

CORRIGENDUM-I,

ADDENDUM-I

&

CLARIFICATIONS-I

For

Tender No. AA: GAX:24: TAMS:101, dated 13-12-2024

Date of issuing Addendum-I: 06-01-2025

Date of issuing Corrigendum-I: 06-01-2025

Date of issuing Clarifications-I: 06-01-2025

References:

- I. NIT_87289
- II. Tender ID: 2024_BHEL_781645_1

- a) Addendum -I details are attached (03 pages)
- b) Corrigendum - I details are attached (02 pages)
- c) Clarifications -I details are attached (04 pages)

Notes:

- a) These corrigendum, addendum and Clarifications along with Revised Annexures 01 to 17 {Technical Specifications} (43 pages), Revised Annexure-D (Revised list of Nodal Officers) (03 pages), Annexure-Z1(01 page), Annexure-Z2 (01 page) and Annexure-Z3 (01 page) shall be treated as part of the tender enquiry; hence all the bidders are requested to enclose duly signed & stamped Corrigendum-I, Addendum - I and Clarifications - I and all aforesaid ANNEXURES along with Part-I bid.
- b) Rest all terms & conditions and other clauses of NIT No. AA: GAX:24: TAMS:101, dated 13-12-2024 will remain same.

Thanking you,

For & on behalf of

Bharat Heavy Electricals Ltd.


मीना ठाकरान / MEENA THAKRAN
(Meena Thakran)
06/01/2025
कॉर्पोरेट प्रशासन एवं आई.एस.एम.जी. / Corporate Admin. & ISMG
भारत हेवी इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Limited
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Tender Reference no. AA: GAX:24: TAMS:101

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S. No.	Clause/ Section No.	Description	Section No.	Suggestion/ Query / Recommendation	Reply from BHEL
5		Land Border Sharing Clause	Suggestions by vendor	Components not used from countries, which sharing land border with India. Kindly accept this suggestion.	In this regard, a compliance to Order dated 19 July 2024 issued by DPIIT and condition related to Raw materials, components etc. sourcing from any bidder representing countries sharing land borders with India has been made mandatory in PQR clause no. 1.7 of Section -VI, Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V. Further, it is clarified that BHEL reserves the right to visit the respective OEM factory/manufacturing unit / project site at any stage of evaluation & during currency of contract. Bidder shall co-ordinate and facilitate the same. Travelling & lodging (if any) expenses for such visit shall be borne by BHEL. Further, Annexure-Z3 DECLARATION CERTIFICATE has also been added additionally in tender; covering this point..
6			Suggestions by vendor	Bidders to give an affidavit that while selecting OEMs of equipment's, Hardware and Software (proposed to be supplied for this tender) they have ensured that the Hardware, Software and Firmware (proposed to be supplied for this tender) selected are actual manufacturers and are not getting 3rd party manufacturing like branding and reselling in India through importing/trading and rebranding such equipment from country that shares a land border with India.	In this regard, a compliance to Order dated 19 July 2024 issued by DPIIT and condition related to Raw materials, components etc. sourcing from any bidder representing countries sharing land borders with India has been made mandatory in PQR clause no. 1.7 of Section -VI, Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V. Further, Annexure-Z3 DECLARATION CERTIFICATE has also been added additionally in tender, covering this point..
7			Suggestions by vendor	OEM to submit an affidavit that they own the source code of the Software and Firmware being supplied for all the models being supplied against this tender and does not reside in any country that shares a Land Border with India.	In this regard, a compliance to Order dated 19 July 2024 issued by DPIIT and condition related to Raw materials, components etc. sourcing from any bidder representing countries sharing land borders with India has been made mandatory in PQR clause no. 1.7 of Section -VI, Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V. Further, Annexure-Z3 DECLARATION CERTIFICATE has also been added additionally in tender, covering this point..
8			Suggestions by vendor	Bidders while selecting OEMs of equipment's (proposed to be supplied for this tender) to ensure that OEMs must not be: A. Blacklisted/Delisted/Debarred with any Government Entity in India. B. Getting 3rd party manufacturing/ OEM / ODM (which includes branding and reselling products manufactured by any 3rd party) from any company that is Blacklisted/Delisted/Debarred with any Government Entity in India or any other country sharing land border with India. C. Importing Equipment (in Semi Knocked Down Kits/Complete Knocked Down kits and re-assembling them under their brand), sub-assemblies from any company that is Blacklisted/Banned/Debarred with any Government Entity in India or any other Country sharing land border with India.	Annexure-Z3 DECLARATION CERTIFICATE (enclosed) is added.


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S. No.	Clause/ Section No.	Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
9		Suggestions by vendor	The tender is governed by Government of India (GOI) Rules and Regulations like General Financial Rules (GFR), DPIT Policies etc. Bidders to ensure all GOI guidelines are followed. Bidders while selecting OEMs of equipment's, Hardware and Software (proposed to be supplied for this tender) are to ascertain the documents submitted by OEMs carefully as they shall be held accountable for submitting any False Claims/Representations made by ANY OEMs of equipment's, Hardware and Software (proposed to be supplied for this tender) as per GOI guidelines. Bidders to read / well versed with the GFR of GOI.		Suitably covered in Annexure-Z "Compliance to Restrictions Under Rule 144 (Xi) Of GFR 2017" and Annexure-V "DECLARATION BY AUTHORISED SIGNATORY OF BIDDER". <u>Annexure-Z3 DECLARATION CERTIFICATE has also been added additionally in tender.</u>
10	Clause No 2.1s	SECTION-II GENERAL CONDITIONS OF TENDER	New Clause		Clause 2.1s of Section II(General Conditions of Tender) "The vendor should integrate & process the access and attendance punch data from any other Biometric reader/ device installed in BHEL or to be installed in future, The input data may come either from the biometric reader or the other biometric server if any cost is incurred on this account the same shall be be done on mutually agreed cost

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With reference to above mentioned NIT, following CORRECTIONS herein are being made:

S. No.	Clause/ Section No.	Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
1	Pg 119, Sl No 23	ANNEXURE 8 (Common Technical Specifications of Facial Recognition Device)	A/V Indicators: It shall be capable to provide a unique tone (70 db) and / or tonal sequence for various status conditions such as attendance marked / denied, access granted / denied, reader power condition etc and clear visual LED indications (Multi-color) shall be provided for various status conditions	Seek clarification on the exact requirements for tone and LED behavior for different conditions.	Revised Description i.e. S.No. 23 of Table of Annexure-8 is as follows: A/V Indicators must provide a unique tone (in range of 25-70 db) or tonal sequence for various status conditions, including attendance marked/denied, reader power status, etc., with multi-color (red & Green) LED indications. Tone range should be audible and adjustable as per respective BHEL unit instructions. <u>Green LED for allow/permitted condition, Red LED for Access denied.</u>
2	Pg 125, Annex 10, Sl. 10	ANNEXURE-10 (Turnstile)	Integration - Should be integrable / configurable with the Gate Access Face & Palm Type -III Reader	Request clarification on the definition and specifications of Palm Type-III Readers.	Its TYPO. Words "a. PALM TYPE-III are removed. (Revised Annexure 1 to 17 are attached)
3	Clause 4.3.1	SECTION-IV (SCOPE OF WORK)	4.3.1 Enrollment Unit (Annexure-7): b) Contractor should maintain sufficient number of cartridges to prepare Smart Cards as mentioned in the tender scope for the entire contact period along with the lease period.	How the contractor will calculate this	Revised Clause No. 4.3.1 (b) is as follows: Contractor should provide cartridges to prepare smart cards as mentioned in the tender scope for the entire contract/lease period. Approx. 60% of the estimated quantity of card shall be used in start of respective phase only. Remaining quantity of smart cards shall be used in due course of contract & lease period.
4	Sl No 6 of Annexure 7	ANNEXURE 7 (Technical Specifications of Enrollment Unit)	6. Communication Interface: High speed USB 3.0 or better	USB 2.0 is sufficient for such type of solution. Hence, USB 2.0 or better should be the specification.	Revised "Annexure 7. Technical Specifications of Enrollment Unit Point 6. Communication Interface: High speed USB 2.0 or better"
5	Sl No 10 of Annexure 8	ANNEXURE 8 (Common Technical Specifications of Facial Recognition Device)	10. RAM: Minimum LP-DDR4, Min 2 GB (5000 Face templates), minimum 4 GB (15000 Face templates)	Request you to please change this as: Minimum LP-DDR4, min 1 GB (5000 Face Templates), min 2 GB (15000 Face Templates)	Revised S.No. 10 of Annexure-8 is as follows: 10. RAM: Minimum LP-DDR4, Min 2 GB & above (for 5000 & 15000 Face Templates).
6	Sl No 10 of Annexure 8	ANNEXURE 8 (Common Technical Specifications of Facial Recognition Device)	10. RAM: Minimum LP-DDR4, Min 2 GB (5000 Face templates), minimum 4 GB (15000 Face templates)	We request the clause to be amended as follows: RAM: Minimum LP-DDR4, Min 1 GB (instead of 2GB) (5000 Face templates), minimum 2 GB (instead of 4 GB) (15000 Face templates). The storage of face templates primarily depends on efficient data encoding, compression algorithms, and hardware optimization. Industry standards and testing confirm that 1 GB of LP-DDR4 RAM is sufficient to handle up to 5000 face templates, while 2 GB of RAM can effectively manage up to 15,000 face templates without compromising performance. By lowering the RAM requirement to realistic levels (1 GB for 5000 templates and 2 GB for 15,000 templates), the hardware costs can be optimized, making the solution more cost-effective without impacting functionality.	Revised S.No. 10 of Annexure-8 is as follows: 10. RAM: Minimum LP-DDR4, Min 2 GB & above (for 5000 & 15000 Face Templates).
7	Clause 2.9.3 a	SECTION-II (GENERAL CONDITIONS OF TENDER)	Evaluation of Bids a. Facial Recognition devices (with Tower Light): Readers for PoC should be as per Annexure 9 - Type III, IV and V and should be demonstrated with functioning of Tower light. Readers should function in no network/offline mode. Demonstration of minimum 25 nos. of transactions from each Facial recognition reader (in 1:1, 1: N mode) and smart card reader for proving the specified parameters of the Technical specification like verification speed & Face Authentication Distance of the reader, FAR, FRR etc. Face Authentication Distance: as per technical specifications with Auto face detection, Wide angle detection for users of different heights. The vendor has to show/ prove the number of users & template stored in BHEL database for confirming the verification speed and user turnaround time. The	DB connection will take significant time as administrative & security aspect. Can we provide timestamped device log	Revised Clause No. 2.9.3 is as follows: a. Facial Recognition devices (with Tower Light): Readers for PoC should be as per Annexure 9 - Type III, IV and V and should be demonstrated with functioning of Tower light. Readers should function in no network/offline mode. Demonstration of minimum 25 nos. of transactions from each Facial recognition reader (in 1:1, 1: N mode) and smart card reader for proving the specified parameters of the Technical specification like verification speed & Face Authentication Distance of the reader, FAR, FRR etc. Face Authentication Distance: as per technical specifications with Auto face detection, Wide angle detection for users of different heights. The vendor has to show/ prove the number of users & template stored in Biometric Reader for confirming the verification speed and user turnaround time. NOTE: The following Clause added in POC (Annexure Z2) & Declaration (Annexure Z3) " BHEL reserves the right to check the country of origin for the components used in the devices supplied under the contract." Further, detailed process of POC is attached as Annexure Z2

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S. No.	Clause/ Section No.	Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
8	SI No 12 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	12. HBA: All FC adapters to be min. 8Gbps and in Redundant Mode	Need Change: If the solution requires FC adapters then min 8Gbps and in Redundant Mode to be supplied.	Revised Point no. 12 of table mentioned at Annexure-1 " In case, the solution requires FC adapters then min 8Gbps and in Redundant Mode to be supplied."
9	SI No 18 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	18. A systems management software capable of handling both OEM and non-OEM clients should be available with the HCI Solution.	Need Clarity	Revised S.No. 18 of Annexure-1. Revised SI No. 18 (System Management Software) of Annexure 1 is as follows: HCI solution should provide one single management console to manage DC and DR HCI setup including Compute, storage and networking.
10	SI No 26 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	26. Virtualization: 4. Virtualization software should provide visibility into storage throughput and latency of hosts and virtual machines that can help in troubleshooting storage performance issues. 9. The solution shall provide a centralized interface from which virtual machine across data centre can be configured, moved, monitored and administered 10. Virtualization software shall be able to dynamically allocate and balance computing capacity across collections of hardware resources aggregated into one unified resource pool with optional control over movement of virtual machines like restricting or moving VMs to run on selected physical hosts. 12. Should provide the ability to thin provision disks to avoid allocating all storage space upfront. 13. Hypervisor must support IPV4, IPV6/dual stack configuration. 14. Virtualization software should be offered with all above features & all the required licenses for operating the offered HCI cluster using management console.	Need Change: 4. Virtualization software should provide visibility into storage throughput and latency of hosts/ virtual machines that can help in troubleshooting storage performance issues. 9. The solution shall provide a centralized interface for all nodes in the cluster, from which virtual machine across the cluster can be configured, moved, monitored and administered 10. Virtualization software shall be able to control over movement of virtual machines like restricting or moving VMs to run on selected physical hosts. 12. Should provide the ability to thin provision disks to avoid allocating all storage space upfront. 13. Hypervisor must support IPV4, IPV6/dual stack configuration. 14. Virtualization software should be offered with all above features & all the required licenses for operating the offered HCI cluster using management console.	It is recommended that sub point No. 4,9,10,12 and 14 of SI. no. 26 of Table Mentioned at Annexure 1 remains same. Further sub point No. 13 of SI. no. 26 of Table Mentioned at Annexure 1 is revised as 'Hypervisor must support IPV4, IPV6 or dual stack configuration'.
11	SI No 37 of Annexure 8	Annexure 8 (Common Technical Specifications of Facial Recognition Device)	37. Make in India	Yes	Make in India word written anywhere in technical specifications/BOQ is REMOVED as Clause related to Make in India has been covered in PQR clause no. 1.7 of Section -VI , Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V. Accordingly, revised Annexure 1 to 17 is attached herewith and re-issued as Corrigendum.
12	SI No 21(Protection Level)	Annexure 10	IP 54, TUV/BIS certificate for IP rating to be submitted	Query raised by bidder during pre-bid meeting	SI. No 21 of the table mentioned in Annexure 10 is revised as follows "Minimum IP 44 an above, TUV/BIS certificate for IP rating to be submitted"

