

**Specifications and Allied Technical Details**

**1. SUPPLY, INSTALLATION & COMMISSIONING, DEMONSTRATION AND TRAINING OF ENTERPRISE GRADE CORE SWITCHES, ENTERPRISE GRADE DISTRIBUTION SWITCHES, EDGE SWITCHES AND COMPLIANT NMS SOFTWARE**

**Specifications**

<b>1. Enterprise Grade Core Switches - 2 nos.</b>				
<b>Sl. No.</b>	<b>Parameter</b>	<b>Specification/ Description</b>	<b>Compliance (Yes/No), mention deviation, if any</b>	<b>Reference from Technical Data Sheet/ Website</b>
1	Make	Mention make of the proposed switch in the compliance column		
2	Model	Mention model of the proposed switch in the compliance column		
3	<b>GENERAL FEATURES</b>			
3.1	Form Factor	19 Inch Rack Mountable Ethernet Switch (to be supplied with all accessories for mounting)		
3.2	Ports	Min 4 slot modular/ chassis/ equivalent stackable switch with 48 x SFP+ ports, 8 x QSFP+ ports, with future scalability option to at least 8 x 100G ports from Day 1		
3.3	SFP Transceivers	Switch should be loaded with 32 Nos. LR SFP+ , 5 Nos. SR SFP+ modules and 10 nos. SFP+ to SFP+ 5M twinax cable		
3.4	IPv6 Compliance	All functionalities of switch shall be IPv6 compliant, and it should work on IPv6 Platform without any additional hardware/software/license		
3.5	End of Sale	OEM End of Sale declaration shall not have been released for the quoted model at the time of the bid submission		

3.6	Latest OS Version	The Switches shall be supplied with the latest OS Version and all proposed Switches should have same OS		
3.7	Feature Availability	All the specified features/parameters/ certifications must be available on the Technical Bid opening date. Features/parameters/certifications proposed to be available in near future/on roadmap shall not be considered. Switch should support Fabric or virtualization deployment. Switch should support technology to empower a seamless transition to an agile, software defined virtualized networking solution as Fabric or Virtualization.		
3.8	Layer-3 Support	Switches must be managed layer - 3 type for better broadcast Segmentation		
3.9	Port status display	Each port must have a dedicated LED status display		
3.10	Operating temperature	Switch should comply to operating Temperature range 10 degree C to 45 degree C and can sustain upto 60% RH or more.		
3.11	Power supply	N+1 redundant power supply must be included (In case of stackable, all switches should be supplied with redundant power supply)		
4	<b>HARDWARE SPECIFICATIONS</b>			
4.1	Backplane Bandwidth	At least 2.5 Tbps Switching bandwidth		
4.2	Packet throughput	1000 Mpps or more		
4.3	MAC Addresses	82K or More		
4.4	VLANs (802.1q tagged VLAN)	Should support 4000 or more concurrent VLANs		
5	<b>STANDARDS AND PROTOCOLS</b>			
5.1	Loop Protection	802. 1s MSTP (Multiple Spanning		

		Tree Protocol)		
		802.1w RSTP (Rapid Spanning tree protocol)		
		Should support G.8032 or equivalent for ethernet ring protection switching		
5.2	Link Aggregation	802. 3ad link aggregation		
5.3	QoS Support	At least 8 Nos. of 802.1p priority Queues per port		
5.4	IP Multicast	IGMPv1, v2, v3 Snooping, MLD Snooping v1 & v2		
5.5	Port Mirroring/Span port	Port Mirroring must be available		
6	<b>ROUTING FEATURES</b>			
6.1	Routing protocols	The switch shall support minimum 10K IPv4 and IPv6 routes and should be enabled with OSPF & VXLAN from day 1		
6.2	Routing redundancy	Must support VRRP for IPv4 and IPv6 from day 1		
7	<b>SECURITY FEATURES</b>			
7.1	Port Security	MAC and 802.1X based login must be available from day 1		
		MAC Address based lockdown and limited learning		
		All the supplied switched must be able to support MACsec with AES-based encryption on all the ports for end-to-end deployment		
7.2	Access control Lists	Min 2000		
8	<b>MANAGEMENT AND MONITORING</b>			
8.1	Management	Following in-band management methods should be available:		
8.1a		Secure Web based management (On https)		
8.1b		SSH based management (SSH/SSHv2), SNMPv1,v2, and		

