

HOSTING OF BROAD DETAILS FOR AoN ACCORDED BY DAC
UPGRADATION OF SECURITY AND FIRE FIGHTING INFRA
IN 16 X AMMUNITION DEPOT AT 20 LOCATIONS

PART-I

RECOMMENDED FOR SHARING WITH INDUSTRY POST ACCORD OF AoN

1. AoN Date : **16 Mar 2023.**
2. Item Description : Upgradation of Security and Fire Fighting Infra in 16 x Amn Depots at 20 locations as per broad details attached.
3. Quantity : 16
4. Categorisation : 'Buy (Indian-IDDM) with minimum of 50% IC iaw Chapter-I of DAP 2020 on Turnkey basis iaw Para 32 of Chapter-II of DAP 2020.
5. Special Instruction on Trial, if any : As per DAP 2020.
6. Offset is applicable : NA.
7. ToT if applicable : NA.
8. Any other special Instructions :
 - (a) Selection of Vendor for project implementation and Consultants for Project Management Consultancy will be carried out through a multi-Vendor Selection Process at competitive bidding. Separate RFPs to be issued for project implementation and Project Management Consultancy.
 - (b) AHQ to ensure indigenous sourcing of critical components in accordance with MoF policy order No (Public Procurement No 4) F-7/10/2023-PPO (1) dt 23 Feb 2023 pertaining to restriction under Rule 144 (xi) of GFR 2017.
 - (c) It is to be ascertained that no company linked to the company which has prepared the DPR will be participating in the bidding process for project management consultancy or project execution.

Contact Details

Directorate General of Ordnance Services (OS-7)
MGS Branch, Room No-116, D-II Wing, Sena Bhawan
Integrated HQ of MoD (Army)
DHQ PO – New Delhi -110105
Tele Number – 011-21410489
Email ID – oosdte@gmail.com

**BROAD DETAILS OF AON FOR UPGRADATION OF SECURITY AND
FIRE FIGHTING INFRASTRUCTURE IN 16 x AMMUNITION DEPOTS AT
20 LOCATIONS**

1. **Introduction.**

(a) **Nomenclature.** Upgradation of Security and Fire Fighting Infrastructure in 16 x Ammunition Depots at 20 locations.

(b) **Sponsor Directorate.** Directorate General of Ordnance Services (OS Dte).

(c) **Brief Description.** Increased security threats and recent incidents of fire in Ammunition Depots warrant an immediate upgradation of the existing archaic '**Security and Fire Fighting (FF) Infrastructure**' currently found in all the ammunition installations of Ordnance. Therefore, there is a need to acquire force multipliers in terms of modern **Security and FF Systems**, which would not only be economical in terms of resources but also be potent to ward off any threat. Directorate General of Ordnance Services, Integrated HQs of Ministry of Defence (Army) invites response from interested vendors with proven track record to undertake Project for '**Upgradation of Security and Fire Fighting Infrastructure in 16 x Ammunition Depots at 20 locations**' located in various parts of the country and meant to store defence explosives of all types, on a Turnkey basis as per the provisions contained in Para 32 of Chapter-II of DAP-2020. Vendors must submit their response as per format attached as **Appendix 'A' and Appendix 'B'**.

(d) **Objective.** **The main objectives of the Broad Details of AoN are as follows:-**

(i) To identify potential Vendors for implementation of Project.

(ii) To generate inputs for the RFP.

(iii) To determine any Conditions Precedent.

2. **Important Parameters.**

(a) **Operational Requirements.** Considering the prevalent security environment and the sensitivity as well as cost and importance of ammunition held at Ammunition Depots, there is an inescapable requirement to **modernise Security and FF Systems on priority at 20 locations.**

(b) **Locations.** The locations where the Upgradation of Security and Fire Fighting Infrastructure is proposed will be communicated by the user (MoD/ DGOS) during the RFP Stage. The places where the Security and Fire Fighting Infrastructure is proposed to be upgraded occupy varying area which is enumerated below:-

Location	Approx Area (In acres)
Place-1	686
Place-2	620
Place-3	491
Place-4	1407
Place-5	502
Place-6	560
Place-7	522
Place-8	879
Place-9	856
Place-10	1500
Place-11	2016
Place-12	2211
Place-13	62.39
Place-14	45
Place-15	1728
Place-16	1235
Place-17	1466.162
Place-18	1340
Place-19	2196.28
Place-20	70
Total	20392.832

(c) **Technical Requirements.** The technical specifications of the proposed equipment/systems reqd for upgradation is attached at **Appendix 'C'**. Equipment which is required to be installed and offered by the vendor must be of same or higher technical specifications as suggested in **Appendix 'D'**. The equipment offered with lower technical specifications will not be accepted. A summary of equipment required to be installed for the project is as under:-

S. No	Equipment Description
(i)	Surveillance IP System - Thermal Camera (13 MM, 19 MM,35 MM, 60 MM), PTZ Camera
(ii)	Lighting System along the periphery - Pole, LED Unit & Central Control Unit
(iii)	PA System - Speakers with AMP, command and control software
(iv)	Cabling - Cat 6 cable, Power Cable and PA System Cable
(v)	Establishment of Security Network - Firewall, CAT-6 I/O Outlet, SFP Modules
(vi)	Power - UPS 30+30 KVA and DG set
(vii)	Fire Alarm System - for all important fire risk locations
(viii)	Locking /Security System - Guard Tour Management, key, guard locks
(ix)	Command & Control Centre - C4I Integration of all sensors for intrusion detection system, access control
(x)	Communication System with Voice logger - Line exchange, Radio Interoperability System and radio sets
(xi)	Civil Infrastructure & Allied Services - Gate redesign and C4I control room design
(xii)	Barriers for gates - Crash and Boom Barrier, Gate automation

(d) **Scope of the Work.**

(i) **Intrusion Detection and Surveillance System.** Thermal cameras of different specification are proposed to be installed along the perimeter on poles to capture the presence of intruder. The cameras should be connected through buried cable sensor which is to be connected to display at central location. The thermal cameras on intrusion should trigger the alarms in central location and focus the PTZ Cameras and perimeter lighting on the intrusion site.

(ii) **Access Control System (Locking System).** Each location should have a workstation to keep record of the guard/patrolling parties patrolling the perimeter to record their presence at each designated check point. The data collected should be fed to the workstation. It should record the time of reaching the check point and also the interval between the check points. Check points may consist of magnetic strips, RFIDs, NFC or optical barcodes. Its main features should be as under: -

- (aa) Secure login via a control key and a PIN code.
- (ab) Supports remote programming device management.
- (ac) Manages and creates:-
 - (aaa) Access permissions.
 - (aab) Audit trails — including activities from remote devices.
 - (aac) Time-based authorization.
 - (aad) Recurring validation.
 - (aae) Reports.
- (ad) Enables system grouping into manageable domains.
- (ae) Allows remote key programming.
- (af) Key and personnel management.

(iii) **Quick Reaction Capability.** A safety and security vehicle that increases the response capabilities as a mobile operational unit is proposed. This Veh fitted with GPS, Portable Video camera, Siren with PA system, Radio communication and fog light & flash light will provide a “look-up and see” capability to cover wide area of security operation. The flexible modular architecture of the system installed will enable progressive system growth with connectivity to command & control center. The Quick Reaction vehicle will be a fully customizable all-terrain vehicle unit with rapid deployment capability in all weather conditions.

(iv) **Fire Fighting System (Remote Control Monitor).** Main objective of Remote Water Cannon spraying system is to fight fire with water and foam application by remote cannons, hand held nozzles in case of fires in shed areas, surrounding areas including grass fires etc. The water cannon needs to be connected with existing Static Water Tank (SWT) through Fire Water Hydrant Line. Remote Control Monitor system should consist of Water Cannon, Monitor assy with motor, proximity sensors, junction box and panel for it to be operated remotely.

(v) **Fire Detection System for WP Shed.** Flame detectors (IR and UV type of detectors) ammunition is proposed. They are required to detect the fire in early stage and should trigger alarm in time which be suppressed by Remote Control Monitors installed near by the ammunition sheds.

(vi) **Communication System.** The broad purpose for providing Communication System is to upgrade existing communication facility and propose an efficient communication system with redundancy in terms of line communication to effectively control the suggested Security and Fire Safety system. The system is proposed to include the following:-

- (aa) Radio sets for all guard posts.
- (ab) Line communication for all guard posts.
- (ac) IP based PA System.
- (ad) Line Exchange 200 Line.
- (ae) Radio Interoperability System.

(vii) **Integrated Command & Control Centre.** The Integrated Command and Control Center is required to receive input from different sources (field devices like ultra HD fixed camera, outdoor PTZ cameras, perimeter thermal cameras, internal thermal PTZ cameras, RCM etc.) installed in the Ammunition Depot. Feeds from these sources needs to be assimilated, analyzed and visualized over single platform resulting in aggregated depot level information, thus providing integrated single view to operators and stakeholders. This aggregated depot level information needs also to be transmitted to relevant stakeholders for appropriate responses and information.

(viii) **Power Backup for Depot.** DG set are required to be installed in the depots for catering the emergency power, as for the security related requirements alternate power backup system is required. Adequate rating UPS power system and DG Set is required in each depot for power backup.

(ix) **Video Management System (VMS).** The system brings together physical security infrastructure and operations by using the IP network as the platform for managing the entire surveillance system. End users need to be provided with rapid access to relevant information for analysis.

(e) **Indigenization.** The Vendor is required to state whether the equipment is available in Indian market and the level of Indigenization. If the equipment is produced Indigenously **the method of verification of indigenous content is also required to be specified.** The Firms ability to design, develop, manufacture and integrate should also be specified. Holding of Industrial License for the production of the equipment and the Indian origin of sub parts is mandatory requirement. Vendors are also requested to give comments with respect to efforts made for indigenization of the equipment asked for in Para 1 of Annexure I to Appendix 'B' of the Broad Details of AoN.

(f) **Proof of Concept (PoC).** Proof of Concept (PoC) as part of Technical Evaluation will be carried out in 01 X location. Commercial Bids of only those Vendors will be opened who qualify during the PoC. During the PoC, the evaluation committee reserves the right to verify any technical/functional compliance requested in the tender.

(g) **Functionality of equipment in all Terrain.** The Vendor is also required to confirm the suitability of equipment in various types of terrain i.e. deserts, plains, mountainous and high altitude areas. The equipment is also required to be certified by accredited laboratory.

(h) **Warranty.** The selected Vendor will be required to provide three years warranty of the equipment being installed.

(j) **Comprehensive Maintenance Contract (CMC).** The selected Vendor will be required to provide 03 years Comprehensive Maintenance Contract (CMC) post 03 years warranty for the equipment installed, associated software, technical support & other services as per Para 12 of Appendix F to Chapter II of DAP-2020.

(k) **Alternative Equipment.** The best available equipment must be installed at each location as per the technical specifications attached at Appendix 'C'. The Vendor is required to provide approximate cost of each equipment being recommended for installation. The Vendor will ensure that all working components are fully compliant with the technical specifications and contract conditions. If any equipment or component is not available as per Technical Specifications given in Appx C, then alternative equipment with better Technical Specifications must be provided. The Equipment offered with lower Technical Specifications will not be accepted.

(l) **Manpower Deployment Plan.**

(i) **Manpower During Implementation Phase.**

S.No	Position	Quantity/ Nos	Location
(aa)	Project Director	1	Central location
(ab)	Project Manager	1	Central location
(ac)	Solution Architect	1	Central location
(ad)	Technical Lead	2	For two critical locations (one at each site)
(ae)	Master Trainer	1	Central location
(af)	Project Engineer	20	One at each site

(ii) **Manpower During Warranty & AMC phase.**

S.No	Position	Quantity/ Nos	Location
(aa)	Surveillance and Security Expert	1	Central location
(ab)	Datacenter Expert	1	Central location
(ac)	Resident Engineer	20	One at each site

(m) **Temperature Range.** The equipment must be able to operate in the environment conditions as specified below without any deterioration in reliability or condition of the equipment:-

(i) **Operating Temperature.**

(aa) **Minimum Range.** Minus 15⁰ C to minus 5⁰ C.

(ab) **Maximum Range.** Between 40⁰ C to 45⁰ C.

3. Vendor is requested to confirm that the following conditions are acceptable:-
- (a) Acceptability of the terms of payments as per DAP 2020.
 - (b) The validity of commercial offer to be atleast 18 months from the last date of submission of offer.
 - (c) Selection of Vendors will be on a 'Single Stage – Two Bid System'. The RFP would be issued soliciting the technical with Proof of Concept (PoC) on No Cost No Commitment basis and commercial offers together, but in two separate sealed envelopes. The technical offers would be evaluated by a Technical Evaluation Committee (TEC) to check its compliance with the Request For Proposal (RFP) and PoC. Commercial Bids of Vendors who have cleared technical evaluation including PoC will only be opened.
 - (d) Vendors would be bound to provide product support for time period specified in the RFP, which includes spares and maintenance tools/ jigs/ fixtures for field and component level repairs.
 - (e) The Vendor would be required to accept the General Conditions of Contract given in the Standard Contract Document at Chapter VI of DAP 2020 placed on www.mod.nic.in.
 - (f) An Integrity Pact alongwith appropriate Bank Guarantee is a mandatory requirement as per Schedule I of Chapter II (RFP Format) of DAP 2020.
 - (g) A Performance-cum-Warranty Bank Guarantee of 5% value of the Contract will be furnished by the seller in the form of a Bank Guarantee after signing of Contract.
 - (h) Transfer of Technology as applicable to categorisation would be needed to be confirmed by the Indian lead Integrators/ Vendors.
4. **Procedure for Response.**
- (a) Vendors must fill the forms of response as given at Appendix A and Appendix B.
 - (b) Apart from filling details about Company, details about the exact product meeting the generic technical specifications should also be carefully filled. Additional literature on the product can also be attached with the form. Questionnaire for Vendors is attached as Annexure I to Appendix B.
 - (c) Last date of acceptance of response to the Broad Details of AoN is four weeks from issue of Broad Details of AoN.
5. The Government of India invites responses to this request only from Original Equipment Manufacturers (OEMs)/ Authorised Vendors/ Integrators. The end user of the equipment is the Indian Army.

6. **Criteria for Vendor Selection.** Criteria for Vendor selection are as follows: -

(a) **General Parameters.**

(i) Applicant Entity should be an Indian Vendor as defined at Paragraph 20 of Chapter I of DAP 2020.

(ii) Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization (as defined in Guidelines for Penalties in Business Dealings with Entities issued vide Ministry of Defence, D(Vigilance) MoD ID No 31013/I/2006-D(Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a wilful defaulter.

(iii) "Entities" will include companies, with whom the Ministry of Defence has entered into, or intends to enter into, or could enter into contracts or agreements.

(iv) "Applicant entity" may be a company, subsidiary, an associate company (as defined in the Companies Act, 2013), a consortium or a Joint Venture (JV).

(b) **Technical Parameters.**

(i) Vendor shall be a manufacturing entity or a system integrator of defence equipment and not a trading company, except in cases where the OEM participates only through its authorised Vendors/ Integrators.

(ii) Minimum two years experience in broad areas like manufacturing/integration of electronic systems etc. as applicable in the instant procurement/ upgradation case. If not, then cumulative experience of at least three years in above areas, resulting in gaining of competence for manufacturing the proposed product. (In case the SHQ feels that for a particular equipment a lesser experience could be accepted, then the same should be got approved by the competent authority before including the same in the RFP).

(iii) Where product involves integration, previous experience of not less than one year/ one project in integration of systems/ equipment shall be required.

(iv) **Turnkey Projects.** Experience of successful completion of one Turnkey project of Security upgradation and modernization where supply, commissioning and installation of varied machines/equipment is involved within last five years or currently executing a contract. In case of no experience in Turnkey projects, the Vendor for main component of such Turnkey projects may be selected if it has experience of installation or integration of equipment/system or system for security and fire fighting systems upgradation.

(v) **Information and Communication Technologies (ICT).**

(aa) Certification to be included if linked to scope of work – Gartner Quadrant /ISO9001/CMMi3 or more (specifying development/service/ acquisition models)/ISO27001. For Information Security and large value projects preferably CMMi5 may be specified.

(ab) Compliance with IEEE/ ITU standards depending upon nature/type of project or solution required.

(c) **Financial Parameters.**

(i) **Average Annual Turnover.** Minimum average annual turnover for last three financial years, ending 31st March of the previous financial year, should not be less than 30% of estimated cost of the Buy (Indian) project.

(ii) **Net Worth.** Net worth of entities, ending 31st March of the previous financial year, should not be less than 5% of the estimated cost of the (Indian) project.

(iii) **Insolvency.** The entity should not be under insolvency resolution as per Indian Bankruptcy Code at any stage of procurement process from the issuing of RFP to the signing of contract.

(iv) **Credit Rating** (Desirable Financial Parameter). Long term credit rating equivalent to CRISIL rating on Corporate Credit Scale as CCR-BBB or better, and SME-04 or better for SMEs issued by credit rating agencies recognized by SEBI. Credit rating should be as on 31st March of the previous financial year.

Note : The turnover and net worth of the Vendor shall be rounded off to the nearest lower ten/ hundred crores so as to keep the estimated cost of procurement confidential).

(d) **Other Parameters.**

(i) **Industrial License (IL).** Vendors should be either holding a valid defence industrial license or should have applied for the same before responding to RFP. In any case the Vendor must confirm holding of IL before commencement of FET. (Items requiring IL will be as per DIPP Press Note 3 of 2014 as amended from time to time).

(ii) **Registration.** Registered for a minimum of two years (one year for SMEs). Minimum number of years not applicable for JVs constituted specifically for a project.

(e) **Previous Experience.** The company needs to specify the previous experience/expertise in Modernization and Upgradation of Security and Fire Fighting System or any of its sub-components like Intrusion Detection and Surveillance System, Access Control System (Locking System), Quick Reaction Capability, Fire Fighting System for Ammunition sheds/similar flammable stores, Fire Detection System, Communication System, Integrated Command & Control Centre System, Power Backup and Video Management System (VMS) project undertaken in MoD/other ministries. The details of the same needs to be provided.

7. **Stipulations for Applying Parameters.**

(a) Areas like manufacturing/ electronics etc. referred to at Paragraph 2(b) (ii) should be defined in each case of procurement.

(b) In case the Applicant Entity is unable to meet the Financial Parameters by itself, it may rely on its Holding Company (as defined in the Companies Act, 2013 and amendments thereof) ("Companies Act") for fulfillment of the Financial Parameters, in which case reliance must be placed on the Holding Company towards fulfillment of all the Financial Parameters.

(c) In case the Applicant Entity is unable to meet one or more of the Technical Parameters by itself, it may rely on a Group Company(ies) for fulfillment of the Technical Parameters. A Group Company in relation to the Applicant Entity may be:-

- (i) A company of which the Applicant Entity is an Associate Company. Such company should have ownership, directly or indirectly, of at least 26% of the voting shares of the Applicant Entity.
 - (ii) A company which is an Associate Company of the Applicant Entity. The Applicant Entity should have ownership directly or indirectly, of at least 26% of the voting shares of such Associate Company.
 - (iii) A Company with whom the Applicant Entity is commonly owned, directly or indirectly, for at least 26% of the voting shares by another company. For example: An Applicant Company A is an Associate Company of Company B, in which B holds at least 26%. Further, C is also an Associate Company of B, in which B holds at least 26%. In this case the Applicant Company may use the credentials of C as well.
 - (iv) The Holding Company and Subsidiary Companies (as defined under the Companies Act) of the Applicant Entity.
- (d) The Applicant entity may be a single entity or a group of entities (the "Consortium"), coming together to implement the project. In such case:-
- (i) The credentials of only those members or their related entities may be counted, who have at least 26% equity stake in the Consortium.
 - (ii) Each Consortium should have a designated Lead Member.
 - (iii) For Technical Parameters, any of the Consortium members or their Group Companies may meet the criteria.
 - (iv) For Financial Parameters; the Turnover and Net Worth of the Consortium Member shall be reckoned proportionate to Consortium Member's equity stake in the Consortium, and each Consortium member should meet the other criteria pertaining to Insolvency and Credit Rating. In case the Consortium Member relies on its Holding Company for any one of the above-mentioned Financial Parameters, then reliance must be placed on the Holding Company for meeting all the financial Parameters.
- (e) Vendors should provide all necessary self-authenticated documentation in support of their achievement of criteria. Such documentation should inter-alia include:-
- (i) Details of projects/ supply orders successfully executed in the last two years.
 - (ii) Annual reports for three years of applicant entity, parent and associate companies, consortium and JV partners.
 - (iii) Details of shareholders, promoters, associated, allied and JV companies.
 - (iv) Details of vigilance action, viz. ongoing investigation and suspension/ debarment/ blacklisting actions against the applicant entity or any of its allied entities, parent company or consortium and JV partners, if any by any Department/agency of Central Government.
 - (v) A certificate from CA/CS indicating the financial parameters for the last three years as per Paragraph 2©.
- (Note: If a Vendor is already a supplier to MoD and/ or has already provided the above documents in such cases, it should be necessary for the Vendor to resubmit only such documentations as is necessary to update the above).
- (f) Any Vendor furnishing false information will be liable for action as per existing guidelines.

