NEPAL ELECTRICITY AUTHORITY

(An Undertaking of Government of Nepal)

Finance Directorate

INSTITUTIONAL STRENGTHENING PROJECT

(A Component of Electricity Grid Modernization Project-Additional Financing)

BIDDING DOCUMENT
FOR

Procurement of Information Technology Products and Services

Supply and Installation of RMS (Revenue Management System)

Volume II of III

Single-Stage: Two-Envelope
Bidding Procedure

Issued on: Friday, 18 February 2022
Invitation for Bids No.: ICB/FD/EGMPAF/RMS-078/79-02
OCB No.: ICB/FD/EGMPAF/RMS-078/79-02
Purchaser: Nepal Electricity Authority
Country: Nepal

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Preface

This Bidding Document for Procurement of Information Technology Products and Services has been prepared by Nepal Electricity Authority and is based on the Standard Bidding Document for the Procurement of Information Technology Products and Services issued by the Asian Development Bank dated December 2021.

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1 Section I: List of IT products and services

1.1 About the Power Sector of Nepal

Nepal Electricity Authority (NEA) is a Power Generation, Transmission and Distribution Corporation that provides electricity services for Nepal to over 5.08 Million consumers.

The primary objective of NEA is to generate, transmit and distribute the adequate, reliable, and affordable power by planning, constructing, operating, and maintaining all generation, transmission, and distribution facilities in Nepal's power system both interconnected and isolated. In addition to achieving the above primary objective, NEA's major responsibilities are:

a) To recommend the Government of Nepal on long and short-term plans and policies in the power sector.
b) To recommend, determine and realize tariff structure for electricity consumption with prior approval of Government of Nepal.
c) To arrange for capacity building to produce skilled manpower in generation, transmission, distribution, and other sectors.

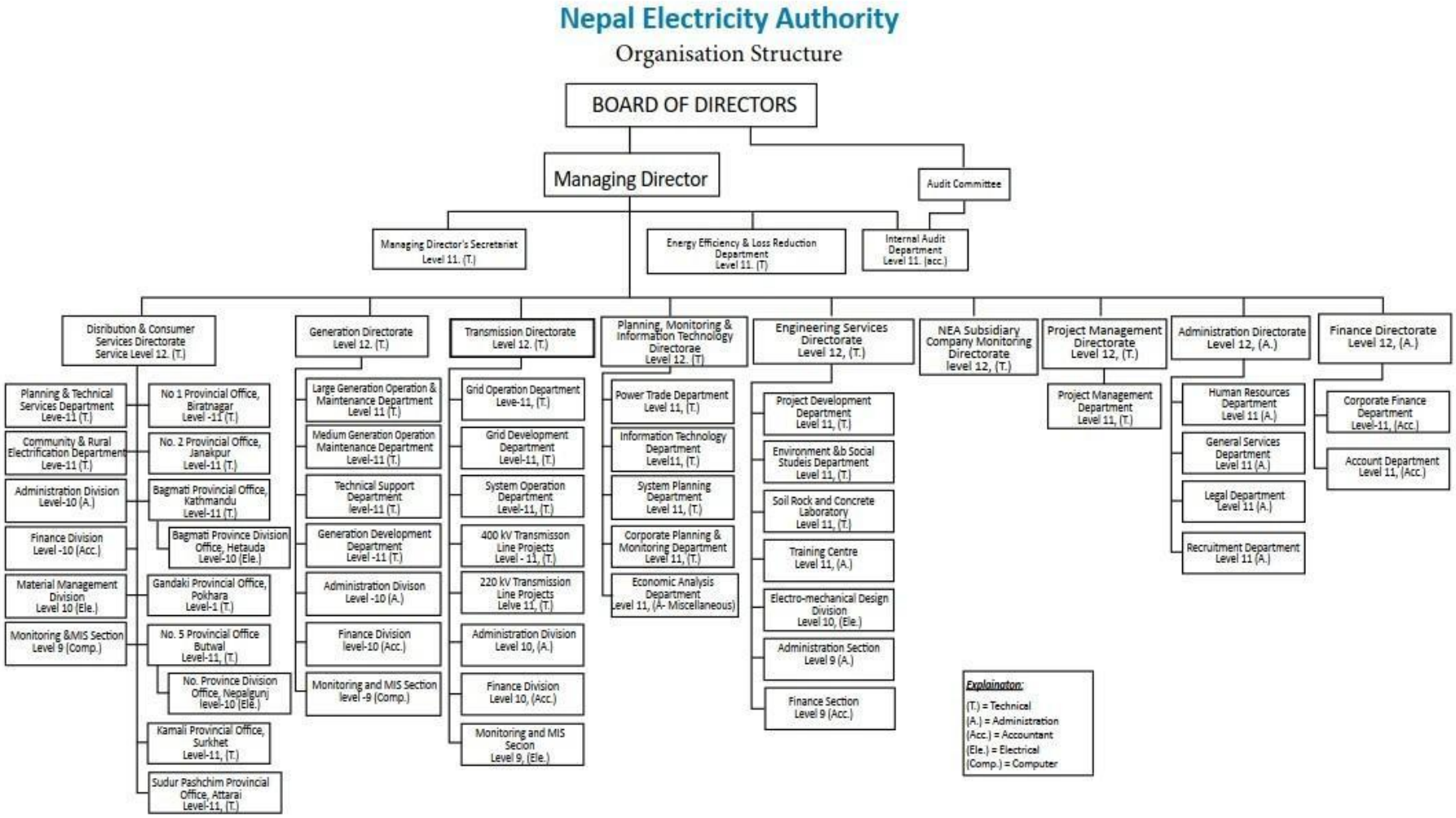
NEA’s hydropower plants including small power stations generated a total of 2810.74 GWh of electricity in FY 2020/21. The total power purchased from Independent Power Producers (IPPs) within Nepal was 3,241 GWh, an increase by 8.36 % from the figure of 2,991 GWh in the FY 2019/20. The total energy in the system increased by 14.68 % to 8,877.95 GWh over the corresponding figure of 7,741 GWh in FY 2019/20. Out of the total available energy, NEA’s own generation contributed 31.66%, whereas those imported from India and domestic IPPs accounted for 31.83 % and 36.51 % respectively. Total energy consumption in FY 2020/21 was 7,319 GWh, a slight increase over the corresponding figure of 6,529 GWh in FY 2019/20. The Covid-19 pandemic played a major role in limiting the anticipated consumption growth.