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CLARIFICATIONS - I (Date of ISSUANCE OF CLARIFICATIONS-06-01-2025)

Supply, Installation, Commissioning & Maintenance of Biometric System for Access Control and Attendance Recording on lease basis for 5 years for PAN INDIA

Tender Reference no. AA: GAX:24: TAMS:101

With reference to above mentioned NIT, following CLARIFICATIONS herein is being made:

S. No	Clause/ Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
1	Pg 20, Clause 2.9.3a	The vendor has also to show/ prove the Facial Recognition Enrolment time, Card Authentication Time & Card Read Range. Face recognition reader with GPRS System should support GPRS for wireless communication with application server web interface through https protocol.	Recommend using Ethernet for connectivity. Request removal of GPRS connection requirement from the specifications.	Description remain same for Clause 2.9.3a - Facial recognition enrollment time, authentication time, card range, and face recognition reader with GPRS. The system should support GPRS for wireless communication with the application server web interface through the HTTPS protocol. Further, it is clarified that SIM charge & Data Charges shall be borne by BHEL and GPRS can be internally or externally supported. In case of external support, Same shall be enclosed in a case with enrollment unit.
2	Pg 21, Clause 2.9.3b	Turnstile: Before the validation is done the turnstile should be in locked mode. On successful reader validation, the turnstile should be automatically unlocked and we should be able to rotate the turnstile in forward mode only. After completion of one arm rotation, the turnstile should be locked. The turnstile should not rotate in the reverse mode. The swipe time of this transaction to be recorded as the time when the rotation of turnstile has been completed.	Transaction time should align with entry time. Request modification to accommodate time differences between authentication and turnstile rotation.	Description remain same for Clause 2.9.3b- Turnstile should remain locked before validation. On successful reader validation, it should unlock and rotate forward only. After one or more rotations, it should relock. Reverse rotation is not allowed, and the swipe time should be recorded when rotation is complete. It is clarified that the swipe time to be taken into account will be as registered by the reader after successful validation & complete rotation of the turnstile.
3	Pg 64, Clause 4.3.2d	The readers should function in 100% offline mode without dependency on network both at the gates and work places. The biometric validation should be done within the reader in 100% offline mode	Offline operation feasible, but adding new users in the application won't sync without data transfer. Ensure power availability.	Description remain same for Clause 4.3.2d- Readers must function 100% offline without network dependency at gates and workplaces. Biometric validation should also be performed in offline mode. Further, it is clarified that Power shall be made available by BHEL. New users can be sync. after restoration of network/power.
4	Pg 67, Clauses 4.4.2.7 & 4.4.3.6	Any modification/customisation to the existing software to be carried out by contractor without any additional cost implication.	Provide details of the existing software to evaluate the effort required for modifications.	Description remain same for Clauses 4.4.2.7 & 4.4.3.6 i.e. Any modifications or customizations to the existing software must be carried out by the contractor without additional cost implications. Further, it is clarified that, existing means new software installed as part of this tender.
5	Pg 72 & 73, Clause 4.10	SHIFTING OF READERS TO NEW LOCATION / SHIFTING OF TURNSTILE ALONG WITH READER TO NEW LOCATION	Specify the make and model of the turnstiles and existing readers. Confirm integration with new software.	Description remain same for Clause 4.10 & Pg 73 i.e. SHIFTING OF READERS TO NEW LOCATION / SHIFTING OF TURNSTILE ALONG WITH READER TO NEW LOCATION Further, it is clarified that, this shifting refers to readers and turnstiles installed as part of this tender.
6	Pg 120, SI No 27	Battery Backup Battery Refresh: SWF (Sealed Maintenance Free) Batteries for backup of min. 4 hours. Should be able to control EM locks.	Request clarification on expected battery backup behavior and control requirements.	Description remain same i.e. SWF (Sealed Maintenance Free) Batteries for backup of min. 4 hours. Should be able to control EM locks. No Change in S.No. 27 of Table of Annexure-8. Already clarified in the description
7	Pg 121, SI No 39	Bi-directional access: Provision to use same reader for both IN as well as OUT in multi-shift environment on 24x7 basis i.e. in same workplace there may be different shifts going on and logic to be built based on shift timings of a particular employee / group of employees	Request detailed explanation of the logic and configuration requirements for multi-shift usage.	Description remains same: Bi-directional access: Provision to use same reader for both IN as well as OUT in multi-shift environment on 24x7 basis i.e. in same workplace there may be different shifts going on and logic to be built based on shift timings of a particular employee / group of employees. Logic will be provided by BHEL, as per unit requirement.
8	Pg 121, SI No 40	Functionality in offline mode.	Readers can function offline, but new user additions won't sync. Ensure power availability.	No Change Readers must function 100% offline without network dependency at gates and workplaces. Biometric validation should also be performed in offline mode. Also, it is clarified that Power shall be made available by BHEL. New users can be sync. after restoration of network/power.

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S. No.	Clause/ Section No.	Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
9	Clause 1.1.2	SECTION-VI (PRE-QUALIFICATION REQUIREMENT (PQR))	1.1.2 Similar Work Experience The Bidder shall have experience of having successfully completed similar works or satisfactorily executed similar minimum one year period in a rolling project, during last 7 years, ending on last day of the month previous to the date of opening of bids. The Bidder shall submit a copy of the contract award certificate and the work order of the project should be in the name of the bidder. The order copies of above mentioned projects in completion/ experience certificate along with the offer is to be submitted as per Annexure - F. Verification of genuineness of PQR documents shall be obtained by BHEL from the respective customer. The value of the works completed (proof of completion to be submitted) should be as follows: i. One similar work of total value not less than INR 9.29 Crore OR ii. One similar work of total value not less than INR 4.4 Crore iii. Three similar work of total value not less than INR 4.4 Crore Definition of Similar Work/s: Similar works shall be defined as: Supply, installation, testing, commissioning and maintenance of Biometric based Access Control & Attendance Management System (including server hardware, networking and /or Barriers/Turnstile etc.) i) One similar work of total 6750 Users for Central/ State Govt./ PSU/ Public/ Private Limited Companies ii) One similar work of total 6750 Users for Central/ State Govt./ PSU/ Public/ Private Limited Companies iii) Two similar work of total 4500 Users for Central/ State Govt./ PSU/ Public/ Private Limited Companies iv) Three similar work of total 2250 Users for Central/ State Govt./ PSU/ Public/ Private Limited Companies. The bidder shall be required to submit work order and performance certificate.	We request the clause to be amended as follows: i) Completion of one similar work for a total of 15,000 users for Central/ State Government, PSUs, or Public/ Private Limited Companies. OR ii) Completion of two similar works for a total of 10,000 users for Central/ State Government, PSUs, or Public/ Private Limited Companies. OR iii) Completion of three similar works for a total of 5,000 users for Central/ State Government, PSUs, or Public/ Private Limited Companies. The bidder shall be required to submit a valid work order and performance certificate as proof of compliance. This amendment is proposed considering the current ecosystem of BHEL, where the major plant strength and user capacity are typically a minimum of 10,000. Additionally, given the tender's higher value compared to similar projects and the complexity involved, the proposed clause ensures a suitable threshold for bidder eligibility while maintaining alignment with project requirements.	No Change in this point of PQR
10	Clause 1.2	Section VI 6.0 Pre-qualification Requirement (PQR)	1.2: Average Annual Financial turnover of the firm for last 3 Financial years up to 31st March 2024 must be at least Rs. 18.17 Crores.	We request the clause to be amended as follows: "The average annual financial turnover of the firm for the last three financial years, up to 31st March 2024, must be at least ₹50 Crores." Rationale for Amendment: This tender is structured on a CAPEX model with a rental basis for five years. The bidder is required to invest a minimum of 25% of the estimated project value upfront. Firms with an annual turnover of less than ₹50 Crores may face financial constraints, potentially impacting their ability to implement the project effectively. Ensuring a minimum turnover of ₹50 Crores will help guarantee the bidder's financial stability and capacity to sustain the project over the entire five-year term.	No change
11	Clause 2.1 p	SECTION-II (GENERAL CONDITIONS OF TENDER)	p) The products whose remaining end-of-support is less than 07 years should not to be offered.	This is feeling like instruction: Please make this point as compulsory and bidder should submit a letter from the different OEM for the same	It is clarified that this is already a compulsory point as per part of GCC. So, no relaxation on this ground is given.
12	Clause 2.31. 6	SECTION-II (GENERAL CONDITIONS OF TENDER)	2.31.6 The validity of Bank Guarantees towards Security Deposit shall be valid till actual completion of work + Guarantee Period + 3 months. The same shall be kept valid by proper renewal till the acceptance of Final Bills of the Contractor, by BHEL	This is for 1 year Contract Period or 5 years, Since you are apaying in opex model: This is for 1 year or entire 5 year	BG validity is for contract period + lease period + 03 months. So, no change.
13	Clause 1.7	SECTION-VI PRE-QUALIFICATION REQUIREMENT (PQR)	1.7: Raw materials, components etc. will not be sourced from any bidder representing countries sharing land borders with India, unless such a bidder is registered with the Competent Authority in India. Contractor would be bound by the guidelines of GoI being issued time to time. In this regard, (Bidder need to submit Annexure- R in this regard)	Asked to Share Annexure R: How BHEL will ensure the same. What if BHEL team will visit the OEM factory and manufacturing plant during the technical evaluation	In this regard, a compliance to Order dated 19 July 2024 issued by DPIT has been made mandatory in PQR clause no. 1.7 of Section -VI, Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V. Further, it is clarified that BHEL reserves the right to visit the respective OEM factory/ manufacturing unit / project site at any stage of evaluation & during currency of contract. Bidder shall co-ordinate and facilitate the same. Travelling & lodging (if any) expenses for such visit shall be borne by BHEL. Further, it is clarified that BHEL reserves the right to check the country of origin for the components used in the devices supplied under the contract.
14	SI No 3 of Table 9.1 SI No 3 of Table 9.2	ANNEXURE - 9 (Facial Recognition Device)	Two types of Devices: Why BHEL is asking for 5000 Faces and 15000 Faces Devices	Why not make the Face template device Common with single face template 15K: The Cost difference between the 5K Face and 15K face template is not very high but it will facilitate the contractor to manage Hardwares more efficiently	No change
15	SI No 3 of Table 9.1	ANNEXURE - 9 (Facial Recognition Device)	Min 5000	Why to have 2 types of devices bifurcation based on just user capacity. As it will hinder the idea of uniform solution across all departments/location. This will also add to the devices specific maintenance, troubleshooting and hampers learning curve for the manpower involved due to differential types. Hence, requesting to add single type of standard, Enterprise Grade device which remains uniform across such scalable manpower enterprises (like BHEL) must be the preferred choice.	No change
16	SI No 38 of Annexure 8	Annexure 8 (Common Technical Specifications of Facial Recognition Device)	Clause 38: Operating system: Linux / Android	In critical applications such as enterprise systems, biometric solutions, or government infrastructures, Linux provides a stable and secure foundation to prevent unauthorized access, safeguard sensitive data, and ensure system integrity. Its emphasis on security and control makes it the ideal choice for environments where safety and reliability are paramount. Hence, requesting to have only Linux as the preferred choice.	No change

मो: बाकशा / MEENA THAKRAN
प्रबंधक / Manager

कॉर्पोरेट प्रशासन एवं आई एल एस जी / Corporate Admin. & ISMG
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सीरि फोर्ट हाउस / BHEL House, Siri Fort
नई दिल्ली-110049
दिनांक: 26/07/2024

