Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
1	SECTION 7 – OPTICAL ADD-DROP MULTIPLEX ER TECHNICAL SPECIFICAT IONS Page 7- 202	The height of equipment shall not be higher than 5U to ensure the flexibility of equipment configuration.	The height of equipment shall ensure the **flexibility of equipment** configuration.
2	OPTICAL ADD-DROP MULTIPLEX ER Page 7- 201 TO 7-211 & 8-17 TO 8-22		Please refer to Appendix-1 (Specification) & 2 (GTP) for Telecom Equipment within Tender Amendment 02.
3	SECTION 7 – 48 VDC MAINTENAN CE FREE Li-Ion BATTERIES TECHNICAL SPECIFICAT IONS Page 7- 232	Number of Battery to be supplied at each site: 5 or more	Number of Ni-Cd Battery to be supplied at each site: **1 set.**
4	Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC- GTP Page 8- 20	**POWER SUPPLY** 60 - rated voltage: V DC Section 6.1 & 7 61 - voltage range: % 90V to 264V 62 - positive pole earthed: - Yes 63 - maximal power consumption (main rack fully equipped): W 2400	61 - voltage range: V 90V to 264V shall be modified as **"61-Voltage range-To be mentioned"**

Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
5	Volume 1 Section 4 Clause GCC 40.4 Page 4-112	Operational Acceptance Certificate (OAC) / PAC of Plant and Facilities are allowed on the basis of successful completion of commissioning and Guarantee Test of the total system. The work shall not be considered as intended completion until a PAC has been issued for the work, signed and dated by the Acceptance Committee constituted by the Head of the Procuring Entity (HOPE) and the Engineer and delivered to the Contractor with a copy to the HOPE. The PAC will be issued (by the Project Director) only after commissioning of complete system has been carried out by a team of representatives of the Contractor, the Engineer and the members of the acceptance committee, and the work has been judged complete and in compliance with the Contract Documents. The test shall be performed as specified in the applicable Technical Requirements. Necessary testing equipment will be supplied by the Contractor.	Operational Acceptance Certificate (OAC) / PAC of Plant and Facilities are allowed on the basis of successful completion of commissioning and Guarantee Test of the **plants/substations within a operation and maintenance circle to the proposed control centres of the employer. However payment will be made once PAC is issued for complete (all the substations including control centres) system**. The work shall not be considered as intended completion until a PAC has been issued for the work, signed and dated by the Acceptance Committee constituted by the Head of the Procuring Entity (HOPE) and the Engineer and delivered to the Contractor with a copy to the HOPE. The PAC will be issued (by the Project Director) only after commissioning of complete system has been carried out by a team of representatives of the Contractor, the Engineer and the members of the acceptance committee, and the work has been judged complete and in compliance with the Contract Documents. The test shall be performed as specified in the applicable Technical Requirements. Necessary testing equipment will be supplied by the Contractor.
6	Vol-1 Section-2 clause ITT 27.4 Page 2-45	Name of the foreign currency: USD.	Name of the foreign currency: USD**/Euro**
7	Vol-2 Section -7 Page 7-277	All the protective relays shall be supplied from any of following manufacturers: - a) ABB (Switzerland/Sweden/Finland). b) Siemens (Germany). c) ALSTOM (UK/France) d) Schneider Electric (UK/France) e) SEL, USA f) Honeywell, USA	e) SEL, USA f) Honeywell, USA **g) GE, USA**
8	Vol-2, Section-8, GTP-ODF, Line-9,10	In GTP-Adaptation, Transducer accuracy class is mentioned as 0.2.	In GTP-Adaptation, Transducer accuracy class is mentioned as **0.5.**
9	CCTV Vol-2, Section-7 Page 7-280 to 7-284 & Section-8 Page 8-55 to 8-63,		For all CCTV related amendment, please refer to Appendix-1 (Specification) & 2 (GTP) within Tender Amendment 02
10	Vol-2, Section-7, CONTROL CENTRE ANCILLARY SYSTEMS TECHNICAL SPECIFICATIONS, Clause-3 7- 262	3.1 AIR-CONDITIONING The works comprise a complete and fully functional ventilation and air conditioning system including design, installations, commissioning and documentation for the SCADA control centre premises. The country of origin shall be either USA, Europe, Japan or South Korea.	The country of origin shall be either USA, Europe, Japan, South Korea **or Bangladesh.**

Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
11	Vol-2, Section-8, GTP-Network Management Server Page 8-53 to 8-54	Guaranteed Technical Particulars for Network Management Server	Please refer to Appendix 2 for formatted NMS GTP of Tender Amendment 02.
12	Volume 1 Section-2 ITT 28.1 (b) Page 2-45	Period of time the Equipment are expected to be functioning (for the purpose of spare parts): 15 (Fifty) years from issuing date of FAC.	Period of time the Equipment are expected to be functioning (for the purpose of spare parts): 15 **(Fifteen)** years from issuing date of FAC.
13	Volume 1 Section-2 ITT 14.1 (b) Page 2 - 3	The minimum specific experience as a Contractor or Subcontractor or Management Contractor in relevant to the proposed Tender shall be at least 1 (One) contract of Installation & Commissioning of 33/11 kV or higher voltage level GIS/AIS Substation with SAS, Successfully completed…….	The minimum specific experience as a Contractor or Subcontractor or Management Contractor in relevant to the proposed Tender shall be at least 1 (One) contract of **Design, Supply, Construction,** Installation & Commissioning of 33/11 kV or higher voltage level GIS/AIS Substation with SAS, Sucessfully completed…….
14	Volume 1 Section-2 ITT 24.2 ® Page 2 - 7	The Tenderer/Manufacturer shall have at least one contract successfully completed within the last 10 (ten) years (years counting backward from the date of IFT) of installation of SCADA system at 33/11 kV or higher voltage level GIS/AIS Substation on turnkey basis with a value of at least USD 1,600,000.00 (One Million Six Hundred Thousand) or BDT 16 (Sixteen) crore ……	The Tenderer/Manufacturer shall have at least one contract successfully completed within the last 10 (ten) years (years counting backward from the date of IFT) of **Design, Supply,** installation of SCADA system at 33/11 kV or higher voltage level GIS/AIS Substation on turnkey basis with a value of at least USD 1,600,000.00 (One Million Six Hundred Thousand) or BDT 16 (Sixteen) crore ……

Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
15	Volume 1 Section -5 (A) Terms of Payment Schedule No. 1 - Plant and Mandatory Spare Parts Supplied from Abroad Page 4- 13	i) Advance Payment: N/A ii) On Shipment: Twenty Percent (20%) of the total..... iii) On Acceptance of PLI Report: Thirty Percent (30%) of the total..... iv) On Operational Acceptance Certificate/PAC: Forty percent (40%) of the total or pro rata CIP amount upon issuance of the Operational Acceptance Certificate (OAC) and a claim bill duly verified by Project Office certified by Engineer and approved by the Project Director. v) On Final Acceptance Certificate (FAC): Ten percent (10%) of the total	**i) Advance Payment: N/A** ii) On Shipment: **Sixty Percent (60%)** of the total..... iii) On Acceptance of PLI Report: **Ten Percent (10%)** of the total..... iv) **On Operational Acceptance Certificate/PAC: Twenty percent (20%)** of the **total CIP** amount upon issuance of the Operational Acceptance Certificate (OAC) **of the total system** and a claim bill duly verified by Project Office certified by Engineer and approved by the Project Director. v) **On Final Acceptance Certificate (FAC): Ten percent (10%)** of the total .....
16	Volume 1 Section -5 (A) Terms of Payment Schedule No. 2 - Plant and Mandatory Spare Parts Supplied from within the Employer's Country Page 4- 13	i) Advance Payment: N/A ii) On Delivery and PLI Report: Fifty percent (50%) of the total ..... Iii) On Operational Acceptance Certificate /PAC: Forty percent (40%) of the total or pro rata CIP amount upon issuance of the Operational Acceptance Certificate (OAC) and a claim bill duly verified by Project Office certified by Engineer and approved by the Project Director. iv) On Final Acceptance Certificate (FAC): Ten percent (10%) of the total	i) Advance Payment: N/A ii) On Delivery and PLI Report: **Seventy percent (70%)** of the total ..... Iii) On Operational Acceptance Certificate /PAC: **Twenty percent (20%)** of the **total CIP amount** upon issuance of the Operational Acceptance Certificate (OAC) **of the total system** and a claim bill duly verified by Project Office certified by Engineer and approved by the Project Director.iv) On Final Acceptance Certificate (FAC): Ten percent (10%) of the total .....
17	Volume 2 Section-2 Page 8-3 and Page 8 - 7	Manufacturer's Name Country of Origin EU/UK/USA	Manufacturer's Name Country of Origin EU/UK/USA**/OECD countries**
19	Vol-1, Section-5 Price Schedule Page 5 - 31	1C802. Optical Unit 1C803. Ethernet Interface Unit	1C802. Optical **Module** 1C803. Ethernet Interface **Module**
20	Vol-1, Section-2, Clause ITT 24.2 (r) Page 2-42		Please refer to Appendix 4 for Warranty Certifcate format within Tender Amendment 02

Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
21	Volume 1 Section-5 Price Schedule Page 5 - 31	Schedule no: 1 - Plant and Mandatory Spare Parts Supplied from Abroad 1C - Telecommunication and Ancillary System	Please refer to Appendix 5 for O&M toolset with Multimeter within Tender Amendment 02.
22	Volume 2 Section 8 Page 8 - 46	Firewall	Please refer to Appendix 2 for Firewall GTP within Tender Amendment 02
23	Vol-1, Section-5 Price Schedule Page 5 - 26		Please refer to Appendix 2 for Substation UPS GTP within Tender Amendment 02
24	Volume 2 Section-7 Page 7-128 4.4.5 Alarm Handling	Alarm Logging The alarming subsystem shall utilize continuous paper printers where alarms are printed as they are generated.	Alarm Logging The alarming subsystem shall **provide provision for** continuous paper printers where alarms are printed as they are generated.
25	Schedules of Rates and Price	Bidder requests NESCO to share the editable excel copy of the Schedule of Rates and Price	Please refer to Appendix 6 editable excel copy of the price schedule within Tender Amendment 02
26	Volume 2 Section-4 GCC 22.3, Page 4-108	The Contractor agrees to supply spare parts for a period of [insert years] Addition to PCC22.3	The Contractor agrees to supply spare parts for a period of **minimum 15 years** Addition to PCC22.3
27	VOLUME 2 Section 6.1 - Scope of Supply Page 6.1- 19	Further Cyber Security of this system shall be built in with the system. The objective of cyber security is to protect information and physical assets from damages caused by theft , corruption or natural disasters while allowing the information and assets to remain accessible and productive to employer. All potential causes of cyber attacks need to be considered when employing a defense in depth approach.	All potential causes of cyber attacks need to be considered when employing a defense in depth approach. **The proposed Solution shall comply to the following standards as minimum:** **1. IEC 62443-3-3:2013 Product Capability Assessment** **2. IEC 62443-4-1:2018 Process Capability Assessment.** **3. IEC 62443-2-4:2015 +A1:2017- Industrial Cyber Security Capability - Process Capability Assessment**

Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
28	Volume-2, Section 6.1 Page 6.1- 41 & 42	At each substation, one (1) modem will be installed for data communication to the control center in case of fiber optic network failure	Please refer to Appendix 2 for Modem GTP within Tender Amendment 02.
29	Volume-1, Section 1 Page 2- 43	Note: Major Equipment means SCADA, Remote Terminal Units, Gateway Server, Substation Automation System, Optical Add-drop Multiplexers, UPS, ADSS, Relays, Battery and Battery Charger, Camera (Thermographic Camera & CCTV)	Note: Major Equipment means SCADA, Remote Terminal Units, Gateway, Server, Substation Automation System, Optical Add-drop Multiplexers, UPS, ADSS, Relays, Battery and Battery Charger.
30	Volume-2, Section 6.1 Page 6.1- 19	All software components shall be sized and include necessary licenses for full system implementation by 2041. Complete descriptions of the required SCADA functionality is defined in Section 7-SDSI_NPLC-SCADA. SCADA software country of origin and country of manufacturer shall be UK/USA/European Union.	All software components shall be sized and include necessary licenses for full system implementation by 2041. Complete descriptions of the required SCADA functionality is defined in Section 7-SDSI_NPLC-SCADA. SCADA software country of origin and country of manufacturer shall be UK/USA/European Union**/OECD Countries. Performance certificate of the proposed SCADA software shall be provided which have been installed in an utility outside manufacturing country and performing satisfactorily for minimum five (5) years.**
31	Volume-2, Section 6.1 Page 6.1- 25	The RTUs shall be designed in accordance with applicable International Electro- Technical Commission (IEC), Institute of Electrical and Electronics Engineer (IEEE) standards, unless otherwise specified in this Technical specification. In all cases, the provisions of the latest edition or revision of the applicable standards in effect shall apply. RTU country of origin and country of manufacturer shall be UK/USA/European Union	The RTUs shall be designed in accordance with applicable International Electro- Technical Commission (IEC), Institute of Electrical and Electronics Engineer (IEEE) standards, unless otherwise specified in this Technical specification. In all cases, the provisions of the latest edition or revision of the applicable standards in effect shall apply. RTU country of origin and country of manufacturer shall be UK/USA/European Union**/OECD Countries. Performance certificate of the proposed RTU shall be provided which have been installed in an utility outside manufacturing country and performing satisfactorily for minimum five (5) years.**

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
32	Volume-1, Section 4 Page 4- 110	Further Contractor shall arrange visit to demonstrate the functionality their proposed system installed in any of the utility company for additional two (2) groups each with Five (5) Engineers in Asia Pacific/EU/UK/USA.	Further Contractor shall arrange visit to demonstrate the functionality their proposed system installed in any of the utility company for additional two (2) groups each with Five (5) Engineers in **EU/UK/USA.**
34	Volume-1, Section 2 Clause ITT 24.2 (r) Page 2- 44		Add after 22 23. (a). The qualified tenderer has to demonstrate the operations, functions of the proposed CCTV system with thermographic and fire detection feature/capability on a substation selected by the Employer to confirm compliance of the tender requirements.Demonstration shall be made within 10 days after such request is made in writing. (b) If the tenderer fails to perform required demonstration within stipulated time of the sample CCTV system or whose demonstration if considered unsatisfactory as per technical specification and requirements, shall be considered technically non-responsive and as such their tender will be rejected and shall not be considered for any further evaluation.

Tender Amendment-02

Project Name: Design, Supply, Installation, Integration, Testing & Commissioning for Implementation of Smart Distribution System in NESCO Area on Turnkey Basis.

Tender Reference No: 27.29.0000.107.07.001.22-84 Issue Date: 17/10/2022

Document No.: 27.29.0000.107.07.001.22-107 Issue Date: 20/12/2022

Sl No	References (Section/Clause/Page No)	Current Paragraph/Bidders Request	Amended As
35	48 VDC Section 7 Page 7-230 to 7-235 & Section 8 Page 8-31 to 8-32		For all 48VDC amendment, please refer to Appendix-1 (Specification) & 2 (GTP) within Tender Amendment 02
36	Volume-1, Section 5 Price Schedule "Line Item No: C701 Page 5- 31 & 39	Line Item No: C701 Description of Item: Supply of 2* PTZ Camera + 2*Dome Camera CCTV system with Thermo graphic option and Fire Detection capability and associated accessories Unit: Set Quantity: 88	Line Item No: C701 Description of Item: Supply **of CCTV system** with Thermo graphic option and Fire Detection capability and associated accessories Unit: **Lot** Quantity: **1** For lot details breakdown please refer to Appendix-3 within Tender Amendment 02.

Note:

1. In case any item of the tender amendments-02 contradicts with other item of the tender documents, then that aprticular item of tender amendment-02 shall prevail.
2. All other terms and condition of the tender documents remain unchanged.

