



NORTHERN ELECTRICITY SUPPLY COMPANY LIMITED

[An Enterprise of Bangladesh Power Development Board]

Superintending Engineer
Procurement
NESCO Ltd., Rajshahi

Memo No: 27.29.0000.012.07.05.19.168

Date: 12/03/2019

2nd Amendment of Tender Notice & Document

Tender Name: Establishment of Data Centre for NESCO Ltd. on Turnkey Basis.

Tender Ref. No: NESCO/Procurement/2019/75, Date: 30/01/2019

Notice Sl. No	Subject to be Amended	Existing As	Shall be Amended As
17	Last Date and Time for Selling the Tender Document	13/03/2019 up to 2:00 P.M (BST)	01/04/2019 up to 2:00 P.M (BST)
18	Last Date and Time for Submission of Tender	14/03/2019, 11:00 AM BST	02/04/2019, 11:00 AM BST
19	Tender Opening Date & Time	14/03/2019, 11:30 AM BST	02/04/2019, 11:30 AM BST

Amendment of Tender Document

Sl. No	Page No.	Section No.	Item No.	Written As in Tender Document	Shall Be Amended As
01.	27	2	ITT 14.1(b)	The minimum specific experience as Supplier in supply of similar Goods and related services [includes development of Data center physical infrastructure (passive, power, cooling), data center computing, hyper converse server system, storage, networking, back up and virtualization infrastructure etc.] of at least 02 (Two) contract(s) successfully completed within the last 07 (Seven) years each with a value of at least Tk. 7 (Seven) Crore; years counting backward from the date of publication of IFT in the newspaper.	The minimum specific experience as Supplier in supply of similar Goods and related services [includes development of Data center physical infrastructure (passive, power, cooling), data center computing, hyper converse server system, storage, networking, back up and virtualization infrastructure etc.] of at least 02 (Two) contract(s) (Each partner must have one (01) & Leading Partner must have 02 (Two) in case of JVC) successfully completed within the last 07 (Seven) years each with a value of at least Tk. 7 (Seven) Crore; years counting backward from the date of publication of IFT in the newspaper.
02.	27	2	ITT 15.1(a)	The minimum amount of liquid assets i.e. working capital of the Tenderer shall be Taka 18 (Eighteen) Crore. [Supported by last Three (03) years Audited Financial Reports.]	The minimum amount of liquid assets i.e. working capital of the Tenderer shall be Taka 18 (Eighteen) Crore. [Supported by last Three (03) years Audited Financial Reports of Tenderer. Each Partner must have at least 10 (ten) Crore in case of JVC]
03.	29	2	ITT 21.1(l). 19	Newly Added	All the certificates, supply records & other related documents must be in English.
04.	29	2	ITT 28.1(f)	Manufacturer's Authorisation is required for all the items [All active parts, passive parts (from 2.4 to 2.9)] listed in Section 6: Schedule of Requirements stating that "the tenderer is authorised representative of the manufacturer for supplying the offered type goods" in manufacturer's official pad. The tenderer shall have to submit the authorisation letter from OEM regional head quarter (under which Bangladesh fall). Also the manufacturer's authorisation of OEM regional head quarter is required.	Manufacturer's Authorisation is required for the items [Passive parts (AVR, TVSS, SPD, ATS/STS, Isolation Transformer, MDB, IPCAM & Surveillance Solution, Access Control Solution, Fire Detection & Suppression System, VESDA, Rodent System, Comfort AC, Dehumidifier)] listed in Section 6: Schedule of Requirements stating that "the tenderer is authorised representative of the manufacturer for supplying the offered type goods" in manufacturer's official pad. The tenderer shall have to submit the authorisation letter for the items [All active parts] listed in Section 6: Schedule of Requirements from OEM regional head quarter (under which Bangladesh fall). Also the manufacturer's authorisation of OEM regional head quarter is required.
05.	31	2	ITT 70	New clause	JVC is allowed:

			(New clause)		<p>Two Partners will be allowed for JVC (Joint Venture Consortium).</p> <p>JV agreement shall be executed on a non-judicial stamp of TK 300 or alternately with the intent to enter into such an agreement supported by a Letter of Intent along with the proposed agreement duly signed by all legally authorized partners of the intended JV and authenticated by a Notary Public, with the declaration that the partners will execute the JV agreement in the event the Tenderer is successful.</p> <p>Each partner of the JV shall be jointly and severally liable for all liabilities and ethical or legal obligations to the Employer for the performance of the Contract.</p> <p>JV shall nominate the Lead Partner as a REPRESENTATIVE being entrusted with the Contract administration and management at Site who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the Tendering process and, in the event the JV is awarded the Contract, during contract execution including the receipt of payments for and on behalf of the JV.</p> <p>If any of the partners of JV has been debarred from participating in any procurement activity due to corrupt, fraudulent, collusive or coercive practices, the bid will be rejected and /or the contract shall be terminated.</p> <p>Each party of JV shall have to fill up the Tenderer Information Sheet {PG3-2} properly and submit it, which will be supported by necessary documents.</p>
06	Item Name: Generator			Item Will be deleted from Price Schedule, Schedule of Requirements & GTP.	