Appendix 'A'
(Refers to Para 1(c) & 4(a) of Broad
Details of AoN dt Apr 2023)

PROFORMA FOR REPLY TO BROAD DETAILS OF AON (INDIAN VENDORS)

1. **Name of the Vendor/Company/Firm.**

_____.

_____.

(Company profile including Share Holding pattern, in brief, to be attached)

2. **Type (Tick the Relevant Category).** The list to be prepared in tabulated manner for all major equipment. The list of which is placed at Appx 'D'.

- (a) Original Equipment Manufacturer (OEM)/Integrator Yes No
- (b) Authorised Vendor/ Integrator of Foreign Firm Yes No
(attach details, if yes)
- (c) Other (give specific details)
-

3. **Contact Details.**

Postal Address : _____

City : _____ Province : _____

Country : _____ Pin/Zip Code : _____

Tele : _____ Fax : _____

URL/Website : _____

4. **Local Branch/Liaison Office/Authorised Representatives in Delhi (if any).**

Name and Address : _____

City : _____ Province : _____

Pin/Zip Code : _____

Tele : _____ Fax : _____

5. **Financial Details.**

- (a) Category of Industry (Large/Medium/Small scale): _____.
- (b) Annual turn over : _____ (In INR).
- (c) Number of employees in firm _____.
- (d) Details of manufacturing infrastructure available: _____.
- (e) Earlier Contracts with Indian Ministry of Defence / Government Agencies.

<u>Contract No</u>	<u>Equipment</u>	<u>Quantity</u>	<u>Cost (In Rs)</u>

6. **Certification by Quality Assurance Organisation.**

Type of Equipment	Name of Agency/ Integrators (Certification obtained from)	Certification	Applicable From (Date & Year)	Valid Till (Date & Year)

7. **Details of Registration.**

Agency	Certificate	Applicable From (Date & Year)	Valid Till (Date & Year)
GeM			
DGQA/DGAQA/DGNAI			
OFB			
DRDO			
Any other Govt Agency			

8. **Membership of FICCI/ASOCHAM/CII or other Industrial Associations.**

Name of Organisation: _____ . Membership Number: _____ .

9. **Equipment/Product Profile (to be submitted for each product separately).** The list of equipments being used in the project is at Appx 'D'.

- (a) Name of the Product : _____ .
(IDDM Capability be indicated against the product)
(Should be given category wise for e.g. all products under Night Vision Devices to be mentioned together)
- (b) Description (attach technical literature): _____ .
- (c) Whether OEM or Integrator: _____ .
- (d) Name and address of Foreign collaborator (if any): _____ .
- (e) Industrial License Number: _____ .
- (f) Indigenous component of the product (in percentage): _____ .
- (g) Status (in service / Design development state): _____ .
- (h) Production capacity per annum: _____ .
- (j) Countries/ agencies where equipment supplied earlier (give details of quantity supplied): _____ .
- (k) Estimated price of the equipment: _____ .

10. Details of any such project implemented with any of the Government agency/establishment.

11. Alternatives for meeting the objectives of the equipment set forth in the Broad Details of AoN.

12. Any other Relevant Information : _____ .

13. **Declaration.** It is certified that the above information is true and any change will be intimated at the earliest.

(Signature of Authority)

Appendix 'B'

(Refers to Para 1(c) & 4(a & b) of Broad details of AoN)

BROAD DETAILS FOR UPGRADATION OF SECURITY AND FIRE FIGHTING INFRASTRUCTURE IN 16 x AMMUNITION DEPOTS AT 20 LOCATIONS

1. The Indian Army (Directorate General of Ordnance Services) is undertaking Project for 'Upgradation of Security and Fire Fighting Infrastructure in 16 x Ammunition Depots at 20 locations' located in various parts of the country. With the view to identify probable vendors who can carry out the said project, OEMs/Authorised Vendors/Integrators are requested to forward information on the product which they can offer as per the parameters/ broad specifications of the item and services mentioned in the questionnaire attached as per Annexure-I to Appendix 'B'. In addition, the Vendors are required to furnish details as per proforma attached as -Appendix 'A' (Indian Vendors).
2. Apart from the information as per the Appendices, the Vendors may also forward technical details/ product brochures/ literature etc pertaining to the item in question.
3. The required information / details may please be forwarded and same to reach at the following addresses by **23 May 2023, 1500 hr**. The envelopes be dropped in the box kept at **Gate No 04, Sena Bhawan** on any working day (Mon-Fri) between 0900 to 1600 hrs.
 - (a) Directorate General of Ordnance Services (OS-7)
Room No 118, D-II Wing, Sena Bhawan
Integrated HQ of MoD (Army)
DHQ – PO, New Delhi – 110011
 - (b) Directorate General of Capability Development (CD - 9)
General Staff Branch
Room No 411, 'A' Wing, Sena Bhawan
Integrated HQ of MoD (Army)
DHQ PO, New Delhi –110011
 - (c) Directorate General of Capability Development (RFP Cell)
General Staff Branch
Room No 444, 'A' Wing, Sena Bhawan
Integrated HQ of MoD (Army)
DHQ PO, New Delhi – 110011
 - (d) Army Design Bureau (GSQR Cell)
General Staff Branch
Room No 16, 'C' Wing, Sena Bhawan
Integrated HQ of MoD (Army)
DHQ PO, New Delhi - 110011
 - (e) ADG Acquisition Tech (Army)
Room No 30, D-II Wing, Sena Bhawan
Ministry of Defence,
New Delhi - 110011

QUESTIONNAIRE

S No	Specification/Parameter	Reply
1.	<p><u>Indigenous Content/ Production.</u></p> <p>(a) Are the equipments (as per appendix 'C' of this Broad Details of AoN) available in Indian market? What is the level of indigenization, maintenance support and life time support?</p> <p>(b) Can the equipment /platform be produced indigenously by the Indian Industry? If yes, what will be the Indigenous Content provided & verification process? Is the equipment indigenously designed and developed (IDDM)?</p> <p>(c) What are the critical technologies which the industry has taken from their global partners or Joint Venture, if any? Or what are the essential critical technologies which are required to be obtained?</p> <p>(d) If you have a startup/Joint venture, then how much time will the startup / Joint Venture take to start production?</p> <p>(e) Does the Indian Industry have the capability to design, develop, manufacture, test and integrate the system including the critical technology?</p> <p>(f) If there is no Joint venture, does the OEM/Vendor/Integrator (Buy Global) plans to have any Indian Manufacturer as its Partner? If No, is the OEM willing to enter into Joint Venture with Indian Defence Industry/ DPSU?</p> <p>(g) Is the OEM willing to offer licensed production in India?</p> <p>(h) What are the enhanced parameters/specifications that can be provided?</p> <p>(j) Do you have Industrial Licenses for the production of the equipment? If not, have you applied for the same and when (date) and by which it is likely to be granted?</p> <p>(k) How many sub Vendors are involved in the manufacturing of product? Is product support from all sub Vendors also assured for the same period, as committed by you?</p> <p>(l) Can you provide Indian origin batteries, tyres & tubes, bulbs and other such items/accessories with your equipment, where applicable?</p> <p>(m) What is your firm's annual production capacity? Is it likely to increase?</p> <p>(n) How much time is reqd to deliver the Equipment post contract for operational use with the stipulated indigenous content?</p> <p>(o) What is the suitability of platform for dply in various types of terrain in India? Specify separately for deserts, plains, mountains, High Altitude Area.</p> <p>(p) What is the minimum time period for the Vendor to deposit the Equipment for Proof of Concept post submission of Bids?</p> <p>(q) Which US Military Standards are being conformed to by the Equipment produced by the OEM/Vendor/Integrator? Or which standards does your equipment conform to?</p>	

S No	Specification/Parameter	Reply
	<p>(r) Which Joint Service Specifications (JSS)/ Joint Service Guidelines (JSG) are being conformed to by the Equipment produced by the OEM/Vendor/Integrator?</p> <p>(s) Which accredited laboratory (Indian/ International) has certified your equipment?</p> <p>(t) Will your firm be able to offer sectionised/ Cut Models, 3D model CDs for training?</p> <p>(u) What is your preferred mode of shipment of goods _ rail, road, sea or air or a combination?</p> <p>(v) Is the Applicant Entity an Indian Company as defined under the Companies Act 2013?</p> <p>(w) Has the Applicant Entity or any of its allied entities ever been banned or suspended by MoD/SHQ or any Government Department or Organization? Details of vigilance action viz ongoing investigations by any Department/ agency of Central Government may be provided.</p> <p>(x) Is the Applicant Entity a Manufacturing Entity or System Integrator or a Trading Company?</p> <p>(y) Does the Company has any previous experience/ expertise in this field? Specify the field of expertise/ experience of your company and duration of experience in years.</p>	
2.	<p><u>Product Support.</u></p> <p>(a) Will your firm be able to provide a Service Life of 08 years for all equipment and services? If not, then provide the Service Life of each equipment separately.</p> <p>(b) Will your firm be able to provide Comprehensive Maintenance Contract for 05 years post 03 years Warranty. If not, then what kind of 'Product Support' will you ensure? What will be the 'Time Period'?</p> <p>(c) What is the period for which you commit the product support for sustenance of equipment in terms of supply of spares / CMC etc?</p> <p>(d) What is the expected life of your equipment and main sub-assemblies in terms of usage?</p> <p>(e) Have you supplied the equipment to any other company? If yes, furnish details of quantity supplied to the country and year of supply?</p> <p>(f) Does the company have major repair and overhaul facility for major assemblies and component level repair?</p> <p>(g) What kind of 'Engineering Support Package' will you be offering?</p> <p>(h) Will your firm be able to provide 03 years Warranty? If not, then what is the warranty period offered for each equipment?</p> <p>(j) What life time support can be provided by the Vendor?</p>	

S No	Specification/Parameter	Reply
	<p>(k) Does the equipment have capability of backing up data? What all redundancies are provided for the same?</p> <p>(l) Will your firm provide Interactive Electronic Training manuals (IETMs) as part of technical literature? If yes which class?</p> <p>(m) Will the engineering support package be provided exclusively by your firm or will it be outsourced through sub Vendors?</p> <p>(n) What are the facilities available at OEM/ Vendor/ Integrator premises to conduct training?</p> <p>(o) How will you assist in carrying out training for user?</p> <p>(p) Will your firm provide soft copies of the 'User Hand book' and other manuals including Technical Manuals along with the CBT for training?</p> <p>(q) Which INCOTERMS 2010 are suitable/ preferred by your company and for what reasons?</p>	
3.	<p><u>Budgetary Estimate.</u> (Exclusive of all taxes)</p> <p>(a) Approx basic cost of the all equipments as per appendix 'C' of this Broad Details of AoN ?</p> <p>(b) Complete cost of project implementation.</p> <p>(c) Rate/Cost (Per year) at which CMC will be provided on completion of warranty period.</p> <p>(d) Estimated Cost per equipment including cost of Product Support Package and training cost?</p> <p>(e) Details of Taxes as applicable to be provided.</p>	
4.	<p><u>Vendor Certification.</u> Vendor needs to provide Vendor Certification for all parameters which have not been validated during Proof of Concept (PoC)/ Trials. If not, Vendor needs to satisfy giving reasons for it.</p>	
5.	<p><u>Company Profile.</u></p> <p>(a) Specify the turnover and net worth of Company in the last three (03) years.</p> <p>(b) Is the company under insolvency resolution as per Indian Bankruptcy Code?</p> <p>(c) What is the Credit Rating of the Company equivalent to CRISIL rating?</p> <p>(d) Does the Company qualify under Start up or MSME Category?</p>	

Appendix 'C'
(Refers to Para 2(c) Broad Details of AoN)

LIST OF EQUIPMENT PROPOSED FOR INSTALLATION

Ser No	Equipment Description	A/U	Total Qty
1	Surveillance IP System		
	13MM Thermal Camera	Nos	592
	19MM Thermal Camera	Nos	294
	35MM Thermal Camera	Nos	134
	60MM Thermal Camera	Nos	292
	IP ultra HD Camera with IP 66 outdoor Housing	Nos	604
	IP Outdoor PTZ Camera 1080 P(CCD/ CMOS, 30x, IP 66)	Nos	875
	Supply installation, testing and commissioning of Joystick for PTZ controlling	Nos	61
	Supply, installation, testing and commissioning of Operator Workstation	Nos	82
	Supply, installation, testing and commissioning 65" Industrial Grade LED Screens with Controller & Software	Nos	115
	Supply, installation, testing and commissioning of Video Management Solution (VMS) with all licenses required to support the cameras	Nos	20
	Recording and management Servers	Lot	20
2.	Lighting System		
	Pole	Nos	2,817
	LED Unit with communication Unit	Nos	6,144
	Central Control Unit	set	20
3.	PA System		
	Speakers with Amp	Nos	1,031
	Command & Control Software	Nos	20

LIST OF EQUIPMENT PROPOSED FOR INSTALLATION

Ser No	Equipment Description	A/U	Total Qty
4	Cabling (Measure and Pay)		
	Cat 6 cable @ 75 m/camera	mtrs	2,31,900
	Fiber Cable	mtrs	3,97,300
	Junction Box	Nos	5,331
	PA System Cable	mtrs	1,00,000
	Power Cable 25 Sqmm	mtrs	3,07,300
	Power Distribution Cable 2 sq mm	mtrs	3,68,760
	HDPE Conduit	mtrs	6,76,060
	MS Conduit 20/25 mm	mtrs	2,31,900
5	Security Network		
	Chassis Layer 3 Core fiber switch as per specification	Nos	40
	Firewall	Nos.	40
	8 (10/100) port industrial Distribution switch with Jack Panel	Nos	3,517
	24 (10/100) Port with 2 SFP Switch with Jack Panel	Nos	40
	SFP Modules	Nos	14,111
	SFP+ transceiver module for multimode fiber, commercial operating , temperature range, 32°F to 158°F (10°C to 50°C)		
	Supply, installation, testing and commissioning of Other network equipment (Server racks, Connectors etc)	Lot	20
	CAT-6 I/O Outlet with SMB	Nos	12,369
	Cat-6 Patch Cords 3 mtrs	Nos	4,023
	Racks (42u)	Nos	40
6	Power		
	UPS 30+30 KVA dual hot standby	Nos	20
	UPS 30 KVA for field	Nos	120
	DG set for power back for all security equipment 200 KVA	Nos	20

LIST OF EQUIPMENT PROPOSED FOR INSTALLATION

Ser No	Equipment Description	A/U	Total Qty
7	Fire		
	Fire alarm system for WP shed	Set	20
	Thermal Camera for depot	Nos	325
	Remote Control Monitor for Fire Fighting	Nos	645
8	Locking System		
	Guard Tour Management	No's	456
	Key	No's	3,880
	Guard Locks	No's	5,920
	IP Programmer	No's	40
	Transfer key	No's	100
	Software	No's	20
	Work station for locking system	No's	20
9	Command & Control Centre – C4I		
	Integration of all sensors for IDS, Access Control, Surveillance, Gate Control, Communication, Fire & Alarm Management etc	Set	20
	QRT Veh with focus light, radio, night vision device	Nos	38
10	Communication System with Voice logger		
	200 Line exchange (Incl exchange & line)	Set	20
	Radio Interoperability System (Incl radios, phones, computers & video assets)	Set	20
	Radio sets	Nos	1,376
11	Civil Infrastructure & Allied Services		
	Gate – redesign and construction to be done	Nos	20
	C4I control room design & construction design	Nos	20
12	Barriers		
	Crash Barrier	Set	128
	Gate automation	Set	40
	Boom barrier	Set	128

Note: Bill of Quantities (BOQ) given is tentative in nature and it may vary on the basis of actual requirement of respective locations. A variation of +/- 10% of total quantity is permissible (overall cap of 10% of contract value).

**DETAILED TECHNICAL
SPECIFICATIONS FOR UPGRADATION
OF SECURITY AND FIRE FIGHTING
INFRASTRUCTURE IN 16
AMMUNITION DEPOTS**



TABLE OF CONTENTS

INTRUSION DETECTION AND SURVEILLANCE SYSTEM

1. Surveillance IP System

- (a) 13mm Thermal Camera
- (b) 19mm Thermal Camera
- (c) 35mm Thermal Camera
- (d) 60mm Thermal Camera
- (e) IP Ultra HD Camera with IP-66 Outdoor Housing
- (f) IP outdoor PTZ Camera 1080P (CCD/CMOS, 30x IP 66)
- (g) Joystick for PTZ Controlling
- (h) 65" Industrial Grade LED Screen with Controller
- (i) Video Management Solution (VMS)
- (j) 6m Pole with junction Box

2. LIGHTING SYSTEM

- (a) Pole for Lights
- (b) LED Unit with Communication Unit
- (c) Central Control Unit .

3. PA SYSTEM

- (a) Speakers with Amp
- (b) Central Control Software

4. CABLING

- (a) Cat 6 cable (Indoor)
- (b) Cat 6 cable (Outdoor)
- (c) 6/12 Core Fiber Optic Cable Indoor/Outdoor (Multi Mode)



- (d) 6/12 Core Fiber Optic Cable Indoor/Outdoor (Single Mode)
- (e) Pole Junction Box
- (f) PA System Cable
- (g) Power Cable 25 Sq mm
- (h) Power Distribution Cable 2 Sq mm
- (i) HDPE Conduit (j) MS Conduit 20/25 Sqmm

ACCESS CONTROL SYSTEM

1. Locking System

- (a) Guard and Tour Management
- (b) Key
- (c) Guard Locks
- (c) IP Programmer
- (e) Transfer Key
- (f) Software Features

2. Barriers

- (a) Crash Barriers
- (b) Gate Automation
- (c) Boom Barrier

3. Quick Reaction Capability

INTERNAL SURVEILLANCE FOR DEPOTS

1. Thermal Camera for Depot

FIRE FIGHTING SYSTEM FOR 1.1 TYPE ESH

- 1. Remote Control Monitor**
 - (a) 1500 US GPM adjustable to 1000 US GPM & 500 US GPM with the same single nozzle
 - (b) Cannon Foam Induction
 - (c) Specification for Motor

FIRE DETECTION SYSTEM FOR WP SHED

- 1. Fire Alarm System**

COMMUNICATION SYSTEM

- 1. Line Exchange 200 Line**
- 2. Radio Interoperability System**
- 3. Radio Set**

INTEGRATED COMMAND & CONTROL CENTRE

- 1. Command & Control Platform/Application**
 - (a) System Architecture
 - (b) General Requirements
 - (c) Events & Alarms
 - (d) Operator Definitions
 - (e) Reporting



- (f) Trending
- (g) Graphics
- (h) Interfaces

2. Command and Control Room

- (a) Standards for interior works in CCR
- (b) Minimum Required Specifications for CCR components

3. Workstation/Desktop

DATA CENTRE COMPONENTS

1. Chassis Layer 3 Core fiber switch
2. Firewall
3. 8 port (10/100/1000) Industrial Field Switch
4. 24(10/100/1000) Port Managed Switch
5. Server/Network Rack
6. Server
7. Storage

POWER BACKUP FOR DEPOT

1. UPS 30+30 KVA for Control Room and 30 KVA for Field
2. Diesel Generator Set

(d) 60mm Thermal Camera

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Microbolometer
Lens & Angle of view	Lens (>=608<=75MM)providing <= 10 Degree
Thermal Resolution	640 x 480, 25 Hz
Zoom	Up to 4X Digital zoom
Spectral Band	8-13μ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Thermal Sensitivity	<50mK f/1.0
Modes	White-Hot & Black-Hot user selectable
Analytics	Built-in or server based analytics & IQ based processing for Human and Vehicle or other classification
Analytics Range	Shall reliably trigger intrusion detections analytics alarm for human at 550m or higher
Output	Analogue BNC and IP RJ45(Both required)
Streaming	Dual Stream, ONVIF Profile S
Rating	IP-66 with sunshield and MIL-STD-810F
Power	PoE and 24VAC/DC
Operating temp.	Temp: -20° C to 55°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(e) IP Ultra HD Camera with IP 66 Outdoor Housing

Item	Minimum Requirement Description
Make	
Model	
Sensor	1/2.5" or bigger Progressive CMOS Sensor
WDR	High/Low/Medium user configurable
Minimum Illumination	Day 0.5 lux / Night 0.05 lux
Lens	9-50mm varifocal, Auto Iris, Full HD, D/N lens providing 15-40 degree adjustable FOV and detect human at 150m or higher
IR sensitivity	Between 680 to 1100nm IR cut filter
3D Noise reduction	User configurable ON/Off
Tamper Detection	User configurable On/Off
Compression	Dual H.264 streams
Compression Performance	Resolution & FPS Maximum Performance: Stream 1: 3840 x 2160 @ 25FPS and Stream 2: 720 x 576 @ 25FPS on two streams respectively at the same time
Bandwidth	64Kbps to 20Mbps