A nationwide drive launched a few years ago to reduce system losses continued unabated in FY 2020/21 as well, even though the pandemic had a negative effect in attaining the desired result. Though actual figures could not be calculated due to reasons related to the pandemic, the system losses have been estimated to have increased to 17.18 % as compared to 15.27 % of last year. A significant component of loss increase is technical loss in transmission lines about 0.3%. The system loss had come down to 15.27% in the FY 2019/20 over the previous figures of 25.78%, 22.90%, 20.45% and 15.32% in the FYs 2015/16, 2016/17, 2017/18 and 2018/19 respectively. The efforts to bring it down to the least possible figure will continue in the years ahead.

The total population with access to electricity based on the number of consumers has reached 90% of total households in FY 2020/21 and the aim of NEA is to ensure “Electricity for all” by 2023.

To improve efficiency of business operations and increase employee productivity, NEA intends to implement a Revenue Management System (RMS) across all provinces for the entire Nepal in 181 revenue collection centers.

1.2 Organization Structure



1.3 Existing Status

NEA has started the procedure of adopting modern digital technology into its system to enhance its operational efficiency, reduce energy theft and enable itself to serve its consumers in a better way. The existing status of some of the systems implemented at NEA are as follows:

1.3.1 Consumer Facing Applications

a) MPower - being used for power billing and Collections, processing of new connections, etc. and for maintaining consumer ledgers
b) Customer Complaint handling system – No Lite
c) PSI-COBS - being used earlier for power billing and Collections and for maintaining consumer ledgers

1.3.1.1 M-Power System

NEA implemented M-Power in 2006 and this revenue system software is implemented in 178 revenue collection centers out of 181 revenue collection centers. M-Power provides a complete solution for NEA Revenue Department including features like New Service Registration, Customer Complaint, Meter reading and stocks, Billing for consumer, Collection, Debt management, Energy Auditing, Configuration & History and Security Gateway. Functional Specification of the M-power system is mentioned in Annexure-1. Currently the M-Power Billing System covers more than 99.6% of the total consumers count and also covers more than 99.8% of the total NEA revenue. M-power is not implemented at following DCs with approximately 5000 consumer base :

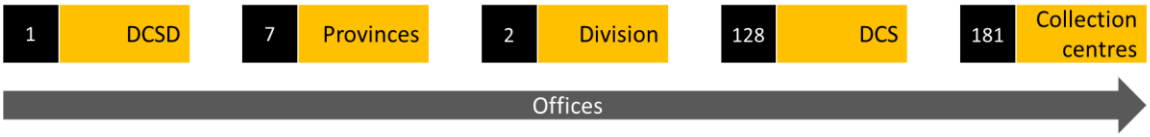
a. Dolpa DCS
b. Gumgadh DCS
c. Bajura DCS
d. Rukum West DCS
e. Humla DCS

Handheld Meter Reading Device (HHD) is currently operating in more than 130 locations. HHD has helped in reducing human errors during meter reading and improving energy sales. With the innovation in new technology, the division has implemented Online Meter Reading Handheld Device (SBM-Spot Billing Machine) with GPRS functions in 60 revenue collection centers. The meter reader directly uploads the meter reading data to the concerned branch server, collecting the data from the consumer premises which results in efficient meter reading.

Web Based Services has been provided to the consumer that helps to view the bills, where the consumers can query regarding bills through NEA website. The Consumer Management Information System (LAGAT) has been implemented in various revenue collection centers which will help to keep the consumer's database up to date. Online Payment Collection system was introduced from Bhadra, 2074 and has been successfully implemented in 176 revenue collection centers. This system has focused all groups of consumers where the consumer can

pay their electricity bills through various online banking, mobile banking services, kiosks, cooperatives etc. Online system has eased the difficulty of the consumers waiting in queue for hours just to pay the electricity bill, saving time and money by reducing traveling expenses on the way to billing counters. Currently, more merchants have been added to the Online Payment Collection System, so that consumers can pay their electricity bills with more ease, within and outside the country as well.

Any Branch Payment System (ABPS) has been implemented inside Kathmandu valley, helping the consumers to pay their bill in any locations within Kathmandu valley. It has facilitated NEA to collect revenue and get analytical reports on time. In the process of striving for excellence, the Computerized Billing and Network Division has enhanced the online meter reading Hand Held Device by providing SMS facilities to a limited quantity of consumers after meter reading to make a paperless environment which will help in financial savings.



1.3.2 Smart Metering/Smart Grid Project

The project scope includes;

Phase 1: This phase includes implementation of Automatic Meter Reading (AMR) System with implementing Advanced Metering Infrastructure in TOD meters like EDMI, Bluestar, Actarius, Wasion, Rise sun. For this purpose, 10,000 Intelligent GPRS/GSM Modem has been procured. Out of the procured modems, 8198 modems have been installed in consumer sites. This phase work had been completed. The information like billing data, load profile, instantaneous data, event tampers can be retrieved via AMR/AMI system. The Integrated Branch Billing data can be retrieved through email and SMS. Server setup with all hardware and Network is completed.