Amendment of Guaranteed Technical Particulars (GTP):

Section No.	Section name	Page No.	Existing Specification/Requirements		Shall Be Amended As
4.4.1	Guaranteed Technical Particulars (GTP) of Online UPS	93	Brand	Emerson/APC	Emerson(VERTIV)/APC/ABB
		93	Country of Manufacture	EU/USA	EU/USA/Philippines
			Country of shipment	EU/USA	EU/USA/Philippines
		97	Total Battery Capacity	Minimum 54 KVA which is calculated To be specify by the bidder in order to fulfil 30 minutes UPS backup at full(100%) load pf=0.9 or higher	Minimum 70 KVA which is calculated To be specify by the bidder in order to fulfil 30 minutes UPS backup at full(100%) load pf=0.9 or higher
4.4.10	Electrical Cabling System for Data Center	113	Cables Brand	BRB/ BBS/ Paradise/ POLY	BRB/ BBS/ Paradise/ POLY / EASTERN CABLES
			Cabling System	Cable measurement	Bidder has to provide unit price as well as price for following measurement. NESCO shall pay for at actual. 1C -1.5 mm2 FRLS Cable 600 Meter

					<p>1C -2.5 mm2 FRLS Cable 200 Meter 1C -4.0 mm2 FRLS Cable 200 Meter 1C-16 mm2 NYY/XLPE Cable 100 Meter 1C-25 mm2 NYY/XLPE Cable 100 Meter 1C-35 mm2 NYY/XLPE Cable 50 Meter 1C -50 mm2 NYY /XLPE Cable 100 Meter 1C -70 mm2 NYY /XLPE Cable 250 Meter 3C-6 mm2NYY 312 Meter</p> <p>-----</p> <p>1C-1.5mm2 BYA Cable(Green) 500 Meter 1C-2.5mm2 BYA Cable(Green) 300 Meter 1C-4.0mm2 BYA Cable(Green) 200 Meter 1C - 6 mm2 BYA Cable(Green) 200 Meter 1C - 16 mm2 BYA Cable(Green) 100 Meter 1C - 35 mm2 BYA Cable(Green) 100 Meter 1C -50 mm2 BYA 100 Meter</p>
4.5.4	Guaranteed Technical Particulars (GTP) of Fire Detection and Suppression System	146	NAFS 125 with Cylinder & Accessories (server Room & PAC Room)		NAFS 125/NOVEC1230 with Cylinder & Accessories (server Room & PAC Room)
			NAFS 125	Brand: Please Specify, Country Of Origin: EU or USA, Composition: HFC-125+ 0.15% of Limonene safe due to fast extinguishment of fires (discharge in 10 seconds compared to 60 seconds for inert gases) Internationally recognized:UL Listed,ISO accredited.	NAFS/NOVEC1230
4.5.6	Guaranteed Technical Particulars (GTP) of Rodent System	152	Country of Origin	EU/USA	EU/USA/India
4.6.1	Guaranteed Technical Particulars (GTP) of Precision Air Cooling for Server Room	154	Precision Air Cooling for Server Room	Brand Emerson/Stulz/Uniflair	Brand Emerson/Stulz/Uniflair/Bluebox
4.7.1	Network Racks	165	Minimum. 750 mm (W) x 1070 mm (D)		Minimum. 750-800 mm (W) x 1000-1200 mm (D)

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4.9.1	Guaranteed Technical Particulars (GTP) of CAT 6 Cabling Solution	171	Country of Manufacturing : USA/EU	For All These Items Country of Origin: USA/EU/KOREA/JAPAN Country of Manufacturing: USA/EU/KOREA/JAPAN
4.9.1	Category 6, 24 port Patch Panel	172		
4.9.1	Category 6, Modular Jack	174		
4.9.1	Category 6, Patch Cord 1 mtr	176		
4.9.1	Category 6, Patch Cord 3mtr	177		
4.9.1	UTP CAT6 A Cable	178		
4.9.1	Category 6A, 24 port Patch Panel (LED)	179		
4.9.1	Category 6A , Modular Jack (LED)	180		
4.9.1	Category 6A, Patch Cord 1 meter	182		
4.9.1	Category 6A, Patch Cord 2 meter	183		
4.9.1	Category 6A Patch Cord 3mtr	184		
4.9.2	Guaranteed Technical Particulars (GTP) of Optical Cabling Solution	187		
4.9.2	Fiber LIU 24 Port Loaded	187		
4.9.2	Fiber Patch Cord 3mtr/5mtr/10mtr/15mtr	189		
4.9.2	Pigtail	189		
1	Server Type-1	196	Should be proposed with minimum 240GB SATA M.2 SSD as boot drives and 240GB Enterprise Value SATA SSD for system log on each server • Should propose with 32GB internal Flex Flash SD cards • Should support for RAID 0 mirroring between two SD cards	Should be proposed with minimum 1 unit of 375GB NVMe SSD for Storage Data Tiering and caching per server node. • Should propose with 32GB internal Flex Flash SD cards
5	Server Type-3	211	<ul style="list-style-type: none"> • Should propose with internal Flex Flash SD cards (32, 64 or 128 GB) for installing an operating system or hypervisor • Should support for RAID 0 mirroring between two SD cards • Should support with dedicated Baseboard Management Controller (BMC) Micro SD card (32 GB) for server utilities • Should support dual M.2 SATA SSD or NVMe 	<ul style="list-style-type: none"> • Should propose with internal Flex Flash SD cards (32, 64 or 128 GB) for installing an operating system • Should support dual M.2 SATA SSD or NVMe
			Should be proposed with minimum 128 GB of DDR4 Memory.	Should be proposed with minimum 384 GB Total memory of DDR4 Memory.
7	Edge Switch	215	Switch should be stackable / virtual chassis link or similar technology from day 1 with 60Gbps Stack capacity.	Switch should be stackable / virtual chassis link or similar technology from day 1 with Minimum 60Gbps Stack capacity. Bidder can proposed same or higher capacity.