Motion Detection	Built-in Multi-zone motion detection
Protocols	Unicast, Multicast, RTP, TCP, UDP, HTTP, IGMP, ICMP, DHCP, ONVIF etc. or as per solution requirement to fulfill functional requirement
Connectivity	10/100 Base-T Auto sensing, Half/Full Duplex (RJ45)
Audio	Audio IN and Audio out for two way audio communication using suitable external microphones and speakers
SD Card Support	Built in Micro SD card slot to support up to 32GB storage for local recording, SD Card will be supplied by system Integrator
Alarm I/O	At least one potential free Alarm IN and one Alarm out
Power	Power : 802.3af class 3 PoE and 12VDC/24VAC auto sensing
Enclosure	Vandal resistant enclosure with IP66 rated, built in Heater and Blower, Sun shield.
Mounting	Wall, Pole as required
Operating conditions	Temp: -20° C to 50°C , Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

(f) IP outdoor PTZ Camera 1080P (CCD/CMOS, 30xIP 66)

Item	Minimum Requirement Description
Make	
Model	
Sensor	1/3" CCD/CMOS Progressive Sensor
Minimum Illumination	Minimum Illumination : Color 0.5 lux & B/W 0.05 lux
Lens	Auto iris, Auto focus, Motorized 4.3mm-129mm or better zoom lens (30X) providing adjustable 3-65 degree or better FOV and detect human at 400m or higher
Compression	H.264
Compression Performance	Resolution & FPS Maximum Performance: Stream 1: 1920 x 1080 @ 25FPS and Stream 2: 720 x 576 @ 25FPS on two streams respectively at the same time
Bandwidth	Bandwidth : 64Kbps to 16Mbps
Protocols	Unicast, Multicast, RTP, TCP, UDP, HTTP, IGMP, ICMP, DHCP, ONVIF etc. or as per solution requirement to fulfil functional requirement
Connectivity	10/100 Base-T Auto sensing, Half/Full Duplex (RJ45)
Pan-Tilt	Endless 360° pan and -10° to 90° tilt movement
Speed	Manual Pan/tilt speed up to 90 deg per second and preset speed up to 200 deg per second
Mode	200 or more preset positions and 8 tour
Audio	External audio input and output: Required
SD Card Support	Built in Micro SD card slot to support up to 64GB storage for local recording
Alarm I/O	At least one potential free Alarm IN and one Alarm out
IR	Built-in or external IR with minimum 150m range
Power	Power input: 24VAC or POE++ as per manufacturer standard
Rating	IP66 rated, Built in heater
Operating conditions	Temp: -20° C to 50°C , Humidity: 90%

Mounting	Mount: Wall or pole or pendant
Standard	BIS Standard 13252 (Part 1):2010

(g) Joystick for PTZ Controlling

Item	Minimum Requirement Description
Make	
Model	
Keyboard	Electromechanical
Joystick	3-axis, vector-solving, twisting, return to-center
Connector	RS232
Display	LCD, 75.2mm x 33.85mm
Max User Accounts	1 Admin, 10 User
User Account Type	Admin, User
Power Supply	Input 100V ~240V 50Hz / 60Hz, Output 12V DC 1000mA
Power Consumption	Max 5W
Operating Temperature	Temp: 0° C to 40°C
Operating Humidity	<90%RH

(h) 65" Industrial Grade LED Screen with Controller

Item	Minimum Requirement Description
65" LED TV & Video Wall Controller with Software	
Make	
Model	
Screen Size (Inches)	Minimum 65
Type of Television	LED
Backlight	Yes
Resolution (Pixels)	1920 x 1080
Picture Processor	Yes
Aspect Ratio	16:09
Number of Selectable Picture Modes	Vivid, Standard, Custom, Cinema Pro, Cinema Home, Sports,
Picture In Picture	Yes
Selectable Sound Modes	Standard, Cinema, Live Sports, Music
Audio Output (PMPO) (Watts)	20W



Stereo Playback	Yes
Number of Speakers	2
Youtube	Yes
Web Browser	Yes
HDMI Input	2
USB Port	2
VGA Input	1
Composite Input	1
Component Input	1
Ethernet	1
DLNA Support	Yes
Dimensions (W x D x H) (mm)	Approx 1230mm x 210mm x 753mm
Approximate Net Weight (Kgs)	20
Remote Control	Yes
Brand	Should be from Sony/Samsung/LG/Panasonic
Digital Audio Output(Optical)	1 (rear)
Included Accessory	TV Remote
Power Supply	AC Auto 110-240 V, 50/60 Hz
Visible Screen Size (diagonal)	106 cm , 42 inches
Rated Power Consumption	97 W
Standby Power Consumption	0.20 W
Screen Resolution	1,920 (W) x 1,080 (H)
Dimensions (W x H x D) (w / o stand)	963 x 566 x 69 mm
Dimensions (W x H x D) (with stand)	963 x 610 x 247 mm
Stand	Mount wall stand with rotation facility
Brand	Should be from Sony/Samsung/LG/Panasonic
Item	Minimum Requirement Description
Certification	BIS, Energy Star
Video Wall Controller with Software (3x2)	
Make:	
Model:	

General	Display Controller should be scalable to control video wall in a matrix of M x N (any combination of Row & Column) up to total of 6 screens. It should also be capable of taking universal inputs for video as well as data along with necessary wall management software's
Networking	Dual-port Gigabit Ethernet Controller inbuilt Support for Add on Network adapters
Wall Configuration	6 DVI-D/ HDMI Outputs
Resolution Output support:	Minimum 1920x1080 or higher
Universal Ports	6 Universal Inputs (Should be able to accept at least 3 kinds of signals i.e. DVI/RGB/HDMI)
Redundancy Support:	System should have the redundancy support for following: <ul style="list-style-type: none"> - Controller Hard Disk Data - Power Supply - LAN
Matrix Combination	The video wall of any matrix combination (CR) should be capable of displaying multiple type of outputs as desired in CCC facility
Software Certification	Compatible Video Wall Management software to meet the required functionality BIS

(i) Video Management Solution (VMS)

- (i) The VMS software shall consist of an MS-SQL 2012 or better based Main Directory Database, Failover directory, Recording Server licenses, Failover recording, Redundant recording, Incident Reports, Alarm and Management. All the related software licenses should be the part of the offered system.
- (ii) Vendor should consider additional server for maintaining system administration database if required by the offered system configuration apart from recording servers.
- (iii) The VMS system should be accessible from at least 15 computers from the network for system administration and video monitoring with minimum 5 simultaneous users. System administration and monitoring can be distributed depending on the sub division of the surveillance areas/zones. Even though system should allow to create unlimited user ID's in the system.
- (iv) The VMS Server shall maintain a catalogue of settings for all the client, servers and IP cameras in the system.
- (v) The VMS shall support up to 250 camera connections.



- (vi) The VMS Archive Server, for video and audio, shall be capable to support and manage cameras @ 1920x1080 @ 25FPS, camera @ 1280x720. But considering the future intention to zonalise the recording not more than 120 cameras be loaded on any server during initial design of the system.
 - (vii) The VMS shall be able to set each camera frame rate, bit rate and resolution independently from other cameras in the system, and altering these settings shall not affect the recording and display settings of other cameras. This should be applicable even if vendor propose to use multi-channel encoders.
 - (a) The VMS shall utilize multicast network communication for video monitoring.
 - (b) Unicast based equipment will not be considered as an approved equal for alternate system.
 - (viii) The VMS shall have Digital Video Matrix Switcher.
 - (a) The Virtual Matrix Switch shall provide a full matrix operation of IP video to digital (computer) screens.
 - (b) The Virtual Matrix Switch shall have the capability of creating at least 20 sequences including: i) Multiple cameras with independent dwell time for each camera ii) PTZ camera presets iii) Sequence of multiple pre-loaded pre-configured tile layout.
 - (ix) The VMS shall support thick clients/web basedclients connecting to the VMS system.
 - (x) The VMS shall be based on a true open architecture that allow for use of non-proprietary PC and storage hardware that shall not limit the storage capacity and shall allow for gradual upgrades of recording capacity.
 - (xi) The VMS Server shall be of the most recent computer technology and shall cover the VMS requirements. To provide an advanced and reliable system the operating system shall be Linux/Windows 2012 server or higher.
 - (xii) The VMS shall allow use of latest Windows 10 OS or higher for client machines as we intend to access the video from existing machines which has these operating systems and cannot be changed.
 - (xiii) The VMS shall provide support for industry standard SNMP V2.0 and V3.0 and should provide the compatibility with any SNMP application to report the status of various component of VMS system. Required interface license shall be included in the offer.
 - (xiv) The VMS shall provide alarm dry contact interfaces to allow for any alarm input initiating any action in the VMS system. All the cameras should be provided with easily panic button accessible near each camera. If anyone press this switch, relevant camera should popup automatically on the client work station.
-

- (xv) The VMS Shall support full duplex audio communication and transmission signals over the IP Digital Transmission Network without the need of any additional license.
- (xvi) The VMS shall support the group functionalities to facilitate the administrator to change the setting of all the cameras in single go. i.e. Changing resolution/FPS of all the cameras in single command, Changing user privileges of all the users etc.
- (xvii) The VMS shall provide a reporting utility for tracking but not limited to the following options. Video and images shall be stored with reports for documenting events.
 - (a) Alarms, Incidents, Operator logs, Service requests.
 - (b) The Email Alert should be generated in responds to alarms triggered in VMS software and sends out email alerts to a preconfigured list of recipients.
 - (c) It should be possible to export the settings of various entities within the VMS i.e. Archiver, Directory, cameras etc. It should be possible to print these reports.
- (xviii) The VMS should allow to mask a specific area within the picture of any cameras in order to maintain privacy of sensitive areas without compromising the security. Any privileged user should be able to unmask the view during playback or live in case of specific situational requirements.
- (xix) The VMS should allow to configure automatic scheduled backup of videos from user selected cameras to specified network drive. It should also allow to configure specific timings of the day whose video need to be backed up.
- (xx) The VMS shall provide module to allow access of system through iPad, iPhone, Android phones. At least one license for the same shall be supplied.
- (xxi) The VMS shall provide the facility so as any Android OS smart phone can capture the video using its in-built camera and stream it to the VMS server through 3G, 4G, LTE or Wi-Fi network. VMS shall have the capability to automatically popup this video and also indicate the GPS location of the smart phone.
- (xxii) The VMS shall provide alarm management module without the need of any additional license.
 - (a) The alarm management shall be able to set any monitor or groups of monitors to automatically display cameras in response to alarm inputs.
 - (b) The alarm management shall be able to reset automatically or manually alarmed video.
 - (c) The alarm management shall allow for multiple modes of alarm handling capability, these modes to be programmed within the same system.

VMS Client



- (i) The VMS client shall consist of Monitoring application, an Archive Player application, alarm handling, virtual matrix capability, and all other user related features. Each VMS system videos and administration should be possible from all unit workstations.
- (ii) The VMS client shall perform the following applications simultaneously without interfering with any of the Archive Server operations (Recording, Alarms, etc.)
- Live display of cameras.
 - Play Live audio.
 - Broadcast audio to remote locations.
 - Live display of camera sequences.
 - Live display of panoramic camera views.
 - Control of PTZ cameras.
 - Playback of archived video and audio
 - Playback of panoramic camera clips.
 - Retrieval of archived video and audio.
 - Instant Replay of live video and audio.
 - Instant Replay of panoramic camera clips.
 - Use of graphical controls (maps).
 - Configuration of system settings
- (iii) The VMS client applications shall support any form of IP network connectivity, including: LAN, WAN, VPN, Internet.
- (iv) The VMS client applications shall support IP Multicast (UDP) and Unicast (UDP) video and audio streaming.
- (v) The VMS client applications shall automatically adapt to the network topology and use the best available method to receive streaming video.
- (vi) The VMS client applications shall provide an authentication mechanism, which verifies the validity of the user.
- (vii) The Client application shall allow for live monitoring of video and audio.
- The Monitor shall enable view of up to 25 video tiles simultaneously on a single monitor.
 - The IP Based VMS Shall provide more than 15 tile layouts on each of the VGA monitors independently including below formats.
 - Full screen, Quad, 3x3, 4x4, 5x5 etc.
- (viii) The VMS Monitor application shall allow operators to view an instant replay of any camera or audio input (microphone).
- (ix) operator shall be able to define the amount of time he wishes to go back from a predefined list or through a custom setup period.
-

- (x) The operator shall be able to control the playback with play, pause, forward, and speed buttons.
- (xi) The VMS Monitor application shall allow operators to add bookmarks to recorded clips of video or audio.
- (xii) The operator shall be able to choose and trigger an action from a list of available actions included but are not limited to: -
- View camera in a video tile.
 - View Map or procedure in a video tile.
 - Starting/stopping PTZ pattern.
 - Go to PTZ Preset.
 - Sending alert messages.
- (xiii) VMS Monitor application shall display all cameras attached to the system regardless of their physical location on the network.
- (xiv) The VMS Monitor application shall display all camera sequences created in the system.
- (xv) The VMS Monitor application shall allow for unlimited cameras sequences, which can be run independently of each other on either digital monitor tiles or analog CCTV monitors.
- (xvi) The VMS Monitor application shall allow operators to control (Pause/Play, skip forwards, skip backwards) Camera Sequences, without affecting other operators' ability to view and control the same sequence.
- (xvii) The VMS Monitor application shall display all cameras, sequences and analogue monitors in a logical tree.
- (xviii) The VMS Monitor application operator shall be able to drag and drop a camera from a tree of available cameras into any video tile or an analogue monitor icon for live viewing.
- (xix) The VMS Monitor application operator shall be able to drag and drop a camera sequence from a tree of cameras into any video tile or an analogue monitor icon for live viewing. The VMS Monitor application shall support Graphical Site Representation (Maps) functionality, where digital maps are used to represent the physical location of cameras and other devices throughout facility.
- (xx) The VMS Maps shall be able to import maps from any graphical software supporting BMP, JPEG and/or GIF image formats.
- (xxi) The VMS Monitor application operator shall be able to drag and drop a camera from a map into a video tile for live viewing.
- (xxii) The operator shall be able to click on an icon in a map to initiate PTZ camera preset, run PTZ pattern, view camera in an analog monitor or send an I/O stream.



- (xxiii) The VMS Monitor application shall support the procedure functionality, where procedures can be triggered to appear during a certain event and can be used to provide detail written or verbal instructions to the operator as to the actions to be taken.
- (xxiv) The VMS Monitor application shall support digital zoom on a fixed camera's live and recorded video streams.
- (xxv) The VMS Monitor application shall support digital zoom on a PTZ camera's live and recorded video streams.
- (xxvi) The VMS Monitor application shall provide management and control over the system using Joystick controller of any compatible make. Each client workstation should be provided with joystick controller.
- (xxvii) The VMS software must support PTZ cameras with complete PTZ functionality from any client workstation GUI.
- (xxviii) The VMS should provide the application which should be integrated to the offered VMS and provide the below mentioned Incident Reporting and backup mechanism. Offered prices should include the price of this application.
- (xxix) This application should provide the facility to create the incident reports for specific incidents.
- (xxx) It should be possible to access recorded video within the VMS system for play back and export from this application.
- (xxxi) It should also allow the operator to write the text, attach the snapshots, video clip, audio clip or any other type of attachment which can be used in conjunction with this incident and form the entire incident report.
- (xxxii) It should be possible to send these reports by email or archived on offline media.
- (xxxiii) Software shall have the facility to monitor the desktop of any networked computer in camera tiles. We intend to use this facility to create the central monitoring display of all the systems (BMS, FAS, ACS, PIDS etc.) on same monitor simultaneously.

Alarm Management

- (i) The IP based VMS shall provide alarm management module.
 - (ii) The IP based VMS shall notify a user on any alarm set in the system.
 - (iii) The VMS user shall be able to support multiple alarms.
 - (iv) The VMS system administrator shall be able to set for each user the maximum alarms to be viewed at one time.
-

- (v) It should be possible to populate the alarm on the maps indicating their actual location and current status.
- (vi) It should be possible to drag the alarm related video on tile.
- (vii) It should also be configurable to popup the procedural URL/standard operating procedure for alarm handling specific to the active alarm.
- (viii) Alarms should be prioritized and displayed in different color for easy understanding of operators.
- (ix) The VMS user shall be able to forward alarms to other users.

Integration Interface

- (i) VMS shall provide SDK/API's interface for possibility to integrate it with third party security systems. Any required license shall be supplied.

(j) 6m Pole with junction Box

Item	Minimum Requirement Description
Make	
Model	
General Requirement	Shall be minimum 6.5m height as per NHAI norms
General Requirement	Hot dip galvanized pole with silver coating of 86 micron as per IS: 2629 min 10 cm diameter pole and suitable bottom and top thick HT plate along with base plate size 30x30x15 cms suitable for wind speed 50 m/sec with suitable arm bracket and with J type foundation bolts. Fabrication in accordance with IS 2713 (1980)
Foundation	Pole would be fixed on an adequate and strong foundation to withstand city weather conditions and wind speed of 150 km/hr
Foundation	Casting of civil foundation with foundation bolts to ensure vibration free (video feed quality should not be impacted due to wind in different climatic conditions) Expected foundation depth of minimum 100 cms or better
Sign Board with number plate	Sign board depicting the area under surveillance and with serial number of pole
Height	Height of the pole shall be as per requirement of the location varying from 6 m to 12/15 m.
Electrical Connection	Electrical power requirement for the systems/devices installed on the pole should be available with metering and protection equipment
Lightning Protection	Lighting arrestors with proper grounding



Earthing	Pole should have proper earthing system
Network Communication Certification	All communication passive & active devices should be housed in enclosure of adequate standards and protection ISI, BIS

OS DIRECTORATE

2 Lighting System

(a) Pole for Lights

Item	Minimum Requirement Description
Make	
Model	
General Requirement	Shall be minimum 6.5m height as per NHAI norms
General Requirement	Hot dip galvanized pole with silver coating of 86 micron as per IS:2629 min 10 cm diameter pole and suitable bottom and top thick HT plate along with base plate size 30x30x15 cms suitable for wind speed 50 m/sec with suitable arm bracket and with J type foundation bolts. Fabrication in accordance with IS 2713 (1980)
Foundation	Pole would be fixed on an adequate and strong foundation to withstand city weather conditions and wind speed of 150 km/hr
Foundation	Casting of civil foundation with foundation bolts to ensure vibration free (video feed quality should not be impacted due to wind in different climatic conditions) Expected foundation depth of minimum 100 cms or better
Sign Board with number plate	Sign board depicting the area under surveillance and with serial number of pole
Height	Height of the pole shall be as per requirement of the location varying from 6 m to 12/15 m.
Electrical Connection	Electrical power requirement for the systems/devices installed on the pole should be available with metering and protection equipment
Lightning Protection	Lightning arrestors with proper grounding
Earthing	Pole should have proper earthing system
Network Communication	All communication passive & active devices should be housed in enclosure of adequate standards and protection
Certification	ISI, BIS

(b) LED Unit with Communication Unit

Feature	Minimum Requirement Description
Operating Voltage	100 - 277vAC
LED Power	150W
Colour Temp	Neutral White (3700-5000k)
Brightness	Neutral White 18,275LM
CRI	Neutral White >70
Spot Type	Polarized Oval
Adjustable Angle	15°
Lifespan	>50,000 hours



Communication Unit	Should be able to integrate with PIDS & CCC (RS232/485/422/TCP/IP or equivalent)
Power Factor	0.95
Efficiency	90%
Protections	Short Circuit/Over Load/Over Voltage/ Over Temperature/Lightning Protection
Surge Protection	4 KV
Working Temperature	-40to +55 °C
IP Rating	IP66
Certifications	CE, RoHS, UL