Appendix-1

SECTION 7 – OPTICAL ADD-DROP MULTIPLEXER TECHNICAL SPECIFICATIONS

Table of Contents

1 Technical Requirement 2
1.1 Product Description 2
1.2 Mechanical Characteristics 2
2 Technical Characteristics 2
2.1 Terminal and Subrack 2
2.2 Aggregate Interface 3
2.2.1 Optical STM-4 aggregate interface 4
2.2.2 Optical STM-16 interface 4
2.3 User Interfaces 4
2.3.1 Electrical E1 interface 5
2.3.2 Electrical Ethernet interface 5
2.3.3 Tele protection interface 5
2.3.4 G.703 interface 6
2.3.5 Electrical V.35 interface 6
2.3.6 Electrical V.24/V.28 interface 6
2.4 Alarms and Indications 7
3 Network Management System (NMS) 7
4 Testing 9
4.1 Type Tests 9
4.2 Production (Routine) Tests 9
4.3 Factory Acceptance Tests 9
4.4 Pre-commissioning 9
4.5 Commissioning 10

1 TECHNICAL REQUIREMENT

1.1 PRODUCT DESCRIPTION

The offered equipment shall be designed, and field proven, to operate in similar climatic and power utility environments that are prevailing in this project. In addition to the requirements specified in this document, the offered equipment shall strictly fulfil, where applicable, the requirements specified in the general technical requirements unless otherwise stated in this document:

- Common Specifications — Section 7 SDSI_NPLC-CS
- General Technical Requirements — Section 7 SDSI_NPLC-TS-General
- Documentation Requirements — Section 7 SDSI_NPLC-DR
- Testing Specifications — Section 7 SDSI_NPLC-TS&R

The supply shall include all required material for installation and operation to full satisfaction of the Employer. The bidder shall fill the guaranteed technical characteristics of the proposed equipment in the schedules in specification Section 7 SDSI_NPLC-SCADA

QUALITY STANDARD.

The equipment shall be designed and manufacturing in accordance with the following quality management systems:

- ISO 9001
- ISO 14001.

1.2 MECHANICAL CHARACTERISTICS

The offered equipment shall be mounted together with other offered equipment in freestanding cubicle which supports to be equipped with 19” rack or 21” rack. The height of equipment shall ensure the flexibility of equipment configuration. The final position shall be shown in the design documentation. Easy access to all connectors shall be ensured. The cubicle protection class and requirements shall follow the common requirements.

2 TECHNICAL CHARACTERISTICS

2.1 TERMINAL AND SUBRACK

The proposed equipment shall be modular of design and allow a wide variety of user configurations, and can support multiple services such as SDH/Packet/OTN in single platform with a unified cross-connection ability. The proposed equipment shall be modular in design. It shall have provision to change the technology to MPLS-TP by only replacing modules/cards etc. without replacing the entire telecom equipment. The proposed equipment shall be designed and delivered with the functions as follows:

General Requirement:

- Device Minimum Capacity with unified cross-connection:
  - Packet Capacity: 100 Gbit/s

  - Switching Capacity: 100 Gbit/s (High-order Capacity) & 2.5 Gbit/s (Low-order Capacity)
- Support 10G line card, and can upgrade to support 100G line card in future
- Maximum rate per channel: STM-64
- External 2.048 Mbit/s synchronization interface
- The proposed system shall be supported for future evolution
- Equipment shall support Transponder/Muxponder
- Support ASON for future network protection evolution
- Support hitless protection switching which can provide multiple times (≥2) fiber break protection for teleprotection service, when switching is performed, the service will not be interrupted or bit errors are made.
- All the proposed equipment should follow power grid standard IEC61850-3, vendor should provide certification for IEC61850-3
- ADM must support IP packet routing.
- ADM must support IP packet ring formation.

Protection Requirement:

- Support client 1+1 protection, intra-board 1+1 protection
- Support Tunnel APS protection
- Support MSP 1+1 path protection (Linear & Ring), TPS Protection
- Support Hitless Protection Switching
- Full remote configuration from remote NMS-system with automatic recognition of network elements
- Input voltage DC and AC power supply

2.2 AGGREGATE INTERFACE

2.2.1 The following refer to minimum aggregation interface unit requirement shall be configured by the proposed equipment

- 4* STM-16 interface
- 8*STM-4 interface
- 4*GE (RJ45) interface
- 8*FE interface
- 8*E1 (Electrical) interface
- 8*E1 (Optical) interface

The proposed equipment family shall have various optical transmitters operating at 1310 nm and 1550 nm for short haul and long haul communication links. The long haul communication shall support > 120 km distances.
The output power of the transmitters shall be configurable for optimal received power.

2.2.2 The following refer to future evolution aggregation interface unit requirement shall be supported by the proposed equipment

- Optical STM-64
- Optical STM-1
- 10/100GE

- V.35
- V.24/V.28;
- C37.94

2.2.1 Optical STM-4 aggregate interface

The following requirements shall be met for the optical STM-4 aggregate interface unit:

- Minimum number of STM-4 interfaces: ≥ 4
- Bit rate: ITU-T G.707
- Frame structure: ITU-T G.707
- Chromatic dispersion tolerance: ≥ 18 ps/nm x km
- Nominal operation wavelength: 1310 and 1550 nm
- Transmission mode: Single Mode
- Extinction ratio value: ≥ 10
- Maximum target distance: ≥ 120 km
- Optical connector: SC, FC or LC

2.2.2 Optical STM-16 interface

The following requirements shall be met for the optical STM-16 interface unit:

- Minimum number of STM-16 interfaces:≥ 4
- Bit rate: ITU-T G.707
- Frame structure: ITU-T G.707
- Chromatic dispersion tolerance: ≥ 18 ps/nm x km
- Nominal operation wavelength: 1310 and 1550 nm
- Transmission mode: Single Mode
- Extinction ratio value: ≥ 10
- Maximum target distance: ≥ 120 km
- Optical connector: SC, FC or LC

2.3 USER INTERFACES

The following electrical/optical user interfaces shall be available for the proposed equipment:

- Optical STM-1 (155 Mbit/s)
- E1 (2.048 Mbit/s)
- Ethernet
- Tele Protection
- G.703
- V.35

- V.24/V.28

2.3.1 Electrical E1 interface

The following requirements shall be met for the electrical E1 interface unit:

- Minimum number of E1 interfaces/unit: ≥ 2
- Minimum number of channels of E1 Services ≥ 32
- Bit rate: ITU-T G.703
- Frequency tolerance: ± 50 ppm
- Coding: HDB3
- Frame structure: ITU-T G.703
- Number of bits/time slot 8
- Maximum jitter input/output ITU-T G.823
- Impedance 75 Ω and 120 Ω
- Protection TPS Protection, SDH SNCP, ASON

2.3.2 Electrical Ethernet interface

The following requirements shall be met for the electrical Ethernet interface unit:

- The following requirements shall be met for the electrical Ethernet interface unit:
- Minimum number of interfaces/units: ≥ 8
- Supported channel bit rate:
  - 10Base-T
  - 100Base-TX
- Frequency tolerance: ± 100 ppm
- Standard: IEEE 802.3u
- Cabling: UTP CAT 5 or higher
- Maximum jitter input/output ITU-T G.823

2.3.3 Tele protection interface

The following requirements shall be met for the teleprotection interface unit:

- Minimum number of interface units/rack: ≥ 2
- Commands:
  - Unit alarms:
  - Critical, Major, Minor
  - Loss of Synchronization
  - BER > 10E-6
  - Remote alarm
  - Error rate of guard signal too high

- Optically isolated command input: 33-60 VDC
- Command output open circuit voltage: 280 VDC
- Channel delay measurement: Yes
- Maximum transmission time without path propagation:
  - Blocking: 10 ms
  - Permissive: 10 ms
  - Direct tripping: 10 ms

2.3.4 G.703 interface

The following requirements shall be met for the electrical G.703 interface unit:

- Minimum number of interfaces/units: ≥ 2
- Bit rate: ITU-T G.703
- Timing: Co-directional and contra-directional
- Impedance: Balanced 120 Ω
- Nominal pulse amplitude: 1 V
- Jitter performance: ITU-T G.823
- Impedance 75 Ω and 120 Ω

2.3.5 Electrical V.35 interface

The following requirements shall be met for the electrical E1 interface unit:

- Minimum number of Channel 2
- Minimum number of interfaces/units: 1
- Bit rate: n x 64 kBit/s
- Standard: ITU-T V.35
- Impedance: 100 Ω
- Nominal pulse amplitude: 3 V ± 20%
- Jitter performance: ITU-T G.823

2.3.6 Electrical V.24/V.28 interface

The following requirements shall be met for the electrical E1 interface unit:

- Minimum number of Channel 2
- Minimum number of interfaces/units: 1
- Bit rate: 1.2 kBit/s to 19.2 kBit/s
- Compliance to standard: ITU-T V.24
- Data Bits: 7 and 8
- Parity: none, even, odd

2.4 ALARMS AND INDICATIONS

1.1 ALARMS AND INDICATIONS

The offered equipment shall be able to recognize fault situations by means of constant supervision. The alarms shall be visible locally on the terminal and remotely from the NMS. Additionally, programmable potential free alarm contacts shall be available and wired to the SCADA system and to the general alarm indication lamp located on the outside of the cubicle. The equipment shall be able to identify three alarm levels that are locally indicated with different color LED's on the control unit. The levels are

- Critical fault Red
- Major fault Orange
- Minor fault Yellow

Additionally the control unit shall indicate with a LED when the operation conditions are normal or any fault has been detected.

At a minimum the following alarms shall be detected by the equipment:

- Loss of synchronization
- Loss of received signal
- Low optical transmission level
- BER > 10E-6
- Local equipment/interface unit failure
- Wrong slot configuration
- Remote equipment alarm
- Power supply alarm

Each unit shall indicate with a LED when unit is powered and in operation.

3 NETWORK MANAGEMENT SYSTEM (NMS)

The NMS shall support:

1	Features of Network Management System	NMS should provide web-based client interface which enables anywhere management
		NMS must support E2E service configuration, monitoring and performance checking
		NMS must support user-friendly GUI and easy point & click operations
		NMS should provide Fault, Configuration, Performance & security features in their respective Window
		NMS shall provide management functionalities and web-based management.
		The NMS should have the capability of auto discovery of new NE
		Real time status and performance monitoring of network elements
2	Fundamental Requirement	Alarm monitoring and reporting in standard spreadsheet and word editor formats
		Automatic recognition of network elements
		Remote configuration of network elements
		Possibility to add manually other elements in the network

		Various levels of user views from network view to single network elements and units within the network elements
		End-to-end service latency detection and latency map visible
		Online optical fiber monitoring
		NMS access shall be provided to newly installed SDH systems which are connected to each other by fiber line for monitoring and supervision.
		1+1 NMS Backup
		NEs on the network shall have the test feature to detect connection errors.
		It shall generate appropriate alarms by monitoring the performance of the circuits.
		Alarms may be listed. Each alarm shall have a defined alarm type category.
		Graphic display shall be available and the alarm status shall be monitored via graphic display.
		The fault location on the network shall be detected.
		NMS shall provide end-to-end visualization of wavelength Paths
3	Visualization of Network Domain	NMS shall provide end-to-end display of optical power measurements
		End-to-end wavelength channel provisioning and automated wavelength channel restoration
		NMS shall provide visualization of OTDR report of fiber spans.
		Fault Management
4	Management Facilities of NMS	Configuration Management
		Inventory Management
		Alarm Management
		Performance Management
		NMS shall support service availability function
5	Network Assurance	NMS shall support service SLA visibility
		NMs shall support latency map on the services
6	Configuration License Requirement	NMS configuration shall consider all licenses for all network equipment/ NE

The NMS shall be installed on a separate industrial class server/personal computer equipped with monitors, printers and other peripherals as specified in the Scope of Supply.
Any required licenses shall cover the full network plus 100% expansion capacity.
Operating system, word editor, spread sheet and other reporting software shall be supported.
The bidder shall provide comprehensive data of the NMS in his bid.

4 TESTING

4.1 TYPE TESTS

The complete ADM shall be type tested according to the requirement set forth in the pertinent IEC standards.

The type tests need not to be repeated for the units in this delivery provided that type tests have previously been performed on similar units. The bidder shall include evidence of successfully performed type tests in his bid. Copies of the type test reports shall be included in the FAT report.

4.2 PRODUCTION (ROUTINE) TESTS

The manufacturer shall perform all relevant production tests in accordance with relevant IEC standards and his QA-program.

The Employer's shall be allowed to perform a stage inspection at any time before final shipment.

4.3 FACTORY ACCEPTANCE TESTS

The Factory Acceptance Tests shall at minimum include the following tests and inspections:

- Verification of type test results and certificates
- Inspection of production test result
- Calibration verification on test equipment
- Verification of marking to the design documentation
- Electrical characteristics
    - Input voltage tolerance
    - Single/redundant operation
- Optical levels and sensitivity
- Interface measurements (such as speed, BER etc. as relevant)
- Alarms
- Inventory
- Shipment details

At least 50% of the network shall be powered, connected and active during the FAT to provide sufficient evidence of proper functionality, such as routing etc. Substation automation systems, RTU's and SCADA (system/simulator) shall be used for demonstrating the SCADA support.

4.4 PRE-COMMISSIONING

The Contractor shall ensure the quality of the material and installations before requesting Commissioning tests to start (pre-commissioning). Proper test and

verification records from the pre-commissioning shall be available during commissioning.

4.5 COMMISSIONING

After successful pre-commissioning witnessed commissioning tests shall be performed.

The commissioning tests shall at minimum include:

- Inspection of installation records and “red-pen” documents
- Inspection of pre-commissioning records
- Calibration verification on test equipment
- Electrical characteristics
- Alarms
- Optical characteristics
- System characteristics and functionality

SECTION 7–48 VDC MAINTENANCE FREE NiCd BATTERIES TECHNICAL SPECIFICATIONS

Table of Contents

1 General 12
1.1 Product Description 12
1.2 Quality Standard 12
2 Construction 12
3 Electrolyte 12
4 Technical Requirements 12
4.1 Basic Requirements 12
4.2 Cells 13
4.3 Blocks 13
4.4 Battery 13
5 Characteristics 13
6 Fuse Boxes 13
7 Installation 14
8 Battery Arrangements 14
9 Delivery and Commissioning Charging 14
10 Accessories 15
11 Tests 15
11.1 Type Tests 15
11.2 Routine Tests 15

1 GENERAL

1.1 PRODUCT DESCRIPTION

The 48 V DC auxiliary power supply system shall consist of a redundant constant voltage battery charger, a fully maintenance free NiCd battery bank as well as of DC distribution board facilities.

The delivery includes a complete power supply system readily assembled, equipped, wired and tested at the manufacturer's workshop. All internal and external cables are included in the delivery. In addition to the requirements specified in this document, the offered equipment shall strictly fulfil, where applicable, the requirements specified in the general technical requirements unless otherwise stated in this document:

- Common Specifications SDSI_NPLC-CS
- General Technical Requirements SDSI_NPLC-TS
- Documentation Requirements SDSI_NPLC-DR
- Testing Specifications SDSI_NPLC-TS&RT

1.2 QUALITY STANDARD

The equipment shall be designed and manufacturing in accordance with the following quality management systems:

- ISO 9001
- ISO 14001.

2 CONSTRUCTION

The cell or cell block containers shall be manufactured from proven materials of ample strength, and shall feature bolted low resistance electrical connections and proven flame arresting vent arrangement to allow the free exit of gasses. Moreover, they shall be of transparent material to enable clear perception of electrolyte level.

3 ELECTROLYTE

The electrolyte for the batteries shall meet the requirement of IEC 60993 standard and shall be delivered to site un-mixed, i.e. potassium hydroxide and lithium hydroxide in a dry, powdered form and distilled water separately in non-returnable plastic jerry-cans. Distilled water shall be delivered in ample quantity to allow topping up after discharge tests and during Defects Liability period.