			Forwarding rate (64-Byte L3 Packets) - minimum 85 Mpps	Minimum Forwarding rate (64-Byte L3 Packets) should be 85Mbps. Bidder can quote Higher Forwarding rate.
			Support port Auto negotiation, MDIX, LACP, UDLD	Minimum Requirement is Auto negotiation, MDIX, LACP, UDLD. Bidder proposed additional feature
8	Core Router	218	Dedicated Route Processor with Quad Core Processor	Minimum Requirement is Quad core processor. Bidder can proposed Higher code
		221	Router should support more than 14,000 queues or 8 queue per port	Minimum requirement is to support 14,000 queues.
			Should support IEEE 802.1AE standards based Layer 2 hop-by-hop encryption	Minimum requirement is IEEE 802.1AE standards based Layer 2 hop-by-hop encryption.
9	Core Switch	223	Support Dual-stack for IPv4/IPv6 for IPv4-to-IPv6 migration.	Minimum requirement is to Support Dual-stack for IPv4/IPv6 for IPv4-to-IPv6 migration.
10	Core Firewall	225	The appliance hardware should be a multicore CPU architecture with a hardened 64 bit operating system to support higher memory Proposed IPS 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 appliance hardware should be a multicore CPU architecture with a hardened 64 bit (minimum) operating system to support higher memory Proposed IPS 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.
		227	Should have more than 4000 application layer and risk-based controls that can invoke tailored intrusion prevention system (IPS) threat detection - policies to optimize security effectiveness.	Minimum Requirement is 4000 application layer and risk-based controls that can invoke tailored intrusion prevention system (IPS) threat detection policies to optimize security effectiveness.
11.	Server Farm Switch	229-232		Note: Bidder can propose converged switch from any OEM.
14.	Distribution Switch	241	Must have 30 MB of shared buffer for traffic/packet Queuing and processing	Minimum Requirement is 30 MB of shared buffer for traffic/packet Queuing and processing.
15.	Access Switch	244	Support 20 MB of shared buffer for traffic/packet Queuing and processing	Minimum Requirement is Support 20 MB of shared buffer for traffic/packet Queuing and processing. Bidder can Quote extra features.

GTP No. 4.5.3 (Guaranteed Technical Particulars (GTP) of Datacenter Infrastructure Monitoring System) will be replaced as follows-

Sl No	Item	Item Description
Datacenter Infrastructure Management and Control		
A	Make & Model	
S#	Parameter	Bidder to supply and implement proposed DCIM solution including hardware/Virtual server, dcim application/os, dcim db, dcim software licenses for successful installation of DCIM application.
A1	Brand	Please Mention
A1.1	Model	Please Mention
A1.2	Country of Origin & Manufacture	USA/EU