S. No	Clause/ Section No.	Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
17	Clause 2.9.3 a	SECTION-II (GENERAL CONDITIONS OF TENDER)	Evaluation of Bids a. Facial Recognition devices (with Tower Light): Readers for PoC should be as per Annexure 9 - Type III, IV and V and should be demonstrated with functioning of Tower light. Readers should function in no network/offline mode. Demonstration of minimum 25 nos. of transactions from each Facial recognition reader (in 1:1, 1: N mode) and smart card reader for proving the specified parameters of the Technical specification like verification speed & Face Authentication Distance of the reader, FAR, FRR etc. Face Authentication Distance: as per technical specifications with Auto face detection. Wide angle detection for users of different heights. The vendor has to show/ prove the number of users & template stored in Biometric Reader for confirming the verification speed and user turnaround time.	DB connection will take significant time as administrative & security aspect. Can we provide timestamped device log	Revised Clause No. 2.9.3 is as follows: a. Facial Recognition devices (with Tower Light): Readers for PoC should be as per Annexure 9 - Type III, IV and V and should be demonstrated with functioning of Tower light. Readers should function in no network/offline mode. Demonstration of minimum 25 nos. of transactions from each Facial recognition reader (in 1:1, 1: N mode) and smart card reader for proving the specified parameters of the Technical specification like verification speed & Face Authentication Distance of the reader, FAR, FRR etc. Face Authentication Distance: as per technical specifications with Auto face detection. Wide angle detection for users of different heights. The vendor has to show/ prove the number of users & template stored in Biometric Reader for confirming the verification speed and user turnaround time. NOTE: The following clause added in POC (Annexure Z2) & Declaration (Annexure Z3) " BHEL reserves the right to check the country of origin for the components used in the devices supplied under the contract." Further, detailed process of POC is attached as Annexure Z2
18	SI No 34 of Annexure 8	ANNEXURE 8 (Common Technical Specifications of Facial Recognition Device)	Certifications:CE, FCC, RoHS, BIS	Is all certification Mandatory? FCC & RoHS will be very time consuming.	No change
19	Clause 1.1.2	SECTION-VI (PRE-QUALIFICATION REQUIREMENT (PQR))	Similar work experience: The Bidder shall have experience of having successfully completed similar works or satisfactorily executed similar works for minimum one-year period in a running project, during last 7 years, ending on last day of the month previous to the one in which tender is invited in any one of the following (including GST).	As per our understanding that if project completed during last 07 years will be accepted as PQR.	No Change. Already clarified in the description. Further, vendor was explained during pre-bid.
20	SI No 1 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	1. Hyper-Converged Infrastructure: Proposed solution must be based on converged IT infrastructure platform that integrates storage, computer, networking, hypervisor, real-time deduplication, compression, and optimization along with high availability, powerful data management, data protection, and disaster recovery capabilities in a standard x86 server building block	Need Change: Proposed solution must be based on converged IT infrastructure platform that integrates storage, computer, networking, hypervisor, real-time deduplication or compression, and optimization along with high availability, powerful data management, data protection, and disaster recovery capabilities in a standard x86 server building block	Point no. 1 of Table Mentioned at Annexure1 remains same ie. Proposed solution must be based on converged IT infrastructure platform that integrates storage, computer, networking, hypervisor, real-time deduplication, compression, and optimization along with high availability, powerful data management, data protection, and disaster recovery capabilities in a standard x86 server building block.
21	SI No 9 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	9. Storage:Minimum 20 TB usable storage capacity for complete HCI solution. Also, Virtual server Instance Data Deduplication and compression feature to be available across the virtualization cluster.	Need Change: Minimum 20 TB usable storage capacity for complete HCI solution. Also, Virtual server Instance Data Deduplication / compression feature to be available across the virtualization cluster.	Point no. 9 of Table Mentioned at Annexure1 remains same ie. Minimum 20 TB usable storage capacity for complete HCI solution. Also, Virtual server Instance Data Deduplication and compression feature to be available across the virtualization cluster.
22	SI No 17 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	Remote Facility: 3. Offered hyper-converge appliance shall have the ability to manage all aspects of the Hyper-convergence for all sites through Virtualization Manager of a given Hyper-Converge. 5. Offered Hyper-converge shall be able to globally manage Backup Policies per Datastore or per VM and shall be able to control all of them directly through virtualization manager of given hypervisor.	Need Change: 3. Offered hyper-converge appliance shall have the ability to manage all aspects of the Hyper-convergence through Virtualization Manager of a HCI Cluster. 5. Offered Hyper-converge shall be able to globally manage Backup Policies per Datastore or per VM.	Point no. 17 of Table Mentioned at Annexure1 remains same. Further it is clarified that "All Sites" means " both DC at Hyderabad and DR at Haridwar"
23	SI No 19 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	Pre Failure Notifications: Pre-Failure alerts covering processor, memory, HDD, Power Supplies and Fans	Need Change: Proactive Health Check by the OEM on quarterly basis for Hardware components.	Point no. 19 of Table Mentioned at Annexure1 remains same
24	SI No 22 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	22. Security: Bidder shall be responsible for periodic Vulnerability Assessment, Penetration Testing and Server hardening of all the associated servers and applications.	Need Clarity	Point no. 22 of table mentioned at Annexure-1 remains same i.e. 22. Security: Bidder shall be responsible for periodic Vulnerability Assessment, Penetration Testing and Server hardening of all the associated servers and applications. It is further clarified that "VAPT shall be conducted by BHEL from time to time and bidder needs to fix those vulnerabilities as per severity and mutually agreed timelines"
25	SI No 24 of Annexure 1	ANNEXURE-1 (1.1 HCI Solution for Data Centre Requirements)	24. Capacity Augmentation: Bidder shall support for incorporating/integrating any additional server node, provided by BHEL, in the existing infrastructure.	Need Clarity	Point no. 24 of table mentioned at Annexure-1 remains same i.e. Capacity Augmentation: Bidder shall support for incorporating/integrating any additional server node, provided by BHEL, in the existing infrastructure. It is further clarified that " Any additional node shall be procured by BHEL with required licenses separately without any extra cost to the contractor"

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S. No	Clause/ Section No.	Description	Suggestion/ Query / Recommendation	Reply from BHEL
26	SI No 9 of Annexure 8	9. Processor: Minimum ARM Cortex/Intel/AWD Quad Core, 64-Bit, 1.4GHz Processor release year should on or after 2021	Minimum ARM Cortex/Intel/AWD Quad Core, 64-Bit, 1.4GHz Processor release year should on or after 2021	Point no. 9 of table mentioned at Annexure-8 remains same. No Change.
27		Work experience	System Integrator or OEM any one of work experience should be consider.	No change/ Not to be considered.
28	OEM Eligibility Criteria	In house R&D Centre in India	The products must be researched, designed, and manufactured in India. The Biometric OEM must have its own in-house, government-registered R&D facility in India, and should not outsource any development or research activities, submit the undertaking on OEM Letterhead. Also, R&D registration certificate issued by a government body must be attached as proof.	No change/ Not to be considered.
29	Technical Criteria	Compliance to General Data Protection Regulation	Biometric Software should comply with General Data Protection Regulation Act. Report to be attached.	Tender already states compliances with all relevant legal provisions. Annexure 1 (Non Disclosure Agreement-Each Party will comply with all applicable data protection laws and regulations.)
30		GDPR Compliant	The readers should be GDPR Compliant, Kindly accept this suggestion.	Tender already states compliances with all relevant legal provisions. Annexure 1 (Non Disclosure Agreement-Each Party will comply with all applicable data protection laws and regulations.)
31		Device Algorithm	Algorithm should be NIST listed, Kindly accept this suggestion.	No change/ Not to be considered.
32		IK06 Vandal Protection	the device should have IK06 vandal protection rugged protection as it is expensive device and enhances its longevity, making it suitable for high-traffic or exposed environments, kindly accept this suggestion.	No change/ Not to be considered.
33		Walk-through feature.	The Device should be able to support the Walk-through feature, Kindly accept this suggestion.	No change/ Not to be considered.
34		Lux	The device should have up to 25000 lux, Kindly accept this suggestion.	No change/ Not to be considered.
35		Image Logs	Face Reader should have 20,000 Image logs capacity which enables tracking changes in a user facial expression making it more efficient and reliable to work so kindly accept this suggestion.	No change/ Not to be considered.
36		Multi Face Detection	The device should support multi face authentication which can reduce false rejections or acceptances, improving overall accuracy and reliability, kindly accept this suggestion.	No change/ Not to be considered.
37		Bidders while selecting OEM's of equipment's, Hardware and Software (proposed to be supplied for this tender) to ensure that OEM's must be genuine and as per definition below: A. OEM is defined as a company that has its own manufacturing setup for the production of equipment's (not assembly / white labeled) required in this tender and is currently manufacturing the offered models under their own brand in their own manufacturing setup. B. OEM getting 3rd party manufacturing for offered products will not be considered as eligible OEM. C. Buyer reserves the rights to check that the models quoted are currently being manufactured at the OEM own facilities for manufacturing by visiting the premises, design and IPR's held in the name of OEM's name and may ask for any supportive documents for verifying the claims.		No Change
38			OEM should have been manufacturing offered / similar technology equipment's for at least 5 Years (proof to be submitted).	Already covered suitably in PQR
39			Bidders to give an affidavit that while selecting OEM's of equipment's, Hardware and Software (proposed to be supplied for this tender) they have ensured that the Hardware, Software and Firmware (proposed to be supplied for this tender) selected are actual manufacturers and are not getting 3rd party manufacturing and like branding and reselling in India through importing/trading and with India.	In this regard, a compliance to Order dated 19 July 2024 issued by DPIIT has been made mandatory in PQR clause no. 1.7 of Section -VI , Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V
40			OEM to submit an affidavit that they own the source code of the Software and Firmware being supplied for all the models being supplied against this tender and does not reside in any country that shares a Land Border with India.	In this regard, a compliance to Order dated 19 July 2024 issued by DPIIT and condition related to Raw materials, components etc. sourcing from any bidder, repeated to the tender clause no. 1.7 of Section-VI, Annexure-R submission is mandatory and also covered in Point no. (vi) of clause 5.5 of section-V
41	Technical Criteria	MAC ID in the name of OEM	The MAC ID of the biometric devices must be registered in the name of the OEM (Original Equipment Manufacturer) to validate authenticity and traceability.	Already covered in Technical specifications भारत री इलेक्ट्रिकल्स लिमिटेड / Bharat Heavy Electricals Limited कोयल्ट म्यासुत ख और एल एन जी / Corporate Admin. & ISMG श्री एच ई एल हाउस, सीरी फोर्ड / BHHEL House, Siri Fort नई दिल्ली - 110049 / New Delhi-110049

Access Control Business Rules for HPEP and PE&SD Units, Hyderabad

- Turnstiles to be in locked mode (24X7).
- Face recognition (FR) readers should unlock the turnstiles after successful validation.
- The unlocked turnstile should operate only in the forward direction and the swipe of the person should be recorded into the system.
- Employee can enter through any gate/turnstile and leave through any other gate/turnstile. This should be permissible. However, permissions for entry /exit should also be restricted as per business rules.
- If a user is exiting the gate during allocated shift time except break and shift end time, then the user should have permission for special movements that are granted from the front-end applications or should swipe-out through the FR reader by operating one of the 2 key codes as per the business rule and system should authenticate him accordingly and record the movement with special key codes operated for exit movement.

To facilitate employee movement into/out of factory area, the following two key codes should be available on the reader for usage. No permission is required from the front-end application for operating the below mentioned key codes.

1. Emergency
2. Personal Pass (For Workmen)

In addition to the above, the following movements to be facilitated by the reader. The permissions for these movements shall be granted in the front-end web-based application which shall be pushed to the reader on daily basis through a scheduled job at early hours:

1. Free movement (F)
2. Special movement (M)
3. Union pass (U)
4. Sports (S)
5. Nursing Break (N)
6. PwD employees
7. Personal Pass (P) (For Executives and Supervisors)

Sl no	Special Permission type	Permission granted for a period (Yes/No)	Indicator	Permission pushed from Front end application to reader	Remarks
1	Emergency	No	NA	NA	To swipe in/out in emergency situation.
2	Sports	Yes	S	Yes	NA
3	Union	Yes	U	Yes	NA
4	Special movement	Yes	M	Yes	NA
5	Nursing Break	Yes	N	Yes	NA
6a	Personal Pass	Yes	P	Yes	For Executives and Supervisors
6b	Personal Pass	No	NA	NA	For workmen; They will operate a key code on the reader
7	Free Movement	Yes	F	Yes	Applicable for executives in E5 and above grade
8	PwD employees	Yes	D	Yes	Applicable for persons with disabilities (PwD)

Meena Thakran
06/10/2023
मीना ठाकरान / MEENA THAKRAN
प्रबंधक / Manager

Annexure - Z2 POC Requirement as per Clause No 2.9.3 of Section II (General Conditions of Tender)	
SL. NO.	PARAMETERS
1	Facial Recognition devices/ readers should function in no network/offline mode. Demonstration of minimum 25 nos. of transactions from each Facial recognition reader (in 1:1, 1: N mode) and smart card reader for proving the specified parameters of the Technical specification like Authentication Time & User Turnaround Time of the reader, FAR, FRR etc. The vendor has to arrange actual or dummy facial template of 5000 or 15,000 user as per technical specification to prove Authentication Time & User Turnaround Time of the reader. BHEL will not arrange the same for the bidders.
2	Face Authentication Distance: as per technical specifications with Auto face detection, Wide angle detection for users of different heights.
3	The vendor has to show/ prove the number of users & template stored in Biometric Reader as per device type for confirming the verification speed and user turnaround time.
4	The vendor has also to show/ prove the Facial Recognition Enrolment time, Card Authentication Time & Card Read Range.
5	Face recognition reader with GPRS System should support GPRS for wireless communication with application server web interface through https protocol.
6	Reader shall confirm to biometric technology like Auto Face detection, Fake Face Detection, Auto Push, real-time face recognition and shall support high speed processing.
7	It must be capable of detecting and authenticating the face either through device capability or inbuilt LED light in extreme dark/ daylight environment.
8	Live Face Detection Method - System should be intelligent enough to accept only live faces and prevent security breach by a face in a recorded video, live stream, a photograph or any other means.
9	Display of the readers should accommodate all the parameters as mentioned in technical specs. and readable in the mentioned distance of face recognition.
10	Facial log (photo of user) must be stored along with punch data as per industry practice to enquire the FAR situations.
11	There should be option in software for checking deduplication (already enrolled as a different entity) & Blacklist/ suspended person.
12	The bidder shall prove the working of keypad based Biometric readers along with software for accommodating various permissions to allow & track the entry & exit through a gate pass.
13	The device should be customisable to display/accommodate message/ instructions as per unit Time office requirement. The device should be operable to stop punching for a particular reader after a time period as per requirement in access gates.
14	BHEL reserves the right to check the country of origin for the components used in the devices supplied under the contract.