4 TECHNICAL REQUIREMENTS

4.1 BASIC REQUIREMENTS

1. Service: Indoor
2. Pollution degree: 3
3. Type of battery: type Vented nickel-cadmium pocket plate block battery for stationary use.
4. Application: control Substations and plants protection, and communications

5. Autonomy: 24 h

4.2 CELLS

6. Rated end voltage: 1.10 V/cell
7. Float charge voltage: 1.42 V/cell

4.3 BLOCKS

8. Number of cells within a block: max. 3

4.4 BATTERY

9. Nominal voltage: 48 V
10. Type of earthing: Positive Pole, load side TT
11. Number of cells: 37
12. Rated Capacity (C_5): To be defined by the Contractor
13. End voltage of discharged battery: 43.2 V
14. Standard specifications: IEC 60623 (for cells)
    IEC 60993 (for electrolyte)

5 CHARACTERISTICS

The battery capacity shall be defined by relevant calculations, based on 24 h discharge time, i.e. the battery shall supply the full design load of the associated system for a period of 24 hours and under worst circumstances before reaching the specified overall end voltage for the discharged battery.

The Contractor shall define the battery capacities based on the criteria and safety factors below:

- prospective load — under the worst circumstances and including emergency lighting as defined by the Contractor by relevant load calculations
- foreseen future extensions — as defined by the Contractor by relevant load calculations
- unforeseen future extensions — safety factor of 1.2
- ambient conditions — safety factor of 1.1
- incomplete charge — safety factor of 1.2
- inefficient discharge — safety factor of 1.1
- ageing — safety factor of 1.1

Where more than one battery has been specified for a supply system, each of the batteries shall alone be capable of supplying the full associated system load.

The Bidder shall state the expected life time of the batteries within his Bid.

6 FUSE BOXES

Each battery bank shall be supplied with a battery fuse box or insulated and alkali resistant material, installed in the connections between the battery and the

charger and located adjacent -as close as physically possible- to the battery bank.

The fuse box shall be double pole for floating polarities batteries and single pole for batteries with earthed polarity. All cabling between the battery and the charger shall, however, run through the terminals provided in the fuse box.

The fuse box shall house the HRC or equivalent type battery fuses and fuse bases equipped with an alarm contact. Alternatively, the alarm annunciation may be realized by a low-rated miniature circuit breaker of sufficient short circuit performance.

The rating of the above fuses shall be such that they will discriminate clearly with the largest DC fuses, miniature circuit-breakers, or compact miniature circuit breakers used in the distribution circuits.

7 INSTALLATION

The cells or cell blocks shall be mounted on prefabricated stands and shall be arranged in the most space saving and efficient manner, however, allowing unhindered access to all cells or cell blocks for maintenance purpose (visual inspection, cleaning, checks on tightness of connections, adding water) as well as providing facilities for bridging and removal/replacement of any single cell or cell block without disturbing the others.

Insulating covers shall be provided to shield cell poles and bridging strips from accidental contact: The cells or cell blocks themselves shall be installed on a layer of insulating material.

Where recommended by the manufacturer, a thin layer of mineral jelly shall be applied to all pole connections.

The cells or cell blocks shall be clearly numbered with printed cell number labels of alkali resistant material having reliable bonding to the cell or cell block container. The numbering shall be consecutive and ascending and shall start from number one (1). The numbering shall run from the most negative pole of the battery towards the most positive pole.

8 BATTERY ARRANGEMENTS

Connections between the battery and charger shall be color coded for polarity and arranged in such a way which eliminates the possibility of incorrect connection. The connections shall be of adequate capacity to cope with all conditions of charging and discharging including allowances for protective device operation under fault conditions.

The Contractor shall clearly state problems which may arise from the gas formation from cells either under normal or boost charging conditions as well as define the precautions which shall be taken by him to alleviate any such problem. Ventilation requirements shall be stated in the Bid and providing the necessary ventilation arrangements shall be included in the Contract.

9 DELIVERY AND COMMISSIONING CHARGING

The cells or cell blocks shall be delivered discharged and dry. They shall be filled with electrolyte and - subsequently - commissioning charged according to manufacturer's recommendations at site as soon as the erection and assembly works have been completed, however, not later than stated in the manufacturer's recommendations. A detailed method statement describing the filling and initial charging procedure shall be provided for the Employer's review before the works may commence.

Once the Contractor has satisfied himself that a battery is correctly charged he shall carry out a discharge test under controlled conditions to demonstrate compliance with the stated performance figures. All battery banks shall be tested in this way and the Contractor shall make provisions for any material / test equipment required to carry out the tests.

The Contractor shall co-ordinate the delivery of the batteries to the site so that they may be commissioning charged within minimum time after arrival at site.

10 ACCESSORIES

Each battery bank shall be provided with the following accessories as a minimum requirement. A tool box of alkali resistant material shall be provided for tolls, test equipment and small material. The instructions and record cards shall be on durable folder:

- cell testing voltmeter with suitably insulated probes 1 pc
- spare cell bridging connectors with bolts and washers (5 %) 1 set
- insulated tools for cell connections 1 set
- instruction card, maintenance program card and record cards1 set
- safety kit (glasses, gloves, eye washing bottle etc) 1 set

11 TESTS

11.1 TYPE TESTS

The cells or cell blocks shall be type tested according to the requirement set forth in the pertinent IEC standards.

The type tests do not need to be repeated for the units in this delivery provided that type tests have previously been performed on similar units. The bidder shall include evidence of successfully performed type tests in his bid. Copies of the type test reports shall be included in the FAT report of the chargers.

11.2 ROUTINE TESTS

The cells or cell blocks shall be type routine tested according requirement set forth in the pertinent IEC standards. These tests shall include - but not limit to - the following:

- visual inspection
- insulation test to earth
- discharge test for five (5) battery cells or cell blocks selected at random

SECTION 7 – CCTV TECHNICAL SPECIFICATIONS

Contents

1 Technical Requirement 17
1.1 Product Description 17
1.2 Quality Standard 17
1.3 Mechanical Characteristic 17
2 Technical Characteristic 17
2.1 Bi-spectrum Thermography Network Dome Camera 17
2.2 PTZ Camera (Thermal & Optical Bi-spectrum Network Speed Dome) 18
2.3 Bi-spectrum Thermography Network bullet Camera 20
2.4 Panoramic Fixed Turret Network Camera 21
2.5 GIS/AIS substation NVR 22
2.6 Gigabit Smart POE Switch (16 Port) 23
2.7 Central Video surveillance system 23
2.9 UTP cable, power cable/solution, Accessories (mounting pole, pvc pipe/channe etc.) 28

1 TECHNICAL REQUIREMENT

1.1 PRODUCT DESCRIPTION

The offered equipment shall be designed in similar climatic and power utility environments that are prevailing in this project. The offered equipment shall strictly fulfil, where applicable, the requirements specified in this document.

1.2 QUALITY STANDARD

The equipment shall be designed and manufacturing in accordance with following quality management systems:

- Open Network Video Interface Forum (ONVIF)
- Ethernet standards including 802.3ab, 802.3u, and 802.3z (IEEE 802.3)
- Certification of CE, CCC, GB/T 28181

1.3 MECHANICAL CHARACTERISTIC

The IP Rating (Water and dustproof level) of camera shall support at least IP66 and the IK Rating(impact protection rating) supports at least IK10.
For NVR and Center Video Cloud Node, the offered equipment shall be mounted together with other offered equipment in a freestanding cubicle that is equipped with a 19'' rack.

2 TECHNICAL CHARACTERISTIC

2.1 BI-SPECTRUM THERMOGRAPHY NETWORK DOME CAMERA

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- The camera shall use a at least 1/2.7" Progressive Scan CMOS with Optical Module
- The camera shall use vanadium oxide uncooled focal plane arrays with thermal Module
- The camera shall use Max. Resolution 256 × 192 with thermal Module
- The camera shall have Pixel Interval at least 12 μm with thermal Module
- The camera shall have Spectral Range at least 8 μm to 14 μm with thermal Module
- The camera shall use < 40 mK (@ 25°C,F# = 1.0) with thermal module
- The camera focal length shall support at least 4.3 mm.
- The camera shall use at least IFOV 3.33 mrad with thermal module
- The camera shall use Field of View at least 50.0° × 37.3° (H × V) with thermal module
- The camera shall provide the Min. Focusing Distance at least 0.5 m meters with thermal module and Digital Zoom ×2, ×4
- The camera shall provide minimum Image Resolution 2688 × 1520, 4 MP at optical module
- The camera shall provide Min. Illumination Color: 0.0089Lux at optical Module
- The camera shall support linear, histogram, self-adaptive thermal AGC mode, DDE, 3D DNR Image processing technology
- The camera shall display the details of optical channel on thermal channel and Display partial image of thermal channel on the full screen of optical channel

- The camera shall provide Target Coloration with white hot and black hot mode.
- The camera IR range shall be at least 15m and White Light Range 30m
- The camera shall offer various analytic functions: line crossing, intrusion, region entrance, and region exiting and Video content analysis-vehicle/human classification
- The camera shall offer video compression of MJPEG/H.264/H.265.
- The camera shall support dual streams.
- The camera WDR shall be at least 120 dB.
- The camera shall provide comprehensive security User authentication (ID and password), MAC address binding, HTTPS encryption, IEEE 802.1x access control, IP address filtering
- The camera shall have Visual White light alarm with adjustable flashing frequencies and three types of audible alarm (VCA and Temperature Exception)
- The camera shall have Smoking detection Algorithm
- The camera shall support 3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line) at temperature Range -20°C to 550°C (-4°F to 1022°F) and Temperature Accuracy Maximum ± 2°C, ± 2 %
- The camera shall be equipped with one RJ45 10M/100M adaptive Ethernet port and 1, RS-485 interface (half duplex)
- The camera shall have 1 Mic in/Line in audio interface and audio Linear level, impedance: 600 Ω output
- The camera shall support audio interface and Audio Compression should be G.722.1/G.711ulaw/G.711alaw/MP2L2/G.726/PCM
- The camera shall have at least Alarm 1-ch inputs and 1-ch Alarm
- The camera shall operate on 12 V DC and PoE (802.3af, class 3) power supply and Miximum power supply 6W
- The camera shall meet IP66 weather rating standards.
- The camera Lightning protection, surge protection, voltage transient protection maximum value is TVS 4000V

2.2 PTZ CAMERA (THERMAL & OPTICAL BI-SPECTRUM NETWORK SPEED DOME)

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- The camera shall use at least 1/2.8" Progressive Scan CMOS at Optical Module
- The camera shall use Vanadium Oxide Uncooled Focal Plane Arrays image sensor at Thermal Module
- The camera shall use Max. Resolution 256 × 192 (the resolution of output image is 1280 × 720) with thermal Module
- The camera shall have Pixel Interval at least 12 μm
- The camera shall have response waveband at least 8 μm to 14 μm
- The camera shall use NETD ≤ 35 mK (@25°C,F# = 1.0)

- The camera shall use at least Lens (Focal Length) 10mm with thermal module
- The camera shall use at least IFOV 1.20 mrad with thermal module
- The camera shall use Field of View at least 18° × 13.5° (H × V) with thermal module
- The camera shall provide the Min. Focusing Distance at least 1.2 meters with thermal module
- The camera shall provide minimum Image Resolution 2688 × 1520, 4 MP at optical module
- The camera shall provide Min. Illumination Color: 0.05 Lux at optical Module
- The camera focal length shall support Wide-angle prime lens: at least 4.8 to 153 mm, and 32x optical zoom
- The camera IR range shall support at least 100m.
- The camera shall display partial image of thermal channel on the full screen of optical channel
- The camera shall provide horizontal FOV 58.4° × 33.8° (H × V) to 2.14° × 1.2° (H × V) with optical Module
- The camera shall offer various analytic functions line crossing, intrusion, region entrance and exit and minimum 10 scenes and 8 VCA rules for each scene
- The camera shall provide Smart tracking: Panorama tracking, Event tracking and Multi-scene patrol tracking and Smart tracking linkage: thermal view and optical view
- The camera shall support 3 temperature measurement rule types, 273 presets as scene, 21 rules of each scene (10 points, 10 areas, and 1 line) at temperature Range -20°C to 550°C (-4°F to 1022°F) and Temperature Accuracy Maximum ± 2°C, ± 2 %
- The camera shall provide Dynamic fire point detection, up to 10 fire points detectable.
- The camera shall provide Temperature exception alarm for fire prevention
- The camera shall have PTZ movement Range at least Pan: 360° Continuous Rotate; Tilt: From -5° to + 90° (auto flip) with Pan Speed from 0.1°/s to 200°/s, Preset Speed: 240°/s and Tilt Speed From 0.1°/s to 105°/s, Preset Speed: 200°/s
- The camera shall have Proportional Zoom
- The camera shall have Presets at least 300 with 08 Patrol Scan and 04 Pattern Scan (10 Minutes Per Pattern)
- The camera shall support Power Off Memory
- The camera shall support Scheduled Task (Preset/Pattern Scan/Patrol Scan/Auto Scan/Tilt Scan/Random Scan/Frame Scan/Panorama Scan/Doom Reboot/Doom Adjust/Aux Output
- The camera shall offer Optical Defog
- The camera shall offer video compression of MJPEG/H.264/H.265.
- The camera shall support Dual streams.
- The camera WDR shall be at least 120dB.
- The camera shall provide comprehensive security control system, including User authentication (ID and password), MAC address binding, HTTPS encryption, IEEE 802.1x access control, IP address filtering

- The camera shall be equipped with one RJ45 10M/100M adaptive Ethernet ports and one RS-485 interface and one Reset Button and 1.0 V [p-p]/75 Ω, BNC for thermal channel for Analog Video Output
- The camera shall support audio interface and Audio Compression should be G .711u/G.711a/G.722.1/MP2L2/G.726/PCM
- The camera shall have MicroSD card slot that supports Micro SD/SDHC/SDXC card (up to 256G). The camera shall have built in 128 GB Surveillance grade Micro SD card
- The camera shall have at least Alarm 7-ch inputs and 2-ch relay Alarm outputs and Alarm Action shall be Preset, Patrol Scan, Pattern Scan, SD Card Record, Relay Output, Smart capture, FTP upload, Email linkage
- The camera shall operate on AC24V power supply and power consumption maximum 30W
- The camera shall meet IP66 weather rating standards or better.
- The camera Lightning protection, surge protection, voltage transient protection maximum value is TVS 6000V

2.3 BI-SPECTRUM THERMOGRAPHY NETWORK BULLET CAMERA

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- The camera shall use a at least 1/2.7" Progressive Scan CMOS with Optical Module
- The camera shall use vanadium oxide uncooled focal plane arrays with thermal Module
- The camera shall use Max. Resolution 256 × 192 with thermal Module
- The camera shall have Pixel Interval at least 12 μm with thermal Module
- The camera shall have Spectral Range at least 8 μm to 14 μm with thermal Module
- The camera shall use < 40 mK (@25° C,F# = 1.0) with thermal module
- The camera focal length shall support at least 3.6 mm.
- The camera shall use at least IFOV 3.33 mrad mrad with thermal module
- The camera shall use Field of View at least 50.0° × 37.3° (H × V) with thermal module
- The camera shall provide the Min. Focusing Distance at least 0.5 m meters with thermal module and Digital Zoom ×2, ×4
- The camera shall provide minimum Image Resolution 2688 × 1520, 4 MP at optical module
- The camera shall provide Min. Illumination Color: 0.0089Lux at optical Module
- The camera shall support linear, histogram, self-adaptive thermal AGC mode, DDE, 3D DNR Image processing technology
- The camera shall display the details of optical channel on thermal channel and Display partial image of thermal channel on the full screen of optical channel
- The camera shall provide Target Coloration with white hot and black hot mode.
- The camera IR range shall be at least 30m and White Light Range 30m

- The camera shall offer various analytic functions: line crossing, intrusion, region entrance, and region exiting and Video content analysis-vehicle/human classification
- The camera shall offer video compression of MJPEG/H.264/H.265.
- The camera shall support dual streams.
- The camera WDR shall be at least 120 dB.
- The camera shall provide comprehensive security User authentication (ID and password), MAC address binding, HTTPS encryption, IEEE 802.1x access control, IP address filtering
- The camera shall have Visual White light alarm with adjustable flashing frequencies and three types of audible alarm (VCA and Temperature Exception)
- The camera shall have Smoking detection Algorithm
- The camera shall support 3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line) at temperature Range -20°C to 550°C (-4°F to 1022°F) and Temperature Accuracy Maximum ± 2°C, ± 2 %
- The camera shall be equipped with one RJ45 10M/100M adaptive Ethernet port and 1, RS-485 interface (half duplex)
- The camera shall have 1 Mic in/Line in audio interface and audio Linear level, impedance: 600 Ω output
- The camera shall support audio interface and Audio Compression should be G.722.1/G.711ulaw/G.711alaw/MP2L2/G.726/PCM
- The camera shall have at least Alarm 2-ch inputs and 2-ch Alarm
- The camera shall operate on 12 V DC and PoE (802.3af, class 3) power supply and Miximum power supply 9W
- The camera shall meet IP67 weather rating standards.
- The camera Lightning protection, surge protection, voltage transient protection maximum value is TVS 4000V