Phase 2: This phase includes implementation of Smart Three phase energy meter to replace the three phase whole current electromechanical meter. The programming of these smart meters can be executed remotely, and supply can be controlled remotely in case of due payment. Out of 72,000 Three Phase Smart Meters, 72,000 meters have been delivered to NEA. Out of 72,000, around 43,935 old electro- mechanical meters are replaced with the new Smart Meter and about 22,000 meters are installed in new connections. Out of 43,935 smart meters installed, more than 5000 consumers' demand was found to have increased and more than 4000 defaulter's lines were disconnected. About 1000 lakhs amount was collected from those consumers within till date. The billing of consumer reading is integrated with the M-power Billing System. The system is two way allowing AMI system to read and write as per requirement. The mode of communication between meter and system is GPRS.

1.3.3 Smart Metering for 2 DCS in KTM Valley

NEA is implementing Smart metering in 2 DCS in Kathmandu valley. The total number of Smart meters under implementation are 98,000. As part of the AMI implementation NEA has procured Head End System (HES), Meter Data Management System (MDMS), Business Intelligence as well as Smart Meters, DCU, etc. The communication network is RF and the DCUs are connected using sim cards. Out of 98,000 Smart meters 89000 have been installed till December 2021.

For this phase implementation, the proposed system has HES an MDM from Wisdom along with Middleware and database. From the Infrastructure the proposed system has blade chassis and blade server for compute infrastructure along with SAN storage and SAN switches at DC and SAN storage at NLDC, Both DC and NLDC will be connected to fibre by NEA. It also has firewalls, Load balancers and Network L2 and L3 switches for connectivity and for management and monitoring of the Applications, Servers, Storage, Network and Databases proposed under Smart Metering Phase- I system integrator has also provisioned for EMS software.

NEA has planned to implement GIS (Geographical Information System) software to manage DCS asset inventories like substation, feeder, transformer, poles & meters along with its position on earth. It will help to identify the actual information about s/s, feeder, and poles, transformers, and consumers' capacity and also to balance the transformer's load as per connection to the consumer. It also helps to facilitate the consumer service faster & reliable against any fault in the distribution system. Additional benefits of this smart distribution system will aid outage management, no light management, and an optimal connection path for new consumers can be built.

1.3.4 Other IT Applications

The IT Department is responsible for providing the infrastructure for automation. It implements the governance for the use of network and operating systems, and it assists the operational units by providing them the functionality they need. Especially in NEA, under Planning, Monitoring and Information Technology Directorate, IT Department plays a vital role for core IT related activities within the organization with its rudimentary data center located in the IT Department Building at central office. Apart from the implementation of new IT Systems, the department provides continuous ICT support, maintenance and training to all NEA offices round the clock. Information Technology Audit has been conducted (assessment of internal controls within its information system environment to assure validity, reliability and security of information and information systems) After the assessment of the audit, the department has upgraded the necessary Computer Hardware (Server) requirements, network security equipment and software requirements. Communication Backbone establishment (intranet connectivity) is being carried out throughout the nation. The IT Department has started connecting all the NEA offices and has plans to connect all the offices within this Fiscal Year.

2 Scope of Work

2.1 Project Objective

The scope of work for System Integrator(SI) is to implement a web - based Commercial Off the Shelf(COTS) Revenue Management System (RMS) including Metering, Billing, Collection, New Connection, Disconnection & Reconnection, Energy Audit, Customer Relationship Management, Web Portal & Mobile Application, Management Information System, Document Management System(DMS), Analytics and Customer Care Center (CCC) for 6 million consumers of NEA.

Broad objectives of the RMS implementation are:

- Standardize the process of new connection, reconnection and disconnection.
- Making a more robust system for metering comprising net metering, Gross metering and with Prepaid functionality.
- Ease of access to end users and consumers.
- Transparency and visibility within the organization through a robust IT enabled Billing and collection system.
- Reduction in system loss levels though improved billing and collection efficiency and increased cash flow.
- Timely energy audit and accounting.
- Improved field workforce management.
- Increased operational efficiency.
- Reduction in system loss levels though improved billing and collection efficiency and increased cash flow.
- Better services to customers and enhance customer satisfaction levels.

Figure 1: Objective of implementation RMS at NEA.

2.2 Brief Scope of Work

a) The Scope of work for System Integrator is to implement web - based Commercial Off the Shelf (COTS) Revenue Management System (RMS) across all 7 provinces covering 6 million consumers as on date.
b) The scope of work includes supply, delivery, design, customization, integration, implementation, testing, commissioning of Hardware and software of the RMS with necessary Facility Management Services.
c) The RMS thus supplied and implemented shall be complemented with COTS database, Middleware, Network and customer care equipment and other software in conformance to Industry standards and installation of necessary infrastructure (at DC & DR) and its maintenance for all the users.
d) The total period of the contract would be 6.5 years including 1.5-Year of implementation period and Facility Management Services (FMS) support for 5 Years. During the FMS period, the SI

shall provide requisite manpower and technical support services as described in the relevant section of this RFP.

The envisaged RMS solution shall consist of the following modules:

Table 1: RMS Modules

S. No	Module
1	Metering
2	Billing
3	Collection
4	New Connection, Disconnection & Reconnection
5	Energy Audit
6	Customer relationship management (CRM)
7	Web portal and Mobile Application
8	Management information System (MIS)
9	Document management system (DMS)
10	Customer Care Center (CCC)

2.2.1 Geographical scope

The RMS shall be implemented across 181 revenue and collection centers across 128 DCS of NEA. The number of consumers in NEA stands at 4.54 million which does not include the consumers under Community Rural Electrification, which is serving about 0.55 million consumers in rural areas. Hence the total consumers served has reached approximately 5.08 million in 2021. The current consumer growth rate (in comparison to last year) is 7.3%.