A1.3	Basic Parameters	<p>The Gateway/Field Device Aggregation Device (DIN rail panel mounted) so proposed to integrate third party BMS/BMS controllers and/or Field devices should be capable of integrating all the three protocols at the same time:</p> <ol style="list-style-type: none"> 1. Modbus 2. Bacnet 3. Lonworks. <p>In case the bidder is not able to comply to all three protocols using the same convertor then it will be considered as a Disqualification to apply for the complete DCIM project.</p>
		<p>For all Electrical side installations eg. Energy Meters, Field level device integration to Gateways: design, equipment, installation and/or factory on site testing shall conform to the requirements of the following codes and standards:</p> <ol style="list-style-type: none"> a. Underwriters Laboratory (UL Listed) b. MS IEC 60364 – Code of practice for Electrical Installation c. BS 7430 – Code of practice for Earthing d. All other Authorities having jurisdiction over the installation of equipment and carrying out this contract works in the locality. <p>In addition, compliance with requirements of the local code authority having jurisdiction shall be included if the requirements affect manufacturing of the equipment. It is to note that if a later version of any of the above standards is available at the time of issuance of this document, the more stringent version shall take precedence.</p>
		<p>Proposed DCIM system should be modular and support perpetual licensing which provides us flexibility to purchase and expand enhanced modules according to our future need. The DCIM should be able to run on a physical, virtualized server and Cloud Based Expansion.</p>
		<p>DCIM software licensing should be Perpetual in nature which means that license once bought for various polled devices/racks etc never expire. However the end client is free to buy extension of software warranties on yearly basis to keep up to date with new releases as and when they are launched.</p>
		<p>DCIM system shall be installed at the Data Centre site and will have the ability to aggregate data back to an enterprise dashboard at Head Quarters (HQ). The HQ dashboard can be used to drill in to specific site for detail information. HQ and Datacenter site may or may not be at the same location where the DCIM is installed.</p>
		<p>Proposed DCIM solution should be designed with a top-level 10/100bT Ethernet network, using the BACnet®/IP, LonWorks®/IP, SNMP, and/or Modbus® TCP protocol. DCIM platform should also be capable of pushing monitored device information to any Third Party NMS system using SNMP INFORM/REQUEST procedures and to third party BMS system using Modbus TCP out channel. By this the DCIM system should ensure it integrates back to commonly needed Infrastructure devices like CRAC, Diesel Generators, Energy Meters, Branch Circuit Power meters, Rack mount Intelligent Pdu and Rack Environmental Monitoring systems. (This has to be synched with the Baseline Study as mentioned in A.1.12.)</p>
		<p>The installed system shall be able to use web services to “consume” information within the Network with other products and systems.</p>
		<p>DCIM server/VM system should allow integration of client email server via SMTP channel as well as it should support integration to SMS Gateway servers by utilizing the HTTP post Method.</p>
		<p>DCIM system should be able to create reports in at least .CSV formats.</p>
		<p>After the allocation of Project to a respective DCIM OEM bidder, DCIM OEM has to perform a mandatory baseline Audit of the Datacenter where the proposed DCIM system has to be installed to benchmark on the following areas:</p> <ol style="list-style-type: none"> a. Current state of the datacenter with respect to Power, Cooling and Space Utilization. b. Key Findings and concerns which require immediate attention and remedial actions for the same. c. Existing Datacenter management procedures vs Change recommended to ensure a best fit DCIM implementation. d. Develop a Proper Maturity Model for the Implementation of the proposed DCIM system in discussion with the client team.
A1.4	Energy Reporting	<p>The application should provide real time Power Usage Effectiveness (PUE), DCIE values and able to deliver Weekly, Monthly, Quarterly & Yearly PUE report.</p>
		<p>DCIM should be able to generate Custom Dashboard and Reports pertaining to Energy sub systems for example:</p> <ol style="list-style-type: none"> a. Using the values from various sources it should be able to custom create Formula based Report and Dashboard to show PUE values.

		b. Using the values from various sources it should be able create Custom Energy Reports or Cost Reports as may be needed by us.
B	Installation	Testing and Commissioning
		The DCIM contractor shall carry out tests for all equipment as required for integrating the same to DCIM. These tests shall comprise: a. Test for compliance with Statutory Authorities where required. b. Test for operation and performance as specified to establish that the systems are operating within the specified limits, for the purpose of practical completion.
		The DCIM contractor shall give reasonable notice when tests are to be carried out and a time shall be agreed so that the S.O. or his representatives may be present.
		The DCIM contractor shall keep a record of test carried out and the results thereof and these records shall be compiled into test report.
C	Architecture	DCIM connectivity Architecture
C1	Layers	Proposed DCIM should be created in separate installations to maintain sanctity of data as follows: a. Gateway/Convertor Devices: Required for connecting to third party BMS/ third party BMS controllers/field devices and building side device Integrator system. b. Monitoring layer: Responsible for polling all Infrastructure Monitoring Points. OEM is free to create the following independent Polling Systems: Polling System 1: SNMP base Infrastructure devices inside the datacenter like Rack Mount PDU, EMS systems Polling System 2: Building side devices operating on core Building side protocols like BACNET, LONWORKS, MODBUS RTU etc. c. Operations Layer: Responsible for Analytics and Insightful data analysis of dcim data points. d. Customized Report generator to integrate with Operations and Monitoring Layers e. Cloud based Remote Monitoring Services for DCIM integrated devices (The information should be transferred between the Client Site to OEM Remote Monitoring Cloud site using 2048 bit RSA certificate with in transit 128 bit AES encryption)
		Proposed DCIM SOFTWARE system will utilize Virtualized Infrastructure architecture to provide a redundancy for both Monitoring and Management Layers. This mechanism of Redundancy shall be automatic and should not be confused with a manual process to retrieve any data dump and then recreate a crashed machine to bring up a crashed DCIM machine. To achieve such architecture, the bidder is free to add Third Party redundancy systems as a part of the proposed solution. This complete Redundant system has to be deployed at the same site to avoid any speed lag issues while accessing the core system.
		As a second layer of data security the DCIM system should have Automated NFS share or SAN/NAS backup mechanism so that at a certain off peak time complete data backup is dumped to an external shared drive which may or may not be at the same location as the Core DCIM system. This backup daemon should be user customizable in terms of setting at what time the backup of this system should be done by the system.
C2	Workstation for Building Side-Field Devices	For Building Side-Field level devices, controllers or third party BMS system-administration and Programming a dedicated Workstation system has to be provided. These workstations must be running the standard workstation software developed and tested by the manufacturer of the network server controllers and the standalone controllers. No third party front-end workstation software will be acceptable.
		Web-based users shall have access to all system points and graphics, shall be able to receive and acknowledge alarms, and shall be able to control set points and other parameters. All engineering work, such as trends, reports, graphics, etc. that are accomplished from the WorkStation shall be available for viewing through the web browser interface without additional changes.
		1. From the workstation or web station, it shall be possible to configure and download schedules for any of the controllers on the network. 2. Time of day schedules shall be in a calendar style and viewable in both a graphical and tabular view. 3. Schedules shall be programmable for a minimum of one year in advance. 4. To change the schedule for a particular day, a user shall simply select the day and make the desired modifications. 5. Additionally, from the operator web stations, each schedule will appear on the screen viewable as the entire year, monthly, week and day. A simple mouse click shall allow switching between views. It shall also be possible to scroll from one month to the next and view or alter any of the schedule times. 6. Schedules will be assigned to specific controllers and stored in their local RAM