(c) Central Control Unit

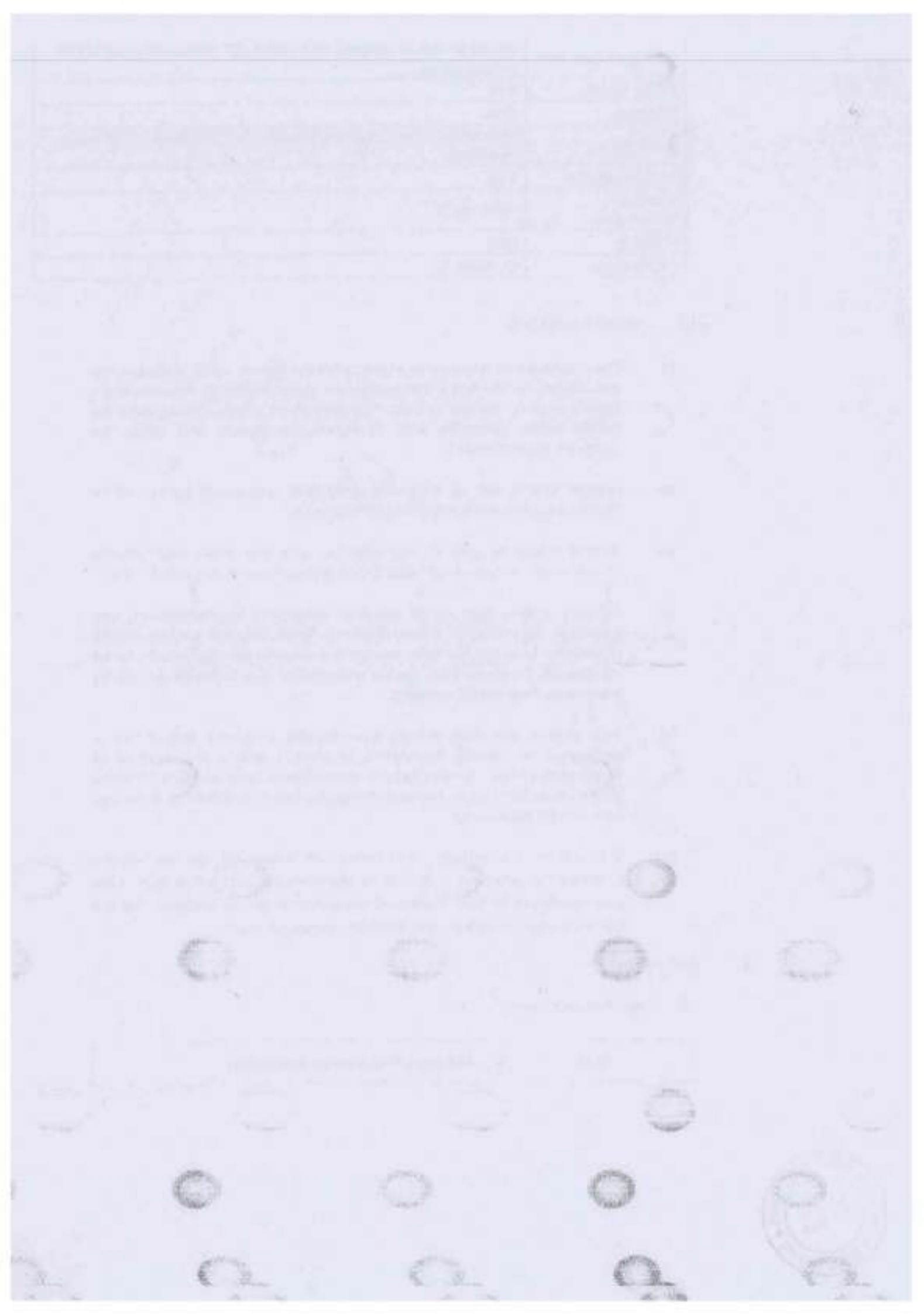
- (i) The Graphical user interface to interact with the system, which is divided into two subsystems: the first is the visualization model to monitor the state of the lighting systems, and also includes the management system; the second is the display model associated with intelligent management that allows for automatic system control.
- (ii) Lighting System will be integrating with PIDS system and Lights will be ON/OFF based on the inputs from the PIDS system.
- (iii) System should be able to segregate the area into zones and Software should be able to control individual Zone/Lighting devise from Control room.
- (iv) Software services: they are the processes responsible for implementing new algorithms for intelligent system behavior. These Software services receive instructions from the intelligent control and monitor the environment to act intelligently. These processes use the web services layer to obtain the missing information from the upper layers.
- (v) Web services: The Web services layer includes a security module that is responsible for filtering information to prevent attacks that attempt to access in-formation. Services will use the hardware layer interface to access the data from the devices. The hardware abstraction layer will define the access inter-face for each device.
- (vi) Data source: the software component will implement the mechanisms to access the information defined by the hardware abstraction layer. Each data source can be from a different manufacturer on the condition that the hardware abstraction layer and interfaces remain constant.

3. PA System

(a) Speakers with Amp

Item	Minimum Requirement Description
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Make	
Model	
Max sound pressure level	> 121 dB
Frequency response	280 Hz -12.5 kHz
Amplifier	Built in or integrated amplifier
Wattage Capacity	Minimum 20 W
Coverage pattern	70° horizontal by 100° vertical (at 2 kHz)
Power	Power over Ethernet (PoE) /220 VAC
Connectors	RJ450BASE-T/100BASE-TX
Operating conditions	20°C to 50°C (-4°F to 122°F) Humidity 10–100% RH(condensing)
Casing	Impact-resistant aluminium, IP66/IP67-rated. Tap: 119 dB
Range	should cover minimum 150 meter in open environment
Certification	EN 54-16 and ISO 7240-16

(b) Central Control Software

Item	Minimum Requirement Description
Make	
Model	
General Requirement	Should have the capability to control individual PAS i.e. to make announcement at select location (1:1) and all locations (1: many) simultaneously.
	The PAS should also support both Live and Recorded inputs.
	Should be able to configure min. 15 zones
	Shall support min. 5 users simultaneously
	Should be client-server architecture
	audio/visual representation of alarms
	should be able to play pre-recorded messages based on different alarms from different systems
	Able to generate reports in different format (word/excel/pdf)
Connectivity	IP Based
Integration	PIDS & Command and Control Centre or any other component if required
Central Server/Software	Redundant central application server/software

4. Cabling.

(a) Cat 6 cable (Indoor)

- (i) Type: Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801.



- (ii) Conductors: solid bare copper.
- (iii) Insulation: High Density Polyethylene.
- (iv) Jacket: Low Smoke Zero Halogen (LSZH)/ Polyethylene.
- (v) Pair Separator: Cross-member (+) fluted Spline.
- (vi) Operating temperature: -20 °C to +60 °C Storage Temperature -20 °C to +80 °C.
- (vii) Frequency: tested up to Minimum 250 MHz.
- (viii) Packing Box of 305 meters.
- (ix) Cable Outer Diameter: 6.3 +/- 0.4 mm.
- (x) Bend Radius: 4 * Cable Diameter.
- (xi) Impedance: 100 Ohms + / - 15 ohms, 1 to 250 MHz.
- (xii) Fire Rating: IEC 60332-1, IEC 60754, IEC 61034.
- (xiii) Conductor Resistance: 73 Ohms Max / KM nominal.
- (xiv) Max. Tensile strength: 110N.
- (xv) Performance characteristics to be provided along with bid Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR.
- (xvi) Standard Compliance: ANSI/TIA-568 C.2 category 6, ISO/IEC-11801, Class E/ IEC 61156-5: category 6.
- (xvii) Application: IEEE 802.af and IEEE 802.3at for PoE Cat 6 Cable.

(b) Cat 6 cable (Outdoor)

- (i) Type: Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801.
 - (ii) Conductors: AWG solid bare copper.
 - (iii) Insulation Material: Foam PE.
 - (iv) Inner Sheath Material: LSZH.
-

- (v) Screening Material: AL/Mylar.
- (vi) Armouring: > 65 % coverage steel wiring.
- (v) Outer Sheath Material: LSZH.
- (vi) Outer Sheath External D.D:11.2+/-1.0mm.
- (vii) Operating temperature: -20 °C to +70 °C Storage Temperature -20 °C to +80 °C.
- (viii) Frequency: tested up to Minimum 250 MHz.
- (ix) Packing Box of 305 meters.
- (x) Cable Outer Diameter: 6.3 +/- 0.4 mm.
- (xi) Min Bend Radius: 8 * Cable Diameter.
- (xii) Impedance: 100 Ohms + / - 15 ohms, 1 to 250 MHz.
- (xiii) Fire Rating: IEC 60332-1, IEC 60754, IEC 61034.
- (xiv) Conductor Resistance: 73 Ohms Max / KM nominal.
- (xv) Performance characteristics to be provided along with bid Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR.
- (xvi) Standard Compliance: ANSI/TIA-568 C.2 category 6, ISO/IEC-11801, Class E/ IEC 61156-5: category 6.
- (xvii) Application: IEEE 802.af and IEEE 802.3at for PoE.

(c) 6/12 Core Fiber Optic Cable Indoor/Outdoor (Multi Mode)

- (i) Type – 6/12 core OM4 (50/125 micron) Multi mode Loose Tube jelly filled, Uni-tube design, indoor/outdoor optical Fiber cable.
- (ii) Outer Jacket: LSZH/ FR PVC, UL OFNR rated.
- (iii) Strength Members: E-glass.
- (iv) Can be used for both indoor and outdoor application.
- (v) Crush Load: 1000N/100mm (Short term), 300N/100mm (Long term) as per IEC 60794-1-2-E3.
- (vi) Colour Code: ANSI/TIA/EIA-598-B.



- (vii) Max attenuation: ≤ 2.3 dB per km@850 nm, ≤ 0.6 dB per km@1300nm.
- (viii) Operating temperature - 20°C to 60°C.
- (ix) Standard Compliance: ITU-T G.651.1 Fiber, ISO/IEC 11801, ISO/IEC 24702, ANSIAANSI/TIA/EIA 568C.3, IEEE 802.3z Gigabit Ethernet, ROHS compliant Directive 2002/95/EC.

(d) 6/12 Core Fiber Optic Cable Indoor/Outdoor (Single Mode)

- (i) Type – 6/12 core OS2 (9/125 micron) Single mode Loose Tube jelly filled, Uni-tube design, indoor/outdoor optical Fiber cable.
- (ii) Outer Jacket: LSZH/ FR PVC, UL OFNR rated .
- (iii) Strength Members: E-glass.
- (iv) Can be used for both indoor and outdoor application.
- (v) Crush Load: 1000N/100mm (Short term), 300N/100mm (Long term) as per IEC 60794-1-2-E3.
- (vi) Colour Code: ANSI/TIA/EIA-598-B.
- (vii) Max attenuation: 0.34 dB per km@1310 nm 0.24 dB per km@1550nm.
- (viii) Operating temperature - 20°C to 60°C.
- (ix) Standard Compliance: ITU-T G.652.D Fiber, ISO/IEC 11801, ISO/IEC 24702, ANSIAANSI/TIA/EIA 568C.3, IEEE 802.3z Gigabit Ethernet, ROHS compliant Directive 2002/95/EC

(e) Pole Junction Box

Suitable Junction Box shall be specified by the bidder.

(f) PA System Cable

Suitable cable shall be specified by the bidder and the cable shall be of relevant IS standards.

(g) Power Cable 25 Sq mm

Suitable cable shall be specified by the bidder and the cable shall be of relevant IS standards.

- (h) Power Distribution Cable 2 Sq mm

Suitable cable shall be specified by the bidder and the cable shall be of relevant IS standards.

- (i) HDPE Conduit

Suitable HDPE Conduit shall be specified by the bidder.

- (j) MS Conduit 20/25 Sqmm

Suitable MS Conduit 20/25 mm shall be specified by the bidder.

ACCESS CONTROL SYSTEM

1. Locking System

- (a) Guard and Tour Management

- (i) The guard tour Management logger is a simple device that can be installed anywhere, doesn't require power or wiring and serves as Patrol logger.
- (ii) The guard tour Management Often security guards need to have access to premises as well as log their presence on those premises which means they need to have keys and a logging device.
- (iii) The guard tour Management Patrol guard solution combines the controlled access of the premises and at the same time includes the logging solution.
- (iv) All events created by the guard (by opening/locking the locks and by inserting his key in logger) are stored on the key and the logger.
- (v) When the key downloads all the access logs to the software, a clear report can be issued to verify that the user has done his rounds when required.
- (vi) On-line Guard Tour Management system is an automated record keeping system that



records tours and inspections performed by security officer at specific locations in a real time basis.

- (vii) It allows for one or more card readers to be checked during routine tours to verify that predefined routes are completed. Security officers use their credentials at card readers in a Sequential order that is conducive to their watch path.
- (viii) Each tour delivers events to Alarm Monitoring, allowing operators to know if checkpoints are reached on time, early, overdue, or late. Each guard tour station is equipped with a card reader that is attached to a guard tour control panel.
- (ix) The security management software will update the latest guard tour transaction record via TCP/IP/ USB or any other protocol onto Guard tour management system. Each security guard as he or she makes rounds from one assigned guard tour station to the next. All entries are date and time stamped stored into system database.
- (x) User configurable tour route definition, the Guard tour system come with interface for system supervisor to program the touring point sequence, the system user can have a flexible touring point vary from time to time, instead of having a constant tour route.
- (xi) Comprehensive activities report can easily generate from the recorded transaction event. And best of all, the information is logged as it is happening in real time.
- (xii) A conventional security guard tour system must wait until the security guard returns to the central office and downloads the security guard tour information from a system reader or scanner but with this real time scanning Guard Tour System, a supervisor can monitor the tour movement efficiently via computer workstation and do not need to wait until the completion of touring.

(b) Key

Item	Minimum Requirement Description
Make	
Model	
Number of Accessible Locks	1,00,000
Number of Access Logs	Last 1,000 Access (First-In/First-Out)
Battery Type	2 x LR1 batterie
Battery Life	25,000 opening or up to 2 years
Encryption	AES 128bit
LED	1 x Tri-color (Green, Red & Orange)
Locks	All Accsys Lock Types
Operating Temperature	-20 to 55 o C
Dimensions	40.7 x 72.7 x 17.8 mm
Material	BLADE SUS 316L / TOP COVER PC+25% GF / LED LENS / LCD 6 CHARACTERS / KEYPAD 7 BUTTONS PET/ SWIVEL SUS 304
Quality Certification	CE, FCC, ROHS

Water Protection	Splash Water resistance
LED Status	4 statuses LED (Access / No Access / Restricted Access / Low Battery)
LCD	LCD screen allows the user to see what digits are being entered before pressing OK
Certification	ISI

(c) Guard Locks

Item	Minimum Requirement Description
Make	
Model	
Dimensions	Type 1: 130 x 120 x 55 mm Type 2: 109 x 89 x 40,5 mm
Material	Hardened Steel
Locks	PL5 Padlock (shackle removable)
Security	Can be bolted and/or welded on gates
Usages	Easy to use (4 easy steps)
Protection	Casing serves as a robust barrier to entry on any doors, gates, by re-enforcing their fastening. Protects against cutting / grinding / drilling
Certification	ISI

(c) IP Programmer

Item	Minimum Requirement Description
Make	
Model	
Dimensions	98.5 x 92 x 28 mm
Material	TOP COVER PLASTIC / RAIN CAP ALUMINUM / LED
LED	3, blue color; On / Ready / Busy
IP Rating	IP55
Life Expectancy	10 years
Operating Temperature	-20 to 65 o C
Operating Humidity	0 to 97 R.H.
Power Supply	DC Power Supply (5V, 100mA)
Connectivity	Wired RJ-45
Encryption Algorithm	AES 128bit
Keys	All Key Types



Quality Certification	CE, FCC, ROHS
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(e) Transfer Key

Item	Minimum Requirement Description
Make	
Model	
Dimensions	Type 1: 130 x 120 x 55 mm Type 2: 109 x 89 x 40,5 mm
Material	Hardened Steel
Locks	PL5 Padlock (shackle removable)
Security	Can be bolted and/or welded on gates
Usages	Easy to use (4 easy steps)
Protection	Casing serves as a robust barrier to entry on any doors, gates, by re-enforcing their fastening. Protects against cutting / grinding / drilling
Certification	ISI

(f) Software Features

Function: A web based software program, CLIQ Web Manager is used to manage the CLIQ Remote System. User friendly and intuitive, system administrators use it to remotely manage the day to day functionality of the CLIQ Remote System.

Applications: As a web-based solution, the CLIQ Web Manager provides access to the System's database from any computer with an internet connection and has been specifically designed to handle large, decentralized system.

Features:

- (i) Secure login via a control key and a PIN code
- (ii) Advanced search options
- (iii) Manages and creates: -
 - (a) Access permissions
 - (b) Audit trails - including activities from remote devices
 - (c) Time – based authorization
 - (d) Recurring validation
 - (e) Reports
- (iv) Supports remote programming device management

- (v) Enables system grouping into manageable domains
- (vi) Allows remote key programming
- (vii) Key and personnel management

Specifications

- (i) Web browser: Internet Explorer 7 and up
- (ii) 128 bit Highly secured connection (SSL)
- (iii) Available in multi-language versions

2. Barriers

(a) Crash Barriers

Item	Minimum Requirement Description
Make	
Model	
Crash Barrier	Hydraulic based with Minimum K12 rating
Blocking Width	3 Meter, Blocking Height 1000 MM or more.
Underground Housing	Width: Blocking segment + 0.36 or less
	Length: 2.2 m or less
	Depth: 0.4 m or less
Impact Rate Load	Minimum 1800 KJ.
Construction	All materials of high grade steel ST 355 & AISI stainless steel
Maximum Vehicle Penetration after Impact	1 Meter from barrier.
Blocking Segment	Framework of RSJ type HEA160 or similar beam of 30.4kg/meter & intermediate reinforcement structure of RSJ type IPE 120 beam of 11.6kg/m with durbar chequer plate top 12mm thick providing a wheel load support of 100kN (10,000 kg) according to SLW60-DIN1072.
	Due to the modular design of the blocking part: after impact it should be swapped out immediately.
Underground casing	Outer framework from RSJ type IPE 400 beam of 62.1kg/m with 100 or more stub pieces 8 x 200mm welded externally to tie in with concrete pour for stability. Minimum 2 nos. hinge points, with 25mm diameter or more stainless steel shafts & bearing bushes.
Product Certifications	Certified according to DOS K12 (USA) or PAS 68 K12 (UK) (Documents of certifications to be attached from any of two authority)



Warning plate	Warning plate incorporating red round warning lights with LED illumination
Possibility to perform 500 complete cycles per hour under normal operating conditions.	Normal raise time – 3.5 secs
Operating Times	Normal lower time – 2 secs
	Normal use: Raising approx. 3.5 sec,
	Lowering approx. 2 sec to road surface
Electro-Hydraulic Drive Cabinet	The EHDC shall be remotely located at a maximum distance of 25 meters from the barrier.
	Hoses are rated up to 250 Bar or more and have a burst pressure of at least 850 bar.
	Hoses shall have Plastic non braided reinforcement sleeves.
	The connectors are Quick lock connectors, and prevent a wrong connection, as male and female connectors are provided. These have an inner diameter of 30 mm.
	Flat Rubber O-rings will be used to reduce the possibility of leakage.
	Hydraulic Fluid shall be mineral oil HLP 22 or biodegradable hydraulic fluid Plantohyd 22, to be chosen by buyer
	The standard reservoir is a design conforming to hydraulic industry standards. (harmonized in the CE norm)
	The EHDC shall use standard industrial components, which conform to hydraulic industry standards, and have interchangeable mounting dimensions.
	The majority of hydraulic components shall be manifold mounted to minimize connection points, hydraulic leakage and permit component replacement without requiring the removal of other hydraulic components. The use of in-line valves alone shall not be used.
	The electrical motor shall be capable of being removed from the hydraulic pump, without disturbing the hydraulic lines.
	The EHDC will have a standard outdoor cabinet preventing environmental exposure of the aggregate
	All connections will be industry standard, sealed DIN connectors, on flexible cable assemblies.
Working Life	Average use:
	Per day: 150 cycles
	Cycles length: 8 sec
Cycles between service	50.000 Or every Year, what comes first
Product lifetime	1 million cycles
Emergency Use	By hand pump
Installation Unit	Wedge barrier is to be delivered as a complete installation unit to make sure that there is no assembling work on site necessary. The hydraulic drive unit is delivered in a separate drive unit cabinet.