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नई दिल्ली- 110049 / New Delhi-110049

DECLARATION CERTIFICATE
(to be submitted along with Bid)

Dear Sir/Ma'am,

Please find herewith our offer in line with requirement of BHEL's Tender document. We confirm that:

1. We confirm that bid complies with the total techno-commercial requirements / terms and conditions of the bidding document and subsequent addendum / corrigendum (if any) without any assumptions.
2. We confirm that OEMs whose equipment have been offered by us (including us if applicable) are not Blacklisted/Delisted/Debarred with any Government Entity in India.
3. We confirm that No product/part installed has been offered from any company which shares land border with India; as part of our bid.
4. We further agree that "BHEL reserves the right to check the country of origin for the components used in the devices supplied under the contract." We shall facilitate such checking.
5. We also commit to adhere BHEL Fraud Prevention Policy, BHEL Guidelines on Suspension of Business Dealings, BHEL Guidelines for Reverse Auction.
6. We hereby confirm that we have gone through and understood the bidding document and that our bid has been prepared accordingly in compliance with the requirement stipulated in the said document.
7. We further confirm that we have quoted prices in price bid considering detailed description of scope of work. We confirm that % quoted by us includes costing for all works/activities/supply etc. as mentioned in this tender document.
8. We declare that the statement made and the information provided in our offer is true and correct in all respect. In case, it is found that the information/ documents provided by us are incorrect/ false, our application/offer/tender shall be rejected by BHEL without any reference to us.

Thanking you,

Very Truly Yours,

Signature

With name, Designation & seal of the firm


गोमिना ठाकरान / MEENA THAKRAN
अधीक्षक / Manager
कॉर्पोरेट प्रशासन एवं आईएसएमजी / Corporate Admin. & ISMG
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ANNEXURE -D
REVISED LIST OF NODAL OFFICERS

Phase	Unit/ Region/ Division	Nodal Officer Details
Phase -I	Corporate Research & Dev., Hyderabad	Ms. Susmita Borkar, Sr. Manager, 8886974455 , susmita.borkar@bhel.in Sh.M Satya Prakash, Sr. Manager, 9490499572, msprakash@bhel.in
Phase -I	Delhi-NCR Based Offices	Sh. Shivam Garg, Engineer, 8800257030 , shivam@bhel.in Sh. Indrajeet Chauhan, Engineer, 9958443582, Indrajeetc@bhel.in
Phase -I	Electrical Mach. Repair Plant, Mumbai	Sh. Rajeev Kumar, Engineer, 9769098417, rajeev.kumar@bhel.in
Phase -I	Electronics Division, Bangalore	Ms. Chandrika Kumar Shankar, Sr Manager, 9538000184, chandrika.ks@bhel.in Ms. Juhi, Dy. Officer, 9565409877, juhi@bhel.in
Phase -I	Heavy Electrical Equip. Plant ,Haridwar & Central Foundry Forge Plant , Haridwar	Sh. Nikhil Katiyar, Dy. Manager, 8192000442, Nikhil.katiyar@bhel.in Sh. Praveen Kumar , Dy. Manager, 9489442842, pkc@bhel.in
Phase -I	Heavy Electrical Plant, Bhopal	Sh. Paritosh Kumar Dalei, Manager, 9406903686, paritosh1@bhel.in
Phase -I	Heavy Power Equipment Plant, Hyderabad & Project Engg & Systems Divn , Hyderabad	Sh. M Vijay, Sr Manager, 9491074044, vijaym@bhel.in Sh. P L Bhaskar, Manager, 9490760329 , bhaskarpl@bhel.in
Phase -I	Industrial Systems Group, Bangalore	Sh. Rushil Rajendra Sanghvi, Executive, 9879677795, rushil@bhel.in
Phase -I	PS - Northern Region	Sh. Manoj Kumar Engineer,7408408803, manoj.kmr@bhel.in Sh. Chaman, Dy. Officer,8053217289, chaman@bhel.in

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Phase	Unit/ Region/ Division	Nodal Officer Details
Phase -I	Regional Operations Division-Bhubaneshwar & PS-Spares & Services Business-Bhubaneshwar	Sh Amar Kumar Nayak, Dy. Officer, 9437183660 , AMARKUMAR.NAYAK@BHEL.IN
Phase -I	Regional Operations Division-Mumbai & PS-Spares & Services Business-Mumbai	Sh. Sarin Hariraj Sondawale, Sr. Manager, 7499505309, sarin@bhel.in
Phase -I	Solar Business Division, Bangalore	Ms.Sharda Durga Parameshwaran, Manager , 9916414036, SHARDA.DURGA@BHEL.IN
Phase-II	Boiler Auxiliaries Plant ,Ranipet	Sh,M Kanagaraj , Sr Manager, 9443853110 , KANAGARAJ@BHEL.IN
Phase-II	Component Fabrication Plant, Rudrapur	Sh. Himanshu Martolia, Manager, 9634156780, himanshum@bhel.in Ms. Bhawna Srivastava, Dy Officer, 8006988488, bhawna@bhel.in
Phase-II	Fab,Stamping & Insulator Plant, Jagdishpur	Sh. Ramakant Verma, Manager, 9455112839, ramakant.verma@bhel.in Sh. Tabish , Dy. Manager, 9487237848, tabish@bhel.in
Phase-II	Heavy Equipment Repair Plant, Varanasi	Sh. Abhishek Srivastava, Dy. Manager, 9517211149, abhisheksrivastava@bhel.in
Phase-II	Heavy Plates & Vessels Plant, Vizag	Sh. V Veerababu, Sr. Manager, 9640378657, veeruv@bhel.in Sh. G Chandrashekar , Sr Manager, 9985315840, gcsmpa@bhel.in

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Phase	Unit/ Region/ Division	Nodal Officer Details
Phase-II	High Pressure Boiler Plant, Trichy & Seamless Steel Tube Plant, Trichy	Sh. Emil Richard Singh, Sr Manager, 9486704587, emil@bhel.in Sh. D Srinivasan, Sr Engineer, 9282407897, dsvasan@bhel.in
Phase-II	Industrial Valves Plant, Goindwal	Sh. Pankaj Kumar, Executive, 7500212702, pankajsre@bhel.in Sh. Sachin Kumar Sharma, Manager, 9721527560, sachin.kumar@bhel.in
Phase-II	Power Plant Piping Unit, Thirumayam	Sh. N V Raja Vikram, Manager, 9443590398, nvrajavikram@bhel.in Sh. Deepu Thomas, Manager, 9489202805, dthomas@bhel.in
Phase-II	PS - Eastern Region	Sh. Abhishek Kumar Shaw, Sr. Manager, 9836369767, akshaw@bhel.in Ms. Anjana Kumari, Sr. Manager, 9490760271, anjana@bhel.in
Phase-II	PS - Southern Region	Sh. Karthikeyan P, Sr. Manager, 044-24589515, karthikeyan.p@bhel.in Ms. Simduja Venkatraman, Executive, 9167282670, simduja@bhel.in
Phase-II	PS - Western Region	Ms. Priyanka Bargaiya, Executive, 7000010892, pbargaiya@bhel.in Sh. Subodh Chandra Pawar, Dy. Officer, 9425684820, subodhcp@bhel.in
Phase-II	Transformer Plant, Jhansi	Sh. Parvinder Singh, Engineer, 9651910122, Parvinder.singh@bhel.in

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ANNEXURE- 1 TO 17 DETAILS

Sl. No.	ANNEXURE	DESCRIPTION
1	Annexure 1	HCI Solution for Data Centre/ Data Recovery Requirements
2	Annexure 2	Database
3	Annexure 3	Load Balancer
4	Annexure 4	TOR & Management Switches
5	Annexure 5	Backup Solution
6	Annexure 6	Centralized Software
7	Annexure 7	Enrollment Unit
8	Annexure 8	Common Technical Specifications of Facial Recognition Device
9	Annexure 9	Facial Recognition Device
10	Annexure 10	Turnstile
11	Annexure 11	Boom Barrier
12	Annexure 12	Tower Lights
13	Annexure 13	Smart Card
14	Annexure 14	Miscellaneous Items
15	Annexure 15	Installation and Commissioning
16	Annexure 16	Auto Swing Barriers
17	Annexure 17	EM Lock

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06/11/25

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ANNEXURE-1

1.1 HCI Solution for Data Centre Requirements

SR NO	Characteristic	Specification	Compliance
	Make & Model	to be specified by vendor	
1	Hyper-Converged Infrastructure	Proposed solution must be based on converged IT infrastructure platform that integrates storage, computer, networking, hypervisor, real-time deduplication, compression, and optimization along with high availability, powerful data management, data protection, and disaster recovery capabilities in a standard x86 server building block	
2	HCI Nodes	Minimum 3 Nodes Configuration with HCI Software Solution with N+1 nodes ensure high availability for achieving usable resources across cluster in the event of 1 physical node failure.	
3	CPU	Latest generation Intel Xeon/AMD EPYC processor with minimum 20-cores per processor with minimum base frequency 2.00GHz	
4	Processors	Minimum 2 Processors per node	
5	Cache	30 MB Cache or higher	
6	Memory	Minimum 128 GB per node	
7	Network Interface	Minimum 10G Ethernet Card - In Redundant Mode. No Single Point of Failure Minimum 4*10G Ethernet Ports per node.	
8	Graphics	Integrated Graphics Controller with 64 MB embedded video SDRAM	
9	Storage	Minimum 20 TB usable storage capacity for complete HCI solution. Also, Virtual server Instance Data Deduplication and compression feature to be available across the virtualization cluster.	
10	System Cooling/Fan	4x 80 mm heavy duty fans with PWM fan speed controls. Each node to have dedicated non-shared dual-PSU's with redundant fan.	
11	PCI Slots	Minimum of 6 * PCI Express Expansion Slots per node should be supported	
12	HBA	In case, the solution requires FC adapters then min 8Gbps and in Redundant Mode to be supplied	
13	Operating Environment	Op Temp Range: 50° to 77°F (10° to 25°C) Non-Op Temp Range: -40° to 158°F (-40° to 70°C) Op Humidity Range (non-condensing): 8% to 90% Non-Op Humidity Range: 5% to 95%	
14	Chassis type	Rack	
15	Supported Operating System	The following operating systems should be supported on the server:- Latest version of Microsoft Windows Server/Linux-preconfigured, with requisite enterprise licenses	
16	Clustering	Required Clustering Services/Software for supplied OS	

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SR NO	Characteristic	Specification	Compliance
17	Remote Facility	1. Offered Hyper-converge solution shall support VM-centric management through a single pane of glass via the virtualization manager of given hypervisor. 2. Virtualization Manager of given Hypervisor shall be able to manage single or multiple clusters through single management console of hypervisor. 3. Offered hyper-converge appliance shall have the ability to manage all aspects of the Hyper-convergence for all sites through Virtualization Manager of a given Hyper-Converge. 4. Offered Hyper-converge shall be able to expose / connect to existing customer servers for hosting VMs and applications while taking advantage of the functionality of the solution 5. Offered Hyper-converge shall be able to globally manage Backup Policies per Datastore or per VM and shall be able to control all of them directly through virtualization manager of given hypervisor. 6. Hyper-converge solution should have single upgrade management console to simplify upgrade of Hyper-converge Software, hypervisor and ability to roll back upgrades.	
18	System Management Software	HCI solution should provide one single management console to manage DC and DR HCI setup including Compute, storage and networking.	
19	Pre-Failure Notifications	Pre-Failure alerts covering processor, memory, HDD, Power Supplies and Fans	
20	Guest VM OS	Latest version of Microsoft Server OS/Enterprise Linux with back to back support from OEM for the entire contract period and all the required licenses from day 1.	
21	Software Licenses	Bidder to provide all the licenses for managing HCI Solution, monitoring of server health, Databases, VM Operating Systems and any other application deployed from day 1	
22	Security	Bidder shall be responsible for periodic Vulnerability Assessment, Penetration Testing and Server hardening of all the associated servers and applications.	
23	Patches and upgrades	Bidder shall be responsible to apply OS/Service pack/Patch upgrades periodically/as and when available in all the associated servers, operating systems, databases and applications. Highest priority is to be given to critical patches and to be applied immediately on release.	
24	Capacity Augmentation	Bidder shall support for incorporating/integrating any additional server node, provided by BHEL, in the existing infrastructure	