		<p>memory. Any changes made at the workstation will be automatically updated to the corresponding schedule in the controller.</p> <p>7. It shall be possible to assign a lead schedule such that shadow/local schedules are updated based upon changes in the Lead.</p> <p>8. It shall be possible to assign a list(s) of exception event days, dates, date ranges to a schedule.</p> <p>9. It shall be possible to view combined views showing the calendar and all prioritized exemptions on one screen.</p> <p>10. It should accommodate a minimum of 16 priority levels.</p> <p>11. Values should be able to be controlled directly from a schedule, without the need for special program logic.</p>
C3	Dashboard & Reporting System	<p>A Portal Interface should be created within the DCIM system to ensure that all components can depict Top Level Views of complete system on single screen. This will act as a Top Level view of Datacenter performance which will allow links to drill down into more granular systems as and when required.</p> <p>To ensure that client can generate totally user customizable reports any time a completely flexible Dashboard & Reporting System has to be provided along with the DCIM system which hooks up into DCIM system using WEB API, REST, SOAP etc as may be needed to derive the best report at any point of time.</p> <p>To enhance client experience Dashboard & Reporting System should allow integration through common database connections:</p> <ul style="list-style-type: none"> Amazon Elastic Cloud Integration Custom JDBC DB2 HADOOP CLUSTER MYSQL MSSQL ODBC ORACLE POSTGRES SYBASE TERADATA WEBSERVICE
D.	MONITORING LAYER	
D1	Monitoring Points	<p>DCIM OEM should propose a Monitoring System that operates on Ethernet network at the least and talks to Building, Building side device aggregators using MODBUS TCP/WEBAPI/REST/SOAP and at the same it should support SNMP v1 and v3 for devices that have SNMP NMC systems for monitoring them. Owing to criticality aspect of Building side field devices and polling cycles at times required to be at millisecond, it is recommended to have a separate Monitoring server/vm to manage and monitor them. This system should be able to pull and push data of these field devices to Core Monitoring system which is managing SNMP based devices.</p> <p>It is required that the DCIM OEM shares a list of KPI for the client datacenter which will be depicted on the dashboard and/or reports. These KPI will be cross verified by client and client is free to choose all or some from them and accordingly the configuration of deliverables from Building side and SNMP based Infrastructure side devices has to be fine-tuned (Owing to existing client side installation for Building side Field devices all KPI may or not may not be feasible at all times, which has to be discussed with the client and solutions be given to client to resolve them in addition to documenting the same where possible).</p>
D2	Alarm Status Tracking	DCIM Monitoring layer should have Alarm filters in the Monitoring dashboard. The solution should provide alert compression and advanced alerting algorithms including deviation from normal and time over threshold to help reduce false positive alarms.
D3	Email Server Integration	DCIM Monitoring Layer server/VM system should allow integration of client email server via SMTP channel.
D4	Trend Analysis	Should offer Graphical trending analysis for historical data pertaining to day, week, month, year and user defined durations.
D5	Rule Creations for Threshold Alert	Proposed DCIM solution should allow for custom logics for creating Rules of Escalation and Email alerts for various devices based on alarm severity and priority.
D6	Auto Timed Reporting	DCIM Monitoring Layer should allow for Auto Timed/Scheduled Report Emailing to selected audience on required key performance indicators. These Reports should be mailed to relevant users as CSV format.