		v3		
8.1c		Switch must support standards-based operations and management tools for connectivity fault management (802.1ag or equivalent)		
8.2	Out - of band management	Following out-of- band management methods should be available:		
8.2a		Serial/ equivalent console port		
8.2b		Management ethernet port		
9	Log management	Syslog should be supported with multiple syslog destinations		
10	Flow export	Shall support NetFlow/IPFIX/sFlow for flow exports		
11	Time Synchronization	Time synchronization using Network time protocol must be available		
12	Configuration backup & restore	The switch shall have feature of backing up the configuration & restoring a backed-up configuration. Multiple configuration files should be supported. Should have USB interface/ other similar mechanism for taking backup locally.		
13	TFTP/FTP upload and download	Config/ image upload and download from TFTP/FTP server should be available		
14	SDN	Switch should support Openflow or equivalent technology to seamlessly integrate with centralized management platform to achieve complete LAN automation.		
15	<b>CERTIFICATIONS</b>			
15.1	EMI Certifications	Switch should have EMI CERTIFICATE of FCC/IC and CE or equivalent Indian Standard.		
15.2	Safety	Switch should have SAFETY CERTIFICATE of UL or		

	Certifications	equivalent Indian standard.		
15.3	Environmental Certifications	Switch should have ENVIRONMENTAL CERTIFICATE of RoHS or equivalent Indian standard.		

<b>2. Enterprise Grade Distribution Switches - 24 nos.</b>				
Sl. No.	Parameter	Specification/ Description	Compliance (Yes/No), mention deviation, if any	Reference from Technical Data Sheet/ Website
1.	Make	Mention make of the proposed switch in the compliance column		
2.	Model	Mention model of the proposed switch in the compliance column		
3.	<b>GENERAL FEATURES</b>			
3.1	Form Factor	19 Inch Rack Mountable Ethernet Switch (to be supplied with all accessories for mounting)		
3.2	Ports	Switch should support minimum 24x10/100/1000 Base-T ports and minimum 4x10G SFP+ available from day 1		
3.3	Upgradability	Switch should have option for scalability to minimum two 40Gbps uplink ports (without aggregation) from day 1		
3.4	SFP Transceivers	Each switch must be supplied with 2x10G LR SFP+ modules		
3.5	IPv6 Compliance	All functionalities of switch shall be IPv6 compliant, and it should work on IPv6 Platform without any additional hardware/software/license		
3.6	End of Sale	OEM End of Sale declaration shall not have been released for the quoted model at the time of the bid submission		
3.7	Latest OS Version	The Switches shall be supplied with the latest OS Version and all proposed Switches should have same OS		
3.8	Routing support	Should support both static IPv4 and IPv6 routing.		
		Should support minimum 5K for IPv4 and IPv6 routes		
		It shall also support OSPFv2, OSPFv3 and VXLAN or equivalent from Day 1		
		Should support VRRP		