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SR NO	Characteristic	Specification	Compliance
25	Redundancy & Business Continuity	(a) Proposed solution should have replication software to DR site. Licenses for applicable VMs replication should be made available. If any additional hardware, software or/and licenses are required for this functionality, these should be provided by the bidder at no additional cost to BHEL. (b) Replication should be possible locally (within same datacentre) and/or remote site (between DC & DR). (c) Third party Replication software (not from appliance OEM) are acceptable, however, these should integrate with the hypervisor.	
26	Virtualization	1. Latest version of Industry standard Hypervisor to be provided for all the nodes.2. Virtualization software shall provide a virtualization layer that sits directly on the bare metal server hardware with no dependence on a general-purpose OS for greater reliability and security.3. Hypervisor layer should support features like snapshots / cloning of individual virtual machines, non-disruptive Scale-Up & Scale-Out to grow capacity and/or performance whenever required. It should provide ease of use wizard for snapshot scheduling and instant batch cloning of Virtual machines.4. Virtualization software should provide visibility into storage throughput and latency of hosts and virtual machines that can help in troubleshooting storage performance issues. 5. Virtualization management software should support user role and permission assignment.6. Virtualization management software console shall maintain a record of significant configuration changes and the administrator who initiated them.7. Virtualization management software should have integrated Physical Host and Virtual Machine performance monitoring.8. The solution shall provide the ability to create new virtual machines from scratch or based on templates (created from fully configured virtual machines or ISO images).9. The solution shall provide a centralized interface from which virtual machine across data centre can be configured, moved, monitored and administered.10. Virtualization software shall be able to dynamically allocate and balance computing capacity across collections of hardware resources aggregated into one unified resource pool with optional control over movement of virtual machines like restricting or moving VMs to run on selected physical hosts.11. Hypervisor software should support Virtual Machine image like Virtual disk format, OVF, RAW(.img, .raw),ISO.12. Should provide the ability to thin provision disks to avoid allocating all storage space upfront. Full monitoring capabilities & alerts to prevent from	

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SR NO	Characteristic	Specification	Compliance
		accidentally running out of physical storage space should be there.13. Hypervisor must support IPv4, IPv6 and (removed) or dual stack configuration.14. Virtualization software should be offered with all above features & all the required licenses for operating the offered HCI cluster using a single console.	
27	Support Warranty &	OEM's Premium 24x7 support for the entire contract period should include remote and onsite support, labour, parts warranty.	

1.2 HCI Solution for Data Recovery Requirements

All the resources, as envisaged in DC, shall be applicable for DR as well along with periodic sync with DC.

In case of disruption at DC, the services to be automatically shifted to DR node


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ANNEXURE-2

2. Database

		Compliance
Database	Latest version of Enterprise class Oracle/Microsoft SQL	
Licenses	The bidder shall provide all required database licenses for this deployment at DC and DR. All the licenses required for proper running of the setup shall be provided from Day 1.	
OEM Support	OEM's Premium 24x7 support for the entire contract period should include remote and onsite support, labour, parts warranty.	

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ANNEXURE-3

3. Load Balancer

SR NO	Characteristic	Specification	Compliance
	Make & Model	to be specified by vendor	
1	Solution	ADC Solution for HCI to optimize the availability, performance and security of cloud services and enterprise applications while reducing cost and complexity in the data center. ADC to be deployed in HA in DC and DR.	
2	Application Performance	Dynamic detect - Client connection persistence - Connection multiplexing - TCP buffering - IEEE 802.3ad link aggregation	
3	SSL Acceleration	Hardware SSL processing - SSLv3 and TLSv1 - 4096-bit maximum cipher key size (RSA or ECC) - End-to-end security (Server-side SSL communication) - SSL session reuse and timeout control - Cipher strength reduction - Customizable cipher suite order - Customizable SSL error pages - Sharable to multiple SLB services - SSL selfcheck - Server name indication (SNI)	
4	Platform and performance	1. ADC to have 3Gbps of L7 throughput scalable to 10Gbps with license upgrade. 2. ADC to handle upto 6000 SSL TPS 3. ADC to have Minimum L7 Concurrent connections: 1.5M for 30,000 Users.	
5	Compression	Hardware or software accelerated - Virtualized compression - Inline HTTP processing - Compresses HTML, XML, Java scripts and CSS - Compresses Microsoft file formats (DOC, XLS, PPT) and PDF	
6	Caching	Virtualized, memory-based cache - HTTP 1.1 compliant, policy-based cache	

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SR NO	Characteristic	Specification	Compliance
7	Application Security	Hardened OS - Secure access only, access control based on client certificate; information and access method - Customer configurable SSL/TLS version; cipher suite and minimum cipher strength - Tamper-proof key and certificate protection; ADC should support WAF feature on same ADC OS version through license upgrade; Proxy-based firewall; TCP syn-flood protection; Flash and surge event protection; DoS protection; HTTP access method control; URL filtering; HTTP/DNS cache for mitigating DDoS; Deep application data inspection for dealing with attacks such as SQL injection and cross-site scripting; Detects and responds to known application vulnerabilities; Programmable to deal with future threats	
8	Secure Application Access	AAA support for Security Assertion Markup Language (SAML), LDAP, RADIUS and Open Authorization (OAuth) protocols - Supports definition of multiple AAA methods for multifactor authentication - Supports web single sign-on (SSO) and web single logoff (SLO) - Serves as a SAML SP (service provider) - Supports restriction on number of sessions, session timeout and session reuse	
9	Client Server Management, Auth and Authorization	CSR and private key generation - Self-signed certificate support - Import certificate and private key - Import certificate format - Extensive certificate support - Certificate backup and restore - Wildcard certificate support - Server Name Indication (SNI) Turbo client certificate verification - Root and intermediate CA import - Basic client certificate verification - Certificate chain support - Certificate revocation list (HTTP, FTP, LDAP) - Online certificate status protocol (OCSP, HTTP/HTTPS) - Certificatebased access control - Inside SSL server, two-way certificates	

SR NO	Characteristic	Specification	Compliance
10	Application Integration	Parse client certificate field information with different language/encoding - Pass individual field/group and field/customer format to back-end applications - HTTP header, URL and cookie - Integrated with proxy rewrite - Detailed SSL statistics	
11	System Management	Centralized cluster management - Secure CLI, WebUI and SSH remote management - XML-RPC for integration with 3rd party management and monitoring - SNMP V2/V3 and private MIBs - Syslog (UDP or TCP) - Administrator and operator account management - E-mail, paging and alerting capability - Multiple configuration files and unit configuration synchronization - Online troubleshooting - Real-time monitoring - Role-based administration control - HTTP/2 support - Top 10 statistics for users of IP, TCP, UDP and ICMP traffic	
12	Support Warranty &	OEM's Premium 24x7 support for the entire contract period should include remote and onsite support, labour, parts warranty.	

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ANNEXURE-4

4. TOR & Management Switches

SR NO	Characteristic	Specification	Compliance
	Make & Model	To be specified by vendor	
1	Solution Requirements	Managed Switches for Implementation of HCI Solution and part of HCI Infrastructure and configuration, quantity should be as per requirement of solution	
2	TOR Switch	Form factor: 1U Fiber Ports: Minimum 24 x 10G SFP+ HA Mode: Switches to be configured in High Availability mode All the required SFP modules for connecting TOR switch to HCI nodes to be provided by the bidder	
3	Management Switch	This switch will be used for configuring management interface of HCI and TOR switch nodes. Formfactor: 1U Copper Port: 24 x 1G Base-T Fiber Ports: 02 x 1G SFP	
4	Support & Warranty	OEM's Premium 24x7 support for the entire contract period should include remote and onsite support, labour, parts warranty.	
5	Connectivity	All the cables required for connecting switches to be provided by bidder.	

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ANNEXURE-5
Backup Solution

5.1 Disk based backup

SR NO	Characteristic	Specification	Compliance
1	Hardware	Processor: 01 x Intel Xeon/AMD EPYC with 16 Cores Memory: 02 x 32GB RDIMM (Total: 64 GB) Storage: 02 x 1TB SSD RAID1 - For OS and Software 10 x 12TB HDD RAID 5 + HS - For Backup Repository Network I/O: 02 x 10G Base-T Power Supply: 02 x Power Supply HBA: Minimum 8 Gbps FC connectivity with Tape Library	
2	Backup Software	Latest version of compatible backup software with requisite licenses The software to handle both disk based backup as well as tape library based backup Backup success/failure email intimation Backups to be configured as per prevailing BHEL backup policy Restore testing is to be carried out as per prevailing BHEL backup policy	
3	OS	Latest version Windows Server/Linux - with requisite licenses from day 1	
4	Cables & Accessories	& all necessary cables - FC, power & accessories should be supplied	
5	Support & Warranty	& OEM's Premium 24x7 support for the entire contract period should include remote and onsite support, labour, parts warranty.	

5.2 Tape Library based backup

S. No.	Parameters / Feature	Detailed Specifications	Compliance
1	Make		
2	Model		
3	Tape library	Proposed Tape Library shall be from the industry leading OEMs.	
4	Capacity	2 Nos. of LTO9 tape drives with minimum 40 cartridge slots	
5	Connectivity	Minimum 8 Gbps FC connectivity with Backup Server	
6	Management	Web Based Management	
7	Scalability	4 Drives and 100 slots	
8	Performance	Minimum 300 MB/s per drive	
9	Redundancy	No single point of failure including Power Supply, FAN etc.	

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S. No.	Parameters / Feature	Detailed Specifications	Compliance
10	Cartridge Tapes	Barcode labels, 60 Nos. of Cartridge Tapes along with 2 nos. of cleaning Tapes	
11	Mounting	Tape Library must be rack mounted. Rack mounting kits and accessories should be supplied.	
12	Cables & Accessories	all necessary cables - FC, power & accessories should be supplied	
13	Support Warranty &	OEM's Premium 24x7 support for the entire contract period should include remote and onsite support, labour, parts warranty.	


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ANNEXURE-6
Centralized Software

6.1 Time & Attendance Recording Software

Sl no.	BHEL Specification	Compliance (Yes/No)
1	The Time & Attendance recording software to be developed and deployed by the vendor with the provision to configure unit-wise specific/different business rules.	
2	Configuration of time & attendance rules (Annexure-16) for the units/locations as per Annexure-14 added at a later stage to the centralized setup or modification to the existing rules, to be carried out by vendor without any additional cost implication.	
3	Attendance data interface API to be provided by vendor for various requirements like payroll processing etc. as per specifications mentioned in 1.5	
4	Management Information Reports to be available in the proposed Time & Attendance recording software as per Annexure-13. Provision to develop additional reports to be made available in the software.	
5	Role-based (Employee, Manager, HR, IT, Time Office, Unit/HR Heads, etc.) dashboards and reports to be made available for analysis. Sample templates are available at Annexure-15	
6	The key components include (not limited to): - Time Management linked to Biometric devices providing real-time visibility to workforce - Leave management - Absence Management - Clock-in and Clock-out Management - Scheduling, Shift Management - Provisions for adhoc hierarchical reporting - Overtime Calculation - Late Night Shift Allowances - Holiday Management - Employee-wise weekly offs - Compensatory Off	
7	The software to have the capability to record attendance regularizations by employees. After approval by competent authority as per extant business rules, schedules and timesheet of employees to be updated.	
8	Proposed software to have complete audit trail capabilities of changes made to employee's shift, attendance, regularization, access records etc. including information on who made the changes and when	
9	The software to provide the option to restrict entries to inactive/ terminated/ retired/ suspended employees on the attendance readers as well as access control readers. Software to check deduplication (already enrolled as a different entity) & Blacklist/ suspended person.	

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Sl no.	BHEL Specification	Compliance (Yes/No)
10	Provision for time-based escalations or reminder notifications for a given task in the approval process	
11	Provision to create unlimited shift patterns like AB, ABC, BAC, CAB etc.	
12	Provide the ability to schedule shifts that cross multiple days (e.g. start at 6:00 p.m. on day one and complete at 2:00 a.m. on day two).	
13	Provision to create shift patterns of varying durations like weekly, monthly, fortnightly, daily or any other Adhoc duration	
14	Provision to schedule shift patterns to be automatically repeated, or rolled forward to future weeks	

6.2 Access Control Software

Sl no.	BHEL Specification	Compliance (Yes/No)
1	The Access control software to capture employee Biometric punch data transactions alongwith facial log both for in-swipe and out-swipe and transfer the data to server for further processing. Vendor to integrate all access control devices at the gates with access control software.	
2	Configuration of access control rules (Annexure-15) for the units/locations as per Annexure-13 added at a later stage to the centralized setup or modification to the existing rules, to be carried out by vendor without any additional cost implication. There should be provision to increase or decrease threshold value in facial device to control FAR situation (if occurs)	
3	Software to support central monitoring and control. If communication to the central control fails, readers shall continue providing access based on the predefined security configuration. Until communication is regained, all event logs and alarms shall be stored locally (based on reader / controller capacity). These events shall be sent to the central server when the communication is regained	
4	Local and global Anti Pass back feature to be available.	
5	Each user to be validated / invalidated for a given period by setting the start date and end date.	
6	It shall be possible to assign one or more access groups for each user.	
7	The system to support all the different combinations of identification modes for users as defined in specification of all access control devices	

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Sl no.	BHEL Specification	Compliance (Yes/No)
8	Software to support central monitoring and control. Provision to provide rights to Unit-level administrator to add/delete/modify/update records (shifts, access, reports, etc.) pertaining to their own unit.	