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D7	SMS server Integration	In case so required the client is free to buy his own SMS Gateway to get alarms over SMS and the Proposed Monitoring System should allow HTTP post method to integrate with such SMS gateways. DCIM OEM shall suggest preferred vendors for SMS GATEWAY to help the client as and when the client requires such a functionality.
D8	Cloud based Remote Monitoring Service.	Proposed Monitoring system should offer in built integration to Cloud Based Remote Monitoring Services from the same OEM who is providing the DCIM. This should be available to client as Service Model which can be enabled or disabled as per Payment of Service Cost per Year basis.
E	OPERATIONS LAYER	
E1	Concept	<p>Operations Layer of DCIM should facilitate the complete Lifecycle approach for Datacenter management involving:</p> <ol style="list-style-type: none"> Analysis Design Implement Operate Evaluate <p>DCIM Operations Layer will have the capability to configure a bird's eye view of the room layout to ensure the layout in the data center model accurately represents the real-world physical environment of the room. This includes any physical attributes of the room such as size, shape, doors, windows, aisles, containments, false floor creations, false ceiling creation and ability to duct the Racks, Containments and CRAC units to False ceiling as per site requirement.</p> <p>DCIM Operations Layer should offer the capability to scan bar codes for assets in order to identify and locate relevant assets in the DCIM system. Bar code scanning should be available through smartphone interfaces offered through IOS or Android Platforms.</p> <p>DCIM Operations Layer should have an ability to import an AutoCAD 2013 dwg floor drawing and display the floor layout. Rooms can be created based on wall detection on the AutoCAD drawing. This is different from the usual SVG/Raster Imaging used and should not be mixed with that which has been provisioned for Monitoring Layer only. The core reason to have AutoCAD Integration is to enable client to push the complete layout as is layer by layer inside the DCIM system without putting an effort into drawing the same inside the DCIM afresh. Many DCIM systems do not allow CAD integration in such a way and hence would not qualify.</p> <p>User will have the capability to toggle on/off for each Layer of AutoCAD imported inside DCIM. This is required since AUTOCAD design may have many layers and within DCIM client may not need all the layers to be viewed and hence should be able to toggle those layers as and when required within the DCIM,</p> <p>DCIM Operations Layer should offer back export of the datacenter design created or modified within DCIM in .DWG format.</p> <p>DCIM Operations Layer should have a combination of Thick client and Web client version so that basic operations tasks can be performed from the web client itself.</p> <p>Web client view of the DCIM should offer at least the following functionalities:</p> <ol style="list-style-type: none"> Perform simple rack inventory edits. Perform quick search and view simultaneous rack front/rear view for the datacenter. User Access Control and license management User Experience customization like Logo and color themes. Customize the language of operation Assign Change Management Tasks to relevant people <p>DCIM Operations Layer will be able to provide a product catalog that contains up-to-date floor and rack mounted data center equipment having drag & drop functionality to populate devices & design DC floor layout within the system as per physical layout/actuals. This product catalog should be periodically updateable with new devices map repository.</p> <p>DCIM Operations Layer should offer inventory and mapping of Direct Current Powered devices like Fuses, Rectifiers along with AC powered. This means that user should be able to create a Power path with both types of sources at the same time if required.</p> <p>The DCIM tool will have the capability to render the floor layout in both 2D and 3D view.</p> <p>DCIM Operations Layer should offer extensive Visual network management and representation of cable route from server to switch. It will show free and occupied ports on servers, switches, and patch panels. See a graphical overview of available network capacity.</p>