Bidders shall quote for 6 million consumers licenses and propose a solution scalable to consider a CAGR of 5% over the duration of the project. The hardware proposed by the bidder shall consider the final consumer base and office counts arrived by considering the CAGR mentioned above.

The detailed consumer count across the seven provinces is mentioned in Annexure **4.3**

Table 2: Province Wise consumer count

Province No.	Branch	Total
1	Pradesh No 1, Biratnagar	8,61,427
2	Pradesh No 2, Janakpur	9,44,148
3	Bagmati Pradesh, Kathmandu	10,94,300
4	Gandaki Pradesh, Pokhara	4,03,286
5	Lumbini Pradesh, Butwal	8,47,026
6	Karnali Pradesh, Surkhet	1,08,698
7	Sudurpaschim Pradesh, Attariya	2,86,652

Province No.	Branch	Total
Grand Total		**45,45,537**

2.2.2 Detailed As-Is Study and To-Be

a) SI shall carry out a current state assessment of the existing IT architecture of NEA including IT Applications & Solutions, Utility Business process, ICT Infrastructure Solutions, End user's competency, information system security, governance structure, etc.
b) SI will identify gap areas also formulate a high level To-Be report including but not limited to recommendation on sunset/carry forward of existing IT applications & solutions which need before/post implementation of the RMS, change management requirements, key risks and mitigation strategy, proposed governance structure, procedures and policies, security requirements, etc.
c) The SI will take the necessary inputs and approval on the formulated As-Is Status and To-Be report from Stakeholders/Nodal Officers of NEA.

2.2.3 Business Blueprinting

a) SI should prepare and submit a detailed solution architecture and deployment architecture of the system (HLD & LLD Reports for IT infrastructure). SI should submit Solution Architecture for IT infrastructure deployment for Data Center and Disaster Recovery Center.
b) SI should submit the Guaranteed technical parameters for each of the IT infrastructure components and obtain approval before manufacturing, design, and supply.
c) The functional and technical requirement specifications mentioned as part of this RFP are indicative and provide broad contours for designing a robust RMS. The SI is expected to conduct requirement gathering workshops with relevant business stakeholders to obtain detailed requirements against the specifications to be able to design a state of art RMS.
d) SI shall commence designing of the RMS post sign off on all requisite design documents submitted to NEA.

2.2.4 Design and Customization

a) SI should carry out the supply, installation, development and customization of modules based on the approved solution design, technical specifications document and FRS document for RMS.
b) SI shall prepare and submit a detailed project plan for the software development /Customization.

2.2.5 Provisioning of DC and DR

Provisioning of DC and DR to be undertaken in parallel with Business Blueprinting.

a) SI shall be responsible for supply and installation of necessary hardware, software and supporting systems for successfully running RMS operations for scope of work at Data Center and Disaster Recovery Centers.
b) SI shall supply, install, commission, and maintain the additional hardware and software systems for RMS including supporting system and services at Data Center (DC) and Disaster Recovery (DR).
c) SI shall procure software licenses in the name of NEA and renew the software licenses during annual technical support.
d) Shall provide business continuity services from the Disaster Recovery site, in case the primary site becomes unavailable.
e) NEA Shall provide space and location of Data Center and Disaster recovery Site post award of the contract.

2.2.6 Integration Requirements

a) SI will provide integration/interfacing services for RMS with upcoming IT/Business solutions like AMI, GIS, DMS, OMS, DCC, Payment Gateway, E-Office System, BI&DA etc. at NEA.

2.2.7 Inspection and Testing

a) The SI shall conduct all types of software testing to ensure that the software is defect free and acceptable to NEA. Software testing shall be in accordance with the general testing procedures of the Software Development Life Cycle (SDLC).
b) Any Level of development and fixes will be tested by the support team of SI in the development environment and subsequently UAT will be carried out by end users in the test environment before they are implemented in the production environment.
b) SI should set up a testing environment at the Disaster Recovery Center hosting facilities for testing requirements.
c) Following the standard testing procedures, the bidder must perform various inspections and Tests including but not limited to Factory Acceptance testing(FAT), Pre-Dispatch Inspection, Type Testing for hardware and Simulated Load testing, Performance test, response time test etc. on the System as part of and the user acceptance procedure for software. Test environment for review by NEA shall be built on NEA on-premise data center on existing hardware.

2.2.8 Solution Security

a) The SI will provide services of quality assurance through IT/Cyber Security ensuring compliance to the recommendations for RMS. Proposed solution should comply with necessary IT/Cyber Security guidelines of Govt. of Nepal, in accordance with electronic transaction Act 2063 and electronic transaction rule 2064.

2.2.9 Data Digitization and Data Migration

a) SI shall carry out data digitization of legacy and existing consumer. Data digitization activity including Pre-scanning(preparation of document prior to scanning), document scanning and barcoding, Post scanning- storage, search, retrieval & backup, data entry for existing consumer

base.

b) SI shall carry out data migration activity including data assessment, data preparation, data cleansing, assessment data format, field and number of fields, prepare data migration strategy and data migration (including master & transaction data) of the entire consumer base to RMS.