6.3 Meal Booking & Canteen Access Software

Sl. no.	BHEL Specification	Compliance (Yes/No)
1	Vendor shall integrate canteen management software with turnstiles and Biometric Access control based system. The Application would be developed and deployed by the vendor in the Application server. Any modification/customisation to the existing software to be carried out by vendor without any additional cost implication.	
2	Vendor shall provide provision for customising the software so as to cater to different types of users & available canteens.	
3	Provision for booking meals in advance to be made in the online system/mobile app for all users.	
4	Online Dashboard to monitor Daily / weekly/ monthly analysis of meal taken (summary and detailed), Canteen expenditure, Meal planning report and options to add / deduct meals from individuals.	
5	Canteen wise / shift wise meal analysis and reconciliation	
6	Solution should be able to handle multiple counters with different meal rates	
7	Provides salary-debit facility for employees in credit scheme, for canteen facilities used via Integration with existing SAP based payroll system	
8	Facility to maintain various type of masters for Menu, rates, categorization of employees, canteen types, Meal timings	
9	Online dashboard for employees to monitor their daily meal consumptions and allied details	

6.4 Visitor Management Software

Sl. no.	BHEL Specification	Compliance (Yes/No)
1	Integrated with ACS and RFID cards	
2	Software to be accessible from desktop/laptop and to have access to printer and webcam (provided by BHEL)	
3	Provision for Visitor Registration (RFID card details, personal details, area/official to be visited, nature of visit, etc) with advanced/real-time approvals by BHEL employees	

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Sl. no.	BHEL Specification	Compliance (Yes/No)
4	Software and hardware controlled entry & exit building wise and floor wise. Provision to update access privilege and authorizations of visitors.	
5	Rule engine for visitor entry / exit, total hours, access location and time	
6	Frequent visitor, regular visitor, VIP visitors, also clear bifurcation of domestic and international visitors	
7	Quick gate pass generation facility for regular and frequent visitor	
8	Provision for single / multiple entry in a day or in multiple days	
9	VMS shall be installed on application server and will be accessible from PCs installed at BHEL Premises.	
10	Retention of visitor details and access details for a period of minimum 2 years	
11	Provision for printing visitor slip	
12	Evacuation management and alerts and notification to all visitors	
13	Security consideration for visitor data, all visitor data to be encrypted	

6.5 API specifications

Sl. no.	BHEL Specification	Compliance (Yes/No)
	Vendor to provide APIs meeting the following requirements not limited to:	
1	Access time and attendance data unit-wise, employee-wise, cadre-wise, grade-wise, shift-wise, date-wise, etc.	
2	Read, add, modify, delimit employee data	
3	Read, modify employee shift, weekly-off, compensatory-off, holiday calendar, leave data etc.	
4	Read, modify, delimit/revoke user access privileges	
5	Assign, transfer & revoke biometric templates to reader/group of readers.	
6	Read/check status of readers/devices/machines	
7	Access employee biometric template in raw format	
8	Provides salary-debit facility for employees in credit scheme, for canteen facilities used via Integration with existing SAP based payroll system	

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6.6 Device Control Application

Sl no	BHEL Specification	Compliance (Yes/No)
1	The software should have a central management module to remotely manage all the attendance and access control readers/devices/machines deployed across all the locations.	
2	The software to check the status of the readers / controllers on regular intervals.	
3	Provision to add & integrate new readers/devices to the existing setup.	
4	Assign, transfer & revoke devices to one or multiple groups	

6.7 Common Points for Centralized Software

Sl no.	BHEL Specification	Compliance (Yes/No)
1	The software developed shall conform to the latest cyber-security norms.	
2	All data over the network between the reader/ controller and the server to be encrypted and secured through SSL.	
3	Transmissions from the web-based application are to be kept secure through SSL	
4	All software/firmware/security upgrades to be downloadable through the network to the reader / controller.	
5	There can be multiple operators/administrators with hierarchical controls. System to be accessible only after valid authentication.	
6	Remediations of the non-conformities identified in Vulnerability Assessment/Penetration testing of the solution conducted by BHEL/Vendor/Third Party at periodic intervals to be addressed immediately by the vendor.	
7	The system to be accessible to all users based on their rights over the web/ mobile app by entering a user id and password. The Software to be user-friendly & web/ mobile app based so that the administrator / operator / user can access the software console from any location within BHEL Network or Outside BHEL via mobile app. The customized mobile app has to be provided by vendor to provide data like punch records, unauthorized absence, leave data etc. to employees.	
8	To support report scheduling and delivery of scheduled reports either through e-mail or file system share. Auto mailer for reporting based on users rights and roles	

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Sl no.	BHEL Specification	Compliance (Yes/No)
9	To support Visualization tools such as maps, gauges, and charts, indicators. Graphical Reports (like bar charts, pie charts) to be available.	
10	Provision for giving selective user rights	
11	All reports to support export to external files (device) in known formats like MS Excel, CSV, PDF etc.	
12	Provision to send customized reports by selecting fields and by entering customized messages to a select group/department/individual using email	
13	That part of the software including reporting module developed using BHEL Business rules will be property of BHEL. System documentation should be provided and any changes should be updated accordingly. This Software along with source code, customization code / objects / libraries shall be handed over to BHEL.	
14	There should not be any transaction data loss	
15	The data archival and back up shall be part of the system architecture and process.	
16	The software shall support a fault tolerant server i.e. in the event of a server failure, the system shall automatically switch over to HA node from the primary node without impeding the operation of the software.	
17	The software to support an import utility that provides importing of user information into the attendance database from BHEL database	
18	The software to do bulk user addition	
19	The software to store user information along with photographs for each user.	
20	The software to allow data to be imported or exported in real time or as a batch operation.	

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ANNEXURE 7

7. Technical Specifications of Enrollment Unit

Sl no.	Description	BHEL Specification	Compliance (Yes / No)
	Make & Model	To be specified by Vendor.....	
1	Usage	Enrollment station shall be used for various administrative function like creating / deleting system operators and managing their profiles / passwords, hardware management, smart card programming / preparation, capture template for all types of readers, card enrollment, card/user modification, system configurations, photo badging & smart card printing, system archiving etc.	
2	Requirements	Each enrollment station shall include a laptop (as per Point no.11), imaging printer, facial recognition enrollment kit, smart card encoder/programmer, HD Quality digital photo camera (as per Point no.10) along with photography setup & photo card preparation module, relevant software.	
3		It should be possible to import previously captured images	
4		Facial pattern template per employee shall be registered and stored in system	
5	Encoder/ Programmer Card Compatibility	Mifare or HiD iClass-has been mentioned in the smart card unit	
5.1	Card Encoding Time	Less than 5 seconds	
6	Communication Interface	High speed USB 2.0 or better	
7	Frequency	Minimum 13.56 MHz	
8	Facial Recognition template capture	Camera	
8.1	Capture formats	Facial image templates	
8.2	Facial Recognition Enrollment time	< 10 secs	
9	Card Preview and Printing	Vendor should be able to print the card on the printer after image has been accessed and layout selected. It should have print preview option before printing	


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Sl no.	Description	BHEL Specification	Compliance (Yes / No)
9.1	Card Printer	High Definition - Dye Sublimation / Resin Thermal transfer; 300 dpi Print Resolution; 16.7 million colour or better; Print Speed 30 seconds/card for CMYKO (Cyan, Magenta, Yellow, Black, Overlay) printing; Washable, Replaceable card cleaning rollers; CR80 (2.125" H x 3.375" W) Card Stock; Print within 2mm of Card Edge; Card Hopper Feeder with Minimum 100 Card Capacity; Simultaneous Dual Sided Lamination; Capable of buffering cards queued for printing	
9.2	Print Cartridges	Sufficient number of cartridges to prepare Smart Cards as mentioned in the tender scope	
10	Camera for Enrolment	HD Quality (1920 x 1080 or higher) Digital Camera	
11	Laptop	1. X-86 Architecture Based, 64-Bit Supported Microprocessor with minimum 8 cores and 12 Threads, base frequency of 1.7 Ghz or higher, turbo boost of 4.2Ghz or higher, 15W TDP (or lower). 2. 12MB Cache or Higher 3. Matching Chipset for the quoted Processor 4. On-board Graphics feature compatible with supplied OS 5. Minimum 16 GB RAM 3200MHz SDRAM upgradeable to 32 GB. 6. 512 GB PCIe NVMe SSD M.2 Hard Drive or higher 7. Minimum 14" high definition anti-glare LED back lit Screen 8. Spill proof/Resistant, backlit keyboard with full size keys 9. Integrated High definition audio with integrated speakers and volume control (Hardware/Software). Single audio jack (single pin) for connecting ear phones and mic 10. Integrated 100/1000 Mbps port 11. Integrated Wi-Fi 6, supporting industry standard IEEE 802.11ax + Bluetooth 5.0 or higher 12. Minimum 2 x USB 3.1 Ports, 1 x Type C, Stereo headphone/ microphone combo jack, 1 x HDMI Port. 1 x RJ - 45 13. Minimum 3-cell battery capable of providing 6 hours or more backup in standard business environment, ACPI Compliant. 14. OEM AC Adaptor suitable for 230V supply 15. Should come pre-installed with Windows 11 Professional Edition or latest version with 64bit latest service pack. The latest system drivers should be available on OEM's website for the	

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Sl no.	Description	BHEL Specification	Compliance (Yes / No)
		entire contract period. 16. OEM carry bag to be supplied. 17. Certification: (a) OS Certification from Microsoft (b) For OEM: ISO 9001 (Latest version) 18. OEM warranty including battery (labour, parts, on-site) for the entire contract period	
12	Body Type	The system to be Impact resistant, scratch resistant, weather durable and corrosion free.	
13	Stand	Proper stand shall be provided to mount the camera on LCD including universal clips for Monitor and laptop	
14	Signature Pad & Pen	Digital Signature Pad & Pen along with compatible software for digitizing employee signature, USB Interface	
15	Unicode Compatibility	System should be Unicode compatible so that entries/printing can be made in Hindi also	
16		Photography, facial recognition enrollment, card preparation and lanyard with Card Holder shall be in the scope of successful bidder	
17	Data Transfer	The system should have facility of transferring the data to central server for storage and retrieval and report generation	
18	Certifications	CE, FCC, RoHS, BIS	
19	Enrollment Application	Smart UI / UX for Enrollment and Registration Application, Step wise enrollment process and biometric login facility for Operators, Capable to Enroll Employee, Visitor, Contractor Staff etc in single application and Operator can use based on rights given to various desk	
20	Image Quality	High Quality image in dry, wet and dirt conditions. The software should accept images with high quality levels , or accept best of five attempts.	


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ANNEXURE 8

8. Common Technical Specifications of Facial Recognition Device

Sr No.	Description	BHEL Specification	Remarks	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....		
2	Authentication Modes	Facial Recognition/ Card / Facial Recognition + card		
3	Authentication Method	1:1 and 1: N		
4	Device Type	Facial recognition reader with Smart Card Reader		
5	Camera	Dual Camera (Color & IR) ,2MP Surveillance Grade		
6	Camera Sensor Operation	It should be capable of authenticating users of different heights. It must be capable of detecting and authenticating the face either through device capability or inbuilt LED light in extreme dark/ daylight environment.		
7	Live Face Detection Method	System should be intelligent enough to accept only live faces and prevent security breach by a face in a recorded video, live stream, a photograph or any other means.		
8	Face Authentication Distance	50-120 cm with Auto face detection, Wide angle detection for users of different heights		
9	Processor	Minimum ARM Cortex/Intel/AMD Quad Core, 64-Bit, 1.4GHz Processor release year should on or after 2021		
10	RAM	Minimum LP-DDR4, min 2 GB & above (for 5000 & 15000 Face Templates).		
11	FAR / FRR	<0.001% FAR (False acceptance ratio) ; <0.01% FRR (False rejection ratio)		
12	Graphical Display	Backlit graphical LCD or advanced display of minimum Resolution: 880 x 620 Pixel and size of min 3.5" IPS Display with Capacitive Touch Panel or higher to show user details or any other information but not limited to name of employee,staff number, photo, punch time , Network connectivity, Device ID & IP etc.		
13	Transaction Storage	Min 2,50,000 transactions (Each transaction consists of date, time, card number, key code, error code, device mode, reader number, slno, facial log etc.).		
14	Card Reader	Card reader shall be capable of reading the selected card technologies (HID iClass / Mifare within 13.56 MHz range). The protocol of data from the reader shall be an open format and non-proprietary. There should be provision to increase or decrease threshold value of matching facial data in facial device to control FAR situation (if occurs)		
15	Card Read Range	within 50 mm		
16	Body Type	Minimum Requirement is IP 65 Protection. The system has to be Impact resistant, scratch resistant, weather durable and corrosion free. Canopy/shed type enclosures are to be provided wherever required.		