		Should support for minimum 100 VLANs SVI or RVI interfaces.		
		Should support Jumbo frame (9000 bytes or above)		
		Should support multicast routing PIM - DM for future Scalability in same hardware		
		Switch should support both L2 and L3 features		
3.9	Feature Availability	All the specified features/ parameters/ certifications must be available on the technical bid opening date. Features/parameters/certifications proposed to be available in near future /on roadmap shall not be considered.		
3.10	Port status display	Each port must have a dedicated LED status display		
3.11	Operating temperature	Switch should comply to operating Temperature range 10 degree C to 45 degree C and can sustain upto 60% RH or more.		
3.12	Power supply	Should support and supplied with redundant AC power supply and cables		
4.	<b>HARDWARE SPECIFICATIONS</b>			
4.1	Switching performance	Should have at least 208 Gbps for 24 ports switching performance or better		
4.2	Packet throughput	Should have minimum 155 Mpps for 24 ports throughput or better		
4.3	MAC Addresses	Should support at least 32K entries in the MAC table		
4.4	VLANs (802.1Q tagged VLAN)	Should support 4000 or more concurrent VLANs, 802.1Q VLAN & Voice VLAN along with user VLAN		
4.5	Hardware Queues	Should support 8 hardware queues per port and shall support ingress policing and egress shaping		
5.	<b>STANDARDS AND PROTOCOLS</b>			
5.1	Loop Protection	Should support BPDU guard, BPDU filter or similar functionality		
		Should support ITU-T G.8032/802.1D STP/RSTP/MSTP Ethernet Ring protection or equivalent mechanisms designed for loop protection and fast convergence times in ring topologies from day 1.		
5.2	QoS Support	Priority Queue, Class of Service (CoS), Rate Limiting (Bandwidth		

		control), Strict Priority Queue (SPQ), Weighted Round Robin (WRR) or equivalent		
5.3	Priority Queues & Priority Flow	Should support 802.1Q VLAN, 802.1p priority queues, IEEE 802.1ad or better (priority Flow Control)		
5.4	Flow Control	Should support 802.3x flow control		
5.5	DHCP Feature	Should support DHCP local server, DHCP relay and DHCP snooping		
5.6	Port Mirroring	Should support port mirroring		
6.	<b>SECURITY FEATURES</b>			
6.1	Port Security	MAC and 802.1X based login must be available from day 1		
		MAC Address based Lockdown and limited learning		
		Should support security features broadcast, multicast, and unicast storm control		
		Should support security features DoS attack prevention/SYN attack protection/Man in middle attack		
		All the supplied switches must support MACsec with AES-based encryption on all the ports for end-to-end deployment from day-1		
7.	<b>MANAGEMENT AND MONITORING</b>			
7.1	Management	Should support IGMP v1/v2/v3, IGMP snooping. MLD v1/v2, SNMPv2c/v3, LLDP from day 1		
7.1a.		Should support management features like SNMP and RADIUS authentication		
7.1b.		Should support transceiver Digital Diagnostic Monitoring for optical ports		
7.1c.		Should support console port and telnet/SSH based management		
7.2	Log management	Syslog shall be supported with multiple syslog destinations		
7.3	Time Synchronization	Time synchronization using Network time protocol must be available		
7.4	Configuration backup & restore	The switch shall have feature of backing up the configuration & restoring a backed up configuration. Should have USB interface/ other similar mechanism for taking backup locally.		

7.5	TFTP/FTP upload and download	Config/ image upload and download from TFTP/FTP server should be available		
7.6	SDN	Switch should support Openflow or equivalent technology to seamlessly integrate with centralized management platform to achieve complete LAN automation.		
8.	<b>CERTIFICATIONS</b>			
8.1	EMI Certifications	Switch should have EMI CERTIFICATE of FCC/IC and CE or equivalent Indian Standard.		
8.2	Safety Certifications	Switch should have SAFETY CERTIFICATE of UL or equivalent Indian standard.		
8.3	Environmental Certifications	Switch should have ENVIRONMENTAL CERTIFICATE of RoHS or equivalent Indian standard.		

<b>3. Edge Switches - 06 nos.</b>				
Sl. No.	Parameter	Specification/ Description	Compliance (Yes/No), mention deviation, if any	Reference from Technical Data Sheet/ Website
1.	Make	Mention make of the proposed switch in the compliance column		
2.	Model	Mention model of the proposed switch in the compliance column		
3.	<b>GENERAL FEATURES</b>			
3.1	Form Factor	19 Inch Rack Mountable Ethernet Switch (to be supplied with all accessories for mounting)		
3.2	Ports	Switch should have minimum of 24 ports 10/100/1000 Base-T and minimum 2 x 10G SFP+ ports. Switch should support Bi-Directional Transceivers		
3.3	SFP Transceivers	Each switch must be supplied with 2x10G LR SFP+ modules		
3.4	Stackability	Switch should have dedicated stacking or clustering port (except above mention port) from day 1. Stack cable to be provided as per actual site requirements. Switch should support at least 4 switches in a single stack		
3.5	IPv6 Compliance	All functionalities of switch shall be IPv4 and IPv6 compliant, and it should work on IPv4 and IPv6 Platform without any additional hardware/software/license		