2.2.10 RMS Pilot Roll Out

a) SI shall carry out a pilot Roll-out at 9 DCS namely ITAHARI DC, JANAKPUR DC, RATNAPARK DC, HETAUDA DC, POKHARA DC, BUTWAL DC, KOHALPUR DC, SURKHET DC, DHANGADHI DC DCS with approximately consumer base of 5.8 lacs as per the timelines provided in the Delivery and Completion Schedule. The pilot locations mentioned are tentative and can be increased/decreased after the As Is study.
Note: The list of consumer count DCS wise is attached in Annexure 4.3

2.2.11 Creation of Customer Care Center

a) The scope of work broadly entails creation of customer care centers at 7 provinces of NEA with 3 agents and 1 supervising agent at each location.
b) The customer care center will operate through one unique number for the entire Nepal.
c) Customer care center will run in integration with the outage management system, distribution management system, revenue management system, mobile application, workforce management system, social media platforms like WhatsApp, twitter, Facebook etc.

2.2.12 Roll Out and Stabilization

a) SI shall carry out the rollout of RMS across the NEA enterprise as per the timelines provided in the Delivery and Completion Schedule.
b) SI shall provide hand holding support for NEA employees.
c) Post successful completion of Roll-out, SI shall provide a stabilization period of 3-months.
d) The system will be called Go-live after due approval from NEA and compliance to the Go-live criteria defined in the RFP.
e) SI shall be required to depute requisite numbers of people who would be responsible for hand holding, resolving end-user queries and problems on RMS at NEA. Deployed manpower shall be skilled and equipped with requisite tools and infrastructure for safe, reliable, proper and correct installation of the required system.

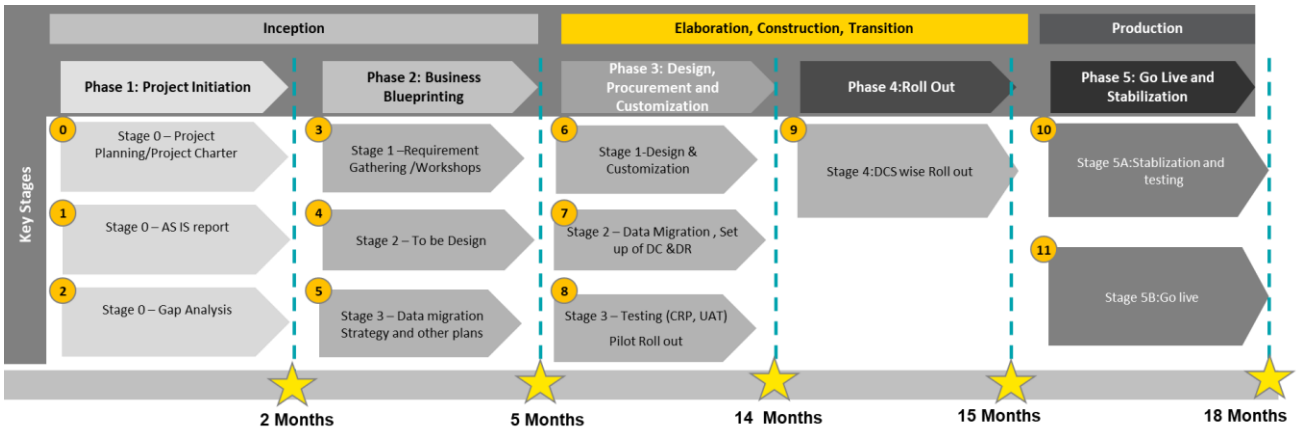


Figure 2: Indicative Project stages

2.2.13 Prevalent laws and guidelines

The SI shall adhere to the prevalent laws and guidelines with subsequent amendments (if any) of NEA and Government of Nepal which would be built into the business logic of the RMS. These rules include but not limited to:

a. Nepal Electricity Authority Act, 1984
b. NEA Employees Rules and Regulations
c. NEA Financial Administration Rules and Regulations
d. Electricity Act,1992
e. Nepal Accounting Standards/ IFRS
f. Electricity Distribution regulation
g. Legislation on Electrical Invoicing, 2074

2.2.14 Change management, Capacity building and training

a) SI will provide basic and specialized training on RMS to the employees of NEA pertaining to their areas of work. This activity shall include Change Management, Hand Holding and Capacity Building sessions including training of users for effective use of the system.
b) SI shall impart training to NEA employees and other key stakeholders on the usage and maintenance of the RMS.
c) SI shall provide a change management plan to NEA which addresses the various aspects of capacity building and training.

2.2.15 Adherence to implementation Plan and Governance Structure

a) SI must ensure implementation of RMS, inline to the agreed implementation schedule and rollout plan.
b) SI shall adhere to roles and responsibilities as defined in RFP but not limited with respect to design, development, customization, implementation as well as operations and maintenance

of RMS across all project locations at NEA.

c) SI must conform to defined Governance Structure for project review and monitoring including risk management during the entire contractual period

2.2.16 Warranty, Technical support, and Maintenance services

a) SI shall provide warranty of all supplied hardware for the entire duration of the project.
b) SI shall have back to back support from OEM for any equipment supplied as part of the project. Proof of the same shall be submitted to NEA upon finalization of the OEM by the successful bidder.
c) Warranty shall entail engineering and technical assistance during the implementation and FMS period.
d) SI shall provide necessary Facility Management Services for 5 years after Successful Go-live of RMS

2.2.17 Exit Management and Knowledge Transfer

SI will be required to provide the necessary handholding and transition support including all information as may be necessary and reasonable required to effect as a seamless handover as practicable in the circumstances to NEA or designated staff or any other agency that is selected for maintenance of RMS solution post completion of Contract with the SI.