Hydraulic Drive Unit	Compact hydraulic drive unit with aggregate, high pressure pump, high pressure cylinder and hand pump in a separate drive cabinet. Power 400 V 4.0 kW
Control	Control unit. Raise – Stop – Lower Control unit in drive cabinet, prewired in factory.
Protection Against Corrosion	Long term protection against corrosion by zinc based multi-layer plastic coating. Certificate according to ISOE N7253/ISO9227 should be submitted. OEM should have certificate for salt testing period of minimum 2000 hrs or more with no significant corrosion on product.
Distance	Distance to road blocker with 25m hydraulic hose length
Power	4.0 kW, 400V/50 Hz AC, 3 - phases
Control Cabinet Voltage	24 V
Standard	BIS Standard or ISO Certification

(b) Gate Automation

(i) Sliding Gate Control Unit

Parameter	
Power supply(Vac+6%-10%50-60Hz)	230
Absorbed power(W)	650 or Better to sustain the 1000 KG gate
Reduction ratio	1 : 30
Type of pinion	Z16 - Z20
Rack	Module4-step12-566
Use frequency	70% (see graph)
Oil quantity(l)	1,8
Operative ambient temperature(°C)	-20 ÷ +55
Protection class	IP 44
Gate max. weight(Kg)	1800 to 1000
Gate speed(m/min)	9,5 - 12
Gate max. length(m)(time-out)	40 - 50
Protective treatment	cataphoresis
Electric motor technical specifications	
RPM	1400 or better
Power (W)	650 or better
Absorbed current (A)	3,5 or better
Starting capacitor (µF)	35 or better
Standard	BIS 2008 Standard or ISO Certification

(ii) Swing Gate Control Unit



Parameter	
Duty type	Apartment, subdivision, industrial, and commercial applications
Duty cycle	80 Cycles/ Hour
Maximum leaf length ⁵ , ft (m)	18 (5.4)
Maximum leaf weight, lb (kg)	1300 (600)
Maximum leaf swing, deg	115
Thrust and traction, lb (kg)	0-1760 (0-800)
90 deg opening time, sec ⁶	15 or Better
Operating temperature range, deg C	-36 to 75
Thermal cut out, deg C	100
Hydraulic locking	Opened and/or closed
Power voltage required, VAC ⁷	230 VAC
Standard	BIS 2008 Standard or ISO Certification

(c) Boom Barrier

Item	Minimum Requirement Description
Make	
Model	
Product Description:	Automatic vehicle boom barriers provide positive, dependable access control for all vehicle entry/exit scenarios. The boom pole will be lifted in response to any legitimate input signal. The barrier can be operated by means of coded cards, tokens, remote push button, keys, ticket machines, computer or loop detector.
Timing:	1.9 Sec or less
Blocking Width:	4 - 6 meter
Drive:	Torque Motor
Materials	Housing: Mild Steel Powder Coated
	Boom pole Aluminium and taped with red reflective tape
Technical Features	Engineered for long term reliability, fast on-site maintenance and durability
	Fully recessed removable access door
	Removable Lid for easy access to motor and linkage assembly
Power Failure	In the event of an emergency or isolation of power supply, the Barrier will remain in the locked position
Interface	Boom barrier is controlled by means of a control panel with following features:

	1 One (0V) Input for opening/closing signal (pulse N/O)
	2 One (0V) Dry Input for Remote Latching Open/close
	3 One (220V) Output for Motor
	4 One (0V) Input for beam
	5 One (0V) Barrier PVC Loop
Technical Data	Power Supply: 220 V DC
	Power Rating: 220/250V 50Hz 400W for 3 meter & 300 W for 6 Meter
	Logic Voltage: 220 V
	Operating Temperature: 0 - 55°C
	IP rating: IP54.
	Per Day Cycle: Up to 10000 for 3 meter fast operation & 2000 for 6 meter boom barrier.
Standard	BIS 2008 Standard or ISO Certification

3. Quick Reaction Capability

The successful bidder has to consider specification of In-service 800 kg Lt. Vehicle 4*4 and provide additional accessories as listed below:

1	Other Accessories	Siren with integrated PA system
		Multi-charger to charge mobile phone, camera, laptop etc. from vehicle
		First-Aid kit



INTERNAL SURVEILLANCE FOR DEPOTS

1. Thermal Camera for Depot

Item	Minimum Requirement Description
Make	
Model	
Sensor Format	Uncooled
Detector Type	VOx Micro bolometer
Camera Type	Multi Sensor
Thermal Resolution	640 x 480, 25 Hz
Streaming	Dual Stream, ONVIF Profile S
Spectral Band	8-13 μ
Frame rate Hz/FPS	Full Frame – 25/30 Hz
Thermal Lens	Between 30(+/-5)mm (Wide) and 120(+/-20)mm (Tele) Continuous Optical 4X Zoom Lens providing wide 20(+/-4) to Tele 5(+/-1) Degree adjustable (HFOV)
Thermal Sensitivity	≤ 50 mK or better
Thermal Detection Range	Should detect an object of size 2.5m X 2.5m for minimum 5Km and Human for minimum 2Km
Visible Sensor Resolution	1/2.8" Full HD CMOS/CCD
Visual Sensor Lens	4.3mm to 129mm 30X optical zoom
Output Type	IP (ONVIF Compliant) and Analogue
Pan and Tilt	Pan: 360°; 0.2° to 60°/s or better, Tilt: +90° to -90° range; Minimum 30°/s
Preset Positions	64 Presets or more
Casing	IP-66, Heater and MIL-STD-810F
Operating conditions	Temp: -20° C to 55°C, Humidity: 90%
Standard	BIS Standard 13252 (Part 1):2010

FIRE FIGHTING SYSTEM FOR 1.1 TYPE ESH

1. Fire Hydrant System

The objective of remote water cannon spraying system is to fight fires with water and foam application by remote cannons, hand held nozzles in case of fires in Shed areas, surrounding areas including grass fires etc.

The system broadly consist of Fire water Hydrant line, Fire Water Storage of approx. 225 Kilolitre, AC motor driven Main pump set (End Suction Type, Capacity – 2000 GPM), Jockey pump set for pressurization with all required accessories including valves, special fittings, instrumentation, control panels, water hydrant pipeline network, remote water cannon of 500-1000-1500 gpm capacity, fire hydrant valves, hose cabinets, hoses, nozzles etc. and other components required to complete the system in all respects.

The System shall be semi-automatic in action and shall be laid by piping covering the entire area. The Hydrant System shall be kept pressurized at all times. The proposed Jockey Pump shall take care of the leakages of the system, pipe lines and valve glands.

The pressure in the hydrant pipe work shall be kept constant at 9 Kg/cm². In the event of fire when any of the hydrant valve in the network is opened, the resultant fall in header pressure shall start the AC motor driven fire pump through pressure switches automatically.

However, shutting down of the pump set shall be manual except for the Jockey Pump which shall start and stop automatically through pressure switches. In addition to auto start arrangements, the main pump shall also have an over-riding manual starting facility by push bottom arrangement.

The piping for the hydrant system in the area shall be laid underground in soil 1 Metre deep or above ground. The pipe laid in soil shall be protected as specified.

The Fire hydrants shall be placed at a regular spacing of 30 m in the hydrant line. The following accessories are to be provided in each arm of the hydrant line.

2 No. Hydrant valves of 900 LPM with Stand Post.

2 Nos. RRL Hoses of size 63mm dia x15m long with ISI Mark Std as per IS:636 Type – B and standard 63mm Male and Female Instantaneous coupling at the end of Flexible Fire hose with ISI Marked

1 Nos. of Solid Jet Nozzle ISI Marked

1 No. of Spray Nozzle

Other than Hydrant valves, all the other accessories shall be kept inside an external mounted Fire Hose Box

2. Remote Control Monitor

The water cannon assembly along with motors, proximity sensors, Junction boxes, panel etc. shall be suitably installed at ground level in safe area on the fire hydrant line. The remote water cannon shall be operated remotely by a control panel. The cannon assembly is connected to pipeline through a motorized operated valve. Motorized operated valve can be operated through control panel. Motors connected to monitor shall control monitor



movements – Vertical, Horizontal, Nozzle and variable flow movements. End position Feedback signals for each movement is obtained on control panel.

The scope covers the requirements regarding design, engineering, procurement, manufacturing, fabrication, assembly, testing, supply, erection, installation, commissioning of electric operated water cannon system to be used for firefighting. The scope shall include supply of UL listed or FM approved foam monitor along with electric operated remote mechanism (remote operated mechanism may or may not be UL listed or FM approved) to facilitate remote movement of the monitor, flameproof control panel, gate valve, fire hydrant line etc. Electric operated cannon is required of the following online variable discharge capacities:

- (a) 1500 GPM (5700 LPM) adjustable to 1000 GPM (3800 LPM) & 500 GPM (1900 LPM) with the same single nozzle

The Electric operated Cannon shall be designed for mounting on stand posts or elevated platform /tower at fixed locations. The water cannon shall be capable to give discharge in the form of hollow jet and spray arrangement.

All the operation of the water cannon viz Horizontal movement, Vertical Movement, Jet/spray adjustment, variable discharge flow should be possible from Electric FLP Control panel, manually from Monitor (without use of power) and also from Central Command Centre (CCC) through CCTV system.

- (b) Cannon Foam Induction

- Foam Induction System: Foam feeding shall be by a separate & single aqua powered foam controller. The induction system shall be UL listed or FM approved. The Foam controller should be capable of feeding foam concentrate from a horizontal distance of up to 50 meters from the Monitor Nozzle. The inlet and outlet of foam controller shall be provided with standard 63-mm male and female instantaneous couplings as per IS: 903.

The length of the foam pick up tube shall be 3-4 Meters. It should be possible to induct 3% foam for all the three flows, however, variation of +20% of the induction rate is permissible. Manual valve shall be provided at foam inductor to set foam induction as per 1500 GPM, 1000 GPM or 500 GPM water flows.

- Cannon: The cannon shall be able to discharge 1500 GPM, 1000 GPM and 500 GPM (depending upon adjustment at the Nozzle) at a pressure of 10.0Kg/CM² (g) at the mating/mounting flange. The foam compound shall be AFFF/AR-AFFF.

The nozzle shall produce foam with minimum foam expansion ratio 1:4. The pattern of the Water/foam jet nozzle shall be adjustable from straight to 140 degrees wide spray.

The monitor shall have traversing mechanism to give 340 deg. In either direction in horizontal plane and +80 deg. & -15 deg. in vertical plane

through swivel joints operated by worm and worm wheel operated geared unit. There shall be separate hand wheels for horizontal and vertical movement of the monitor. The arrangement shall be such that monitor movements can be done by a single person. All the gear mechanisms shall be sealed by proper enclosure to avoid accumulation of dust on lubricated parts. Both the traversing mechanisms shall be self-locking type. The Swivel Joints shall have SS ball bearing with efficient sealing.

The monitor shall be online variable flow adjustment type and it should be possible to set either of the three flow rates easily and quickly at site by the operator online without stopping of the water / foam flow. The changeover of discharge flow shall be online and should be possible to be from FLP control panel from CCC and manually also.

There shall not be any flanged joint on the monitor body, except one at base flange. Other joint between monitor body & nozzle shall be threaded type. A pressure gauge shall be fitted in the monitor body near inlet of nozzle. Pressure drop across the monitor should be less than 10 PSI. A drain connection with valve shall be provided near the base flange. The monitor shall be so designed as to resist the nozzle reaction forces during operation and shall be capable of being handled by one person. It should be possible to operate the monitor at 12 Kg/cm² inlet pressure.

- **Remote Control Mechanism:** The electrically operated remote mechanism comprises of Geared motor assembly for horizontal, vertical, nozzle movements and variable flow arrangement. The remote accessory also comprises of two junction boxes (i.e. Control & Signal). One for controlling the electrical supply to the motors & other for connection to proximity sensors for obtaining the end position feedback signals. Main cables from control panel are terminated to the junction boxes (Control & Signal) & there on to the respective motors & proximity sensors with unarmored cables.

Remote operated water cannon with variable nozzle, is having following modes of operation:-

Remote Mode: Through electrical geared mechanism from the remotely installed control panel.

Remote Mode: Through Panel at Central Command Centre

Manual Mode: Through Hand wheels

- **Integration with Central Command Centre:** Through CCTV surveillance system, the water cannon shall be able to be operated from the CCC. All the required software for fire detection and remote operation from CCC shall be provided. Graphic Console with Pop-Up arrangement shall be



provided. Video Analytics for detection of FIRE and subsequent messages by Email / SMS shall be provided.

➤ Cannon Assembly Comprises of the following parts

Inlet base flange	:	Facilitates Installation on Hydrant line
Monitor Body	:	Facilitates water path
Swivel Bearings	:	Facilitates Horizontal & Vertical Rotation of monitor
Hand wheels	:	Facilitates Movement of Monitor in desired directions
Worm Shaft	:	Facilitates Motion Transmission
Nozzle	:	For discharge of desired flow rate
Pressure Gauge	:	Indicates pressure at nozzle inlet
Drain Valve	:	Draining of Residue Water from Monitor body
Springs	:	for Counter Balancing the eccentric load
Mounting Brackets & Hardware	:	Installation of Monitor and its accessories

➤ Material of Construction

Item/Part	Material of Construction
Nozzle	SS-304
Cannon / Monitor Body	SS-304
Flange	SS-304 (150LBS, ANSI B16.5 rating size 100 mm)
Swivel Joints	SS-304
Worm	SS-304
Gear	SS-304
Spindle for worm	SS-304
Hand-wheel for Nozzle, horizontal/vertical movement	SS-304
Pick up tube	PVC tube reinforced with high tensile steel wire helix as per ASTM D1785 sch.80 (3-4 meter length)
Drain connection	SS-304
Drain valve	SS-304
Foam strainer	SS-304 (removable type)
Foam Inductor	SS-304

Foam Inductor Couplings	SS-304 (63 mm)
Nuts/bolts at Monitor	SS-304

➤ Approval

The Monitor, Foam Nozzle and Foam Induction device shall be UL listed or FM approved with following features:

- (i) Nozzle : Non-Aspirating Nozzle
- (ii) Monitor Solution Flow : Online variable flow of 1500 GPM, 1000 GPM & 500 GPM in single nozzle
- (iii) Operating Pressure : 10 Bar
- (iv) Induction : Foam Induction tube with three flow settings

➤ Remote Control System

Electric Panel: Remote Control System shall be provided for horizontal and vertical rotation of the cannon, Jet and spray movement of the monitor nozzle and changing of the variable flow of the monitor from flameproof control panel to be supplied along with the monitor. The remote control system shall be electrical.

Control Panel shall have minimum following indication and control functions for each monitor.

- Push Button Control with indication - Up/down, right / left movements
- Push button control with indication - Spray / jet
- Push button control with indication - Variable flow (i.e. 500, 1000) 500 GPM
- Push Button with indication on/off valve - Open /Close Isolation
- Power On / Off - Indication Lamps

Control Panel shall be complete with motor starters consisting of required rating AC-3 motor duty switch, fuse, contactor and bimetal overload relay to suit motor rating, motor start / stop push button, selector switch, voltmeter etc. and suitable structural frame for mounting of the panel. The control panel shall be minimum Ex-n / Ex-e / Ex-d type in flameproof enclosure suitable for Zone -2, Gas group – IIA / IIB with GI sheet canopy. Weather protection for motor enclosure shall be minimum IP55.

Motor shall be minimum Ex-n / Ex-e / Ex-d type suitable for Zone – 2, Gas group IIA / IIB, temperature class: T3. Weather protection for motor enclosure shall be minimum IP55. All the motors shall comply with requirements described below.



Minimum conductor size for power cable for Control panel shall be 4 mm² copper and all cables shall be 1100 V grade PVC insulated, PVC sheathed, armoured fire retardant type.

Power and Signal cable of 150 meters length for each motor shall be provided along with the supplies for connection between the motor motors and control panel. Flameproof Junction Box, Signal cable of 150 meters length for motor operated isolation valve and common cable tray for above cables shall be supplied along with each monitor.

- Central Control Centre (CCC): In addition to the above FLP Control Panel the monitor shall be able to be operated from the Central Control Centre (CCC). The movement of the monitor shall be viewed by the help of CCTV system.
- Performance: With pressure of 10 Kg/cm² (g) at base flange and Nozzle at 30 to 35 deg. from horizontal the Monitor shall be capable of giving following performance:
 - (i) Flow: 1500 GPM - Horizontal Foam Throw - 70 meters (minimum); Horizontal Water Throw 75 meters (minimum).
 - (ii) Flow: 1000 GPM - Horizontal Foam Throw - 64 meters (minimum); Horizontal Water Throw - 70 meters (minimum).
 - (iii) Flow: 500 GPM - Horizontal Foam Throw - 45 meters (minimum); Horizontal Water Throw 50 meters (minimum).

Throw to be calculated on the basis of arithmetic average of throws (measured from monitor base flange to approximate centre of the footprint) in downwind & upwind directions at prevailing wind speed at the time of performance test.

- Workmanship and Finish: All the parts shall have good workmanship and finish. All burrs and sharp edges shall be removed. Passages for foam/water shall have smooth finish.
- Painting and Marking.: All external surfaces shall be properly shot blasted & provided with two coats of primer followed by two coats of final paint finish of 50 micron.

The water cannon shall be kept near to the sheds and hence special blast proof treatment should be provided on the cannon such that in case of any explosive the same is able to withstand the impact. The said painting shall also be corrosion proof and leak proof, thus enhancing the life cycle of the water cannon. Vendors / Bidders to submit technical details of the said painting / coating.

➤ Site Work: Erection, installation and commissioning of the monitor at site shall be in the scope of the contractor.

➤ Information/Documents required from bidder

(i) During bid submission:

- Details and drawings of the offered foam cum water monitor with bill of material of monitor & accessories. Details & Drawings shall be in line with UL listing or FM approval document of the vendor.
- Performance details like.
 - Projectile curves of both water and foam streams showing horizontal & vertical throw for foam and water at Nozzle angle of 30 degree from horizontal plane.
 - Foot print (shape, size, area) of both streams at landing zone.
- K-factor of the nozzle with supporting calculations.
- Pressure drop across the monitor.
- Vendor to give details of the proposed foam induction system and schematic sketch of the monitor with Foam induction and foam source along with the technical bid.
- Valid certificates of UL Listing or FM approval of offered manually operated foam-cum water monitor, foam nozzle and foam induction mechanism.
- CMRI/DGMS/CCOE approval for flame proof enclosures for motors & panel.
- Proven Track Record of the offered or higher capacity variable flow (minimum two flow) monitor as per tender specification along with site activities.
- General arrangement Plan (GAP) incorporating the stipulated inspection and testing requirements.

(ii) At the Time of delivery:



- As built drawings of monitor assembly.
- Electrical circuit diagrams for junction boxes & remote panel. Cable termination details & cable schedule.
- Installation procedure.
- All inspection and testing records.
- Operating and instruction manual.
- Testing and maintenance procedure/manual.

(c) Specification for Motor

- Codes and Standards: The Motor and their components shall comply with the latest editions of relevant standard issued by BIS (Bureau of Indian Standards). In case of imported motors standards of the country of origin shall be applicable, if these standards are equivalent or stringent than the applicable Indian Standards. The motor shall also conform to the provisions of Indian Electricity Rules and other regulation currently in force in the country. In case, Indian standards are not applicable or not covering any part, the standards issued by IEC /BS /VED/IEEE /NEMA or equivalent agency shall be applicable. In case of any contradiction between various referred standards/ specifications / Data sheets and statutory regulations the following order shall be govern.

- Statutory Regulation
- Data Sheet
- Job specification
- This specification
- Code and standards

- Operating Conditions

- Ambient Conditions: Motor shall be suitable for operating satisfactorily in humid and corrosive atmosphere found in refineries, petrochemical plants. Service condition shall be as specified in the motor data-sheet. If not specifically mentioned therein, a design ambient temperature of 45° C and an altitude not exceeding 1000M above mean sea level shall be taken in to consideration.
 - Frequency and Voltage: Unless otherwise agreed motor shall be designed for operation at rated output under the following conditions:
-

- The terminal voltage differing from its rated value by not more than $\pm 6\%$ or
- The frequency differing from its rated value by not more than $\pm 3\%$ or

➤ Starting

- Unless otherwise specified, motor shall be designed for on-line starting with suitable protection.
- Motor shall be designed for reacceleration under full load after a momentary loss of voltage with residual voltage being 100% and is in phase opposition to the applied voltage.
- Unless otherwise specified, all motors shall be suitable for starting under specified load conditions with 75% of the rated voltage at the motor terminals.

➤ Performance

- Motor shall be rated for intermittent duty cycle (S3), unless otherwise specified.
- Unless otherwise specified, the starting current (as % rated current) shall not exceed 600% subject to tolerance.
- In particular cases, when the starting with reduced voltage is specified, care shall be taken such that the design values of torque meet the load requirement while at the same time complying to starting conditions mentioned above in 5.No.4.

➤ Construction

- Insulation: Unless otherwise specified the motor shall be with Class 'B' insulation as a minimum. In case of motor with class 'F' insulation the permissible temperature rise above the specified ambient temperature shall be limited to those specified in the applicable Indian Standard for class 'B' insulation.

In case of motors driving equipment with pulsating loads, special care shall be taken for the joints of rotor bars and end rings to avoid premature failure due to induced fatigue stress.

- Terminal Box and Cable entries. The terminal box shall be suitable enough to facilitate easy connection of the cables. The terminal box shall be with necessary clearances, creepage distances between live parts and between live parts to earth considering air insulation and without any compound filling.

The terminal box shall be provided with cable lugs and entries for suitable cable glands corresponding to the size of the specified cable. Nickel plated brass (or aluminium if specifically required),



double compression type cable glands/ flame proof cable gland shall be supplied along with the motors for the specific cable size. Equipment and accessories shall conform to the hazardous area classification and the environmental conditions as specified. The terminal box shall be capable to withstand internal short circuit conditions without danger to personnel or plant. Appropriate phase markings as per IS shall be provided inside the terminal box. The marking shall be non-removable and indelible.