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Sr No.	Description	BHEL Specification	Remarks	Compliance (Yes/No)
17	Mounting	The readers to be mounted on SS Pedestal/ MS pole (stand) / wall for ease of operation and accessibility.		
18	Spares	Sufficient spares to be maintained to meet contingencies to maintain uptime. Fault of one reader should not affect the operations of other readers in the network.		
19	Quality	Reader shall be manufactured using the latest and most accurate state of the art biometric technology like Auto Face detection, Fake Face Detection, Auto Push, real time face recognition, multi-threading and shall support high speed processing.		
20	Seamless operation	Template uploading from Central server shall not affect the normal working of Reader.		
21	Communication with Server	Reader should communicate with central server using TCP/IP protocol over Ethernet or Internet, 10/100 Mbps or higher auto sensing Ethernet with DHCP, SSL, IPv4 and IPv6 Support (Optional)		
22	Fault Detection	In the event of reader failure / malfunction / tempering, it shall be capable of being detected by the server and appropriate alarms shall be generated at workstations/ server. Fault of one reader should not affect the operations of other readers in the network. Also mail to ADMIN/ Superuser shall be triggered		
23	A/V Indicators	A/V Indicators must provide a unique tone (in range of 25-70 dB) or tonal sequence for various status conditions, including attendance marked/denied, reader power status, etc., with multi-color (red & Green) LED indications. Tone range should be audible and adjustable as per respective BHEL unit instructions. Green LED for allow/permitted condition, Red LED for Access denied.		
24	Centralised Monitoring	It should be possible to configure, manage and diagnose multiple geographically dispersed readers from a central desktop application without custom programming		
25	Clock	Shall have built-in RTC (real time clock) Calendar. Should be able to sync the clock with the central server / NTP server.		
26	Power	Shall have built-in or external power supply required for internal operations. Should be able to work with 220-240V single phase power supply		
27	Battery Backup Battery Refresh	SMF (Sealed Maintenance Free) Batteries for backup of min. 4 hours. Should be able to control EM locks. 01 EM lock should be provided by the vendor. Lithium battery to maintain data in RAM and supply power for the on-board RTC etc. The bidder shall compulsorily replace all the batteries after 3 years and as and when the batteries get faulty during the entire lease period		

Sr No.	Description	BHEL Specification	Remarks	Compliance (Yes/No)
28	Environmental	Device shall have working temperature range of 0 to 50 degree C and humidity range of 10% to 80% RH non-condensing		
29	Availability of Data	The solution should be able to download punch information of employees from the readers in auto-push real-time mode. There should be no batch process required. Also, if required in case of LAN network failure, Power outage or any other possible interruption in DB Server etc., communications with server should be performed at regularly scheduled intervals or preset times, or on an "on demand" or "when available" basis.		
30	Software / Firmware Updates	Software/Firmware updates should be possible through network/communication Port and Software/Firmware updates to be provided free of cost during lease period.		
31	Replacement	Should be of Plug and Play Type. Should be possible to replace the faulty reader/ sensor or camera module without needing to reprogram the control unit.		
32	Biometric Modalities	The device should support Face+Mifare card/HID iClass card based solution The reader, face detection cameras, battery or any other components are to be enclosed in the same unit		
33	ESD	>=1 kV. (All the devices should be properly earthed).		
34	Certifications	CE, FCC, RoHS, BIS		
35	Communication Interface	Relay, TCP/IP, RS485, USB (Optional)		
36	Integration with Tower Lights	The Tower lights being procured should be installed with these Readers and should indicate "GREEN" colour for access granted and "RED" colour for access denied		
36	Data Security	Minimum AES 128 bit data encryption		
37	REMOVED			
38	Operating system	Linux / Android		
39	Bi-directional access	Provision to use same reader for both IN as well as OUT in multi-shift environment on 24x7 basis i.e. in same workplace there may be different shifts going on and logic to be built based on shift timings of a particular employee / group of employees		

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Sr No.	Description	BHEL Specification	Remarks	Compliance (Yes/No)
40	Functionality in offline modes	The readers should function in 100% offline mode without dependency on network both at the gates and work places. The biometric validation should be done within the reader in 100% offline mode. When the employee faces the reader, reader authenticates the templates with already available templates in the reader's memory and accordingly decision is made. Access (IN/OUT) movements should be provided only after validation of business rules even in offline mode (no network).It should be able to send all events once connectivity is re-established (employees must be able to punch- in/ out for shift or lunch break during offline condition). Should work on First-In-First-Out mode.		
41	Reader Dump	There should be a facility for getting reader dump (of all the transaction data) online directly, by-passing the management software with proper authentication (username/password).		
42	MAC Address	MAC (Media Access Control) addresses of the quoted devices should be registered in the name of OEM		

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ANNEXURE - 9
Facial Recognition Device

9.1 Type I : Technical Specifications of Wall Mount Facial Recognition Device

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Device	High End Standalone Wall Mount Facial Recognition Device for Attendance Recording	
3	Users Storage	Min. 5000	
4	Card Authentication Time	(1:5000) <2 secs	

Face Recognition Reader

Refer Annexure 8 for Facial Recognition Device technical specification

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Authentication Time for face recognition	(1:5000) <2 secs	
2	User Turnaround Time for face recognition	Less than 3 Second per user (1:5000) including capture, matching and audio / visual validation	

9.2 Type -II Technical Specifications - Facial Recognition Device for Access Control at Gates

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Device	High End Standalone Facial Recognition Device for Gate Access Recording	
3	Users Storage	Each machine individually should be capable of storing employee information/ employee profile/ master data (Min 15,000 users) for local validation.	

Face Recognition Reader

Refer Annexure 8 for Facial Recognition Device technical specification

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Authentication Time for face recognition	(1:15000) <2 secs	
2	User Turnaround Time for face recognition	Less than 3 Second per user (1:15000) including capture, matching and audio / visual validation	

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9.3 Type - III Technical Specifications - Portable Facial Recognition Device with Wi-Fi connectivity (For Access Control at Gates Emergency/ sudden breakdown situation & for Suspend employees)

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Device	High End Standalone Wall Mount Facial Recognition Device for Attendance Recording for Breakdown	
3	Communication Interface	USB, 2 I/O inputs, relay, Wiegand	
		TCP/IP using RJ45 and in-build Wi-Fi	
		Device should support IEEE 802.11a/b/g/n compatible networks with Security	

Face Recognition Reader

Annexure 8 for Facial Recognition Device technical specification

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Authentication Time for face recognition	(1:15000) <2 secs	
2	User Turnaround Time for face recognition	Less than 3 Second per user (1:5000) including capture, matching and audio / visual validation	

9.4 Type - IV - Facial Recognition Device reader with cellular connectivity and RFID card reader (For locations in Township where LAN connection is not available)

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Device	High End Standalone Wall Mount Facial Recognition Device with cellular connectivity for Attendance Recording	
3	Communication Interface	It should support cellular connectivity for wireless communication with application server web interface through https protocol. USB, Min. 1 nos. I/O inputs, relay, Wiegand TCP/IP using RJ45, Cellular Connectivity	

Face Recognition Reader

Annexure 8 for Facial Recognition Device technical specification

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Authentication Time for face recognition	(1:5000) <2 secs	
2	User Turnaround Time for face recognition	Less than 3 Second per user (1:5000) including capture, matching and audio / visual validation	

9.5 Type-V- Technical Specifications - Face recognition reader with card reader (Access Control at Gates) and Keypad

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Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Device	High End Standalone Wall Mount Facial Integration Recognition Device for Gate Access Recording	
3	Users Storage	Each machine individually should be capable of storing employee information/ employee profile/ master data (Min 15,000 users) for local validation.	
4	Reader Special Key Functionality	For the special key code operations i.e. 01 to XX, the reader will validate whether the employee has permission to avail that particular special movement at that moment and accordingly accept or reject the request. The complete details and logic for validation of the special movements 01 to XX will be a part of HR business rules.	

Face Recognition Reader

Refer Annexure 8 for Facial Recognition Device technical specification

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Authentication Time for face recognition	(1:15000) <2 secs	
2	User Turnaround Time for face recognition	Less than 3 Second per user (1:20000) including capture, matching and audio / visual validation	


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ANNEXURE-10
Turnstile

10. Technical Specifications of Turnstile

Sr No.	Description	BHEL Specification	Compliance (Yes/No)	Vendor's Remarks
1	Make & Model	Please Specify		
2	Tripod Turnstile	Three Cylindrical Arms of Stainless Steel		
3		Motorized drive mechanism (Motorized with either Servo Motor or Direct Drive Technology (Electro Mechanical and Only Mechanical are not accepted) 100% duty cycle high performance high torque motorised drive system providing bi-directional control of pedestrian passage in excess of 10 million maintenance free cycles of operation or a minimum of 7 years in a pedestrian gate application, integrated resolver for precise positioning feedback, high output torque for fast acceleration and deceleration. The above has to be certified by OEM on his letter head. Tripod should perform with Normally Close condition. References of vendor sites where the proposed model is working for last 4 years or more should be provided.		
		Stainless steel SS304; ; stainless steel face panel for mounting of peripheral components such as card readers, etc		
4		Mechanism to have Rotating Speed Adjustable/ Configurable		
5		Allows only one user to enter at a time.		
6		The tripod arms should not have the sharp ends to catch clothing		

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Sr No.	Description	BHEL Specification	Compliance (Yes/No)	Vendor's Remarks
7	Rotation	Rotate 120 Deg and Stop. Rotate 3 x 120 degree pivot arms and stop/locked in normal position. It should not get locked in improper position. The turnstile should get unlocked for rotation by user only after successful validation. In all other situations/conditions, the turnstiles should be in locked position only and user should not be able to rotate the turnstile. In case the turnstiles gets locked in improper position (other than home position), an alternate mechanism should be provided physically at the turnstile housing to bring to home position.		
8	Operation	Bi Directional Super smooth arm movements with minimal force and no kickback for utmost safety - will not spring forward at end of travel (i.e. hit child in back of head) Forced entry/exit and impact detection Card readers/keypad mounting plates standard (Flush Mounted) - The power and network cables connected to readers should be completely concealed and not available for access to users. Card readers/keypad mounting plates standard (Flush Mounted) - The power and network cables connected to readers should be completely concealed and not available for access to users. High speed, noise free and maintenance free operation The turnstiles should have drop arm feature during emergency situations Easy to program controller for common lane configurations Adjustable hold and open time		
9	Walk way	515 mm passage width + 50 mm clearance		
10	Integration	Should be integrable / configurable with the Gate Access Face & Palm Type III Reader (REMOVED)		
11	Fail Safe Mode / Fail Lock Mode	Fail safe Mode: In the event of power failure or switched off, tripod arms will be free to rotate in either direction/should drop and allow free passage for both directions Fail Locked mode: Tripod arms can be locked in case of power failure or switched off		

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Sr No.	Description	BHEL Specification	Compliance (Yes/No)	Vendor's Remarks
12	Anchoring	Turnstile Bolted to the floor using anchor bolt		
13		Dust proof body covering the mechanical system ensuring long life.		
14	Safety	The gates are electrically insulated to avoid electrical shock. (complete body of turnstile should be earthed)		
15	Locking	Locking mechanism to prevent tripod rotating in the opposite direction once it has travelled 25 degree past the rest position.		
16	Seamless operations	Self-centering mechanism should be smooth. No hydraulic damper or mechanical limit switch should be used		
17	Security	Positive action lock to prevent two passage at one time.		
18	Certification	CE Certified against Electrical & EMC Safety		
19	Height of rotor arm from ground	Min 840mm. Total system height and length of rotating arm shall be suitable according to walkway dimension.		
20	Opening Time	< 2 secs		
21	Protection Level	IP 54, TUV/BIS certificate for IP rating to be submitted		
22	Temperature	0 to 50 degree C		
23	Humidity	Humidity: 10% to 80% (non-condensing)		
24	Power	220-240 VAC Single phase @50Hz		
25	Quality	The case work must be of corrosion resistant stainless steel grade 316/304		
26	Housing Dimension (L X W X H)	(1200-1300) x (220-260) x (1000- 1050) mm approximately.		
27	Construction	One standard width dual pedestal housing with minimum 400mm arm length, 3 x 120 degree pivot arms, high performance high torque Motorised drive system designed for an excess of 10 million maintenance free cycles of operation, 100% duty cycle, 0.5s open/close time, minimum 30 persons per minute. Should have lane indicator. Dust proof body covering the mechanical system ensuring long life. Semi-Outdoor. To be installed under a canopy / RCC structure		


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Sr No.	Description	BHEL Specification	Compliance (Yes/No)	Vendor's Remarks
28	Controller	Motor Controller using the latest Micro processor technology allowing for very accurate control of torque, speed, acceleration and deceleration parameters of the motor in any position resulting in highly dynamic operation; extremely fast reactions in abnormal situations such as impact detection or forced entry/exit attempts; closed loop operation for precise positioning; ramping up and ramping down configuration; fully adjustable speed; resolver input for position feedback; LED indicators for operation and error diagnostics		
29	Performance Requirement	MCBF (Mean Cycles Before Failure)- 10 Mil Cycles. MTTR (Mean Time To Repair/Rectify)- 30 Minutes. For the above 2 points, references of vendor sites where the proposed model is working for last 7 years or more should be provided.		