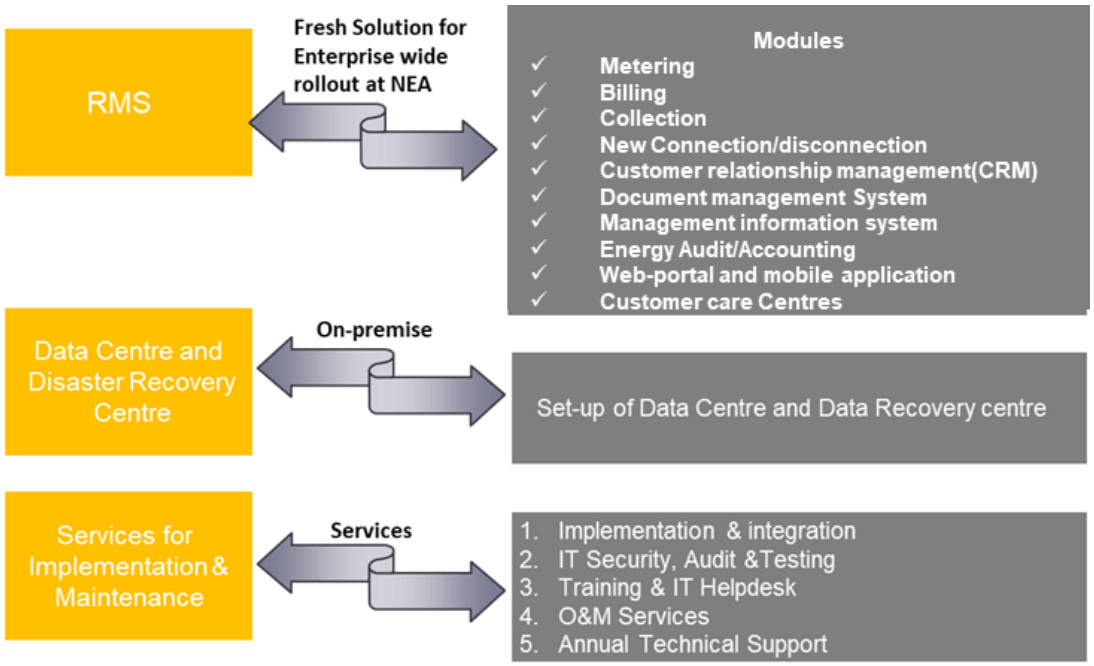


Figure 3 Indicative RMS deployment Construct

2.3 Detailed Scope of Work

2.3.1 System Scope

NEA has carried out a functional requirements analysis and detailed Functional Requirements Specifications (FRS) are attached in Section-III of the RFP document for reference. The scope of work including but not limited to the broad scope of work of the project as detailed below:

a. SI shall design, supply, install, test, commission and provide commercial off the shelf (COTS) based revenue management system deployed on premise DC-DR on 1:1 replica for production environment only.
b. SI shall design a system that is modular, extensible and elastic to meet future and current requirements, is secured, scalable and meets the desired high-performance requirement of an enterprise business system.
c. SI shall provide a System that at the least meets or exceeds the functional requirements and performance benchmarks as specified in this RFP.
d. SI shall upgrade the latest version of software without any additional charge to NEA during the duration of the project.
e. SI shall design a system that provides capability to the end users of the 7 provinces to be able to use the RMS without any hindrances or performance challenges. For example data migration/de-migration or associated activities being carried out in one province should not result in downtime for other province end users. Also, records of consumers or each province should be segregated at application and database levels as NEA is planning to unbundle the Distribution services directorate into 7 individual distribution companies. Hence, the system design must mandatorily cater to this requirement on all levels.
f. SI shall hand over the source code of all the customizations in the RMS product stack.

2.3.2 Supply of Licenses

a. SI shall provide enterprise wide perpetual licenses for all the software mentioned in the RFP.
b. All software which will be proposed shall be of the latest version of that product as released globally. Any deviation in this respect may lead to rejection of bid, for which the SI will themselves be responsible.
c. All software components for DC and DRC should be of commercially licensed version, including but not limited to RMS Product Stack, Database (RDBMS), OS, Middleware, Virtualization, and others as required. In case the bidder chooses to use any open source software, it should be licensed/enterprise version
d. All the licenses should be in the name of NEA. SI shall renew the licenses during the annual technical support period so that if NEA wants to renew the subscription of licenses at the end of the contract period, NEA should not bear the cost of previous years.
e. In case NEA decides to unbundle into different DISCOMs or utilities, Licenses should be transferred in the name of respective DISCOM or utility thus formed without any additional cost implications to NEA.
f. Above said licenses should carry with them required Support & Subscription services directly from their OEM for a 24x7x365 support with unlimited incident support including the unlimited upgrades with 30 mins or less response time for severity 1 calls.

g. Appropriate required number of licenses as above will be quoted without any restriction on access/usage, limitations of any kind of functionality.
h. The license unit rates proposed by the successful bidder shall remain valid for the entire duration of the project. NEA will have a liberty to order additional RMS Licenses & Other Software Licenses items in the unit rates of items offered in the commercial bid.
i. RMS Licenses including Application, Database, Supporting Solution, Tools, etc. shall be property of NEA, and shall be utilized by purchaser as per its business requirement.

2.3.3 Detailed As-Is Study and To-Be

2.3.3.1.1 Project Charter

a. SI shall formulate a detailed project charter including the detailed project plan, indicating all activities along with the resources required, their roles, responsibilities, and time schedule of deliverables to be prepared at the start of project and submitted to NEA for approval.
b. The project charter should also contain detailed approach and methodology, project management templates, deliverables, project organization, project risks and mitigation plans, dependencies etc.
c. NEA shall constitute a project governance mechanism with adequate representation from all stakeholders to review the documents & deliverables of SI and accord necessary approval.
d. SI shall deploy a project team inline to the manpower requirement as mentioned in the RFP document.

