____} days.

The price break-up including that of line items is as given below.

Total

- =====
Rs.
=====

Thanking you and looking forward to the valuable order from BHEL.

Yours sincerely,

For _____

Name:**Company:****Date:****Seal:**