2.4 PANORAMIC FIXED TURRET NETWORK CAMERA

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

−The camera shall use a at least 2 × 1/1.8" Progressive Scan CMOS
−The camera shall use Max. Resolution 5120 × 1440, 08 MP
−The camera shall have Min. Illumination Color: 0.0005 Lux @ (F1.0, AGC ON), 0 Lux with light with 24/7 colorful imaging
− The camera WDR shall be at least 130 dB.
− The camera shall have Active strobe light and audio alarm to warn intruders off andOne image that presents all the scenes covered by the camera
−The camera focal length shall support at least fixed focal lens, dual lens: 4 mm
−The camera shall use Field of View at least Horizontal FOV: 180° ± 10°Vertical FOV: 44 and Aperture F1.0

−The camera supplement White Light Range shall support at least 30m
−The camera shall suppprt dual Stream with Video Compression H.265+/H.265/H.264+/H.264
−The camera Video Bit Rate shall be 32 Kbps to 16 Mbps with CBR, VBR Bit Rate Control

- The camera shall provide Mono sound with G.711/G.722.1/G.726/MP2L2/PCM/MP3/ AAC-LC Audio Compression
- The camera shall provide NAS (NFS, SMB/CIFS), Auto Network Replenishment (ANR), NVR,Together with high-end Hikvision memory card, memory card encryption and health detection
- The camera shall have Image Parameters Switch with saturation, brightness, contrast, sharpness, gain, white balance, adjustable by client software or web browser
- The camera shall have BLC, HLC, 3D DNR
- The camera shall have MicroSD card slot that supports Micro SD/SDHC/SDXC card (up to 256G). The camera shall have built in 128 GB Surveillance grade Micro SD card
- The camera shall be equipped with one RJ45 10M/100M adaptive Ethernet ports
- The camera shall be equipped with Built-in Microphone and Built-in Speaker (1.2W)
- The camera shall have 1 Mic in/Line in audio interface and audio Linear level, impedance: 100 Ω output
- The camera shall have at least Alarm 1-ch inputs and 1-ch Alarm
- The camera shall offer various analytic functions: Motion detection (support alarm triggering by specified target types (human and vehicle)), alarm input and output, flashing alarm light output, audible alarm output,exception
- The camera shall offer various Smart analytic functions: Line crossing detection, intrusion detection, region entrance detection, region exiting detection (support alarm triggered by specified target types (human and vehicle)), scene change detection
- The camera shall operate on 12 VDC and PoE (802.3af, Class 3) power supply and Miximum power supply 11W
- The camera shall meet IP67 weather rating standards.
- The camera shall be UL, CE, FCC certified

2.5 GIS/AIS SUBSTATION NVR

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:
Three Set of network cameras are connected to each NVR. Each camera has 4 Mbit/s bit rate and is stored for 30 days. Enterprise-class hard disks to improve NVR reliability and stability. Each PV plant requires one NVR. Each NVR is configured with two 8 TB enterprise-level hard disks

- The NVR shall Integrates storage, compute, and search functions and supports comprehensive service functions such as access, storage, analysis, search, and alert.

- The NVR shall provide Intelligent analytics based on deep learning algorithm for Facial Recognition, Face Picture Comparison and face picture search (16 face picture libraries, with up to 100,000 face pictures), human and vehicle recognition, Automatic License plate recognition (ANPR), Perimeter Protection, heat map, motion, line crossing, intrusion, people counting and throwing objects from building.
- The NVR shall support 8-ch face picture comparison alarm
- The NVR shall support 08-channel video access, storage, and forwarding, with a maximum access bandwidth of 320 Mbps incoming and 256 Mbps Outgoing
- The NVR shall feature no more than 2 U chassis with two disk trays and supports 10 TB hard disks.
- The NVR shall support manual recording, alarm-triggered recording and POS triggered recording
- The NVR shall support H.264, H.265, and MJPEG
- The NVR shall support Recording resolution Up to 32MP Network camera
- The NVR shall support Dual stream recording
- The NVR Audio compression shall be G.711ulaw/G.711alaw/G.722/G.726/MP2L2
- The NVR shall equip with 2, RJ-45 10/100/1000 Mbps self-adaptive Ethernet interface
- The NVR shall support at least one HDMI port (Up to 4K), one VGA Port, audio-in/out port, one CVBS output.
- The NVR shall support hybrid storage of video and images

2.6 GIGABIT SMART POE SWITCH (16 PORT)

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- The POE Switch shall have 16 × gigabit PoE ports, and 2 × gigabit fiber optical ports with IEEE 802.3at/af standard for PoE ports.
- The POE Switch shall provide minimum 225 W and minimum 30 W in each port.
- The POE Switch port type shall be RJ45 port, full duplex, MDI/MDI-X adaptive
- The POE Switch shall be capable of Long Range 300 m transmission
- The POE Switch shall be capable of PoE watchdog: Ports 1 to 16 auto detect and restart the cameras that do not respond.
- The POE Switch shall be UL, CE, FCC certified

2.7 CENTRAL VIDEO SURVEILLANCE SYSTEM

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- In this project, at least 450 cameras are configured to connect to the Center Video surveillance system at the rate of 4 Mbit/s for 30 days. To improve the reliability and stability of the video cloud node, enterprise-class hard disks are used. To save investment and avoid using the cold backup solution, the hot backup solution must be used. Five storage system have at least 1000 (One thousand) TB enterprise-level hard disks (100 HDD 10TB each) are configured.

- In this project in the Video management system, 450 cameras are configured and 256 channels live viewed simultaneously, VMS System shall provide real-time events during live view and playback with Viewing maps, Supports decoding stream from cameras with high-definition, such as PanoVu series camera, schedule recording, facilitate Storing videos on encoding devices, Hybrid SANs, cloud storage servers, pStors, Real-time alarm management for added security control panels, Adding zone as hot spot on E-map and viewing the video of the linked camera, Event and alarm linkage with added cameras, including pop-up live view, captured picture and also provide Intelligent Analysis-setting resource groups and analyzing data by different groups intelligent analysis reports including people counting, people density analysis, queue analysis, heat analysis, pathway analysis, person feature analysis, temperature analysis, and vehicle analysis Displaying the number of people in specified regions in real-time.
- The VMS triggering events shall classify by modules, including video (camera, alarm input, face), alarm (radar, alarm input), intelligent analysis group (regional people counting), digital signage, maintenance, user, user-defined event, generic event, visitor, broadcast, and security inspection.
- The VMS Edit Alarm page shall provide the icon for remote configuration of the triggering source. You click the icon to open the remote configuration page of the device or server.
- The VMS System Support selecting TCP or UDP as the transport type and transport types of HTTP and HTTPS
- The VMS System shall Support selecting Search or Match as the match type.
- The VMS System shall Support selecting AND or OR as the expression.
- The VMS System shall Support setting self-defined event if the system-monitored events or the generic event cannot meet the need. When adding an event, support selecting multiple triggering events and sources.
- The VMS System shall Support deleting all invalid events quickly by clicking the Delete All Invalid Items button.
- The VMS System shall Support setting multiple events as alarms in a batch.
- The VMS System shall Support enabling and disabling multiple alarms in a batch.
- The VMS System shall Support testing alarms.
- The VMS System shall Support filtering events that are set as alarms.
- The VMS System shall Support filtering events and alarms by source type, event & alarm name, area, source, and triggering event.

- The VMS System shall Support highlighting abnormal events and alarms with a red exclamation mark.
- The VMS System shall Support highlighting events and alarms that are not supported by the sources.
- The VMS System shall Support event and alarm statistics.
- The VMS System shall Support classifying events and alarms by modules.
- The VMS System shall Support logging by IP address or domain name, and Support enabling auto-login
- The VMS System shall Support remembering historical server addresses and logged-in users
- The VMS System shall Support grouping modules and customizing the module arrangement on the control panel
- The VMS System shall Support adding modules to the navigation bar, clicking a module on navigation bar to quickly access the module, and searching for modules
- The VMS System shall Support displaying the resource updating indicator, time, and CPU usage/network speed on the title bar of Control Client
- The VMS System shall Provide the guidance about how to start using the Control Client for the first-login user
- The VMS System shall Support displaying the default control panel for the first-login user
- The VMS System shall Support editing the name and the layout (including adding windows, deleting windows, editing windows, moving windows, and adjusting the window size) of control panel
- The VMS System shall Support restoring to the default control panel when editing
- The VMS System shall Support self-adaptive layout based on different screen resolutions
- The VMS System shall Support managing multiple control panels, including adding, deleting, and switching control panels
- The VMS System shall Support opening and closing auxiliary screen for the control panel
- The VMS System shall Support displaying the control panel in the full screen mode and exiting the mode, maximizing or minimizing the window, and displaying the window in auxiliary screen
- The VMS System shall Support restoring the control panel after restarting the Control Client or switching users
- The VMS System shall Support a maximum of 64 cameras in single-window live view. Support a maximum of 256 cameras in four-window live view.
- The VMS System shall Support starting live view of one or multiple camera(s).
- The VMS System shall Support auto-switch windows with the switching time interval of 5s, 10s, 20s, 30s, 1min, 3min, 5min. Support pausing and playing video.
- The VMS System shall Support displaying vehicle passing events. Support adding vehicle license number to the vehicle plate list.

- The VMS System shall Support displaying days with recorded video. Support playback of a certain day/time. Support dragging the time slider.
- The VMS System shall Support filtering video by video type (time recording schedule, event recording schedule, manual recording, and ANR recording), by tag type (event tag, manual recording tag, and other tags), and by storage type.
- The VMS System shall Support grouping video into person and vehicle, tagging person and vehicle in video, and filtering video according to the type of person or vehicle appearance.
- The VMS System shall Support displaying the corresponding image when you drag the time slider.
- The VMS System shall Support switching between synchronous/asynchronous playback.
- The VMS System shall Support displaying the video image in thumbnail view during playback. Support going to the corresponding time if you click the thumbnail view.
- The VMS System shall Support play the video back at the speed of 1x, 2x, 4x, 8x, /2x, 1/4x, and 1/8x.
- The VMS System shall Support playing, pausing, normal/reverse single-frame playback.
- The VMS System shall Support private view and public view.
- The VMS System shall Support saving view during the live view or playback, and Support saving cameras, window divisions, presets, auto-switch settings, digital zoom settings, map, and web page.
- The VMS System shall Support adding views directly by batch adding cameras in different areas. Support configuring camera stream type. Support configuring auto-switch interval.
- The VMS System shall Support previewing views in thumbnail.
- The VMS System shall Support dragging a camera to the view to start live view or playback.
- The VMS System shall Support editing view. Support editing auto-switch interval, pause, change view, edit camera information, etc., when playing the video.
- The VMS System shall Support displaying view on the smart wall.
- The VMS System shall Support configuring the default view upon next login.

- In this project in the Video management system will configurable in an independent server which shall have Up to two Intel® Xeon® SP, up to 28 cores per processor, configured 64G DDR4 DIMM and 24 DDR4 DIMM slots, Supports RDIMM /LRDIMM, speeds up to 2666MT/s, 3TB max and Up to 12 NVDIMM, 192 GB Max, Front drive bays: up to 8 x 3.5” SAS/SATA HDD max 80TB, Optional DVD-ROM, DVD+RW, Titanium configured 495W(1+1) with Hot plug power supplies with full redundancy and Up to 6 hot plugs fans with full redundancy. Server shall have 4 x 1GE or 2 x 10GE + 2 x 1GE or 4 x 10GE or 2 x 25GE I/O & Ports.
- The system shall support direct storage of streams to the physical storage devices, each storage device shall support 24 Hard disk slots up to 16TB each Hard disk.

storage devices shall support RAID 0, 1, 3, 5, 6, 10, 50, JBOD, hot spare with 4, 1000M Ethernet interface (extendable to 4 × 1GbE or 4 × 10GbE) and build in Dual 64-bit multi-core processor. Total Five storage device at least 1000 (One thousand) TB enterprise-level hard disks (100 HDD 10TB each) are configured.

- The system shall support the flexible deployment of video access, storage, forwarding and search service.
- The system shall support multiple encoding formats such as H.264 and H.265.
- The system shall support TCP, UDP, IPv4, HTTP, HTTPS, RTP, RTSP, RTCP, SIP, ARP, SSL, NTP, and SMTP.
- The system shall allow users to restore the most recent video pane layout and continue to play live video that was played before the logout.
- The system shall allow users to search for historical recordings by device, time, and alarm information.
- The system shall allow users to download and play back the recordings. The playback controls include playback at normal speed, fast-forward, slow-down, pause, zoom-in, and zoom-out.
- The system shall allow users to play back recordings from a specified time point in the timeline.
- The device shall be installed in a 42-inch standard rack.
- The system shall support at least 1024 Mbit/s video access, 1024 Mbit/s video forwarding, and 1024 Mbit/s recording download at the same time.
- The system shall cable of decode 450 cameras with minimum 1080p@30fps , Output Resolution up to 4K with 16 HDMI output and 08 BNC output. The system shall equip with RJ45 interface × 2, 10/100/1000 Mbps adaptive Optics interface × 2, 100 base-FX/1000 base-X, RS-232 (RJ45) × 1, RS-485 × 1 Serial Interface, 16 Audio Output and 1 Two-way Audio Out, 08 Alarm In and 08 Alarm out. Each decoding device shall capable to decode up to 128 cameras with 1080p@30fps and up decode capacity of 24MP@30fps.
- This system shall design with 16 nos of 55-inch 3.5mm LCD Display Unit, LCD display Resolution shall be 1920 × 1080@60 Hz with 2.3 mm (top/left), 1.2 mm (bottom/right) Bezel Width, LCD display Brightness shall be 500 cd/m². LCD display shall provide Video & Audio Input: HDMI × 1, DVI × 1, VGA × 1, DP× 1, USB × 1 and HDMI × 1 Video & Audio Output
- The LCD Display Units shall be installed with sixteen Modular Bracket and four Pedestal bases.
- This system shall design with one Multi-Screen Video Wall Controller with five HDMI input and five HDMI out board. This Wall Controller shall provide 11, sub board slots, 1, switch board slot, 2, main control slots. HDMI input board shall provide 4, HDMI input interfaces and HDMI input board shall provide 4, HDMI output interfaces. This Multi-Screen Video Wall Controller 1+2 redundant power supplies, 10 Gigabit networks

switching and 2, 10 M/100 M/1000 M self-adaptive Ethernet interfaces and 1, 10 Gigabit optical interface with RS232, RS232, RS485 Serial Interface. This Video Wall Controller Exchange Capability total broadband 1.2Tb

- Total CENTER VIDEO SURVEILLANCE SYSTEM shall have 10 KVA, Backup Time: Stansard Backup, Rated Voltage: Single Phase 230/220 Vac, Output PF: Unity, Installation Mode: Rack/Tower Convertible, SNMP card: Integrated in UPS with all types of power and necessary accessories.
- This system shall be design with 10Gpbs ethernet Access switch 20 x GE/10GE SFP+ Port 2 x 40GE/100GE QSFP Port, 800Gbps Backplane, 1K Total SVI & 32 MB Flash, 1024 MB DRAM, 600 Mpps Forwarding Rate, 32K MAC & 9K Jumbo Frame, MPLS VPN & 1U Rack-Mounted

2.8 SURGE PROTECTOR ETHERNET LIGHTNING ARREST BOX

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- The system shall use ethernet lightning arrest box in each camera to prevent ethernet devices from possible damage caused by surge voltages as a result of lightning strikes
- Ethernet lightning arrest box shall provide 20 KA lightning surge protection.
- Ethernet lightning arrest box shall have two passive 10/100/1000 Ethernet ports along with 1 ground position and Flexibly designed for various Ethernet devices including POE

2.9 UTP CABLE, POWER CABLE/SOLUTION, ACCESSORIES (MOUNTING POLE, PVC PIPE/CHANNE ETC.)

The propose equipment shall be modular of design and allow a wide variety of user configurations. The proposed equipment shall be designed and delivered with the functions as follows:

- In this system each camera shall be connected to NVR through CAT6 UTP Network Cable (Solid Copper, 0.565 mm, CM), with 99.95% SOLID-Bare Copper Content and Reference Standard shall be ISO/IEC11801, TIA-568-C.2, UL444. This CAT6 UTP Network Cable shall be quality verified by Fluke test and Guaranteed long PoE transmission distance. Each PV plant require one box (305 meter) CAT6 UTP Network Cable.
- In this system providing the power, system shall use Proper 3core Cable, MK peripheral & related all Active & passive products supply, commission & test

- In this system All Cabling shall be done through PVC Pipe, Channel & related all passive products supply & commission
- Each PV plant require two 8-Meter-tall GI pole for Camera for camera hang, Mounting Pole shall made of MS pipe with galvanize/ electroplating/ silver color. 6" Dia & 4" dia connect with reducer. Have a bottom plate for fixing, 6" Length: 5 meters (On bottom), 4" Length: 3 meters (On top), Need to be 2" dia & 0.5 meter length MS Pipe joint for camera hanging, Bottom plate must be 6mm depth, Need to be 1.5' X 1' water resistance MS box for MC/Adopter
- Each PV plant require one 9U Server rack (600 x 600mm) with 6 port PDU, Front Door shall be Glass made.