2.3.3.1.2 Site Study

a. SI shall carry out Enterprise wide As-Is Study of existing IT Initiatives, Applications, Business process and procedures, IT Infrastructure, End user's competency, license requirement for revenue and collection center, etc. to identify the Gaps and areas of improvements in the current state of NEA.
b. SI shall identify and suggest on existing IT Applications & Solutions which needs to carry forward and sunset post implementation of the RMS
c. SI shall study the site locations to understand requirements for RMS at NEA. SI should understand the distribution of users, user's requirements & any other information as required for implementation and successful roll out of RMS at site's locations of utility.
d. SI shall study sites to identify network connectivity requirements for optimal functioning of RMS. (Keeping the future expansion in view. Providing network connectivity at sites is not in scope of work of the SI). The study will include end user's system requirement, functional requirement, network bandwidth requirement (at various site locations), data digitization requirements etc. after studying existing sites and systems.
e. SI Shall submit sizing of network bandwidth in AS-IS report and NEA will provide infrastructure.
f. At the end of site visits, SI would submit the detailed As-Is Study report and Gap analysis report.
g. SI shall take the necessary inputs and approval on the formulated As-Is Status and To-Be report from Stakeholders/Nodal Officers of NEA

2.3.4 Designing of RMS solution

2.3.4.1.1 Requirement Gathering

a. NEA has carried out a high-level analysis of processes and identified the indicative functional requirements. These requirements will serve as a guideline to SI to gauge at NEA's requirements.
b. SI shall conduct a detailed requirement gathering session wherein the SI shall capture the detailed set of features/functionalities/business functions pertaining to the FRS.
c. SI must map the Functional Requirements to proposed RMS and analyze the existing gaps between the Functional Requirements and functionalities provided by RMS. During this process, SI should also identify the customization requirements for implementation in the RMS solution.
d. SI should conduct a detailed requirement gathering exercise with stakeholders at NEA for all RMS modules.
e. SI should arrive at the optimal technical specification, sizing, license requirement, architecture, Bill of Material, SLA's and should formulate the RFP for procurement of solutions accordingly.
f. SI should also assess the user expertise level at each office location for various modules and suitably modify Training/Handholding/Change management programs in consultation with the NEA.
g. Based on requirement gathering activities, conducted as part of this task, will result in the Final deliverable for "RMS - Functional Requirements & Software Requirement Specifications" document, which shall detail the requirements of the complete solution up to the last possible detail. SI shall ensure that all requirements are covered in the developed RMS.

2.3.4.1.2 Business Design

a. SI shall perform a business study and prepare business design documents to map all business requirements of NEA in RMS.
b. SI is expected to conduct workshops, give detailed presentations on Business Design, which will include discussions on the results gap analysis and specific recommendations for adoption of new improved business processes by NEA.
c. Business design objective, approach and methodology should ensure the following four steps:
    - **Simplification and Standardization of Processes:** The processes of all divisions need to be simplified into logical steps. All processes need to be depicted into simple flow diagrams with clear linkages. This will help in reviewing some of the old manual practices in view of the integrated system scenario of the future. The SI also needs to explore and recommend the standardization of processes across all lines of businesses/divisions.
    - **Elimination of Redundant and Non-Value Adding Processes:** After simplifying the processes, all processes are to be reviewed to eliminate the redundant steps and practices. Non-availability of information across the departments results in repetitive and redundant activities in a manual work environment.
    - **Value Addition:** After eliminating the redundant processes, the re-engineering of processes needs to be done keeping in view the standard best available processes/ practices available in the proposed RMS solution. The primary objective of this step is to enhance functional efficiency and process performance. This is the most important phase which will have a strong bearing on the overall performance of the final solution.

- **Configuration:** After finalizing the To-Be process map, configuration through standard processes should be done in the RMS. Configuring the To-Be processes in the system should be able to address all the defined requirements.

d. SI shall prepare a detailed Organogram for NEA and map it with role-based users for RMS solution.
e. SI shall submit a Business Design document covering the complete requirements for necessary approval of NEA.
f. SI shall submit the reports on TO-Be Process Documents to the Nodal Officers of NEA

2.3.4.1.3 System Design

a. SI shall prepare a comprehensive System Architecture and design document after conducting a comprehensive analysis of the requirement for RMS at NEA. This design should include Solution Architecture, Network Design, Security Architecture etc. for RMS.
b. SI shall be required to study the existing Network schema and design IP addressing scheme for Network. The IP addressing scheme proposed by SI shall be reviewed by NEA. However, the implementation of the approved IP addressing scheme including necessary configuration of IP addresses in all the desktops at all locations shall not be under the scope of SI.
c. SI should prepare and submit a deployment architecture of the system including High Level Design and Low-Level Design etc. (HLD & LLD Reports)
d. The architecture documents should give the complete architecture of the proposed RMS. The documents including, but not limited to the following, shall be submitted for necessary approval:
    - Application Functional architecture
    - Format of all input screens including data entry requirements
    - Format of all reports that would be generated by RMS
    - Access control mechanisms, data security and audit trails to ensure that databases are not tampered with or modified by unauthorized users.
e. SI shall develop a comprehensive RMS with audit trail of all transactions (for e.g. add, update, and delete) using transaction log reports, so that errors in data, intentional or otherwise, can be traced and reversed. Also, access controls must be provided to ensure that the databases are not tampered or modified by system operators.
f. To ensure data security, the SI should factor necessary security parameters to be built in RMS.
g. Design and Implementation of System Architecture: SI shall be entirely responsible for architecture of the system implemented to satisfy all features, functions, performance, and security as described in this document.
h. RMS design must be such as to require the minimal installation, if at all, at the user's end, besides the Internet Browser. The RMS should be able to support all latest common browsers (like Internet explorer, Mozilla, Chrome etc.).
i. SI shall consider users' inputs when they are finalizing all design components including user interfaces, mode of data entry, storage and retrieval, outputs reports, queries and the application design.
j. SI shall be responsible for making sure that all the above considerations are adequately met. SI shall submit an architecture document covering the above aspects.