3.6	End of Sale	OEM End of Sale declaration shall not have been released for the quoted model at the time of the bid submission		
3.7	Latest OS Version	The Switches shall be supplied with the latest OS Version and all proposed Switches should have same OS		
3.8	Routing support	Should Support Static routing, VXLAN, RIP, IPv6 static routing, IPv6 MLD snooping, IPv6 MLD proxy from day 1		
3.9	Feature Availability	All the specified features/ parameters/ certifications must be available on the technical bid opening date. Features/parameters/certifications proposed to be available in near future /on roadmap shall not be considered.		
3.10	Port status display	Each port must have a dedicated LED status display		
3.11	Operating temperature	Switch should comply to operating Temperature range 10 degree C to 45 degree C and can sustain upto 60% RH or more.		
3.12	Power supply	Should support and supplied with redundant AC power supply and cables		
4.	<b>HARDWARE SPECIFICATIONS</b>			
4.1	Switching performance	Should have at least 128 Gbps switching performance or better		
4.2	Packet throughput	Should have minimum 95 Mpps throughput or better		
4.3	MAC Addresses	Should support at least 32K entries in the MAC table		
4.4	VLAN	Should support 802.1Q VLAN, Voice VLAN along with user VLAN		
4.5	Hardware Queues	Should support 8 hardware queues per port and shall support ingress policing and egress shaping		
5.	<b>STANDARDS AND PROTOCOLS</b>			
5.1	Loop Protection	Should support BPDU guard, BPDU filter or similar functionality		
		Should support ITU-T G.8032/802.1D STP/RSTP/MSTP Ethernet Ring protection or equivalent mechanisms designed for loop protection and fast convergence times in ring topologies from day 1.		
5.2	QoS Support	Priority Queue, Class of Service (CoS), Rate Limiting (Bandwidth		

		control), Strict Priority Queue (SPQ), Weighted Round Robin (WRR) or equivalent		
5.3	Priority Queues & Priority Flow	Should support 802.1Q VLAN, 802.1p priority queues, IEEE 802.1ad or better (priority Flow Control)		
5.4	DHCP Feature	Should support DHCP local server, DHCP option 82, DHCP relay and DHCP snooping		
5.5	Port Mirroring	Should support port mirroring		
6.	<b>SECURITY FEATURES</b>			
6.1	Port Security	Must support 802.1X and MAC address authentication with the ability to dynamically create and assign a VLAN or micro - segmentation/ automation		
		MAC and 802.1X based login must be available from day 1		
		Should support security features broadcast, multicast, and unicast storm control		
		All the supplied switches must support MACsec with AES-based encryption on all the ports for end-to-end deployment from day-1		
6.2	Other security features	Should support DHCP Snooping, TACACS+, Dynamic ARP Inspection, IP Source Guard, Duplicate Address Detection (DAD) snooping and filtering, DHCPv6 Guard, First - Hop Security, neighbour Discovery Inspection, source Guard and router Advertisement Guard from day 1		
7.	<b>MANAGEMENT AND MONITORING</b>			
7.1	Management	Should support MAC filtering and Role based policies, BootP, DHCP relay/Client, IGMPv1/v2 and v3, multi-Link Trunking or equivalent from day 1		
7.1a.		Should support management features like SNMP and RADIUS authentication		
7.1b.		Should support transceiver Digital Diagnostic Monitoring for optical ports		
7.1c.		Should support console port and telnet/SSH based management		
7.2	Log management	Syslog shall be supported with multiple syslog destinations		
7.3	Time Synchronization	Time synchronization using Network time protocol must be		

		available		
7.4	SDN	Switch should support Openflow or equivalent technology to seamlessly integrate with centralized management platform to achieve complete LAN automation.		
8.	<b>CERTIFICATIONS</b>			
8.1	EMI Certifications	Switch should have EMI CERTIFICATE of FCC/IC and CE or equivalent Indian Standard.		
8.2	Safety Certifications	Switch should have SAFETY CERTIFICATE of UL or equivalent Indian standard.		
8.3	Environmental Certifications	Switch should have ENVIRONMENTAL CERTIFICATE of RoHS or equivalent Indian standard.		