FIRE DETECTION SYSTEM FOR WP SHED

1. Fire Alarm System

Item	Minimum Requirement Description
Make	
Model	
Loop	1 expandable to 10
Detectors	159 per loop
Addressable monitor/control modules	160 per loop

Primary Input Power:	AMPS-24: 110-120 VAC, 50/60 Hz, 4.5 A maximum. AMPS-24E: 240 VAC, 50/60 Hz, 2.25 A maximum
DC Output:	Main 24 VDC: Up to 5.0 A Aux 24 VDC: Up to 5.0 A 5 VDC: Up to 0.15 A.
Temperature and humidity ranges	0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).
Approvals	UL Listed: 5635. ULC Listed: 5635. MEA: 232-06-E. Fire Dept. of New York: COA#6114. CSFM: 7165-0028-0224 (Commercial). FM Approved. FM6320 Approved. Class 6320 for Gas Detection.
Standards	UL 864 (Fire). UL 1076 (Burglary). UL 2572 (Mass Notification Systems). (NFS2-3030 version 20 or higher) LOCAL (Automatic, Manual, Waterflow and Sprinkler Supervisory). AUXILIARY (Automatic, Manual and Waterflow) (requires TM-4) BIS 2008 or ISO Certification
Weight	0.16kg
Operating Temperature	-20 °C to +60 °C
Relative Humidity (non-condensing)	0% to 95%
IP Rating	IP24D
Operating Voltage	17-28V DC
Environmental Specifications	IP65

IR-UV Fire sensor	
Spectral Response	3600-L-LB: UV: 0.185 - 0.260 micron IR: 2.5 - 3.0 micron 3600-L4-L4B: UV: 0.185 - 0.260 micron IR: 4.4 - 4.6 micron
Response Time	Typically 5 seconds. High speed 150 msec response to saturated signal



Sensitive Range	1 sq. ft. (0.1 sq. m) n-heptane pan fire from 50 ft. (15 m)
Field of View	100o Horizontal, 95o Vertical
Temperature Range	Operating: -67oF to 167oF (-55oC to 75oC) Operating Option: -67oF to 185oF (-55oC to 85oC) Storage: -67oF to 187oF (-55oC to 85oC)
Humidity	Up to 95% non-condensing (withstands up to 100% RH for short periods)
Heated Options	To eliminate condensation and icing on the window
Electrical Specifications	Operating Voltage: 24 VDC nominal (18-32 VDC) Power Consumption: Standby: Max. 90 mA (110 mA with heated window) Alarm: Max. 130 mA (160 mA with heated window) Cable Entries: 2 x ¼" - 14 NPT conduits or 2 x M25 x 1.5 mm ISO Wiring: 12 - 22 AWG (2.5 mm ² - 0.3mm ²) Electrical Input Protection: According to MIL-STD-1275B Electromagnetic Compatibility: EMI/RFI protected to EN61326-3 and EN61000-6-3 Electrical Interface: The detector includes twelve (12) terminals with five (5) wiring options (factory set)

<p>Outputs</p>	<p>Relays:</p> <ul style="list-style-type: none"> • Alarm, Fault, and Auxiliary • SPST volt-free contacts rated 5A at 30 VDC or 250 VAC 4-20 mA (stepped) • Sink (source option) configuration • Fault: 0 + 1 mA • Warning: 16 mA +/- 5% • BIT Fault: 2 mA +/- 10% • Alarm: 20 mA +/- 5% • Normal: 4 mA +/- 10% • Resistance Loop: 100-600 ohms <p>HART Protocol: Optional HART communication on the 0-20 mA analog current (FSK) – used for maintenance, configuration changes and asset management, available in mA source output wiring options RS-485: RS-485 MODBUS compatible communication link that can be used in computer control installations</p>
<p>Approvals</p>	<p>Hazardous Area</p> <ul style="list-style-type: none"> • ATEX & IECEx <p>Ex II 2 GD Ex de IIB + H2 T5 (-55o to 75oC) Ex de IIB + H2 T4 (-55o to 85oC) Ex tD A21 IP66/X7 T 95oC Ex tD A21 IP66/X7 T 105oC</p> <ul style="list-style-type: none"> • FM/CSA <p>Class I Div. 1, Groups, B, C & D Class II/III Div. 1, Groups E, F & G</p> <p>Performance</p> <ul style="list-style-type: none"> • EN54-10 (LPCB) • FM-3260 (FM) • DNV Marine Approval <p>Reliability</p> <ul style="list-style-type: none"> • IEC61508 – SIL-2 (TUV) • PDO Approval: Petroleum Development Oman Certificate of Registration • ISO 9001:2008: Registered Quality System



COMMUNICATION SYSTEM

1. Line Exchange 200 Line

Item	Minimum Requirement Description
General Requirement	IPPBX (Hardware & Software) shall be provided in high availability configuration.
Technology	The system should support IP or SIP as well as TDM. The TDM can be supported through an external Gateway.
Interface	Should be compatible with all telecom interfaces or Telecom Service providers
Type Of interfaces	It should compatible with ISDN PRI, Analogy trunks, H.323 trunk, SIP trunk. It should also provide facility to integrate with GSM, Radio devices.
Type of Extension Support	Analogy, Digital, IP, SIP (3rd party SIP phone), IP Phone
Expansion of Extensions	IP Telephone extensions should be expanded based on quantities of data switch ports available.
System Design	The IP PBX should be modular, expandable, embedded IP server-gateway/server based architecture, having Unix or Linux or equivalent operating system software based platform. The system shall have hot standby/Active-Active arrangement so that it should continue to operate in case of failure or maintenance of main processor or power supply or interfacing card or CPU etc. The system should support IP or SIP as well as TDM. The TDM can be supported through an external Gateway.
Conferencing	Conference bridge that can manage multiple calls (min 5) simultaneous conferees.
ACD And CTI Support	Support for ACD Call Centre with CTI and advance call routing
Call Center Communication Support	Support Standard SIP based IP Platform, Session Initiation Protocol over an MPLS or Multiple Label Switching Protocol for connectivity of call center to other call center communications,
Outbound Calling Support	The system shall allow outbound calling from the IP Phones.
General Requirement	The system shall support local announcements and music on hold.

General Requirement	The system shall be able to provide interface to ISDN PRI
Features	The system shall be able to provide following features like Basic Call Setup, Name and Number Support, Transit Counter, called or Calling or Busy or Connected Name and Number, Name Identification, Diversion (Call forwarding), Diversion (Call forwarding) with Reroute, Call transfer.
General Requirement	The system shall have inbuilt web-based software for administration and maintenance of the system. It shall provide the following features:
	▶ The software shall provide GUI based interface for configuration and management of the system.
	▶ The Software shall provide real-time information or alerts and reports regarding health status e.g. up or down status, performance & resource utilization statistics etc. of the system and its components.
	▶ The system shall maintain the accounting and authorization logs of the users accessing the components of the telephony system. The logs shall include information about users who have login into the system.
	▶ It shall be possible to schedule tasks. The tasks could be one or more operations that the user can specify to run at a predetermined date and time.
	▶ It shall provide reports about station alarms, trunk analysis, processor occupancy, system capacity etc.
	The system shall have inbuilt web-based software for administration and maintenance of the system. It shall provide the following features:
General Requirement	▶ The software shall provide GUI based interface for configuration and management of the system.
	▶ The Software shall provide real-time information or alerts and reports regarding health status e.g. up or down status, performance & resource utilization statistics etc. of the system and its components.
	▶ The system shall maintain the accounting and authorization logs of the users accessing the components of the telephony system. The logs shall include information about users who have login into the system.
	▶ It shall be possible to schedule tasks. The tasks could be one or more operations that the user can specify to run at a predetermined date and time.
	▶ It shall provide reports about station alarms, trunk analysis, processor occupancy, system capacity etc.
	The IP PBX system should provide complete inbuilt encryption capabilities or features without any external firewall, with the ability to encrypt all traffic (media and call control signaling) between IP



	phones, soft phones, call controllers and all other associated endpoints via a strong encryption algorithm like IPsec or SRTP etc.
	The system shall provide features viz. silence suppression, comfort noise and voice activity detection.
	It shall provide some features as give below but not limited to these this list. It can be expand further based on requirement
	▶ Call forward all, Call forward while busy, Call forward if no answer
	▶ Call hold, Call Drop and retrieve
	▶ Call Waiting and Retrieve (with configurable audible alerting)
	▶ Call Join
	▶ Call status (state, duration, number)
	▶ Conference for atleast 5 parties
	▶ Missed call information on IP phone
	▶ Directory dial from phone
	▶ Hands-free, speakerphone
	▶ Last number redial
	▶ Malicious Call ID and Trace
	▶ Abbreviated Dial, Speed Dial
	The system should have IP address and connected to the network

	The system must support log services for both Internal and External commands and configuration history for at least 30 days
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2. Radio Interoperability System

- a. The interoperability gateway should offer multiples input channels for radio entry points.
- b. The interoperability gateway should have ability to interface radios, computers, IP video feeds and smart phones within a common multi-user interface.
- c. The interoperability gateway should be an independent node replication and does not require a centralized server or services to make, break or manage multi-node connections.
- d. The interoperability gateway should have ability to break patches even when the systems are disconnected or loses network connection.
- e. The interoperability gateway shall be assigned a unique server identification number.
- f. The interoperability gateway shall support 26-pin voice and data interface ports for radio connections while offering remote radio control for select mobile radio models.
- g. The interoperability gateway should have unlimited gateway scalability. The base system should have ability to add any number of input channels or IP connections.
- h. The interoperability gateway should support an activity log with the ability to double-click on a transmission for instant recall.
- i. The interoperability gateway shall support an unlimited number of simultaneous communications, cross connects, or patches based on the number of assets connected.
- j. The interoperability gateway shall support the ability to create pre-set groups and radio configurations. When selected by the user, the gateway recreates the groups and radio configurations.



- k. The interoperability gateway shall support the ability to interface to remote communications radios at towers using standard tone remote control ones with tone control hardware options.
 - l. The interoperability gateway shall support the ability to offer remote control tones that are user selectable. Controls will be user selectable by audio frequency, tone(s) duration, sequence of multi tones and tone level output. Remote control tones will be capable of outputting audio levels that will key the remote transmitter.
 - m. The interoperability gateway shall support the ability to support all conventional radios, HF, VHF, UHF, 700/800 MHz trunking, conventional and military radios.
 - n. The interoperability gateway shall support a simple to learn GUI with touch screen design.
 - o. The interoperability gateway shall support the ability to configure patches with simple to use cluster groups.
 - p. The interoperability gateway allows the user to create patches by selection of repeater tower locations or radio gateways.
 - q. The interoperability gateway offers the ability to configure a port via predefined software profiles.
 - r. The interoperability gateway shall support the ability to save all settings channel-by channel basis.
 - s. The interoperability gateway shall support the ability to configure channels on the fly with no impact to any other channels.
 - t. The system offers the ability to set up major user types including (1) System Administrator, (2) Dispatcher and (3) User. Users may be assigned rights and privileges regarding which functions maybe performed by the user.
 - u. The interoperability gateway shall support the ability to store and forward audio to account for delays within a trunking radio system.
 - v. The interoperability gateway shall support the ability to allow all channels (radio select chassis) to interface with the "ready" and "transmit" handshakes with trunking radios.
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- w. The interoperability gateway shall support the ability to interface with Nextel PTT radios. Remote users with Nextel PTT phones can communicate seamlessly with any gateway channel set up to network with the radio system.
- x. The interoperability gateway offers full control from a remote client station with the ability to perform all system administrator or dispatcher functions from client stations.
- y. The interoperability gateway shall support the ability to log-in multiple users within a shared workspace (optional computer ports). All users see elements created and affected by users within the system
- z. The interoperability gateway shall support the ability to communicate via TCP/IP protocols.
- aa. The interoperability gateway offers the ability for remote client stations to control all radio functions available from the connected radio front panel, e.g. frequency, power levels, channels, zones, scan, talk-around, etc. This capability is available assuming the radio has a computer control capability.
- bb. The interoperability gateway shall support the ability to create "Dispatch Groups". The dispatcher can communicate with all radios, phones or computer terminals connected through the gateways by PTT a single on-screen element whereas all assets within the group remain operationally independent and do not hear cross connects. The members of the dispatch group may transmit to the dispatcher directly. Other members of the dispatch group may not listen to communications between the dispatcher and the individual members. The dispatcher function shall allow for frequency and transmit control of the radios.
- cc. The interoperability gateway shall support the ability to establish "Private" connections between any gateway channels. Private connections act as nested groups and allow communications only between the gateway channels connected in private.
- dd. The interoperability gateway shall support the ability to place radio entry points in both "Talk Groups" and "Private". When the gateway is connected in both modes, the operator may listen to both the normal Talk Group and the Private connection.
- ee. The interoperability gateway shall support the ability for remote users to control or communicate with the radio subsystem server via TCP/IP wired network using RIOS client software. Remote users can perform all functions (i.e., make/break connections, start recording, etc.) as if they were physically located at the server.



- ff. The interoperability gateway shall support the ability to select the priority of the "listen to" radio entry point. The priority may be changed in real time by the dispatcher with no impact on switch operations.
- gg. The interoperability gateway shall support the ability to be connected using a remote IP connection, e.g., VPN using the Internet (with optional VPN set up and router).
- hh. The interoperability gateway shall support the ability to be connected using an IP network to form a Radio Wide Area Network (RWAN). The RWAN will allow the user to select which gateways are allowed to participate in the radio wide area network. Selection of the gateways servers will be done simply by adding from a drop down list. Upon selecting the gateway assets to participate in the RWAN, the selected servers will appear in the shared RWAN "workspace".
- ii. The interoperability gateway shall support the ability to display to RWAN sites in selectable colors indicating a RWAN gateway. Assets from that location will be color-coded once connected in the shared workspace.
- jj. The interoperability gateway shall support the ability to control RWAN connections using site permission individual to each asset. Site permission shall include the ability to protect (1) patching right and (2) monitoring right from the remote gateway.
- kk. The interoperability gateway shall support the ability to create "chat groups" by the selection of the computer station icon. Chat groups are defined as multiuser capable text messages with the gateway interface.
- ll. The interoperability gateway shall support the ability to allow for the connection of a router (802.11x).
- mm. The interoperability gateway shall support client software that can monitor in mono and stereo mode.
- nn. The interoperability gateway shall support audio channels with individual volume controls.
- oo. The interoperability gateway shall support the ability to communicate with P25 compliant radios.

3. Radio Set

The successful bidder has to consider specification and functionalities of in service radio sets.

OS DIRECTORATE



INTEGRATED COMMAND & CONTROL CENTRE

1. Command & Control Platform/Application

- (i) The Integrated security systems software shall support the following systems on a single platform with a feasibility to create/modify the reports as per client's requirement. The software shall support multiple web clients and desktop clients on client server architecture.
 - (ii) The software shall be an integrated software platform to monitor and manage the below system modules enabling the end user to have the comfort and convenience of establishing a single point responsibility for the monitoring, management and upkeep of their facilities.
 - IP based CCTV monitoring and recording system
 - IP based thermal camera monitoring and recording system
 - Perimeter Intrusion detection system
 - Fire Alarm system
 - Communication system
 - Contraband detection system
 - (iii) Access control system and CCTV System with Digital video transmission and recording including event (access and alarms) linked recording shall be supported.
 - (iv) The software shall support industry standard communication protocols.
- (a) System Architecture
- (i) The application shall be modular and must have a highly scalable architecture that can suit a single site and scale up to manage multiple sites across varied geographies if need be.
 - (ii) The application shall support single / multiple / clustered servers to meet the requirements of the implementation if required.
 - (iii) In its basic form the application, database, communications and user interface may be installed on a single Server / PC. As the system expands in terms of complexity, functionality or volume of data processed it shall be possible to install the different application server components in multiple machines and support full client server architecture for the user workstations.
 - (iv) The responder shall be able to provide load testing reports for defined scenarios covering a defined number of events / alarms / concurrent users on client workstations and defined number of hits to the database. This shall be available both in a LAN and WAN environments. The responder shall be required to establish a proof of concept under the defined load conditions and provide detailed load testing reports and allow inspection of the simulation in the responder's own facilities if need be.
-

- (iv) The application shall support communication drivers for various real time systems / hardware platforms that need to be brought under the command and control infrastructure. The application shall support the ability to include custom developed communication drivers and provide an open architecture in interfacing multiple third party systems that may need to be brought under this infrastructure.
- (v) The application shall be designed for high availability. The solution architecture shall optionally support dual redundancy in the servers and back up servers. It shall also support remote replication of data for disaster recovery. The application shall support remote desktop client workstations that shall be able to work as independent servers managing a local site / set of sites in case of connectivity loss with main / standby servers. Responder shall be able to provide detailed system architecture and a white paper on how the proposed application meets these requirements.

(b) General Requirements

- (i) The application software shall be an integrated application for the management of various services within a building, campus or an enterprise across multiple global locations.
- (ii) The services / disciplines managed by the software shall include Access control, Perimeter intrusion detection system, Fire, lighting, CCTV Systems etc.
- (iii) The software shall have a single integrated back end database for all these disciplines and shall provide an integrated GUI (Graphical User Interface) for monitoring, managing and reporting across these disciplines.
- (iv) The application shall be based on latest technology such as Microsoft.NET
- (v) The application shall not require administrator privileges on the Operating system.
- (vi) The application shall comply with a distributed 3 tier architecture. There shall be a common Business Logic layer and a single Data Access Layer that shall control access to the database.
- (vii) The application should support MS SQL Server at the minimum. It is desirable that the application also support SQL Lite and MySQL.
- (viii) The application shall provide an option of using a desktop based GUI as well as a web based UI.
- (ix) The web based UI shall provide all functionality as the desktop GUI. Web UI restricted to alarm monitoring or only partial configuration shall not be acceptable.



- (x) The desktop UI shall be designed to allow multiple screens to be opened at the same time. The user shall be able to fix windows (dock) or keep them floating.
 - (xi) Floating windows shall be dragged to another monitor in the case of a PC supporting multiple monitors. This shall facilitate graphics views on one monitor and list views or video on another.
 - (xii) The application shall provide a familiar Windows point and click environment. It shall also facilitate easy learning by providing quick access menus like toolbars.
 - (xiii) The application shall display all configurations in at least 2 formats:
 - (a) Hierarchical tree views for displaying all hierarchical data.
 - (b) List views that list all configured items based on user rights.
 - (xiv) It shall have the following Tree Views as minimum.
 - (a) Site Tree – Objects shall be linked under the respective sites. Hierarchical view based on site.
 - (b) Object browser – Objects shall be grouped under the Communication Gateways.
 - (c) Quick View – Objects shall be grouped like a windows explorer folder view (System wise). Operator configuration actions such as add/edit or delete shall be possible from either the tree view or the list view.
 - (xv) All operations on the application should be asynchronous and shall not hold up any other operation, for e.g., bulk data change should not hold up receipt of alarms.
 - (xvi) Communication across layers shall be encrypted. AES with 128 BIT key for symmetric shall be acceptable. Native encryption shall not be acceptable.
 - (xvii) Data transfer across layers shall be compressed to provide optimum utilization of bandwidth.
 - (xviii) Communication across layer shall preferable be over HTTP with suitable authentication. Responder to specify communication technology, port used and authentication mechanism.
 - (xix) Login from the Web UI shall be using MDS or SSL.
 - (xx) The application shall not store any form of passwords in clear text. All such passwords either in configuration files or in the database shall be encrypted. AES with 128 BIT key. Native encryption shall not be acceptable.
-

- (xxi) The access to database shall not be based on the default user; the application shall use a specified or pre-defined login.
- (xxii) It shall be possible to designate a desktop as a specific workstation that exposes only a defined functionality like a specific Video Workstation irrespective of the logged in operator excluding the Master User or Administrator.
- (xxiii) Application shall provide for the ability to copy existing configuration across hierarchies.
- (xxiv) Application shall also provide the ability to clone (create multiple instances) of a configured entity. A minimum of 50 clones should be possible in one user action.

(c) Events & Alarms

- (i) It shall be possible to define messages as normal events or as alarm globally for the system.
- (ii) It shall be possible to define some alarms to require re-entry of operator password before process.
- (iii) The system shall support up to 255 alarm priorities. Each alarm priority shall be associated with a color for easy identification of the alarm's criticality.
- (iv) It shall be possible to define Operator instructions for each alarm from each site.
- (v) System shall support alarm escalation where unacknowledged alarms shall be escalated and reported to supervisory workstations. Time out for each alarm for escalation shall be definable.
- (vi) The application shall display alarms and events in separate windows. Alarm window shall pop up (or become window on top) in case it is minimized and an alarm is received.
- (vii) The alarm window shall group alarms by priority. The group header shall display the total live alarms and acknowledged alarms in each priority.
- (viii) It shall be possible to regroup the alarms by location (sites) or application type on the fly.
- (ix) Alarms messages shall provide the following minimum data:
 - (a) Date & Time of occurrence. Alarm Description (in case of perimeter Intrusion/Access control/CCTV).