Appendix-2

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Schedules of Guaranteed Technical Particulars

PREAMBLE

General

1	The Schedules of Guaranteed Technical Particulars is a tool for tender evaluation and verification of test result against the Guaranteed Technical Particulars during the project implementation.
2	The bidder shall carefully fill all requested information in these sheets. Partially filled schedules may lead to disqualification.
3	The Bidder shall not modify the Schedules. Modification of the Schedules may lead to disqualification.
4	To be filled up by the EPC Contractor's Letterhead, otherwise the bid shall be rejected

.

Schedule of Guaranteed Technical Particulars - 48 VDC Battery

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

Sl	Schedule of Guaranteed Technical Charactristics - 48 VDC Battery	Unit	NESCO's Requirement	Bidder's Guaranteed Value
1	**TYPE DESIGNATION OF OFFERED EQUIPMENT:**			
	MANUFACTURING DATA			
2	- Birth month/year of production line first product:	-	To be mentioned	
3	- Approximate quantity manufactured since birth of production:	nos	To be mentioned	
	DIMENSIONS			
4	- mounted width:	mm	To be mentioned	
5	- mounted depth:	mm	To be mentioned	
6	- mounted height:	mm	To be mentioned	
7	- operation and maintenance height of equipment:	mm	To be mentioned	
8	- total weight (in operation):	kg	To be mentioned	
	MECHANICAL CHARACTERISTICS			
9	- cell type:	-	To be mentioned	
10	- number of cells:	nos	37	
11	- number of cells/block:	nos	max. 3	
12	- mounting in charger cubicle:	-	To be mentioned	
13	- maximum continuous operating temperature:	˚C	To be mentioned	
14	- cell/block material:	-	To be mentioned	
15	- electrolyte:	-	To be mentioned	
16	- density of electrolyte (fully charged):	kg/dm3	To be mentioned	

Sl	Schedule of Guaranteed Technical Charactristics - 48 VDC Battery	Unit	NESCO's Requirement	Bidder's Guaranteed Value
	ELECTRICAL CHARACTERISTICS			
17	- rated output capacity (fully charged):	Ah	To be mentioned	
18	- recommended float charge voltage / cell @ 20 ˚C:	VDC	To be mentioned	
19	- internal resistance of the battery @ 100% charge level:	mΩ	To be mentioned	
20	- battery bank end voltage after 10 h discharge at site with biggest installed load:	VDC	To be mentioned	
21	- battery fuse type:	-	To be mentioned	
22	- battery fuse current rating:	A	To be mentioned	

Schedule of Guaranteed Technical Particulars - Optical ADM

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

Sl	Schedule of Guaranteed Technical Particulars - Optical ADM	Unit	NESCO Requirement	Bidder's Guaranteed Value
1	**TYPE DESIGNATION OF OFFERED EQUIPMENT:**			
	MANUFACTURING DATA			
2	- Year of production line first product:	-	To be mentioned	
3	- Approximate quantity manufactured since birth of production:	nos	To be mentioned	
	MECHANICAL CHARACTERISTICS			
4	- IP class (IEC 60529), location of installation:	-	To be mentioned	
5	- units hot-swappable:	-	Yes	
6	- self extinguishing housing material:	-	To be mentioned	
7	- the maximum height of the equipment rack:	U	To be mentioned	
8	-the power supply mode:	-	AC and DC	
9	- unified VC/PKT/ODUk switching boards in single subrack:	-	Yes	
	EXTERNAL ENVIRONMENT REQUIREMENTS			
10	**Temperature range**		Section 6.1 & 7	
11	- storage (ETS 300 019-1-1.2):	˚C	-40 to +70	
12	- transport (ETS 300 019-1-2.3):	˚C	-40 to +70	
13	- operation (ETS 300 019-1-3.2):	˚C	-5 to +50	
14	**Maximum relative humidity, non-condensing**			
15	- storage (ETS 300 019-1-1.2):	%	5% RH to 100% RH	
16	- operation (ETS 300 019-1-3.2):	%	5% RH to 85% RH	
17	**Cold test (IEC 68-2-1)**			
18	- operation:	˚C	To be mentioned	
19	- storage:	˚C	To be mentioned	
20	**Dry heat test (IEC 68-2-2)**			
21	- operation:	˚C	To be mentioned	
22	- storage:	˚C	To be mentioned	
23	**Damp heat test**			
24	- continuous test (IEC 68-2-3):	days	To be mentioned	
25	- accelerated test (IEC 68-2-4):	-	To be mentioned	
26	- cyclical test:	-	To be mentioned	
27	- temperature variation test (IEC 68-2-14):	-	To be mentioned	
28	- corrosive atmosphere strenght (IEC 68-2):	-	To be mentioned	
29	**Vibration test (IEC 68-2-6)**			

Sl	Schedule of Guaranteed Technical Particulars - Optical ADM	Unit	NESCO Requirement	Bidder's Guaranteed Value
30	- in operation:	-	To be mentioned	
31	- not in operation:	-	To be mentioned	
32	- bump test, not in operation (IEC 68-2-29):	-	To be mentioned	
33	- free fall test (IEC 68-2-27):	mm	To be mentioned	
34	- impact resistance (IEC 68-2-27):	-	To be mentioned	
35	- abrasion resistance:	-	To be mentioned	
	ELECTROMAGNETIC COMPABILITY AND SAFETY			
36	**Emission**		Section 6.1 & 7	
37	- EN 55022 class (RF emission):	-	To be mentioned	
38	**Immunity**		To be mentioned	
39	- IEC 61000-4-2 (electrostatic discharge, ESD):	-	To be mentioned	
40	- IEC 61000-4-3 (radiated RF immunity):	-	To be mentioned	
41	- IEC 61000-4-4 (electrical fast transient/burst):	-	To be mentioned	
42	- IEC 61000-4-5 (surge immunity):	-	To be mentioned	
43	- IEC 61000-4-6 (conducted RF immunity):	-	To be mentioned	
44	- IEC 61000-4-11 (voltage dips snd interruptions):	-	To be mentioned	
45	**Optical Safety**			
46	- EN 60825-1: 2007 (LED/laser classification):	Class	To be mentioned	
47	- EN 60825-2: 2004 (Safety of OFCS):	Class	To be mentioned	
48	**Electrical Safety**			
49	- EN 60950-1 (general requirements):	-	To be mentioned	
	AVAILABILITY			
50	- MTBF (single unit with lowest MTBF [unit type and time]):	h	Section 6.1 & 7	
51	- Method used for availability calculations:	-	Yes	
	TERMINAL AND SUB-RACK			
52	- number of optical channels (single rack):	nos	Section 6.1 & 7	
53	- number of electrical interface card slots (single rack):	nos	To be mentioned	
54	- expansion rack available:	-	Yes	
55	- 1+1 hardware protection (power supply, control unit, other common units):	-	• Cross-connect,	

Sl	Schedule of Guaranteed Technical Particulars - Optical ADM	Unit	NESCO Requirement	Bidder's Guaranteed Value
			system control board backup • Power supply backup • Fan Redundancy	
56	- remote unit configurable from NMS:	-	Yes	
57	- stability of internal synchronization clock:	m x 10En	To be mentioned	
58	- built in management channel interface:	-	Yes	
59	- electrical cross connection at PCM level:	-	Yes	
	POWER SUPPLY			
60	- rated voltage:	V DC	Section 6.1 & 7	
61	- voltage range:	%	To be mentioned	
62	- positive pole earthed:	-	Yes	
63	- maximal power consumption (main rack fully equipped):	W	To be mentioned	
	INTERFACE UNIT AVAILABILITY			
64	**Optical interface units**		Section 6.1 & 7	
65	- STM-16 (2,488.320 Mbit/s):	-	Section 6.1 & 7	
66	- STM-4 (622.080 Mbit/s):	-	Section 6.1 & 7	
67	- STM-1 (155.520 Mbit/s):	-	Section 6.1 & 7	
68	**Electrical interface units**			
69	- E1 (2.048 Mbit/s):	-	Section 6.1 & 7	
70	- V.35 (n x 64 kbit/s):	-	Section 6.1 & 7	
71	- G.703 64 kbit/s co-directional:	-	Section 6.1 & 7	
72	- G.703 64 kbit/s contra-directional:	-	Section 6.1 & 7	
73	- X.24/V.11:	-	Section 6.1 & 7	
74	- V.24/V.28 (1.2 ... 19.2 kbit/s):	-	Section 6.1 & 7	
75	- Ethernet:	-	Section 6.1 & 7	
73	- HDSL:	-	Section 6.1 & 7	
76	- 4-wire E&M voice:	-	Section 6.1 & 7	
77	- 2-wire subscriber (FXS):	-	Section 6.1 & 7	
78	- 2-wire subscriber (FXO):	-	Section 6.1 & 7	
77	- ISDN:	-	Section 6.1 & 7	
79	- teleprotection channel ≥ 4 commands:	-	Section 6.1 & 7	
	STM-4 OPTICAL INTERFACE			

Sl	Schedule of Guaranteed Technical Particulars - Optical ADM	Unit	NESCO Requirement	Bidder's Guaranteed Value
80	- unit designation:	-	Section 6.1 & 7	
81	- maximum number of STM-4 interfaces (main rack):	nos	To be mentioned	
82	- number of STM-4 interfaces / unit:	nos	Section 6.1 & 7	
83	- bit rate:	Mbit/s	To be mentioned	
84	- compliance to ITU-T G.707 Rec.:	-	Yes	
85	- chromatic dispersion tolerance:	ps/nm x km	To be mentioned	
86	- nominal operating wavelength:	nm	1310 and 1550 nm	
87	- transmission mode:	-	Single Mode	
88	- type of optical source:	-	Laser	
89	- life expectancy of optical source:	hours	To be mentioned	
89	- minimum transmit level:	dBm	-2	
90	- maximum transmit level:	dBm	3	
91	- spectral half bandwidth:	nm	To be mentioned	
91	- receiver sensitivity for BER < 10E-9:	dBm	-28	
92	- maximum received power without saturation:	dBm	-8	
94	- maximum connector loss:	dB	To be mentioned	
95	- allowable transmission loss (BER = 10E-9):	dB	To be mentioned	
93	- target fiber length @1310 nm, 0,38 dB/km attenuation , 1 dB connector losses - short haul:	km	15	
94	- target fiber length @1310 nm, 0,38 dB/km attenuation , 1 dB connector losses - long haul:	km	40	
95	- optical connector type:	-	LC	
	ETHERNET INTERFACE			
96	- unit designation:	-	Section 6.1 & 7	
97	- maximum number of Ethernet interfaces (single rack):	nos	112	
98	- supported physical layer type (IEEE 802.3) :	Mbit/s	• 10Base-T • 100Base-TX	
99	- number of Ethernet interfaces / unit:	nos	8	
100	- connector type:	-	LC/RJ-45	
101	- compatible to offered IEC 60870-5-104 RTU-protocol:	-	Yes	
	ALARMS			
102	- number of programmable potential free alarm contacts:	nos	Section 6.1 & 7	
103	- number and type of alarm inputs:	nos	6	
	FUNCTION			

Sl	Schedule of Guaranteed Technical Particulars - Optical ADM	Unit	NESCO Requirement	Bidder's Guaranteed Value
104	-the centralized cross-connection capability of SDH/ MPLS-TP:	G	SDH: 160G VC4 20G VC3/VC12	
105	- the speed rate of line cards:	Gbit/s	10/100	
106	-the equipment subrack must support both the OTN architecture and the transponder/Muxponder board:	-	Yes	
107				
108	-the maximum delay introduced by encryption:	us	1	
109	-Access Service Type: Ethernet:FE/GE/10GE/100GE Video service:DVB-ASI/SD-SDI/HD-SDI/3G-SDI/MADI	-	Yes	
110	- the maximum single haul transmission ability at STM-64 without regeneration and optical layer:	dB	57	
111	- Hitless switching of E1 services:	-	Yes	
112	- Multi-path hitless switching of E1 services:	-	Yes	
113	-the maximum one-way delay of the relay protection service:	ms	5	
114	- the two-way delay difference of the relay protection service:	ms	200	
115				

Schedule of Guaranteed Technical Particulars - CCTV

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
	TYPE DESIGNATION OF OFFERED EQUIPMENT:			
	BI-SPECTRUM THERMOGRAPHY NETWORK TURRET CAMERA:			
1	-Image sensor- Optical Module:	-	1/2.7" CMOS image sensor with	
2	-Image sensor- Thermal Module:	-	Vanadium Oxide Uncooled Focal Plane Arrays	
3	-Min. Illumination:	-	Min. Illumination Color: 0.0089Lux at optical Module	
4	-Thermal Module:	-	▪ Resolution 160 × 120 ▪ Pixel Interval at least 12 μm ▪ Spectral Range 8 μm to 14 μm ▪ NETD < 40 mK (@ 25°C,F# = 1.0) ▪ Focal Length 4.3 mm ▪ IFOV 5.48 mrad ▪ Field of View 50.0° × 37.3° (H × V) ▪ Min. Focusing Distance 0.5 m	
5	-Digital Zoom:	X	× 2, × 4	
6	-Image Resolution:	MP	Minimum Image Resolution 2688 × 1520, 4 MP at optical module	
7	-IR & White light range:	m	The camera IR & White light range shall be at least IR Distance Up to 15 m & White Light Range Up to 30 m	
8	-Target Coloration:	-	Support in white hot and black hot mode	
9	-Analytic functions:	-	Various analytic functions: line crossing, intrusion, region entrance, and region exiting and Video content analysis-vehicle/human classification	
10	-Alarm:	-	Visual White light alarm with adjustable flashing frequencies and three types of audible alarm (VCA and Temperature Exception) Smoking detection Algorithm Alarm 1-ch inputs and 1-ch Alarm	
11	-Video compression:	-	Video compression of MJPEG/H.264/H.265	
12	-Dual streams:	-	Dual streams	
13	-Wide dynamic range (WDR):	dB	WDR shall be at least 120 dB.	
14	-Comprehensive security control system:	-	User authentication (ID and password), MAC address binding, HTTPS encryption, IEEE 802.1x access control, IP address filtering	
15	-Adaptive Ethernet port:	-	One RJ45 10M/100M adaptive Ethernet port and 1, RS-485 interface (half duplex)	
16	-Audio interface:	-	1 Mic in/Line in audio interface and audio Linear	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			level, impedance: 600 Ω output.	
17	-Audio interface:	-	Support audio interface	
18	-Audio Compression:	-	G.722.1/G.711ulaw/G.711alaw/MP2L2/G.726/PCM	
19	-Temperature measurement:	rule	3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line)	
	-Temperature Range:	°C	-20°C to 550°C (-4°F to 1022°F)	
20	-Temperature Accuracy:	%	Maximum ± 2°C, ± 2 %	
21	-Power:	-	12 V DC and PoE (802.3af, class 3) power supply	
22	-Power Consumption:	W	Maximum 6W	
23	-Protection:	-	IP66 weather rating standards.	
		V	Lightning protection, surge protection, voltage transient protection maximum value is TVS 4000V	
24	-Product Certifications:	-	FCC, CE & IC	
25	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper contact details	
26	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	
	PTZ CAMERA (THERMAL & OPTICAL BI-SPECTRUM NETWORK SPEED DOME)			
27	-Image sensor:	-	1/2.8" Progressive Scan CMOS at Optical Module	
28	-Focal length:	mm	Wide-angle prime lens: at least 4.8 to 153 mm, and	
29	-Optical zoom:	X	32x optical zoom	
30	-IR range:	m	The camera IR range shall support at least 100m.	
31	-Thermal Module-	-	• Image Sensor: Vanadium Oxide Uncooled Focal Plane Arrays • Resolution 256 × 192 (the resolution of output image is 1280 × 720) • Response Waveband: 8 μm to 14 μm, • Pixel Interval 12 μm, • NETD ≤ 35 mK (@ 25°C,F# = 1.0) • Focal Length: 10 mm • IFOV: 1.20 mrad, • Field of View at least 18° × 13.5°	