<b>4. Compliant NMS Software - 1 no.</b>			
Sl. No.	Parameter	Compliance (Yes/No), mention deviation, if any	Reference from Technical Data Sheet/ Website
1.	Make of the NMS (Please mention in compliance column)		
2.	Version/ Model (Please mention in compliance column)		
3.	NMS should be virtual / hardware-based appliance and from the same OEM as of that providing switching solution		
4.	Must be able to support minimum 120 Switches from day 1 and should be scalable to support minimum 200 switches on the same physical or virtual appliance		
5.	The dashboard should show the network details and status, event information, and a topology map.		
6.	Must provide centralized management solution that should be able to manage wired switches and monitor any SNMP-enabled managed network devices		
7.	Must allow system-level operations such as device discovery, event management, logging and application maintenance to be performed centrally.		
8.	Must provide the capabilities to modify, filter, and create your own flexible views of the network. Must provide an audit trail (event log) with local storage (in case of appliance).		
9.	Must allow scheduled events or tasks that the user can perform behind the scenes or schedule an event for another time in the future.		
10.	Must provide a system wide deployment of VLAN configuration and monitoring capabilities by identifying different VLANs		

11.	Must support RADIUS/ LDAP Authentication (CSIR-CMERI is already using FortiAuthenticator for authentication purpose)		
12.	Must have SNMP MIB capability to integrate any SNMP compliant device		
13.	Must allow IT administrators to easily define a number of pre-configured network policies, and designate select personnel to activate/ deactivate these policies as appropriate		
14.	Must provide a detailed inventory of products organized by device type.		
15.	Must support the ability to present detailed configuration information including date and time of configuration saved		
16.	Must record the past history (last 1 or more) of device attributes such as configuration changes and reports any changes made to the device		
17.	Must be able to generate valuable, in-depth reports for network inventory for planning purposes.		
18.	Must support the ability to download firmware to single or multiple devices simultaneously and should support automatic or manual backup of configuration		
19.	Must provide a web interface/GUI that contains reporting, dashboards, troubleshooting and monitoring tools.		
20.	Must provide flexible web-based/GUI network view, device views and event logs for the entire infrastructure.		
21.	Must enable diagnosis of network issues like link tampering, network loops, environmental alarms, and failed nodes etc. along with the network performance through near-real-time flow analysis.		
22.	Must provide port level analysis capability and report generation.		
23.	Should have the ability to get actionable business insights and speeding up troubleshooting by separating network from applications		
24.	NMS should support any topology regardless of the number of switches connected and regardless of how they are connected		
25.	The proposed solution should provide Network infrastructure hierarchy visualization for fault impact and troubleshooting		
26.	The tool should be able to identify path taken from source to destination		
27.	Ability to configure workflows to automate tasks		
28.	All features and functionalities asked in the above detailed spec shall be included from day one with all necessary licenses and required hardware/appliance		