- (b) Location.
 - (c) Device Description.
 - (d) Card holder name (in case of access control system card based alarm).
 - (e) Priority (in case of grouping other than priority).
- (x) It shall be possible to double click on every alarm and get additional data that shall consist of the following:
- (a) Alarm instruction for the operator.
 - (b) Alarm Action capture. This shall record free flowing text entered by the operator. This information shall be stored with the operator id and date time stamp.
 - (c) History of last 10 alarms from that Site / device.
 - (d) Last Card Entered in case of an alarm from Access Controllers.
 - (e) Link to play video in case event is linked to a video clip.
- (xi) The application shall provide for a 2-stage alarm management. Operators shall acknowledge the alarm on receipt and after investigation and closure shall be able to process the alarm.
- (xii) Alarms shall be visible till it is processed. It shall be possible to visually differentiate between a live alarm and an acknowledged alarm.
- (xiii) It shall be possible to process a group of alarms. In such cases the application shall prompt for the logged in operator's password.
- (xiv) Existing alarms (live alarms prior to login) shall be displayed separately as History Alarms. History alarms shall be grouped as:
- (a) Today
 - (b) Yesterday
 - (c) Two Weeks
 - (d) Last Month
 - (e) Older

(d) Operator Definitions

- (i) It shall be possible to create Operator Group profiles. Unlimited number of groups shall be possible.
- (ii) Group Profiles shall define the operator menu rights, access rights and action rights.
- (iii) Group profiles shall also define the events and alarm routing, Group Profiles shall also define the rights to acknowledge and/or process the alarms routed.
- (iv) Individual operators may be created and assigned to the group profiles. The following minimum definition shall be possible:
 - (a) Password Change on next logon.
 - (b) Password change not allowed.
 - (c) Password Disabled.
 - (d) Auto Log Out period.
 - (e) Validity days.
 - (f) Partitions (Sites) allowed for access.
 - (g) Application disciplines (Access / Video / Intrusion) allowed for access.
- (v) Operator password must be at least a combination of 6 alphanumeric characters long, containing at least 1 numeric character and at least one character in caps.
- (vi) The application shall not allow last 5 passwords to be repeated.
- (vii) The application shall notify expiry of the password if the validity is less than 15 days.
- (viii) Application shall allow for an operator to have Menu and edit rights for an object say a card-holder, but it shall be possible to restrict the view to avoid any personal data like address, mobile number etc.
- (ix) It shall be possible to restrict operator access to limited workstations in case of desktop UI.

(e) Reporting

- (i) The application shall provide a comprehensive reporting engine.
- (ii) Normal day to day reports shall be predefined and shall consist of but not limited to the following:
 - (a) Listing of all master configurations
 - (b) Listing of all Group Profiles and the rights
 - (c) Listing of all operators and their associated group profiles
 - (d) Listing of Card Holders/point lists with respect to each plant
 - (e) List of all alarms based on date and time
 - (f) List of all normal events based on date and time.



- (iii) These reports shall be available in Crystal Reports or equivalent reporting tool.
- (iv) The application shall provide an additional report option where by the user shall customize the view based on:
 - (a) Groups
 - (b) Sort order
 - (c) Column Selection (based on predetermined sub set)
- (v) The application shall also provide for a customizable report generator whereby report formats shall be created at site. The options shall be the following:
 - (a) Report title
 - (b) Group Headers and titles
 - (c) Column Selections (all fields in the database)
 - (d) Sort order
 - (e) Filter criteria based on SQL like statements. The operations shall be logical (<>, =, <>, in, not in, like) and aggregate (count, sum, avg) functions.
 - (f) Font size, fore color and back color
- (vi) It shall be possible to save report formats created and reused.
- (vii) All reports shall provide an ability to export to the following:
 - (a) CSV
 - (b) Text

(f) Trending

- (i) The application shall provide for creating a data log.
 - (ii) It shall be possible to define unlimited points and their frequency for data logging.
 - (iii) Frequency shall be selectable:
 - (a) Quarter Hourly
 - (b) Hourly
 - (c) Daily
 - (d) Weekly
 - (e) Monthly
 - (iii) Notwithstanding the frequency specified, the data log shall also include all state changes.
-

would be provisioned under the floor. The datacenter area would be protected under 24x7 surveillance and would have biometric (finger print) based access control.

- Electric Room/battery/UPS room
- Officer's cabin
- Support Staff rooms

(a) Standards for construction and interior works in CCR

The scope of the project includes **construction of control room**, designing, engineering, supply & installation of ICCC Interiors with air-conditioners for adequate cooling of entire control room space. As the Control room is a significant place, it is imperative that it is designed properly in terms of Aesthetics, Ergonomics and Functionality. Various aspects should be considered while designing Control Room area to create ideal work place, considering physiological aspects such as line of sight and field of vision and cognitive factors such as concentration and perceptivity as per ISO 11064/ or equivalent.

The Architects & civil engineering experts would undertake the designing of the interior of the ICCC in such a fashion so that they shall reflect human factors requirements including the following:

- Satisfactory environmental conditions for operator personnel. Including noise, airflow, temperature and humidity, and precautionary measure under uncontrolled conditions (like fire) beyond acceptable limits.
- Adequate space for personnel and equipment for the movements and activities they are required to perform during operation and maintenance, under both normal and emergency conditions.
- Adequate visual / auditory status information and other communication links between personnel and equipment under normal and emergency conditions.
- Adequate illumination for the performance of operation, control, maintenance and training.
- The control room shall be built as per the criteria of "Human Factor Engineering" to improvise the efficiency utilization of the operators and provide them Fatigue free working environment.
- The interiors should be designed to
 - Ensure maximum standard of safety.



- Allow Flexibility
 - Minimize maintenance
 - Improve operator's efficiency & alertness.
 - Selection of fire retardant/rated material is must.
 - Implementation agency is responsible for setting up and O&M of entire ICCC including all the, hardware and software, interior work for setting-up of ICCC at physical space provided by authority, Network Cabling, Electrical Works, Video Wall, Furniture's and Fixtures, CCTV Surveillance system of the ICCC, Access Control System etc. as per the scope of work.
 - The Implementation agency will have to provide all necessary Hardware, Network Infrastructure, Active and Passive Connectivity, Power Backup including all IT infrastructures that may be required for the ICCC for the entire contract duration.
 - Video Wall: A state of art 65" LED TV facility should be installed at CCC. Followings are the functional requirement of video wall: -
 - The video wall shall use multi-monitor (e.g., different monitor can display different input source) and split screen (e.g., several intersections can be displayed on one monitor) display technology to provide the flexibility to accept audio and video inputs Camera system, TV signal, recorded video, and Laptop computer.
 - Should have provision for live monitoring and control of various application & Smart solution modules
 - Each operator shall be provided with one workstation with three monitors for system monitoring along with one intercom line.
 - Implementation agencies scope of work and supply of the control room only in the ICCC and its components including Ergonomic Study, Desk, Ceiling, Flooring, Panelling, Partition, Illumination defined in this document shall be on turnkey basis. The expected size of the control would be 2000 Sq. ft.
 - Design, Engineering, Manufacturing, supply of all related goods and providing all related services including installation, testing, integration, commissioning etc. all complete, preparation of related drawings, documentations etc. of the control room.
 - Quality assurance and commissioning of the complete system at site to the complete satisfaction of the owner/consultant.
-

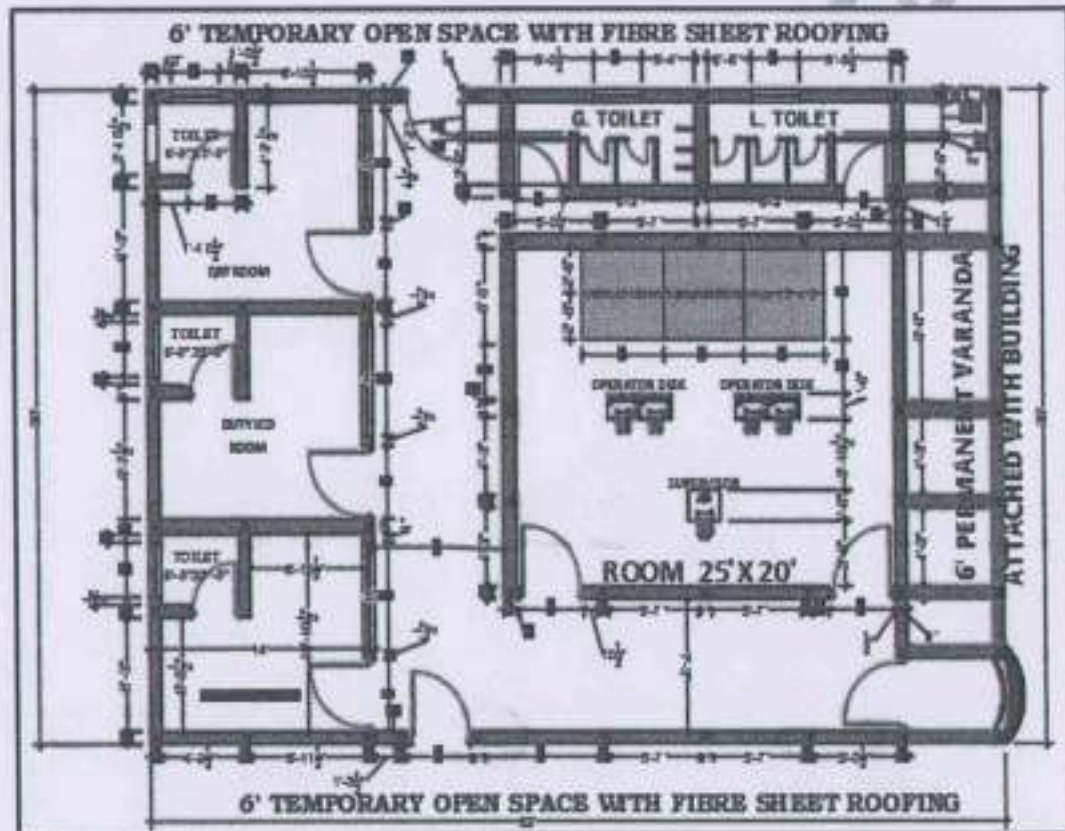
- (a) Time & Attendance with workflow.
- (b) Visitor management.
- (c) Notification.

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3. Command and Control Room

The ICC building will have Command and Control Room (CCR) where the operators would be sitting. Below is an indicative & suggestive layout of the proposed CCR. The exact floor dimensions and interiors of the building would be finalized by architects & the civil engineering experts who will be designing the ICC layout, structural designs and interior planning & designing. The plan indicated in this section is indicative & suggestive in nature. The final architectural plan and relevant details shall be submitted separately.



ICC building will also house the Datacenter, electrical & battery/UPS room. The details of the following are as below:

- **Datacenter:** This area will house all the core IT infrastructure which includes the server farm, storage, security and other datacenter assets in a controlled environment. The datacenter-controlled environment would provide clean power, adequate cooling, fire & hazard protection and physical security for the datacenter assets. The architects & civil engineering experts will design the interiors of the datacenter where in the cabling (both power & network)

- (iv) It shall be possible to define a point in more than one data log with different frequencies.
- (v) The application shall provide for unlimited points from within the data log to be displayed as a trend chart.
- (vi) It shall be possible to select a period on the trend chart and zoom into it.
- (viii) Trend data shall also be represented as a summary consisting of:
 - (a) Max value.
 - (b) Min value.
 - (c) Average for the plotted duration.
- (x) It shall be possible to select the color of each point charted on the trend.
- (x) It shall be possible to save the trend graph as an image.

(g) Graphics

- (i) The application shall provide a fully functional graphics module.
- (ii) It shall be possible to import images into the graphics module to create a graphical representation of the facility.
- (iii) The images can be linked by using a link button.
- (iv) It shall be possible to define generic device properties for each type of physical hardware like doors, inputs etc.
- (v) It shall be possible to create more than one generic device for each hardware type with unique properties like icons, actions and states.
- (vi) It shall be possible to position these devices into the images to indicate actual location within the installation.
- (vii) It shall be possible to associate a group of images and create an animation.
- (vii) Generic devices shall accept animation files for various states.
- (viii) Generic devices shall be associated with a specific instance of hardware to create association. For example, Main Entry Door shall be associated with one generic door device.
- (ix) It shall be possible to define a specific instance of hardware in to more than one generic device.



- (x) It shall be possible to display analog values as a horizontal bar, vertical bar or as plain text. Measurement unit like Celsius shall be definable and visible in the graphics.
- (xi) It shall be possible to define which image must be popped up in case the device goes into alarm.
- (xii) It shall be possible to perform actions from the device icon on the graphics.
- (xiii) It shall be possible to view up to 5 live alarms from each device on the graphics.
- (xiv) It shall be possible to view the device configuration from the graphics.
- (xv) The system shall allow graphic pages to have devices across multiple disciplines. It shall be possible to define on the same graphics page any system device including cameras, access doors and intrusion alarm sensors.

(h) Interfaces

- (i) The application shall be able to provide multiple interface options.
 - (ii) To interact with third party applications. It shall be possible to access and retrieve a list of alarms and events from external applications using web services.
 - (iii) It shall be possible to manually import cardholder data from an excel sheet. The interface shall import from a pre-defined excel template as well as provide the ability to map the excel columns to the required database fields.
 - (iv) It shall also be possible to programmatically import cardholder data from an XML or a CSV file. Any external application shall be able to push an XML or CSV file based on a schemer. The interface shall process the file and add, modify or delete cardholder's records.
 - (a) It shall be possible to export events or alarm to a text file. The following definitions shall be possible.
 - (b) Frequency.
 - (c) File name.
 - (d) File extension.
 - (e) Fields required.
 - (f) Separator
 - (v) It shall be possible to export cardholder data to text or XML file.
 - (vi) The application shall be a comprehensive solution that supports the following plug in modules.
-

- The control room solution provider must be ISO 9001, ISO 14001, OHSAS 18001 and ISO 27001 certified.
- Wall paneling, ceiling & desk system shall be seismic zone 5 tested and certified from government approved test laboratory.

(b) Minimum Required Specifications for CCR components

- **Control Desk:-**
 - **Structure:** - Every desk shall be standing on aluminum pole-based system, the pole shall have 200 mm diameter and minimum 10 mm wall thickness at circumference. Both the load carrying poles shall be visible as design elements on the extreme sides of the desk; work top & floating CPU Cabinets shall be installed on these poles. The CPU cabinet shall be raised by 150mm from floor and shall be firmly mounted between extreme end poles. The CPU cabinet shall have curved extruded aluminum shutters. Straight shapes/profiles of desk like under structure, slat wall, front edge, table tops etc. shall be deemed unacceptable.
 - The standard frame width shall be 1160-1250mm with an overall height of 711-762 mm to correlate to standard seated height applications.
 - Conventional bulky, boxy type desk of metal and aluminum structure shall be deemed unacceptable.
 - **Wire** shall be routed into the cabinet through the pole. Proper maintenance access points to be provided via suitable snap fit plastic /metal covers.
 - **Table Top:** - The table top core shall be made up of aluminum and shall have 2 mm thick acoustic laminate finish on the top. Desk top shall have a feature of tilting by 2 to 5 degrees with help of noise free mechanisms.
 - **Front Edge:** - High-density Poly Urethane Foam molded on industrial grade aluminum core to form 50mm deep tapered edge to be installed on worktop. The Edge shall be mechanically replaceable within 30 minutes in case of damage or wear without opening or removing the worktop.
 - **Cable Managers and Rear Edge:** - All the cable manager openings and rear edge of worktop shall be protected from no spill molded PU edge, 5



mm high above worktop surface to prevent liquid from spilling inside the CPU/Equipment Cabinet.

- **Slat Wall:** - 60 mm thick Curvilinear Slat wall shall have radius matching to the CPU cabinet shutter. Slat wall shall have inbuilt mechanism for tool less & effortless sliding of the monitor arm across the length of the console without removing the monitor pole.
 - **Monitor Arm Assembly** shall have auto-lock, push & add/remove die-cast aluminum extendible arms of 150mm each with tool less addition/deletion feature to cater future requirements. Tool less addition / deletion in less than a minute. UL certificate to be enclosed along with the bid.
 - **Electricals:** - The exhaust fans shall be provided with thermostats. Fans will automatically shut down in case the shutters are opened.
 - **Cable Trays:** - The desks must be designed with vertical and horizontal cable trays to allow for continuous cable management between the cabinets.
 - **Panelling/Partition and Ceiling System:**
 - Look and feel of the control room shall be ultra-modern & unique. To solve monotony in control room in future, the panelling shall have inbuilt design in 20% tiles of panelling to change the colour without ordering new.
 - Conventional Gypsum, wood, Fabric and painting work shall be deemed unacceptable in the control room area.
 - Ceiling and panelling system shall be a combination of hexagonal and rectangular designs defined below: -
 - **Hexagonal design:** - Hexagonal ceiling and panelling shall be made up of extruded aluminum periphery rigid enough to pass seismic test mentioned above.
 - **Rectangular design:** - 25mm deep tray type panelling tiles with rounded corners shall be snap fitted to the main structure and firmly hold in place by die-cast aluminium corner locks. The die-cast locks shall be attached to the main MS structure or min 1.6 mm.
 - **Tiles:** - Tiles shall have minimum 10,000 micro-perforations per square meter to achieve NRC of 0.6 Sound Absorption Coefficient by diffuse field
-

method; IS: 8225-1987 "Measurement of Sound Absorption Coefficient in Reverberation Room" (Equivalent to ISO: 354-1985 and ASTM 423-90).

- **Hexagonal system** shall extend possibility to integrate various raw materials like Solid surface, Fabric, Glass, Metal (perforated and non-perforated), illumination in the tiles to form multiple design combinations.
 - **Structure:** - The structure shall be made up of 1.6mm thick powder coated steel structure.
 - **Cut-outs for LVS:-** Panelling shall have provisions to accommodate Video wall in an aesthetically appealing manner.
 - **Wall Panelling System - Lockable & Replaceable:** Modular wall panelling tile having secure locking arrangement for equidistant mounting. Locking arrangement enables easy replacement without using any tool within 20 seconds. The feature shall provide easy flexibility of locking all tiles in one column through gravity.
- **Doors**
 - **Metallic Door:** With door spring and locking arrangements and both way handle. Prepare with rigid thermo fused film metal panels. Specification: 0.6mm thick Metal panel sheets, cavity filled with glass wool insulation of density 24kg/cum in roll form of make inside adequate quantity. Material of the partition and that of metal door will remain the same.
 - **Metal door with Toughened Glass Vision Panel:** - The door shall have 100mm frame (made of same material as that of wall Panelling /partition) and shall have 12mm thick glass pane in between. Glass Properties: Safety (tempered): when broken, must split into tiny harmless pieces.
 - **Illumination:** - Control Room illumination shall be designed as per ISO 11064.