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ANNEXURE -11
Boom Barrier

11.1 Technical Specifications of 6m Boom Barrier

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Lane width	Max. 6.0 m	
3	Opening/closing time	maximum 6 sec, TUV/BIS certificate for open/close time to be submitted	
4	Power consumption	Maximum 150 W	
5	Voltage	AC110V or AC220V, 50/60 Hz	
6	Duty cycle	100%	
7	Housing dimensions (W x D x H)	(300-350) x (280-360) x (900-1100)mm	
8	Enclosure rating	IP 54, TUV/BIS certificate for IP rating to be submitted	
9	Temperature range	-5 °C to +50 °C or better range	
10	Integrated 2-channel detector for induction loops	Standard	
11	Modular expansion of control system	Freely expandable	
12	Variable I/O assignment	Standard	
13	No. of digital inputs	8	
14	No. of relays/digital outputs	6/4	
15	Input with test for safety light barrier/ Laser scanner	1	
16	Selectable closing speed	Standard	
17	Barrier Weight	Minimum 40 Kg (except Boom)	
18	Built-in delay auto-closing and reverse on obstacle in case of resistance	Yes	
19	Certifications	CE Certified against Electrical & EMC Safety	

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11.2 Technical Specifications of 4m Boom Barrier

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Lane width	Max. 4.0 m	
3	Opening/closing time	maximum 5 sec TUV/BIS certificate for open/close time to be submitted	
4	Power consumption	Maximum 120 W	
5	Voltage	AC110V or AC220V, 50/60 Hz	
6	Duty cycle	100%	
7	Housing dimensions (W x D x H)	(300-350) x (280-360) x (900-1100)mm	
8	Enclosure rating	IP 54, TUV/BIS certificate for IP rating to be submitted	
9	Temperature range	-5 °C to +50 °C or better range	
10	Integrated 2-channel detector for induction loops	Standard	
11	Modular expansion of control system	Freely expandable	
12	Variable I/O assignment	Standard	
13	No. of digital inputs	8	
14	No. of relays/digital outputs	6/4	
15	Input with test for safety light barrier/ Laser scanner	1	
16	Selectable closing speed	Standard	
17	Barrier Weight	Minimum 35 Kg (except Boom)	
18	Built-in delay auto-closing and reverse on obstacle in case of resistance	Yes	
19	Certifications	CE Certified against Electrical & EMC Safety	

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11.3 Technical Specifications of 1m Boom Barrier

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2	Lane width	Max. 1.0 m	
3	Opening/closing time	maximum 5 sec TUV/BIS certificate for open/close time to be submitted	
4	Power consumption	Maximum 100 W	
5	Voltage	AC110V or AC220V, 50/60 Hz	
6	Duty cycle	100%	
7	Housing dimensions (W x D x H)	(300-350) x (280-360) x (900-1100)mm	
8	Enclosure rating	IP 54, TUV/BIS certificate for IP rating to be submitted	
9	Temperature range	-5 °C to +50 °C or better range	
10	Integrated 2-channel detector for induction loops	Standard	
11	Modular expansion of control system	Freely expandable	
12	Variable I/O assignment	Standard	
13	No. of digital inputs	8	
14	No. of relays/digital outputs	6/4	
15	Input with test for safety light barrier/ Laser scanner	1	
16	Selectable closing speed	Standard	
17	Barrier Weight	Minimum 30 Kg (except Boom)	
18	Built-in delay auto-closing and reverse on obstacle in case of resistance	Yes	
19	Certifications	CE Certified against Electrical & EMC Safety	

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ANNEXURE - 12
Tower Lights

12. Technical Specifications of Tower Lights

Sr No.	Description	BHEL Specification	Compliance (Yes/No)
1	Make & Model	To be specified by Vendor.....	
2		2-in-1, Tower Light	
3	Integration	Should support integration with Type III, IV, V based reader as mentioned for all gate access device.	
4	Mounting	Should be mountable on top of above mentioned readers/ scanners/ Reader Stand	
5	Light Source/Lamp Style	LED based light	
6	Operating Temperature	0 to 50 Degree C	
7	Rating	IP65	
8	Quality	Vibration resistant	
9		configurable to steady or flashing mode	
10	Requirement	Pre-wired and pre-assembled with min 100mm pole (excluding height of Light)	
11	Diameter of Light	Min 80 mm	
12	Height of Light	Min 60 mm	
13	Light Colors	Red and Green in the same lens	
14		LED Lamp, Pipe Mount Base and Flasher	
15	Certification	CE & UL / BIS Compliant	

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ANNEXURE -13
Smart Card

13. Technical Specifications of Employee Smart Cards

Sr No.	Description	BHEL Specification	Compliance (Yes/No)	Vendor's Remarks
1	Make & Model	To be specified by Vendor.....		
2	Memory	Card shall have minimum 4 KB memory and to be compatible with Mifare or HID iClass platform for storing and accessing data items		
3	Quality	Card shall be laminated and color coded as per the type of user. Colour fading and card damage due to inferior quality lamination shall be replaced by vendor.		
4	Encryption	Shall support DES, TDES, 3KT DES & AES cryptography. Data inside the card shall be secured with minimum 64 bit encryption so that data can't be modified or accessed until the card and the reader have completed mutual authentication		
5	Material	Card shall be durable, made of PVC and meet ISO 7810 standard for length, width, thickness and construction. Card shall be resistant to alcohol, Fuel, sweat etc. It should be capable of direct two sided dye-sublimation or thermal transfer printing so that cardholder information / images, instructions shall be printed directly onto card.		
6	Standard Compliance	Compliance to ISO/IEC 14443A		
7	Frequency	Contactless smart chip operating at 13.56 MHz		
8	Others	Smart card shall be supplied with 1 meter lanyard (with BHEL logo preprinted at defined distance intervals) and a solid / rigid plastic card holder with slots for clip or lanyard with Card Holder		
9	Warranty	Card shall be warranted against defect in material and workmanship for lifetime		
10	Environmental	Temperature 0 to 50 degree C; 10% to 80% RH non-condensing		
11	Additional Cards	Additional cards along with preparation, if any will be on the same rates		

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Sr No.	Description	BHEL Specification	Compliance (Yes/No)	Vendor's Remarks
12	Distance Recognition	of The card can be used as proximity card within a distance of 50 mm from surface of the reader.		
13	Operation	Compatible with swing barrier gates & EM locks		
14	Multiple Access	The same card should permit user to enter different work premises as per requirement		

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ANNEXURE -14

14. Technical Specifications of Miscellaneous Items

Description			Compliance (Yes/No)	Vendor's Remarks
14.1. Specifications of UTP (Unshielded twisted pair) Cable / RJ45 Connectors				
Make	To be specified by Vendor.....			
1	Cat 6	Should meet minimum Category 6 requirements		
2	Type of Conductors	4 Pair 23 AWG Conductors		
3	Frequency	Characterized to 250 MHz		
4	Standards	TIA/EIA 568B, ISO Class E 11801-2002		
5	Gigabit Requirements	Should meet or exceed Gigabit Ethernet Requirements at 100 mtrs		
6	Connectors	Compatible with cable		
7	Length of the cable	As per the requirement		
8	Qty. of the connector	As per the requirement		
14.2. Specifications of PVC Conduit				
Make	To be specified by Vendor.....			
1	1" PVC Pipe, Medium Strength. ISI Mark			
2	Length of the conduit pipe	As per the requirement		
14.3. Specifications of MS Conduit Pipe				
Make	To be specified by Vendor.....			
1	1" MS Pipe, Medium Strength, ISI Mark, Minimum Wall Thickness 1.6mm			
2	Length of the conduit pipe	As per the requirement		
14.4. Specifications of Power Cable				
Make	To be specified by Vendor.....			
1	3 Core Multi-strand Flexible Copper Power Cable of size 1.5 Sqmm Suitable for Connecting readers / controllers / barriers			
2	Length of the cable	As per the requirement		

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ANNEXURE-15

15.1. Installation and Commissioning

Sl. no.	Description	BHEL Specification	Compliance (Yes/No)
1	Installation and commissioning	Project installation is in the scope of vendor ATP (Acceptance Test Plan) is in the scope of BHEL Commencement of contract period will be after ATP	
2	Manpower	Maintenance personnel viz. Hardware Engineers and Software Engineers (as per BoQ) shall be stationed at BHEL locations during contract period, for upkeep and maintenance of the equipment and for developing and maintaining the attendance recording, access control and canteen management systems and for Adhoc Management Information Reports generation.	

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ANNEXURE-16

16. Auto Swing Barriers

16.1 Auto Swing Barriers 1-Lane PWD

Sl no.	Description	BHEL Specification	Compliance (Yes/No)
1	Automatic Swing Barriers Gates (1 lane) and make it compatible with Face recognition Devices (and through RFID card also) physically handicapped (PH) compatible	1. Material : Stainless Steel Grade 304 and scratch proof / laminated acrylic flap 2. Dimension (Range) : (L) - 1200 - 1500 mm (W) - 180 - 200 mm (H) - 980 - 1100 mm 3. Flap Size : 425 mm - 450 mm 4. For Access width - 900 mm 5. Compatible with Face recognition device (access control) 6. Swing direction : Two ways 7. Pass rate : 20 - 30 person / minute 8. SOFTWARE CONTROLLED ENTRY & EXIT 9. PROVISION FOR MANUAL KEY (EMERGENCY) 10. In case of emergency/power failure, swings should be fully open 11. (REMOVED) 12. LED indicator for entry & no entry 13. Mean Cycle between failure (MCBF) : Minimum 50,00,000 14. Power Supply : 230 Volt / 50 Hz	

16.2 Auto Swing Barriers 2-Lane PWD

Sl no.	Description	BHEL Specification	Compliance (Yes/No)
1	Automatic Swing Barriers Gates (2 / Multi lane) and make it compatible with Face recognition Devices (and through RFID card also) and physically handicapped (PH) compatible	1. Material: Stainless Steel Grade 304 and scratch proof / laminated acrylic flap 2. Dimension (Range): (L) - 1200 - 1500 mm (W) - 180 - 200 mm (H) - 980 - 1100 mm 3. Flap Size: 250 mm - 300 mm & 425 mm - 450 mm 4. For Access width - 600 mm on one side and 900 mm on second side 5. Compatible with Face recognition device (access control) 6. Swing direction: Two ways 7. Pass rate: 20 - 30 person / minute 8. SOFTWARE CONTROLLED ENTRY & EXIT 9. PROVISION FOR MANUAL KEY (EMERGENCY) 10. In case of emergency/power failure, swings should be fully open 11. (REMOVED) 12. LED indicator for entry & no entry 13. Mean Cycle between failure (MCBF): Minimum 50,00,000 14. Power Supply: 230 Volt / 50 Hz	

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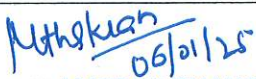
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16.3 Auto Swing Barriers 1-Lane

Sl no.	Description	BHEL Specification	Compliance (Yes/No)
1	Automatic Swing Barriers Gates (1 lane) and make it compatible with Face recognition Devices (and through RFID card also)	1. Material : Stainless Steel Grade 304 and scratch proof / laminated acrylic flap 2. Dimension (Range): (L) - 1200 - 1500 mm (W) - 180 - 200 mm (H) - 980 - 1100 mm 3. Flap Size: 250 mm - 300 mm 4. For Access width - 600 mm 5. Compatible with Face recognition device (access control) 6. Swing direction: Two ways 7. Pass rate: 20 - 30 person / minute 8. SOFTWARE CONTROLLED ENTRY & EXIT 9. PROVISION FOR MANUAL KEY (EMERGENCY) 10. In case of emergency/power failure, swings should be fully open 11. REMOVED 12. LED indicator for entry & no entry 13. Mean Cycle between failure (MCBF) : Minimum 50,00,000 14. Power Supply : 230 Volt / 50 Hz	

16.4 Auto Swing Barriers 2-Lane

Sl no.	Description	BHEL Specification	Compliance (Yes/No)
1	Automatic Swing Barriers Gates (2 / Multi lane) and make it compatible with Face recognition Devices (and through RFID card also)	1. Material: Stainless Steel Grade 304 and scratch proof / laminated acrylic flap 2. Dimension (Range): (L) - 1200 - 1500 mm (W) - 180 - 200 mm (H) - 980 - 1100 mm 3. Flap Size: 250 mm - 300 mm & 250 mm - 300 mm 4. For Access width - 600 mm on both sides 5. Compatible with Face recognition device (access control) 6. Swing direction: Two ways 7. Pass rate: 20 - 30 person / minute 8. SOFTWARE CONTROLLED ENTRY & EXIT 9. PROVISION FOR MANUAL KEY (EMERGENCY) 10. In case of emergency/power failure, swings should be fully open 11. (REMOVED) 12. LED indicator for entry & no entry 13. Mean Cycle between failure (MCBF) : Minimum 50,00,000 14. Power Supply : 230 Volt / 50 Hz	


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ANNEXURE-17

17. EM Lock

Sl no.	Description	BHEL Specification	Compliance (Yes/No)
1	EM locks for Door Access Control (Double Door) and make it compatible with Face recognition Devices (and through RFID card also)	1. Holding Force: minimum 300 kg 2. operating temp.: -10 to 50-degree C 3. Compatible with face recognition device (access control) 4. (REMOVED)	
2	EM locks for Door Access Control (Single Door) and make it compatible with Face recognition Devices (and through RFID card also)	1. Holding Force: minimum 300 kg 2. operating temp.: -10 to 50-degree C 3. Compatible with face recognition device (access control) 4. (REMOVED)	
3	Door Buzzer for access-controlled doors compatible with EM locks	1. Compatible with EM locks 2. (REMOVED)	

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