		<p>DCIM Operations Layer should offer capability to create Cages on datacenter floor and visualize the same in both variants: a. Glass cage b. Mesh Cage c. Solid wall. Cages should not be confused with Zones or Rows as Row or Zone mapping is different to Caging.</p> <p>DCIM should offer complete information on the layout view for the following parameters:</p> <p>a. Empty Racks b. Filled Racks: stating the Racks are being used by a Process/Client c. Reserved: Racks reserved for a specific Process/Client d. Internal Use: Racks reserved for some Internal requirements</p> <p>With reference to Space Management in Datacenter, DCIM should offer following information on the layout view for the following parameters:</p> <p>a. Room Area b. Reserved Area: For specific Process/Client c. Closed: Area filled already and is not available d. Internal Use: Area used by Internal Racks e. Space Efficiency: Ratio between Room Area and sum of Reserved Area, Closed Area and Reserved Area.</p> <p>The proposed solution must offer intuitive, color-coded drawings in both plan and rack elevation views which allows users to:</p> <ul style="list-style-type: none"> - View Rack U-space availability - View Rack Power availability - View Rack weight/Floor Loading - View Raised Floor & Rack space utilization
E2	Sandbox Testing	DCIM Operations Layer should offer a dedicated Test Environment within the same solution which can import the live datacenter 3D layouts and all power, cooling, network and space details into a separate Sandbox Test Model without impacting the live functionality of the Management Layer. This will be used to simulate to simulate different scenarios, for example, whether the design is strong enough to cover your future requirements. If you continue to add equipment at the current pace, would the power supply suffice, or would you need additional power supplies or cooling units; would you continue to have the necessary redundancy, etc. Changes to these lab models should not affect the model of the actual live environment in Core DCIM Operations Layer.
E3	Predictive Analysis	Predictive Analysis/What If Analysis & Hypothetical Provisioning/Modeling to ease decision making (such as: where is the best place to put a new server, Am I having sufficient power, cooling & space to place new equipment, etc.)
E4	Power Path Map	The System should offer mapping capability from UPS to individual Rack within the datacenter. This mapping should be made available as a Power Layout Map within the system.
E5	Impact Simulation	<p>Impact simulation: Generates a list of equipment that would be impacted if the selected piece of equipment, e.g. a UPS or cooling unit, about to fail or put in maintenance mode.</p> <p>The DCIM tool will have a dedicated Equipment browser view where device Fields can be customized and sorted as per user need. It should allow for export of these data fields in the same format in a CSV file which can be opened in Excel as set by the user in the Equipment browser and also to save these formats for later use inside the DCIM.</p>
E6	Recommendation Engine	<p>As a part of the Management Layer it is expected that DCIM tool helps Datacenter Manager with insights into day to day activities for the datacenter including and not limited to:</p> <ol style="list-style-type: none"> 1. U space occupancy details for equipment 2. Floor loading of the Racks 3. Airflow across the perforated tiles 4. Power path configurations 5. Power Draw configurations across Supply Breakers 6. Redundancy of Power supply to Racks 7. Rack's estimated and Peak Load values 8. Associated Device Data Communication Lost
F	Datacenter Thermal Analysis & Design	<p>The graphical floor plan of the configured data center layout should include overlays showcasing:</p> <ol style="list-style-type: none"> A. Capture index (CI), B. Under floor Plenum pressure, C. Under floor Plenum velocities D. 3D rendering of the temperature map (including airflow and temperature thresholds) <p>As the design takes place, client will get a qualified estimation of the effect of changes in:</p> <ol style="list-style-type: none"> A. Supply temperature

		<p>B. Airflow</p> <p>C. Number of cooling units and room-based cooling parameters. The data is expected to be simulated on the basis of plate rating of various cooling devices, racks, perforated tiles, grilles etc.</p> <p>Even with more number of Cooling Units in a room the datacenter may not be able to gather enough cooling and an idea about the Capture Index is always a good idea so DCIM should be able to depict the CI for the Racks across the perforated tiles.</p> <p>Airflow across the plenums whether it is false flooring or the return air duct, plays a very crucial part and DCIM should be able to depict the velocity vectors across the plenums clearly with any change in the datacenter layout immediately reflecting on velocity vectors. In no way velocity vector be treated as normal speed as speed and velocity vectors are two different concepts hence any defiance in showing velocity vector will be considered as Non Compliance.</p> <p>DCIM application should provide design capability of hot aisle and cold aisle ducted to ceiling scenario creation. It should also incorporate other components like Blocking walls, pillars for creation of datacenter design so that it comes as near to real scenario.</p> <p>DCIM should facilitate the 3D model to depict equipment placed on Rack Mounted Trays and at the same time CFD like Model should be able to detect airflow around those equipment when mounted inside the Rack.</p> <p>DCIM thermal model should incorporate Thermal calculations utilizing both mechanisms: Simulated and Real Time T/H sensor polling. User should have the ability to simulate his datacenter on any of them at any time and see Thermal Maps in X,Y and Z Planes.</p> <p>DCIM 3D model should allow for PAN,ZOOM, Rotate the datacenter views as per user requirement.</p> <p>DCIM thermal model should allow Third Party Building Management Rack T/H sensors also to be utilized for calculating Thermal Maps apart from the DCIM OEM's own T/H sensors.</p>
G	REPORTING & DASHBOARD SYSTEM	
G.1	Dashboard & Reporting System requirements	<p>Proposed platform should offer Dashboard & Reporting System on data center key performance indicators, displaying customizable information for a high-level overview of data center operations. As an underlining to above parameters client expects to see these parameters and more provided the same are made available inside the DCIM through the field devices or through third party BMS which may have been integrated to DCIM. The Proposed Dashboard and Reporting functionality offered should comply to the following requirements:</p> <p>It should support the following database connections at the least: Amazon Elastic Cloud Integration Custom JDBC DB2 HADOOP CLUSTER MYSQL MSSQL ODBC ORACLE POSTGRES SYBASE TERADATA WEBSERVICE</p> <p>Dashboard & Reporting System should allow setting up both encrypted and un encrypted data connections to the above mentioned sources.</p> <p>It should have a Custom Query Editor that supports all SQL parameters for query handling and should allow for creation of JOINS and PROCEDURES to enhance SQL query results from the Monitoring and Management Layer of DCIM system.</p> <p>It should have an internal Performance monitoring system which can monitor and trend the Thread Pool of this Reporting server along with maintaining the Audit Log for the same.</p> <p>It should have a dedicated Access control system for creation of Users/User Groups exclusive to Reporting server.</p> <p>It should allow creation of Custom Formula Fields from the SQL query to display Table results the way user wants in his final Reports.</p>