SI	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			(H × V), • Min. Focusing Distance 1.2 m	
32	-analytic functions:	-	Analytic functions: line crossing, intrusion, region entrance and exit	
33	-Smart tracking:	-	Panorama tracking, Event tracking and Multi-scene patrol tracking	
34	-Smart tracking linkage:	-	thermal view and optical view	
35	-Temperature measurement:	rules	3 temperature measurement rule types, 273 presets as scene, 21 rules of each scene (10 points, 10 areas, and 1 line)	
36	-Temperature Range:	°C	20°C to 550°C (-4°F to 1022°F)	
37	-Temperature Accuracy:	%	Maximum ± 2°C, ± 2 %	
38	-Optical Defog:	-	Support Optical Defog function	
39	-PTZ:	-	The camera shall have The camera shall have at least 300 with 08 Patrol Scan and 04 Pattern Scan (10 Minutes Per Pattern) The camera shall support Power Off Memory The camera shall support Scheduled Task (Preset/Pattern Scan/Patrol Scan/Auto Scan/Tilt Scan/Random Scan/Frame Scan/Panorama Scan/Doom Reboot/Doom Adjust/Aux Output	
40	-PTZ movement Range:	°	Pan: 360° Continuous Rotate; Tilt: From -5° to + 90° (auto flip)	
41	-Pan Speed:	°/s	Configurable, From 0.1°/s to 200°/s, Preset Speed: 240°/s	
42	-Tilt Speed:	°/s	Configurable, From 0.1°/s to 105°/s, Preset Speed: 200°/s	
43	-Proportional Zoom:	-	Yes	
44	-Presets:	-	300 in total, 273 are configurable.	
45 46	-Patrol Scan:	-	8; Up to 32 Presets Per Patrol	
47	-Pattern Scan:	-	4; More Than 10 Minutes Per Pattern	
48	-Power Off Memory:	-	Yes	
49	-Park:	-	Preset/Pattern Scan/Patrol Scan/Auto Scan/Tilt Scan/Random Scan/Frame Scan/Panorama Scan	
50	-PT Status:	-	Turn On/Turn Off	
51	-Scheduled Task:	-	Preset/Pattern Scan/Patrol Scan/Auto Scan/Tilt Scan/Random Scan/Frame Scan/Panorama Scan/Doom Reboot/Doom Adjust/Aux Output	
52	- Fire detection fire	-	Dynamic fire detection, up to 10 fire points	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
	detection:		detectable	
53	-Fire prevention:	-	Temperature exception alarm	
54	-Illumination:	-	Min. Illumination Color: 0.05 Lux at optical Module	
55	-Image Resolution:	-	Image Resolution 2688 × 1520, 4 MP at optical module	
56	-Field of View:	°	Horizontal FOV 58.4° × 33.8° (H × V) to 2.14° × 1.2° (H × V) with optical Module	
57	-Picture in Picture:	-	Partial image of thermal channel on the full screen of optical channel	
58	-Video compression:	-	Video compression of MJPEG/H.264/H.265	
59	-Dual streams:	-	Dual streams.	
60	- wide dynamic range (WDR) :	dB	120dB	
61	-Comprehensive security control system:	-	User authentication (ID and password), MAC address binding, HTTPS encryption, IEEE 802.1x access control, IP address filtering	
62	-Adaptive Ethernet ports:	-	1 RJ45 10M/100M adaptive Ethernet ports	
63	-RS-485:	-	1 RS-485 interface	
64	-Reset Button:	-	1 Reset Button	
65	-BNC port:	-	1.0 V [p-p]/75 Ω, BNC for thermal channel for Analog Video Output	
66	-Audio interface:	-	support audio interface enable	
67	-Audio Compression:	-	G .711u/G.711a/G.722.1/MP2L2/G.726/PCM	
68	-Alarm:	-	7-ch inputs and 2-ch relay Alarm outputs	
69	-Alarm Action:	-	Preset, Patrol Scan, Pattern Scan, SD Card Record, Relay Output, Smart capture, FTP upload, Email linkage	
70	-Micro SDHC/micro SDXC:	-	MicroSD card slot that supports Micro SD/SDHC/SDXC card (up to 256G). Built in 128 GB Surveillance grade Micro SD card with camera	
71	-Power supply:	V	AC24V power	
72	-power consumption:	W	Maximum 30W	
73	-Weather rating standards:	-	IP66 weather rating standards or better.	
74	-Protection:	-	The camera Lightning protection, surge protection, voltage transient protection maximum value is TVS 6000V	
75	-Product Certifications:	-	FCC, UL, KC, RCM, IC, CE, UL,CB	
76	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			contact details	
77	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	
	BI-SPECTRUM THERMOGRAPHY NETWORK BULLET CAMERA			
78	-Image sensor- Optical Module:	-	1/2.7" Progressive Scan CMOS with	
79	-Image sensor-Thermal Module:	-	vanadium oxide uncooled focal plane arrays with thermal Module	
80	-Min. Illumination:	Lux	Min. Illumination Color: 0.0089Lux at optical Module	
81	-Thermal Module:	-	▪ Max. Resolution 256 × 192 with thermal Module ▪ Pixel Interval :12 µm ▪ Spectral Range: 8 µm to 14 µm ▪ NETD < 40 mK (@25° C,F# = 1.0) ▪ Focal length 3.6 mm. ▪ IFOV 3.33 mrad ▪ Field of View at least 50.0° × 37.3° (H × V) ▪ Min. Focusing Distance at least 0.5 m	
82	-Digital Zoom:	X	Digital Zoom ×2, ×4	
83	-Image Resolution-optical module:	MP	Minimum Image Resolution 2688 × 1520, 4 MP	
84	-IR & White light range:	m	IR range 30m and White Light Range 30m	
86	-Target Coloration:	-	Target Coloration with white hot and black hot mode	
87	-Analytic functions:	-	Line crossing, intrusion, region entrance, and region exiting and Video content analysis-vehicle/human classification	
88	-Alarm:	-	Alarm 2-ch inputs and 2-ch Alarm	
89	-Video compression:	-	MJPEG/H.264/H.265	
90	-Dual streams:	-	dual streams	
91	-Wide dynamic range (WDR) :	dB.	120 dB.	
92	-Comprehensive security control system:	-	User authentication (ID and password), MAC address binding, HTTPS encryption, IEEE 802.1x access control, IP address filtering	
93	-Adaptive Ethernet	-	1, RJ45 10M/100M adaptive Ethernet port	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
	port:			
94	-RS-485 interface:	-	1, RS-485 interface (half duplex)	
95	-Audio interface:	-	1 Mic in/Line in audio interface and audio Linear level, impedance: 600 Ω output	
96	-Audio Compression:	-	G.722.1/G.711ulaw/G.711alaw/MP2L2/G.726/PCM	
97	-Temperature measurement:	-	3 temperature measurement rule types, 21 rules in total (10 points, 10 areas, and 1 line	
98	-Temperature Range:	°C	20°C to 550°C (-4°F to 1022°F)	
99	-Temperature Accuracy:	°C %	Maximum ± 2°C, ± 2 %	
100	-Power:	V	12 V DC and PoE (802.3af, class 3) power supply	
101	-Power consumption:	W	Maximum 9W	
102	-Protection:	-	IP67 weather rating standards.	
103	-Lightning protection, surge protection, voltage transient protection:	V	Minimum value TVS 4000V	
104	-Product Certificates:		FCC, UL, KC, RCM, IC, CE, UL, CB	
105	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper contact details	
106	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	
	PANORAMIC FIXED TURRET NETWORK CAMERA			
107	-Image sensor:	-	2 × 1/1.8" Progressive Scan CMOS	
108	-Min. Illumination:	Lux	Min. Illumination Color: 0.0005 Lux @ (F1.0, AGC ON), 0 Lux with light with 24/7 colorful imaging	
109	-lens:	mm	Fixed focal lens, dual lens: 4 mm	
110	-Field of View:	°	Horizontal FOV: 180° ± 10°Vertical FOV: 44 and Aperture F1.0	
111	-Image Resolution:	MP	Max. Resolution 5120 × 1440, 08 MP	
112	-White Light Range:	m	White Light Range 30m	
113	-Analytic functions:	-	Motion detection (support alarm triggering by specified target types (human and vehicle)), alarm input and output, flashing alarm light output, audible alarm output, exception	
114	-Smart analytic:	-	Line crossing detection, intrusion detection, region entrance detection, region exiting detection	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			(support alarm triggered by specified target types (human and vehicle)), scene change detection, NAS (NFS, SMB/CIFS), Auto Network Replenishment (ANR), NVR,Together with high-end memory card, memory card encryption and health detection	
115	-Alarm:	-	The camera shall have at least Alarm 1-ch inputs and 1-ch Alarm	
116	-Dual Stream:	-	dual Stream	
117	-Video compression:	-	H.265+/H.265/H.264+/H.264	
118	-Wide dynamic range (WDR):	dB	130 dB	
119	-Image Parameters:	-	Parameters Switch with saturation, brightness, contrast, sharpness, gain, white balance, adjustable by client software or web browser	
120	-BLC, HLC, 3D DNR:	-	BLC, HLC, 3D DNR	
121	-Adaptive Ethernet port:	-	one RJ45 10M/100M adaptive Ethernet ports	
122	-Video Bit Rate:	-	32 Kbps to 16 Mbps with CBR, VBR Bit Rate Control	
123	-Built-in Microphone and Built-in Speaker (1.2W) :	W	Built-in Microphone and Built-in Speaker (1.2W)	
124	-Audio interface:	-	1 Mic in/Line in audio interface and audio Linear level, impedance: 100 Ω output	
125	-Audio Compression:	-	Mono sound with G.711/G.722.1/G.726/MP2L2/PCM/MP3/ AAC-LC	
126	-Micro SD:	-	The camera shall have MicroSD card slot that supports Micro SD/SDHC/SDXC card (up to 256G). Built in 128 GB Surveillance grade Micro SD card	
127	-Power:	VDC	12 VDC and PoE (802.3af, Class 3)	
128	-Maximum Power Consumption:	W	11W	
129	-Protection:	-	IP67 weather rating standards	
130	-Certification:	-	UL, CE, FCC certified	
131	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper contact details	
132	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
	GIS/AIS SUBSTATION NVR			
133	-General requirement:	-	Three Set of network cameras are connected to each NVR. Each camera has 4 Mbit/s bit rate and is stored for 30 days. Enterprise-class hard disks to improve NVR reliability and stability. Each PV plant requires one NVR. Each NVR is configured with two 8 TB enterprise-level hard disks	
134	-Integration:	-	The NVR shall Integrates storage, compute, and search functions and supports comprehensive service functions such as access, storage, analysis, search, and alert. The NVR shall provide Intelligent analytics based on deep learning algorithm for Facial Recognition, Face Picture Comparison and face picture search (16 face picture libraries, with up to 100,000 face pictures), human and vehicle recognition, Automatic License plate recognition (ANPR), Perimeter Protection, heat map, motion, line crossing, intrusion, people counting and throwing objects from building.	
135	-Performance:	-	Support 8-ch face picture comparison alarm The NVR shall support 08-channel video access, storage, and forwarding	
136	-Bandwidth:	-	320 Mbps incoming and 256 Mbps Outgoing	
137	-Height:	-	2 U chassis with	
138	-Hard Disk:	-	2 (two) disk trays and supports 10 TB hard each disks	
139	-Recording:	-	Manual recording, alarm-triggered recording and POS triggered recording, support Dual stream recording	
140	-Recording resolution:	MP	Up to 32MP Network camera	
141	-Video compression:	-	H.264, H.265, and MJPEG	
142	-Audio compression:	-	G.711ulaw/G.711alaw/G.722/G.726/MP2L2	
143	-Interphase:	-	2, RJ-45 10/100/1000 Mbps self-adaptive Ethernet interface 1, HDMI port (Up to 4K), 1 VGA Port, 1 audio-in/out port, 1 CVBS output.	
144	-Hybrid storage:	-	hybrid storage of video and images	
145	-Network mode:	-	Net Fault-Tolerance, Multi-address	
146	-Product Certification:	-	FCC, CE	
147	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper contact details	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
148	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	
	Gigabit Smart POE Switch (16 Port)			
149	-Ports:	-	16 × gigabit PoE ports, and 2 × gigabit fiber optical ports with for PoE ports. The POE Switch shall provide minimum and minimum 30 W in each port. The POE Switch port type shall be	
150	-PoE port standard:	-	IEEE 802.3at/af standard	
151	-POE Budget:	W	Minimum 225 W, each port 30W	
152	-Ports:	-	RJ45 port, full duplex, MDI/MDI-X adaptive	
153	-Long Range transmission:	m	Capable of Long Range 300 m transmission	
154	-PoE watchdog:	-	Capable of PoE watchdog: Ports 1 to 16 auto detect and restart the cameras that do not respond.	
155	-Certification:	-	UL, CE, FCC certified	
156	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper contact details	
157	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	
	CENTER VIDEO SURVEILLANCE SYSTEM			
157	-General:	-	450 cameras are configured to connect to the Central Video surveillance system (VMS) at the rate of 4 Mbit/s for 30 days. To improve the reliability and stability of the video cloud node, enterprise-class hard disks are used. To save investment and avoid using the cold backup solution, the hot backup solution must be used. Five storage system have at least 1000 (One thousand) TB enterprise-level hard disks (100 HDD 10TB each) are configured	
158	-Video management system (VMS):	-	450 cameras are configured and 256 channels live viewed simultaneously, VMS System shall provide real-time events during live view and playback with Viewing maps, Supports decoding stream from cameras with high-definition, such as PanoVu series camera, schedule recording, facilitate	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			Storing videos on encoding devices, Hybrid SANs, cloud storage servers, pStors, Real-time alarm management for added security control panels, Adding zone as hot spot on E-map and viewing the video of the linked camera, Event and alarm linkage with added cameras, including pop-up live view, captured picture and also provide Intelligent Analysis-setting resource groups and analyzing data by different groups intelligent analysis reports including people counting, people density analysis, queue analysis, heat analysis, pathway analysis, person feature analysis, temperature analysis, and vehicle analysis Displaying the number of people in specified regions in real-time.	
159	-VMS Classification:	-	The triggering events shall classify by modules, including video (camera, alarm input, face), alarm (radar, alarm input), intelligent analysis group (regional people counting), digital signage, maintenance, user, user-defined event, generic event, visitor, broadcast, and security inspection.	
			The Edit Alarm page shall provide the icon for remote configuration of the triggering source. You click the icon to open the remote configuration page of the device or server.	
160	-Generic Event:	-	Support selecting TCP or UDP as the transport type and transport types of HTTP and HTTPS	
			Support selecting Search or Match as the match type.	
			Support selecting AND or OR as the expression.	
161	- User-Defined Event:	-	Support setting self-defined event if the system-monitored events or the generic event cannot meet the need.	
162	-VMS Configure and Manage Events and Alarms:	-	When adding an event, support selecting multiple triggering events and sources.	
			Support deleting all invalid events quickly by clicking the Delete All Invalid Items button.	
			Support setting multiple events as alarms in a batch.	
			Support enabling and disabling multiple alarms in a batch.	
			Support testing alarms.	
			Support filtering events that are set as alarms.	
			Support filtering events and alarms by source type, event & alarm name, area, source, and triggering event.	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			Support highlighting abnormal events and alarms with a red exclamation mark.	
			Support highlighting events and alarms that are not supported by the sources.	
			Support event and alarm statistics.	
			Support classifying events and alarms by modules.	
163	-VMS Basic Function:	-	Support logging by IP address or domain name, and Support enabling auto-login	
			Support remembering historical server addresses and logged-in users	
			Support grouping modules and customizing the module arrangement on the control panel	
			Support adding modules to the navigation bar, clicking a module on navigation bar to quickly access the module, and searching for modules	
			Support displaying the resource updating indicator, time, and CPU usage/network speed on the title bar of Control Client	
			Provides the guidance about how to start using the Control Client for the first-login user	
164	-VMS Control Panel:	-	Support displaying the default control panel for the first-login user	
			Support editing the name and the layout (including adding windows, deleting windows, editing windows, moving windows, and adjusting the window size) of control panel	
			Support restoring to the default control panel when editing	
			Support self-adaptive layout based on different screen resolutions	
			Support managing multiple control panels, including adding, deleting, and switching control panels	
			Support opening and closing auxiliary screen for the control panel	
			Support displaying the control panel in the full screen mode and exiting the mode, maximizing or minimizing the window, and displaying the window in auxiliary screen	
			Support restoring the control panel after restarting the Control Client or switching users	
165	- Live View:	-	Support a maximum of 64 cameras in single-window live view. Support a maximum of 256 cameras in four-window live view.	
			Support starting live view of one or multiple camera(s).	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			Support auto-switch windows with the switching time interval of 5s, 10s, 20s, 30s, 1min, 3min, 5min. Support pausing and playing video.	
			Support displaying vehicle passing events. Support adding vehicle license number to the vehicle plate list.	
166	-Playback:	-	Support displaying days with recorded video. Support playback of a certain day/time. Support dragging the time slider.	
			Support filtering video by video type (time recording schedule, event recording schedule, manual recording, and ANR recording), by tag type (event tag, manual recording tag, and other tags), and by storage type.	
			Support grouping video into person and vehicle, tagging person and vehicle in video, and filtering video according to the type of person or vehicle appearance.	
			Support displaying the corresponding image when you drag the time slider.	
			Support switching between synchronous/asynchronous playback.	
			Support displaying the video image in thumbnail view during playback. Support going to the corresponding time if you click the thumbnail view.	
			Support play the video back at the speed of 1x, 2x, 4x, 8x, /2x, 1/4x, and 1/8x.	
			Support playing, pausing, normal/reverse single-frame playback.	
167	- View Management:	-	Support private view and public view.	
			Support saving view during the live view or playback, and Support saving cameras, window divisions, presets, auto-switch settings, digital zoom settings, map, and web page.	
			Support adding views directly by batch adding cameras in different areas. Support configuring camera stream type. Support configuring auto-switch interval.	
			Support previewing views in thumbnail.	
			Support dragging a camera to the view to start live view or playback.	
			Support editing view. Support editing auto-switch interval, pause, change view, edit camera information, etc., when playing the video.	
			Support displaying view on the smart wall.	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			Support configuring the default view upon next login.	
168	-Server:	-	Video management system will configurable in a server which shall have Up to two Intel® Xeon® SP, up to 28 cores per processor, configured 64G DDR4 DIMM and 24 DDR4 DIMM slots, Supports RDIMM /LRDIMM, speeds up to 2666MT/s, 3TB max and Up to 12 NVDIMM, 192 GB Max, Front drive bays: up to 8 x 3.5" SAS/SATA HDD max 80TB, Optional DVD-ROM, DVD+RW, Titanium configured 495W(1+1) with Hot plug power supplies with full redundancy and Up to 6 hot plugs fans with full redundancy. Server shall have 4 x 1GE or 2 x 10GE + 2 x 1GE or 4 x 10GE or 2 x 25GE I/O & Ports.	
169	- storage capacity:	-	support direct storage of streams to the physical storage devices, each storage device shall support 24 Hard disk slots up to 16TB each Hard disk. storage devices shall support RAID 0, 1, 3, 5, 6, 10, 50, JBOD, hot spare with 4, 1000M Ethernet interface (extendable to 4 × 1GbE or 4 × 10GbE) and build in Dual 64-bit multi-core processor. Total Five storage device at least 1000 (One thousand) TB enterprise-level hard disks (100 HDD 10TB each) are configured.	
170	- video operation:	-	The system shall support the flexible deployment of video access, storage, forwarding and search service	
171	- storage of streams:	-	The system shall support direct storage of streams. No extra forwarding server is required	
172	- multiple encoding formats:	-	The system shall support multiple encoding formats such as H.264 and H.265	
173	Network protocol:	-	The system shall support iSCSI, RTSP, ONVIF, PSIA and more	
174	Layout:	-	Allow users to restore the most recent video pane layout and continue to play live video that was played before the logout	
175	- search historical recordings:	-	Allow users to search for historical recordings by device, time, and alarm information	
176	- download and play back the recordings:	-	Allow users to download and play back the recordings. The playback controls include playback at normal speed, fast-forward, slow-down, pause, zoom-in, and zoom-out	
177	- play back recordings:	-	Allow users to play back recordings from a specified time point in the timeline	
178	- configure RAID groups:	-	Allow users to configure RAID groups for one server and support service migration among RAID	