Scope of Work and Other Terms		
Sl. No.	Specification/ Description	Compliance (Yes/No), mention deviation, if any
1	Supply: All the quoted switches, fiber modules and NMS must be from same OEM for better integration and should be compatible to work with the existing edge network infrastructure (Mainly comprising of CISCO, 3Com, HP Aruba, Zyxel and Extreme make switches L2 and basic L3 switches).	
2	All the compliances should be shared with cross reference documents mentioning the features and/or should be with signed letter head of respective OEM .	
3	The OEM should also have 24x7 TAC support with Indian Toll free number and RMA depot in India. The details of claimed support center(s) should be reflected in official website/documents.	
4	OEM End-of-sale declaration shall not have been released for the quoted model at the time of the bid submission.	
5	All the specified features/ parameters/ certifications must be available on the Technical Bid opening date. Features/ parameters/ certifications proposed to be available in near future/ on roadmap shall not be considered. Switch should support technology to empower a seamless transition to an agile, software-defined virtualized networking solution.	
6	Warranty: <b>5 years</b> comprehensive Advance replacement India Next Business Day warranty for all quoted products from date of project handover. All the quoted products must be supported for at service for at least <b>10 years</b> from date of quote.	
7	All the supplied components need to be installed, configured, commissioned and integrated with the existing LAN infrastructure with satisfactory demonstration of the required features and backbone network performance of 10Gbps	
8	Bidder must have at least <b>3 years</b> of sales & implementation experience with the same OEM.	
9	The bidder must deploy OEM certified engineers for implementation of the data network.	
10	Installation includes uninstallation of old core and distribution switches for replacement of the same with newly supplied switches by seeking minimal network downtime.	
11	Two Core switches should be configured in Active-Passive/ Active-Active mode with auto-failover configuration for high availability and should have proper loop protection in OFC network.	

12	Configuration of all switches to forward the logs to a properly configured Syslog server (hardware would be provided by CSIR-CMERI) to log all the activities with MAC address of the end-points for regulatory compliance.	
13	Migration of all old VLANs to newly installed switch networks along with installation, configuration and satisfactory commissioning with 10Gbps backbone link. This includes migration of existing VLANs of WiFi network comprising of CISCO AP (AIR-CAP-2702I), CISCO Catalyst-2960-CX switches and CISCO 2504 Controllers. Existing multi-OEM network inventories comprised of total 105 nos. of managed network devices (including those which needs to be replaced using the proposed 34 nos. of new switches).	
14	Demonstration of successful implementation of 802.1x authentication and port security features alongwith MAC-based authentication from the core to supplied edge switches. (CSIR-CMERI is already using FortiAuthenticator appliance for the authentication service)	
15	Complete documentation of the installed switches, their configuration details and at least five days training to the IT support team of CSIR-CMERI for re-configuration and network monitoring and management through supplied NMS.	

## **2. Scope of Supply and incidental works:**

This tender includes supply, installation, demonstration, training and other services like warranty etc.

## **3. Inspection, Demonstration & Acceptance Tests**

### **3.1 General**

1. The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services as are specified here.
2. The inspections and tests may be conducted on the premises of the Supplier or its subcontractor(s), at the point of delivery and/or at the Goods final destination.
3. Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.
4. Should any inspected or tested Goods fail to conform to the specifications, the Purchaser may reject the goods and the Supplier shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the Purchaser.

5. The Purchaser's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival at final destination shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Purchaser or its representative prior to the Goods shipment.
6. The Supplier shall provide the Purchaser with a report of the results of any such test and/or inspection.
7. With a view to ensure that claims on insurance companies, if any, are lodged in time, the bidders and /or the Indian agent, if any, shall be responsible for follow up with their principals for ascertaining the dispatch details and informing the same to the Purchaser and he shall also liaise with the Purchaser to ascertain the arrival of the consignment after customs clearance so that immediately thereafter in his presence the consignment could be opened and the insurance claim be lodged, if required, without any loss of time. Any delay on the part of the bidder/ Indian Agent would be viewed seriously and he shall be directly responsible for any loss sustained by the purchaser on the event of the delay.
8. Before the goods and equipment are taken over by the Purchaser, the Supplier shall supply operation and maintenance Manuals together with Drawings of the goods and equipment built. These shall be in such details as will enable the Purchase to operate, maintain, adjust and repair all parts of the works as stated in the specifications.
9. The Manuals and Drawings shall be in the ruling language (English) and in such form and numbers as stated in the Contract.
10. Unless and otherwise agreed, the goods and equipment shall not be considered to be completed for the purposes of taking over until such Manuals and Drawing have been supplied to the Purchaser.
11. On successful completion of acceptability test, receipt of deliverables, etc. and after the Purchaser is satisfied with the working of the equipment, the acceptance certificate signed by the Supplier and the representative of the Purchaser will be issued. The date on which such certificate is signed shall be deemed to be the date of successful commissioning of the equipment.