		<p>It should allow creation of User Input based Reporting Fields which can generate Table data on the basis of run time input Box from where the data is used to fine tune the Table results and consequently to be used for Report Creation. To give an example : Client will be generating kwh rating for devices inside Racks, so the system should be able to pull the same and add a user Defined Cost per Unit as per run time input by the user and generate Energy Cost report.</p> <p>As a part of the Dashboard & Reporting System it should allow auto scheduling of these Reports to user defined email ids via client's SMTP server attaching reports to the email in any of the following formats: PDF, WORD AND READ-ONLY EXCEL. Client may choose either one of these formats but the system should be capable of doing all formats mentioned in the requirement.</p> <p>We understand that certain DCIM systems may have restrictions to the number of points being Trended so to keep it logical the OEM will have to provision for trending and reporting parameters on site as per their mutual discussion during Pre Installation Survey.</p> <p>It should allow to save Created Reports in a User Defined Folder on a shared drive, network file share etc. for Audit requirements in all of the following formats: PDF, WORD AND READ-ONLY EXCEL.</p> <p>Dashboard & Reporting System should allow pulling up stored CSV, Tab delimited data, Excel data to be auto imported inside the Dashboard & Reporting System giving user complete flexibility to customize the Report formatting for the imported data and export the same back in a user defined Reporting Document in PDF, WORD etc.</p> <p>Dashboard & Reporting System should offer capability to depict any report generated through the same as a Dashboard widget which can show the data trend on polling cycle defined by user.</p> <p>Dashboard & Reporting System should offer capability to depict the Trended Data in any type of Graph as selected by user which could be: BAR, LINE, PIE charts in Flat or 2D layouts at the least with complete customization for colors and themes.</p> <p>Dashboard & Reporting System should allow integration of Scalable Graphics and creating a clickable interface on that Graphic to showcase pop out Trends for the KPI shown on that Graphic.</p>
H	Energy Management (PUE & DCiE)	<p>The application should provide real time Power Usage Effectiveness (PUE), DCiE values and able to deliver Weekly, Monthly, Quarterly & Yearly PUE report.</p> <p>DCIM should be able to deliver the cost and CO2 emission per subsystem where subsystem data can either be measured (live) or computed (without power meters). It should showcase graphs for IT load, current PUE/DCiE, historical PUE/DCiE, costs and CO2 emission per subsystem.</p>
I	SAMPLE REPORTS	
I.1.	Report Name	The DCIM software shall be able to support the following standard report templates out-of-box:
I.1.1	Audit Trail	The DCIM software shall generate an Audit Trail report that lists actions recorded in the application, whether those actions were in response to work orders, or changes made to the data center model. The audit trail also provides information about user login/logout.
I.1.2	Capacity History	The DCIM software shall generate a capacity history report that shows the capacity change history for one or more data centers over a user-specified period of time. Allow users to choose data from various capacity categories including power, cooling, space, network and energy efficiency, etc.
I.1.3	Contiguous Free U-Space	Provides information about contiguous free u-space per rack.
I.1.4	Customer Inventory Report	Reports all customer inventory (server, rack DPU, racks, cages, PDUs, etc) for one or multiple customer accounts. Customer names and accounts can be selected at the time of report generation.
I.1.5	Executive Power	Provides a summary of total capacity, free capacity, measured peak, failover load, and power sold/all coated data in a report format. The report is sorted by data center sites and rooms.
I.1.6	Executive Space	Provides space usage stats in terms of total, sold, open, reserved, etc square footage and rack counts information. It is sorted by data center sites and then data center rooms.
I.1.7	Network Summary	The DCIM software shall generate a network report that lists the usage of network ports on each server and network devices. It shall also present all network routes in the data center.
I.1.8	Panel Schedule	The DCIM software shall generate a report showing the configuration of the breaker panels including breakers and power consumers.

1.1.9	Rack U-Space	The DCIM software shall generate a rack space report that displays the amount of available positions in specified racks for equipment that takes up one or more U positions.
1.1.10	Device Communication Status	The DCIM software shall generate a Report showing Communication status for all monitored Infrastructure devices.
1.1.11	Device Sensor Report	The DCIM software shall generate a Report showing status of the User selected Device sensor across daily, monthly, weekly period.
1.1.12	PUE REPORT	The DCIM software shall generate a Report showing PUE across defined period.
J.	Warranty	3 Years with all required spares & consumables

**Note: This Amendment shall be a part of the tender document.
All other terms & conditions shall remain unchanged.**

12.03.19
Md. Mizanur Rahman
Superintending Engineer (Procurement)
NESCO Ltd., Rajshahi.

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