Sl	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
			groups upon faults and RAID 0, 1, 3, 5, 6, 10, 50, JBOD, Hot-Spare	
179	- installation:	-	19-inch standard rack	
180	- capacity:	-	1000 (One thousand) TB enterprise-level hard disks (100 HDD 10TB each) are configured.	
181	- hard disk:	-	The device shall support 10TB Enterprise grade	
182	- performance:	-	The system shall support at least 1024 Mbit/s video access, 1024 Mbit/s video forwarding, and 1024 Mbit/s recording download at the same time	
183	- power supply:	-	The device shall support Redundant	
184	- Environment humidity	-	The device shall support Working: 20% to 80%RH (non-condensing/frozen); Storing: 5% to 90%RH (non-condensing/frozen)	
185	- decoding capacity in video wall:	-	450 cameras with minimum 1080p@30fps , Output Resolution up to 4K with 16 HDMI output and 08 BNC output. The system shall equip with RJ45 interface × 2, 10/100/1000 Mbps adaptive Optics interface × 2, 100 base-FX/1000 base-X, RS-232 (RJ45) × 1, RS-485 × 1 Serial Interface, 16 Audio Output and 1 Two-way Audio Out, 08 Alarm In and 08 Alarm out. Each decoding device shall capable to decode up to 128 cameras with 1080p@30fps and up decode capacity of 24MP@30fps.	
186	-LCD Display:	-	16 nos of 55-inch 3.5mm LCD Display Unit, LCD display Resolution shall be 1920 × 1080@60 Hz with 2.3 mm (top/left), 1.2 mm (bottom/right) Bezel Width, LCD display Brightness shall be 500 cd/m². LCD display shall provide Video & Audio Input: HDMI × 1, DVI × 1, VGA × 1, DP× 1, USB × 1 and HDMI × 1 Video & Audio Output	
187	-LCD display Modular Bracket and Pedestal:	-	The LCD Display Units shall be installed with sixteen Modular Bracket and four Pedestal bases.	
188	- Multi-Screen Video Wall Controller:	-	one Multi-Screen Video Wall Controller with five HDMI input and five HDMI out board. This Wall Controller shall provide 11, sub board slots, 1, switch board slot, 2, main control slots. HDMI input board shall provide 4, HDMI input interfaces and HDMI input board shall provide 4, HDMI output interfaces. This Multi-Screen Video Wall Controller 1+2 redundant power supplies, 10 Gigabit networks switching and 2, 10 M/100 M/1000 M self-adaptive Ethernet interfaces and 1, 10 Gigabit optical interface with RS232, RS232, RS485 Serial Interface. This Video Wall Controller Exchange Capability total broadband 1.2Tb	

SI	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
189	-UPS power backup:	-	10KVA UPS power backup with all types of power and necessary accessories.	
190	-Ethernet Access switch:	-	I. 20 x GE/10GE SFP+ Port II. 2 x 40GE/100GE QSFP Port III. 800Gbps Backplane IV. 1K Total SVI & 32 MB Flash V. 1024 MB DRAM VI. 600 Mpps Forwarding Rate VII. 32K MAC & 9K Jumbo Frame VIII. MPLS VPN & 1U Rack-Mounted	
191	-Manufacturer Authorization:	-	Must require to submit the manufacturer authorization certificate along with the proper contact details	
192	-Manufacture certificate:	-	Manufacturers must have ISO-50001 for Energy Management System, ISO-14001 for Environmental Management System, ISO-28000 for Security Management system for Supply Chain and CMMI-DEV ML-5 Certificates	
	SURGE PROTECTOR ETHERNET LIGHTNING ARREST BOX			
193	-Ethernet lightning arrester:	-	The system shall use ethernet lightning arrest box in each camera to prevent ethernet devices from possible damage caused by surge voltages as a result of lightning strikes Ethernet lightning arrest box shall provide 20 KA lightning surge protection. Ethernet lightning arrest box shall have two passive 10/100/1000 Ethernet ports along with 1 ground position and Flexibly designed for various Ethernet devices including POE	
	UTP CABLE, POWER CABLE/SOLUTION, ACCESSORIES (MOUNTING POLE, PVC PIPE/CHANNE ETC.)			
194	-CAT6 UTP Network Cable:	-	NVR through CAT6 UTP Network Cable (Solid Copper, 0.565 mm, CM), with 99.95% SOLID-Bare Copper Content and Reference Standard shall be ISO/IEC11801, TIA-568-C.2, UL444. This CAT6 UTP Network Cable shall be quality verified by Fluke test and Guaranteed long PoE transmission distance. Each PV plant require one box (305 meter) CAT6 UTP Network Cable.	
195	-Power solution:	-	In this system providing the power, system shall use Proper 3core Cable, MK peripheral & related all Active & passive products supply, commission & test	

SI	GTP-7 Schedule of Guaranteed Technical Charactristics - CCTV	Unit	NESCO Requirement	Bidder's Guaranteed Value
196	-Accessories:	-	In this system All Cabling shall be done through PVC Pipe, Channel & related all passive products supply & commission	
197	-9U Server rack:	-	Each PV plant require one 9U Server rack (600 x 600mm) with 6 port PDU, Front Door shall be Glass made.	
198	-GI pole:	-	8-Meter-tall GI pole for Camera Made of MS pipe with galvanize/ electroplating/ silver color. 6" Dia & 4" dia connect with reducer. Have a bottom plate for fixing. 6" Length: 5 meters (On bottom) 4" Length: 3 meters (On top) Need to be 2" dia & 0.5-meter length MS Pipe joint for camera hanging Bottom plate must be 6mm depth Need to be 1.5' X 1' water resistance MS box for MC/Adopter	

.

Schedule of Guaranteed Technical Particulars - NMS

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

Sl	GTP-9 Schedule of Guaranteed Technical Characteristics - NMS System	Unit	NESCO's Requirement	Bidder's Guaranteed Value
1				
	MANUFACTURING DATA			
2	- birth month/year of production line first product:	-	Section 7	
3	- approximate quantity delivered since birth of production:	nos	To be mentioned	
	HARDWARE			
4	- manufacturer and type designation of server/computer:	-	To be mentioned	
5	- network interface:	-	To be mentioned	
6	- other type of interface:	-	To be mentioned	
7	- manufacturer and type designation of display:	-	To be mentioned	
8	- display type:	-	To be mentioned	
9	- native display resolution:	-	To be mentioned	
10	- display size:	inch	To be mentioned	
11	- screen ratio:	-	To be mentioned	
12	- manufacturer and type designation of alarm and reporting printer::	-	To be mentioned	
13	- reporting printer type:	-	To be mentioned	
14	- paper size:	-	To be mentioned	
15	- printing speed A4 colour:	pages/ min	To be mentioned	
	SOFTWARE			
16	- operating system and version:	-	Section 7	
17	- database software:	-	To be mentioned	
18	- softwares with annual license fee:	-	To be mentioned	
19	- advanced text editor type:	-	To be mentioned	
20	- advanced spreadsheet editor type:	-	To be mentioned	
21	- other office SW tools:	-	To be mentioned	
22	- NMS development platform:	-	To be mentioned	
23	- management protocol:	-	To be mentioned	

Sl	GTP-9 Schedule of Guaranteed Technical Characteristics - NMS System	Unit	NESCO's Requirement	Bidder's Guaranteed Value
	FUNCTIONALITY GRAPHICAL USER INTERFACE			
24	- individual user login:	-	Section 7	
25	- password protected user identification:	-	To be mentioned	
26	- complex level requirements of password:	-	To be mentioned	
27	- programmable admin and user account privilegies:	-	To be mentioned	
28	-			
29	- tendered 3rd party equipment (PABX, 48 VDC) alarms via potential free contact	-	To be mentioned	
30	- automatic recognition of new network elements and interface units:	-	To be mentioned	
31	- equipment specific configuration file back up:	-	To be mentioned	
32	- real time fault and alarm mangement:	-	To be mentioned	
33	- wrong configuration alarm:		To be mentioned	
34	- dual view display:	-	To be mentioned	
35	- map based geographical network view:	-	To be mentioned	
36	- status colour indication for each site in geographical view:		To be mentioned	
37	- geographical network view zoom functionality:	-	To be mentioned	
38	- single/double mouse click for detailed site specific graphical view window:	-	To be mentioned	
39	-			
40	- status colour indication of each element/unit:	-	To be mentioned	
41	- hierarchial network view:		To be mentioned	
42	- sequence of event recorder:	-	To be mentioned	
43	- time synchronization source for SOE	-	To be mentioned	
44	- event record time resolution:	s	To be mentioned	
45	- maximal history length of SOE:	nos	To be mentioned	
46	- fully programmable automatic printing option of each separate alarm:	-	To be mentioned	
47	- graphical history reporting:	-	To be mentioned	
48	- file type of graphical history reporting:	-	To be mentioned	
49	- numerical history reporting:	-	To be	

SI	GTP-9 Schedule of Guaranteed Technical Characteristics - NMS System	Unit	NESCO's Requirement	Bidder's Guaranteed Value
			mentioned	
50	- file type of numerical history reporting:	-	To be mentioned	
51	- availability reporting:	-	To be mentioned	
52	- programmable alarm forward to email:	-	To be mentioned	
53	- programmable alarm forward via SMS:	-	To be mentioned	
	COMPATIBILITY			
54	In case of multiple NMS to manage telecom equipment from multiple OEM, bidder has to propose an additional umbrella NMS to control from one platform.	-	To be mentioned	