### **3.2 Manufacturer's Inspection Certificate`**

After the goods are manufactured and assembled, inspection and testing of the goods shall be carried out at the supplier's plant by the supplier, prior to shipment to check whether the goods are in conformity with the technical specifications. Manufacturer's test certificate with data sheet shall be issued to this effect and submitted along with the delivery documents. The purchaser reserves the options to be present at the supplier's premises during such inspection and testing.

### **3.3 Pre Dispatch Inspection.**

Nil

### **3.4 Third Party Inspection *(delete if not applicable) or elaborate.***

### **3.5 Acceptance Test**

The acceptance test will be conducted by the Purchaser, their consultant or other such person nominated by the Purchaser at its option after the

equipment is installed at Purchaser's site in the presence of supplier's representatives. The acceptance will involve trouble free operation. There shall not be any additional charges for carrying out acceptance test. No malfunction, partial or complete failure of any part of the equipment is expected to occur. The Supplier shall maintain necessary log in respect of the result of the test to establish to the entire satisfaction of the Purchaser, the successful completion of the test specified.

On the event of the ordered item failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing which, the Purchaser reserve the right to get the equipment replaced by the Supplier at no extra cost to the Purchaser.

Successful conduct and conclusion of the acceptance test for the installed goods and equipment shall also be the responsibility and at the cost of the Supplier.

#### **4. Training**

**The period of training should be for 5 days after Installation and commissioning by the Service Engineer. Training should cover operation of equipment, operation of facilities, preventive maintenance of equipment (process and supporting facilities) and quality control involved in the equipment. Training should be done by factory trained Service Engineers and Application specialist**

#### **5. Warranty**

The warranty of the equipment should be for a period of **5 Years** from the date of acceptance. During the warranty period upgrades of the software, if any should be provided free of cost.

6. **Documentation:** The Standard operating procedures for all unit and subunit operations, maintenance schedule, preventive maintenance procedures, operation and maintenance manuals, troubleshooting manuals, videos for training etc. should be done in English and part of the delivery of the equipment. The documentation so given, should be comprehensive, easy to understand and should satisfy the user requirements and the users.

#### **7. EXPECTED DELIVERY:**

06 (Six) Months from the date of placement of Purchase Order/ from the date of establishment of Letter of Credit (LC).

#### **8. PAYMENT TERMS:**

##### **Payment for Goods supplied from abroad:**

Foreign LC Payment of foreign currency portion shall be made in currency of the Contract in the following manner:

- (a) On Shipment: Eighty percent (80%) of the Contract Price of the Goods shipped shall be paid through irrevocable letter of credit opened in favour of the Supplier in a bank in its country, upon submission of documents specified in GCC Clause 2.16.
- (b) On Acceptance: Twenty percent (20%) of the Contract Price of Goods received shall be paid within thirty (30) days of receipt of Goods and successful installation & commissioning and



training upon submission of claim supported by the acceptance certificate issued by the Purchaser along with the Performance security, if any.

Payment for Goods and Services supplied from India:

The payment shall be made in Indian Rupees, as follows:

**Indian LC**

- (a) After shipment: Eighty percent (80%) of the Contract Price shall be paid on receipt of the Goods in good condition and upon submission of the documents specified in GCC Clause 16.1
- (b) On Acceptance: The remaining Twenty percent (20%) of the Contract value shall be paid to the Supplier within thirty (30) days after the date of the acceptance certificate issued by the Purchaser subject to submission of performance security, if any.

**9. EMD/ BID SECURITY:**

The EMD/BID Security amount shall be Rs. 6.00 lakh only.

**10. PERFORMANCE SECURITY:**

Performance Security @10% of contract value shall be provided by the supplier within 21 days from the date of issue of Purchase Order.