3. Workstation/Desktop

S. No.	Component	Minimum Requirement
1	Processors	Latest generation X86 Processor
		3.2 Ghz or Higher
		Min 8 MB
2	Mother Board	Latest series 64 bit chipset
		Either on the Display system or on chassis or external OEM speaker
		Intel/OEM
		16 GB DDR-IV (2400 MHz) or higher expandable up to 64 GB
		Graphics Card – 2 GB
		1x PCIe x16 and 1 PCIe x4 (total minimum 2 PCI Slots)
3	Display	21.5" or higher
		Active Matrix TFT LCD (Backlit LED); 3nos. monitor with each workstation/desktop
		1920x1080 or higher
4	Miscellaneous	Minimum 6 USB Ports (minimum two USB 3.0 ports and minimum 2 USB port 2.0 or higher in front) 10/100/1000 Ethernet Card, VGA/HDMI, Display Port/HDMI/DVI, Microphone & Stereo Head Phone/Combo port and other standard ports, tool less cabinet, TPM 2.0
		External/Internal 180 W or higher Power supply (>=85% efficient), Active PFC
		Tower
5	Mouse	Optical/Laser USB
	Optical Drive Keyboard	Internal 8x or higher Standard USB
6	OS & Other Software	Preloaded Windows 10 Prof 64 bit Windows/Linux Ubuntu, MS Office, Adobe acrobat reader, Anti-virus etc.
7	HDD	1 TB SATA (7200 RPM) or higher capacity

DATA CENTRE COMPONENTS

1. Chassis Layer 3 Core fiber switch

S. No.	Detailed Technical Specifications
	Architecture
1.	Switch capacity - 1.4 Tbps or higher
2.	Switch forwarding rates – 18pps or higher
3.	10G/Gigabit - 24 ports scalable to 40 x 1/10G fiber ports 40 Gig interface for uplink – 4 scalable to 12 x 40G Ports
4.	Non-blocking switch architecture and modular operating system
	Switching features
5.	802.3ad based standard port/link aggregation, Jumbo frames, storm control
6.	Support at least 4000 VLAN and 200,000 MAC Address
7.	FIP snooping, Datacentre bridging exchange (DCBX) and IEEE 802.1Qbb (PFC) from day1
	Security
8.	802.1X Network Security and Radius/TACACS AAA authentication
9.	MAC Address filtering based on source and destination address
10.	support for various ACLs like port based, vlan based and L2- L4 ACL's
11.	Should have Control plane (DoS) protection
12.	The switch should support MACsec, SSH v1 & v2 and Dynamic ARP inspection
	Network Protocols
13.	Layer3 routing protocols like Static, RIP, OSPF, OSPFv3 from day 1 for the solution.
14.	The switch should support MPLS, L2 and L3 VPN and IPv6 Tunneling
	Quality of Service
15.	8 number of hardware queues per port
16.	DSCP, 802.1p and FCoE
	Multicast
17.	IGMP v1,v2,v3, IGMP snooping, PIM SM and MSDP
	High Availability
18.	The switch should support ISSU and BFD

	Management
19.	SNMP v1, v2, v3, RMON/RMON-II enabled, SSH, telnet, GUI, Web management and should have dedicated Management port
20.	The switch should support CLI via console, telnet, or SSH and should have image rollback option.
21.	Switch should support port mirroring feature for monitoring network traffic of a particular port/VLAN.
22.	Switch should support Link Aggregation on two different switches.
23.	Built-in real-time performance monitoring capabilities
24.	Power Supply: Switch should have internal Hot Swappable Redundant Power supply
25.	Cooling Fans: Should have redundant cooling FANS
26.	The switch should support NEBS
27.	Switch should be stackable/VPC/Equivalent (All accessories to be provided from day 1)
28.	The Switch should be EAL3/ NDPP certified
29.	Certification - CE, FCC, UL EN 60950-1

2. Firewall

S. No.	Detailed Technical Specifications
	Architecture:
1	The appliance based security platform shall be capable of providing firewall, IPS and VPN (IPSec) functionality simultaneously.
2	The Firewall should support Application visibility and control, Antivirus and Antispam in future.
3	The Firewall should support Advanced Threat Protection like malware and zero-day threats
4	The platform should be based on real time, secure, embedded operating system.
5	Capability to detect hardware failure during power up and before going online
6	Should provide Stateful failover.
7	HA configuration that uses dedicated HA-control interfaces apart from the mentioned traffic interfaces
8	Should provide active/active and active/standby failover
	Sessions
9	Should support upto 2Million Concurrent sessions and at least 50,000 sessions per second
	System Throughput

10	Should provide 9 Gbps Firewall Throughput
11	Should have 4 Gbps IPsec throughput
12	IPS throughput of 3Gbps
13	Memory - atleast 16GB or higher and 100GB storage
14	Support: - IKEv1 and v2, IPsec VPN standards, 56-bit DES, 168-bit 3DES, OSPF routing, x 509, Up to 256-bit AES data encryption
15	Authentication, Authorization and Accounting (AAA) support: RADIUS, TACACS or TACACS+
16	Support for: Network and application level attacks ranging from malformed packet attacks to DoS attacks, Support RSA and Diffie-Hellman, MD-5, SHA-1, SHA-128, SHA-256.
	DHCP relay: -
17	Forwards DHCP requests from internal devices to an administrator-specified DHCP server, enabling centralized distribution, tracking, and maintenance of IP addresses.
	Provides:
18	Rich dynamic NAT and PAT services ; Bidirectional NAT and Transparency; Static NAT and PAT services; Stateful and stateless and Zone-based firewall; Denial of service (DDoS) protection; Traffic anomaly protection; MPLS (RSVP, LDP) , MPLS VPN; Virtual private LAN service (VPLS)
	Management
19	Web based management to support for remote monitoring
20	Accessible through variety of methods including: Telnet, Console Port, SSH
21	Dedicated Out-of-Management interface
22	Support SNMPv1, v2, v3 & Support for syslog
23	Should have the ability to create customizable administrative roles/profiles (monitoring only, read-only access to configuration).
	Software features
24	support for IPv4; RIPv2, OSPF, BGP, VLAN, DHCP. Support for IPv6 RIPng, OSPFv3.
	Power Supply
25	Internal Redundant Power supply
26	Minimum Interfaces Required 4 No's 10Gig ports and 8 No's of 1Gig Ports

3. 8 port (10/100/1000) Industrial Field Switch

S. No.	Parameters	Description
1	Switch Architecture and performance	The switch should provide 8 ports 10/100/1000 Mbps T POE+ ports, (with minimum power budget of 240W) and switch should additionally have 4 GE SFP uplinks. Switch should have wire rate switching capacity of minimum 24 Gbps or more
2	Layer 2 features	802.1Q VLAN on all ports with supply of minimum 256 VLANs and minimum 1K Mac addresses or higher



		Spanning tree protocol as per IEEE 801.1d, 802.1s and 802.1w
		Should support improved resiliency with support of ERPS or equivalent for ring topology
		Link Aggregation control protocol (LACP) as per IEEE 802.3ad
		Switch should support IGMP v1/v2/v3 as well as IGMP snooping and minimum 255 IGMP Multicast Groups
3	Quality of service (QoS)	Switch should support classification and scheduling as per IEEE 802.1P on all ports and four egress queues per port. Switch should support mechanism of applying Automatic QoS or equivalent mechanism
		Switch should support eight hardware based priority queuing or equivalent to guarantee that the highest priority packets are serviced ahead of all other traffic
4	Security Features	Switch should support ACL's, TACACS+, RADIUS, ARP Spoofing, DHCP snooping, DHCP option 82, Dynamic ARP Inspection (DAI), IP source guard and BDU Guard or equivalent
5	Management, Easy-to-use Deployment and Control Features	Switch should have console port, support for SNMP version 1,2 and 3, TELNET, SSHv2, 4 groups of embedded RMON, DHCP server
6	Standards	IPv4/IPv6, IEEE1588v2 PTP, IEEE 802.3af, 802.3at,802.3az, NTP, PTP
7	Industry Standards	RoHS and IP30
8	Certifications	CE, FCC, UL EN 60950-1
9	Mount	DIN rail mount
10	EMC Compliance	FCC, IEC/ EN 61000-{3-2, 3-3, 4-2 to 4-6, 4-8, 4-11}, RoHS
11	Operating Temperature	(-)10° C to +70° C
12	Shock Vibration	IEC 60068-2-27 IEC 60068-2-64 IEC 60068-2-32
13	Relative Humidity	Relative Humidity of 5% or 95% Non-considering
14	stability and credibility	OEM should have supplied minimum 1500+ switches in any surveillance project/multi-location project in Government. To ensure stability and credibility of OEM , Company should not have any history of merger / acquisition in last 10 years.

4. 24(10/100/1000) Port Managed Switch

S. No.	Parameter	Minimum Technical Requirement
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1	Switch Architecture and Performance	Switch should have 24 Nos. 10/100/1000 Base-TX auto-sensing plus with minimum 2x10G SFP+ uplinks.
		Should support stacking using dedicated stacking ports with minimum 40 Gbps upto throughput
		Switch should support link aggregation across multiple switches in a stack.
		Should support stacking of minimum of eight switches
		Switch should have non-blocking wire-speed architecture.
		Switch should support IPv4 and IPv6 from day One
		Switch should have non-blocking switching fabric of minimum 128 Gbps or more
2	Features	Switch should have Forwarding rate of minimum 60 and above Mpps.
		IEEE 802.1Q VLAN tagging.
		802.1Q VLAN on all ports with support for minimum 255 active VLANs and 4k VLAN ids
		Support for minimum 8 k MAC addresses
		Spanning Tree Protocol as per IEEE 802.1d
		Multiple Spanning-Tree Protocol as per IEEE 802.1s
		Rapid Spanning-Tree Protocol as per IEEE 802.1w
		Self-learning of unicast & multicast MAC addresses and associated VLANs
		Jumbo frames up to 9000 bytes
		Link Aggregation Control Protocol (LACP) as per IEEE 802.3ad.
		Port mirroring functionality for measurements using a network analyzer.
3	Quality of Service (QoS) Features	Switch should support IGMP v1 / v2 / v3 as well as IGMP v1 / v2 / v3 snooping.
		Switch should support classification and scheduling as per IEEE 802.1P on all ports.
		Switch should support DiffServ as per RFC 2474 / RFC 2475.
		Switch should support minimum 4 (four) queues per port.
		Switch should support QoS configuration on per switch port basis.
		Switch should support classification and marking based on IP Type of Service (TOS) and DSCP.
		Switch should provide traffic shaping and rate limiting features (for egress as well as ingress traffic) for specified Host, network.
Strict priority queuing guarantees that the highest-priority packets are serviced ahead of all other traffic.		



4	Security Features	Switch should support MAC address based filters/ access control lists (ACLs) on all switch ports.
		Switch should support Port as well as VLAN based Filters/ ACLs.
		Switch should support RADIUS and TACACS+ for access restriction and authentication.
		Secure Shell (SSH) Protocol, HTTP and DoS protection
		IP Route Filtering, ARP spoofing, DHCP snooping etc.
		Should support DHCP snooping, DHCP Option 82, Dynamic ARP Inspection (DAI)
		Should support a mechanism to shut down Spanning Tree Protocol Port Fast-enabled interfaces when BPDUs are received to avoid accidental topology loops.
		Should support a mechanism to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.
		Switch should support static ARP, Proxy ARP, UDP forwarding and IP source guard.
		The Switch should support IPv6 features from day-1.
5	Management, Easy-to-Use Deployment and Control Features	Switch should have a console port with RS-232 /RJ-45 Interface for configuration and diagnostic purposes.
		Switch should be SNMP manageable with support for SNMP Version 1,2 and 3.
		Switch should support all the standard MIBs (MIB-I & II).
		Switch should support TELNET and SSH Version-2 for Command Line Management.
		Switch should support 4 groups of embedded RMON (history, statistics, alarm and events).
		Switch should support system and event logging functions as well as forwarding of these logs to multiple syslog servers.
		Switch should support on-line software reconfiguration to implement changes without rebooting. Any changes in the configuration of switches related to Layer-2 & 3 functions, VLAN, STP, Security, QoS should not require rebooting of the switch.
		Support for Automatic Quality of Service for easy configuration of QoS features for critical applications.

		Support to detect unidirectional links caused by incorrect fiber-optic wiring or port faults and disable on fiber-optic interfaces
		Switch should have comprehensive debugging features required for software & hardware fault diagnosis.
		Should support DHCP Server feature to enable a convenient deployment option for the assignment of IP addresses in networks that do
		DHCP servers configured on servers and integrated with Directory Services.
		Switch should support Multiple privilege levels to provide different levels of access.
		Switch should support NTP (Network Time Protocol)
		Switch should support FTP / TFTP
6	Standards	RoHS Compliant.
		IEEE 802.1x support.
		IEEE 802.3x full duplex on 10BASE-T and 100BASE-TX ports.
		IEEE 802.1D Spanning-Tree Protocol.
		IEEE 802.1p class-of-service (CoS) prioritization.
		IEEE 802.1Q VLAN.
		IEEE 802.3u 10 Base T / 100 Base Tx / 1000 Base Tx.
7	Compliance	The switch should be IPV6 logo ready or Certified
		Switch should be tested and certified for EAL2/EAL3 / NDPP or above under Common Criteria Certification

5. Server/Network Rack

S. No.	Item	Minimum Requirement Description
1	Rack Height	42U
2	Rack Width	19"
3	Max Height	2000mm
4	Max Width	800mm
5	Max Depth	1200mm
6	Color	Black / standard color
7	Front Door	Glass with unique lock
8	Rear Door	Steel
9	Load bearing capacity	1400 kg

6. Server

S. No.	Parameter	Description
1	Chipset	Latest Intel Chipset
2	Form Factor	Max. 2U rack mounted with sliding rails
3	Configured CPU	should be populated with 2nos. of latest series CPU each should be min. 16 core & min. 2.0Ghz or better
4	Memory slots	24 DDR4 DIMM slots supporting speeds up to 2666MT/s.
5	Memory configured	Server should be configured with 256Gb memory
6	RAID Controller	12Gbps PCIe 3.0 with RAID 1, 5, 6
7	Internal Storage	2nos. of 300Gb 10K RPM HDD
8	DVD writer	DVD RW
9	I/O slots	Up to 8x PCIe Gen3 Slots
10	GPU	Server should support upto 2 GPU Cards (SI has to consider GPU cards as per their solution requirement)
11	Network Interface	2 x 1G RJ45, 2 x 10 GbE LAN ports for providing Ethernet connectivity, 2 x Dual-port 16Gbps FC HBA for providing FC connectivity
12	OS Support	Latest version of Microsoft Windows Server / Linux / Unix and Anti Virus
13	Power Supply	Platinum rated redundant Power Supply
14	SD Modules slots	Dual SD Module slots supporting redundant configuration
15	Management integration	Support for integration with Microsoft System Center, VMware vCenter etc.
16	Power & temperature	Real-time power meter, graphing, thresholds, alerts & capping with historical power counters. Temperature monitoring & graphing
17	Pre-failure alert	Should provide predictive failure monitoring & proactive alerts of actual or impending component failure for memory, CPU, HDD etc.
18	Configuration & management	<ul style="list-style-type: none"> • Real-time out-of-band hardware performance monitoring & alerting • Agent-free monitoring, driver updates & configuration, power monitoring & capping, RAID management, external storage management, monitoring of FC, HBA & CNA & system health • Out-of-band hardware & firmware inventory • Zero-touch auto configuration to auto deploy a baseline server configuration profile • Automated hardware configuration and Operating System deployment to multiple servers • Zero-touch repository manager and self-updating firmware system • Virtual IO management / stateless computing • Support for Redfish API for simple and secure management of scalable platform hardware

19	LCD/LED panel	Should display system ID, status information and system error code followed by descriptive text. LCD/LED background should light up in different colours during normal system operation & error conditions.
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7. Storage

S. No.	Parameter	Minimum Requirements
1	Converge/ Unified Storage	Storage solution with NSPoF (No single point of failure) Architecture. The Storage solution shall support NAS or SAN as an integrated offering with high availability at each level. The architecture shall allow upgrades of hardware and software for investment protection.
2	Protocols	Solution shall be configured with required protocols for the solution CIFS/SMB 3/ NFS 4/ISCSI/FCoE/FC. All required protocols required for the solution to be enabled.
3	Controllers	System to have minimum Two controllers with NSPoF Architecture (NO single point of failure architecture). Storage shall support non-disruptive online firmware upgrade for both Controllers and disk drives.
4	Operating System	The storage array should support Operating System Platforms & Clustering including: Linux/Windows
5	Cache Memory	Cache Memory: Each controller/node should be provided with minimum 64 GB RAM h usable protected data cache for disk IO Operations. If NAS controllers with separate controllers additional RAM cache to be provided. The storage array shall have complete cache protection mechanism either by de-staging data to disk/flash or protecting with NVRAM.
6	Host	The storage system shall be capable of providing host connectivity as per solution offered (Unified/SAN/NAS/Scale out NAS).
7	Connectivity	Minimum 2 ports per controller to be provided for host connectivity.
8	RAID Supports	RAID levels Supported: 0, 1, 5, 6, 10 or equivalent
9	Redundancy	Fans and power supplies: Dual redundant, hot-swappable.
10	Disk Drive Support	Storage subsystem shall support 8TB/10TB dual ported or higher NL-SAS/SAS/equivalent 7.2K drives in the same device array.



11	Global Spare	Hot	System shall have the capability to designate global hot spares that can automatically be used to replace a failed drive. Storage system shall be configured with required Global Hot-spares for every thirty drives for the different type and no. of disks configured.
12	Capacity		The capacity should be configured to meet the performance requirement of solution.
13	Snapshots		Shall be able to take "snapshots" of the stored data. Offered Storage shall have support to make the snapshot in scheduled or auto snaps. Snapshot shall support block or file as applicable for solution.
14	Replication		The storage array shall have the capability to do remote replication using IP technology.
15	Software Licenses		All necessary software required for the solution needs to be provided.
16	Monitoring		Shall support the functionality of proactive monitoring of Disk drive and Storage system for all possible hard or soft failure.

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POWER BACKUP FOR DEPOT

1. UPS 30+30 KVA for Control Room and 30 KVA for Field

Sr. No	Parameter	Minimum Requirement Description
1	Capacity	30 KVA
2	Technology	True ON-LINE (Double Conversion) with IGBT based inverter and PWM Technology
3	Connector	RS 232 port for software interface
4	Electrical Input	3 phase 4 wire and ground
		Voltage Range - 330 V - 480V
		Frequency Range - 47 to 53 Hz
		Efficiency AC to AC: > 85% (AC to AC)
		220V AC / 230V AC / 240V AC (Selectable)
		Frequency: 50 Hz + / - 0.1% (free running)
		Voltage Regulation: + / - 1% (or better)
		Overload Capacity: 125% for 1 sec, 110% for 10 secs
	Waveform: Pure Sine wave	
5	Protection	Electronic Overload Sensing, and circuit breaker protection Over heating, short circuit, low battery, input over / under voltage
6	Galvanic Isolation	Through Inbuilt Transformer
7	Battery Type	Sealed Maintenance Free Battery, Mains & Battery with necessary indicators, alarms and protection with proper battery rack
8	Backup Time	Minimum 120 minutes backup on full load
9	DC Voltage	MIN : 240 V DC
		Adjusted to about 10% of battery capacity for fast charging.
10	Charging Features	1. Boost / trickle charging facility
		2. Uncontrolled rectifier with high efficiency and reliability.
		3. Low battery protection to avoid deep discharging of batteries.
		4. Self test diagnostic feature
11	Other Features	UPS Bypass Automatic
		Monitoring panel with LCD display to provide following information:-
		1. Input / output voltage
		2. Input / output frequency



		3. Load current
		4. Charging current
		LED display for:- UPS on, battery operation, bypass, battery charge level, etc. Alarms for :- Mains failure, low battery, overload etc.
12	Environmental	Temperature 0-45°C
		Humidity 0 – 95% RH non-condensing
		Audible noise < 50 dB (A) at 1 meter distance
13	Certification	CE & RoHS Certification with make & model number mentioned on it
		ISO 9001:2000 and ISO 14001 certified.
14	Compliance	Dimension Light Weight / Smaller Footprint

2. Diesel Generator Set

Sr. No.	Item	Minimum Requirement Description
1	General	(KVA as per Depot requirement) at 1500 RPM, four stroke, electric start, six cylinder engine conforming to BS: 5514 Or ISO 3046 with capacity of 10% over loading for one hour in twelve hours operation
2	Air Intake System	Air intake manifold. Dry type air cleaner
3	Exhaust System	Turbocharger. Companion flanges for silencer & bellow. Residential silencer.
4	Coolant System	Engine water pump. Radiator. Coolant additive concentrate
5	Lubricating System	Oil pan. Engine mounted lube oil pump Full flow spin-on lube oil filter.
6	Fuel System	In line fuel pump with Mechanical Governor. Spin-on fuel filter
7	Starting system	12V DC electric starter. 12V DC battery charging alternator
8	Power start Control	Yes

	Microprocessor based	
9	LED including lamps	The control includes LED lamp indication for the following functions Genset Running Remote Start Shutdown Warning Manual, Auto and Stop
10	Data Logs	Includes Engine run time and controller on time
11	Alternator Data	Yes
12	Engine Data	Yes
13	Control	Engine Metering, Alternator metering, Battle switch function, Delay Start /Stop, Configurable Cranking cycle, Sleep mode time
14	Protection	Low lube oil pressure warning Or shutdown High engine temperature warning Or shutdown Low coolant temperature warning Sensor failure indication Low and High battery voltage warning Weak battery warning Fail to start shutdown Cranking lockout High Or Low AC voltage shutdown Under Or Over Frequency shutdown Loss of sensing voltage shutdown.
15	Alternator	Synchronous alternator, single bearing, suitable for continuous operation at 1500 RPM generating 415 volts at 0.8 p.f (lag), 50 Hz, 3 phase, 4 wire system. The alternator shall be Brushless type, self-excited & self-regulated through an AVR. The alternator will be suitable for tropical climate The salient features of the alternator are: + 1.5% voltage regulation (max) in static conditions. IP: 23 protection with insulation. Permanent lubricating bearing. Permissible overload of 10% for one hour in 12 hours of operation
16	Control Panel	The standard Control Panel is alternator mounted & fabricated from 14 Or 16 SWG sheet and Powder Coated after seven tank treatment process. The panel is equipped with:- 200A TP MCCB 10KA (Fixed O /C, & S/C) Thermal Magnetic Release With Spreader Link PS-500 (DG Auto start Or stop, Alt. Mtg., Protection and Engine Protection) Relay Module with 2 relay, 12V DC
17	Base Frame	Engine and alternator are mounted, coupled and aligned on a common channel iron fabricated Base Frame with pre-drilled holes CE & RoHS Certification with make & model number mentioned on it
13	Certification	ISO 9001:2000 and ISO 14001 certified.



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