Schedule of Guaranteed Technical Particulars – Substation Firewall

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

Sl	Schedule of Guaranteed Technical Particulars - Substation Firewall	Unit	NESCO Requirement	Bidder's Guaranteed Value
1	**Quality**		ISO 9001/9002 for manufacturer, FCC for quality assurance	
2	**Brand**		To be mentioned by the bidder	
3	**Model**		To be mentioned by the bidder	
4	**Country of Origin**		To be mentioned by the bidder	
5	**Industry recommendations**		The Firewall solution must be rated leader or challenger in the last five Magic Quadrant Report for Enterprise Firewall published by Gartner. It should also be a leader in last Forrester wave report.	
6	**Hardware Architecture**		The appliance-based security platform should provide firewall, Application Visibility Control, IPS and Advance Malware Protection functionality in a single appliance from day one. Solution should have zero-day threat protection coverage from day one. Bidder has to provide NGIPS,AMP & URL filtering license for 3 Years.	
			The appliance should support at least 8 x RJ45 and 8 x 1/10/25G SFP+ ports from day one and should be scalable to provide additional 4*40G ports if required in future. Bidder has to provide 8 x 10G SR OEM original Transceiver from day 1.	
			The appliance hardware should be a multicore CPU architecture with a hardened 64 bit operating system to support higher memory and should support minimum of 128-GB of RAM and 24 CPU Cores.	
			Proposed Firewall should not be proprietary ASIC based in nature & should be open architecture based on multi-core cpu's to protect & scale against dynamic latest security threats.	
			The proposed solution shouldn't use a proprietary ASIC hardware for any kind of performance Improvement. If option to disable ASIC is there than OEM must mention the performance numbers in datasheet.	
			Proposed firewall should not consume more than 1RU of rack space	
7	Performance & Scalability		Should support at least 38 Gbps of Firewall throughput with 1024B packet size.	
			There should not be degradation in performance on	

Sl	Schedule of Guaranteed Technical Particulars - Substation Firewall	Unit	NESCO Requirement	Bidder's Guaranteed Value
			enabling application control (AVC) and Intrusion Prevention (IPS) security features, and should support at least 36 Gbps of NGFW (FW, AVC and IPS) with 1024B packet size.	
			Firewall should support at least 6,000,000 concurrent sessions with application visibility turned on	
			Firewall should support at least 15000 VPN peers	
			Firewall should support at least 2,40,000 new connections per second with application visibility turned on	
			Firewall should have integrated redundant hot-swappable fans	
8	NG Firewall Features		Firewall should support creating access-rules with IPv4 & IPv6 objects, user/groups, application, geolocation, url, zones, vlan, etc	
			Firewall should support manual NAT and Auto-NAT, static nat, dynamic nat, dynamic pat	
			Firewall should support Nat66 (IPv6-to-IPv6), Nat 64 (IPv6-to-IPv4) & Nat46 (IPv4-to-IPv6) functionality	
			Should support Static, RIP, OSPF, OSPFv3 and BGP, BGPv6	
			Should support Multicast protocols like IGMP, PIM, etc	
			Should support capability to integrate with other security solutions to receive contextual information like security group tags/names	
			Should have the capability of passively gathering information about virtual machine traffic, network hosts and their activities, such as operating system, services, open ports, client applications, and vulnerabilities, to assist with multiple activities, such as intrusion event data correlation, elimination of false positives, and policy compliance.	
			Solution must be capable of passively gathering details unique to mobile devices traffic to identify a wide variety of mobile operating systems, mobile applications and associated mobile device hardware.	
			Should support more than 3000 (excluding custom application signatures) distinct application signature as application detection mechanism to optimize security effectiveness.	

Sl	Schedule of Guaranteed Technical Particulars - Substation Firewall	Unit	NESCO Requirement	Bidder's Guaranteed Value
			Should be capable of dynamically tuning IDS/IPS sensors (e.g., selecting rules, configuring policies, updating policies, etc.) with minimal human intervention.	
			Should support more than 25,000 (excluding custom signatures) IPS signatures or more. Should support capability to configure correlation rule where multiple rules/event can be combined together for better efficacy	
			Should be capable of automatically providing the appropriate inspections and protections for traffic sent over non-standard communications ports.	
			Should be able to link Active Directory and/or LDAP usernames to IP addresses related to suspected security events.	
			Should be capable of detecting and blocking IPv6 attacks.	
			Should support the capability to quarantine end point by integrating with other security solution like Network Admission Control	
			The solution must provide IP reputation feed that comprised of several regularly updated collections of poor reputation of IP addresses determined by the proposed security vendor	
			Solution must support IP reputation intelligence feeds from third party and custom lists of IP addresses including a global blacklist	
			The Appliance OEM must have its own threat intelligence analysis center and should use the global footprint of security deployments for more comprehensive network protection.	
			The detection engine should support capability of detecting and preventing a wide variety of threats (e.g., network probes/reconnaissance, VoIP attacks, buffer overflows, P2P attacks, etc.).	
			Should be able to identify attacks based on Geo-location and define policy to block on the basis of Geo-location	
			The detection engine should support the capability of detecting variants of known threats, as well as new threats	

Sl	Schedule of Guaranteed Technical Particulars - Substation Firewall	Unit	NESCO Requirement	Bidder's Guaranteed Value
			The detection engine must incorporate multiple approaches for detecting threats, including at a minimum exploit-based signatures, vulnerability-based rules, protocol anomaly detection, and behavioral anomaly detection techniques.	
			Firewall should support time based policies, where policies can be enforced for certain time ranges like hours, days, weeks, etc.	
			Firewall should provide integrated DNS security, where firewall should block traffic based on the domain name requested by a client	
			Should support Open based Application ID for access to community resources and ability to easily customize security to address new and specific threats and applications quickly	
9	URL Filtering Features		Should must support URL threat intelligence feeds to protect against threats	
			Should support Reputation- and category-based URL filtering offering comprehensive alerting and control over suspect web traffic and enforces policies on more than 270 million of URLs in more than 78 categories.	
			Should support safe search for YouTube EDU enforcement	
10	Hardware		Temperature Operating: 0 to 40°C	
			Temperature Nonoperating: -20 to 65°C	
			Humidity: 10 to 85% noncondensing	
11	Warranty		Minimum 3 (Three) years warranty for OEM, Manufacturer's warranty part number should be mentioned. The OEM should have local office & Depot in Bangladesh and 24x7x365 Global TAC support	

.

Schedule of Guaranteed Technical Particulars – Substation UPS

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

SI	Schedule of Guaranteed Technical Particulars – Substation UPS	(Unit)	NESCO Requirement	Bidder's Guaranteed Value
1	Brand		To be mentioned by the supplier/tenderer.	
2	Model		To be mentioned by supplier/tenderer.	
3	Country of Origin		To be mentioned by the supplier/tenderer.	
4	Country of Manufacture		To be mentioned by the supplier/tenderer.	
5	Technology		Online	
6	Capacity		>=3 kVA	
7	Transfer time		0ms	
8	Backup Time		6 Hours	
9	Wave shape		Simulated Sine Wave	
10	Input Voltage		100-288Vac 3-wire (1phase, neutral and ground	
11	Input Frequency		50Hz	
12	Output Voltage		Selectable 220/230/240V, 3 Wire (1-phase neutral and ground) 50/60HZ auto sensing) .9 power factor	
13	Output Frequency		50Hz +- .5% (AC input) Auto Tracing	
14	Computer Interface		Support RS 232 for UPS monitoring Software	
15	Battery		Sealed Maintenance free Lead Acid.	
16	Battery Charging		6-8 hours up to 90% Capacity	
17	Protection		Lighting, Spike, Surge, Flicker, Over/under Voltage. Over Load, Short Circuit. Battery low (Deep Discharge) & Noise. (EMI/RFI) followed by International Safety Standard.	
18	Operating Temperature		0^{o} to 50^{o}	
19	Operating Humidity		0 to 95 non-condensing	
20	Brochure and CDs		All brochure, instruction manual and driver CDs should be supplied with the product	
21	Connection Cables		All necessary my power and data connection cables to be supplied along with the product	
22	Warranty Period		Full 3(three) years replacement and instant service warranty. Replacement time maximum 7	

Sl	Schedule of Guaranteed Technical Particulars – Substation UPS	(Unit)	NESCO Requirement	Bidder's Guaranteed Value
			(Seven) days.	

.

Schedule of Guaranteed Technical Particulars - Modem

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

SI	Schedule of Guaranteed Technical Particulars - Modem	(Unit)	NESCO Requirement	Bidder's Guaranteed Value
1	Brand		Any International reputed brand, operating in the recognized continental markets for decades.	
2	Model		To be mentioned by the supplier/tenderer.	
3	Country of Origin		To be mentioned by supplier/tenderer.	
4	Country of Manufacture		To be mentioned by the supplier/tenderer.	
5	Band		3G/LTE/4G	
6	SIM		Internal SIM interface, Push-push SIM holder.	
7	Transmission Channel		Wireless Modem	
8	Data Speed		Download minimum 100 Mbps, Upload minimum 100 Mbps	
9	APN		Support for multiple APNs.	
10	OEM		Yes	
12	Interface		Data interface: USB specification 2.0 compliant full-speed.	
13	Display		LED display, simple integration via plug & play.	
14	Power		USB bus-powered, requires no external power supply.	
15	Dimensions		To be mentioned by Bidder	
16	Weight		To be mentioned by Bidder	
17	Size		Highly compact, light and powerful.	
18	OS Support		OS: Windows XP or higher.	
19	Memory		MicroSD card slot up to 32GB	
20	Package Contents		Modem, USB Extension Cable,Box.	
21	Features		Data/SMS	
22	Warranty Period	(Calendar Year)	Full 03(three) years replacement and instant service warranty. Replacement time maximum 07(Seven) days.	

.

Schedule of Guaranteed Technical Particulars - Workstation

.

VOLUME 2 Section 8.0 – Guaranteed Technical Particulars SDSI-NPLC-GTP

Manufacturer		Enclosed Catalogues / Brochures
Country of Origin		
		Enclosed Technical Information / Descriptions
Factory Address		
Type Designation of Offered Equipment		Enclosed Method Statements
Proposed Application in this Project		Enclosed Drawings
Deviations from Technical Requirement		Enclosed Quality Control Documentation
		Compliance to International Standards
Remarks		Enclosed Type Test Reports

SI	Schedule of Guaranteed Technical Particulars - Workstation	Unit	NESCO Requirement	Bidder's Guaranteed Value
1	COUNTRY OF ORIGIN		To be mentioned by bidder	
2	PROCESSOR		Intel® vPro®, an Intel® Evo™ Design with 12th Gen Intel® Core™ i7 processor	
3	OPERATING SYSTEM		Up to Windows 11 Pro. Windows 10 Pro preinstalled through downgrade rights in Windows 11 Pro	
4	GRAPHICS		Intel® Iris® Xe Graphics	
5	CAMERA		HD RGB, FHD RGB, or FHD Hybrid IR camera with webcam privacy shutter	
6	MEMORY		Minimum 32GB LPDDR5 (4800Mhz)	
7	STORAGE		Minimum 2TB Gen 4 performance PCIe SSD	
8	BATTERY		Up to 57 Whr battery, AC ADAPTER, Up to Type-C 65W (supports RapidCharge)	
9	AUDIO		Dolby® Audio™ Speaker System with Dolby® Voice 2x User-facing Microphones	
10	INPUT/OUTPUT PORTS		2x Thunderbolt™ 4 2 x USB-A 3.2 Gen 1 1x HDMI 2.0b 1x Audio (headphone and microphone combo jack)	
11	WIRELESS		Intel® Wi-Fi 6E (requires Windows 11 Pro) 5G sub-6 (CAT20) with eSIM 4G/LTE (CAT16) with eSIM 4G/LTE (CAT4) Bluetooth® 5.2	
12	NFC		Yes	
13	DOCKING		Thunderbolt™ dock USB-C dock	
14	Security		Intel vPro® Security Secured-core PC	

Sl	Schedule of Guaranteed Technical Particulars - Workstation	Unit	NESCO Requirement	Bidder's Guaranteed Value
			Enabled Power-On Touch Fingerprint Reader FHD IR Hybrid camera PrivacyGuard Display dTPM 2.0 chip Webcam privacy shutter Tile-ready Kensington™ Nano lock slot	
15	Display		Maximum 14" WUXGA (1920 x 1200), IPS, Anti-Glare, Touch, 45%NTSC, 300 nits, 60Hz, Narrow Bezel, Low Weight	
16	DIMENSIONS (W X D X H)		To be mentioned by bidder	
17	Weight		Maximum 2.70 lbs / 1.22 kg	
18	KEYBOARD		Standard and backlit keyboard with TrackPoint and 115 mm wide TrackPad	
19	COLORS		To be mentioned by bidder	
20	MATERIAL		To be mentioned by bidder	
21	CERTIFICATIONS		EPEAT® Gold, registered in the U.S., Canada, and Germany ENERGY STAR® certified TCO v9	

Appendix-3: Lot Details/Breakdown for Thermographic Camera System

Item Type	Name of Item	Quantity	Unit
Thermal Network Camera, NVR, Local Storage HDD	Thermal PTZ camera	59	Pcs
	Thermographic Network Outdoor Bullet Camera	236	Pcs
	Thermographic Network indoor turret Camera	58	Pcs
	Panoramic Color Fixed Turret Network Camera	88	Pcs
	128 GB Surveillance Grade SD Card	441	Pcs
	NVR-16 Channel	88	Pcs
	POE Switch (Gigabit) 16 Port	88	Pcs
	8 TB Enterprise HDD	176	Pcs
Central Monitoring Software	Security management software	1	No
		441	No
		353	No
	Server	1	No
Video Wall	Smart Wall Module	1	No
	55-inch 3.5mm LCD Display Unit	1	Pc's
	Frame	16	Pc's
	Pedestal	16	Pc's
	Decoder	5	Pc's
	Video Wall Controller	1	Pc's
	Input Board	5	Pc's
	Output Board	5	Pc's

Item Type	Name of Item	Quantity	Unit
	42 U server rack	2	Pc's
Storage	**24-slot SAN Storage**	5	Pc's
	10 TB Enterprise HDD	100	Pc's
UPS for Certral surveillamnce center	**10KVA Online UPS**	1	Pc's
Access switch	**10Gpbs ethernet Access switch**	1	Pc's
Surge Protector (20KA)	**Surge Protector Ethernet Lighting Arrester**	442	Pc's
UTP CABLE, POWER CABLE/SOLUTION, ACCESSORIES (MOUNTING POLE, PVC PIPE/CHANNE ETC.)	**CAT6 UTP Network Cable**	88	Box
	Power Solution	88	Lot

Item Type	Name of Item	Quantity	Unit
	Accessories-PVC Pipe, Channel & related all passive products supply & commission	88	Lot
	Mounting Pole with Civil works	176	Pc's
	9U Server rack	88	Pc's
Cable laying, Camera installation and configuration	**Cable laying, Camera installation and configuration in each PV plant**	88	Pc,s
	Central Monitoring room	1	Pc's
	Service and maintenance (01 year)	1	Pc's

Appendix-4

Warranty Certificate (Form PG5A - 12)

[The Tenderer shall require to fill in this Form in accordance with the instructions indicated. This Certificate should be on the official pad of the Tenderer and should be signed by a person with the proper authority to sign documents.]

[The Tenderer shall include it in its Tender, if so indicated in the TDS as stated under ITT Sub Clause 24.2 (r)]

Invitation for Tender No:	Date:
Tender Package No:	
Tender Lot No. (when applicable):	
To: [Name and address of Procuring Entity]	

WHEREAS

We [insert complete name of Tenderer],

who are authorized Supplier of [insert type of goods to be Supplied], having registered office at [insert full address of Tenderer's registered office] do hereby warrants that all the Goods [insert name and brief description of the Goods] will be supplied by us and extend our full guarantee and warranty as stated under GCC Clause 42.2 of the General Conditions of Contract with respect to the Goods offered by us under this contract.

Signed: [insert signature(s) of authorized representative(s) of the Tenderer]
Name: [insert complete name(s) of authorized representative(s) of the Tenderer]
Address: [insert full address including Fax and e-mail]
Title: [insert title]
Date: [insert date of signing]

Appendix-5: Lot Details/Breakdown for O&M toolset with Multimeter			
Sl. No.	**Name of Item**	**Quantity**	**Unit**
1	**Drill Machine**	1	Set
2	**Toolbox**	1	Set
3	**Adjustable Range**	1	No
4	**Rotary Cutter**	1	No
5	**Tube Cutter**	1	No
6	**Anti-Cutter**	1	No
7	**Combination Range**	1	Set
8	**Screw Driver**	1	Set
9	**Scissor**	1	No
10	**Iron Hammer**	1	No
11	**Pliers and Cutters (Different Types)**	1	Set
12	**Wire Stripper**	1	No
13	**True RMS Multimeter**	1	No
14	**Any other accessories necessary for operation and maintenance**	1	Set