k. SI shall ensure that granularity is built in the RMS application modules, sub modules and individual functionalities so that these functionalities can be enabled or disabled through the application administrator as per requirement.
l. The system must possess easy-to-use user interfaces, able to perform tasks with minimum of clicks, maximum select options and provide suitable short-cuts wherever possible and guided through screens.
m. SI shall make necessary provisions for management reports, dashboards, business intelligence tools, SMS gateway and data migration in line with the expectations of users provided in the functional requirements.
n. SI shall address the above requirements according to site-assessment and the solution design.
o. SI shall design the Document management system in such a manner that it should cater at least 10 custom workflows. The details of custom workflows shall be discussed during design discussions.
p. SI shall keep a provision for retrieving the consumer details from the DMS without login into the DMS from the billing portal. Illustrative example is shown Figure 4: consumer files retrieval from DMS

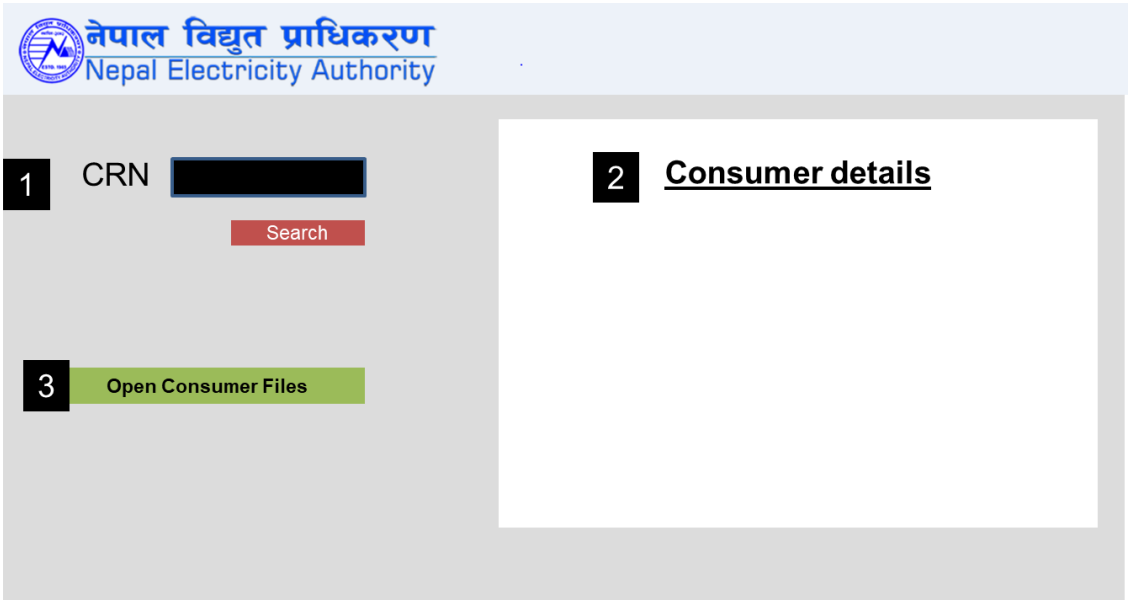


Figure 4: consumer files retrieval from DMS

2.3.5 Provisioning of Data Center and Disaster Recovery Center

a. The SI will execute Data Center (DC) to design, supply, installation, testing and commissioning of necessary IT Infrastructure & hardware equipment including Servers, Network, Storage, Supporting Software etc. at Kathmandu Valley. Data Center solution shall be designed considering the requirement of primary business operations, 24X7 availability, 1:1 replica for production environment only with Secondary Site (Disaster Recovery Site) and implementation of RMS at NEA.
b. SI will execute Disaster Recovery Center (DRC) implementation which shall include, design, supply, installation, testing and commissioning of necessary IT Infrastructure & hardware

equipment including Servers, Network, Storage, Supporting Software etc. at Kathmandu Valley. The Disaster Recovery Center solution shall be designed considering the requirement of Secondary business operations, 24X7 availability, 1:1 replica for production environment only with Primary Site (Data Center Site) and implementation of RMS at NEA.

c. The IT Infrastructure at Data Center & Disaster Recovery Center utilization should not exceed the 70% utilization threshold level at any given point of time. Design, Supply, Installation, Integration, Testing and Commissioning of the overall RMS to meet the business requirements of NEA.
d. NEA will provide space/power/cooling and other basic requirements for servers, storage, and peripherals within NEA Head office or at NEA office within Kathmandu. Data center is likely to be set up at NEA-DCC Building near the Load Dispatch Centre (LDC Office) at Siuchatar substation, Kathmandu Area. However, in case the DCC project is not rolled out at the time of construction of the data center then the location for the data center within Kathmandu will be finalized during design discussion.
e. System Integrator should create a backup site at the location specified by NEA. The location backup site will be finalized during the design discussion. The system integrator should supply the necessary hardware and software for keeping entire SAN-to-SAN replication. System Integrator must ensure to take the backups as per backup policy prepared by System Integrator and as finalized by NEA.

2.3.6 Creation of Customer Care center

a) NEA intends to implement a smart customer care center at its 7 provinces namely province no. 1, Biratnagar, province no. 2, Janakpur, province no. 3, Kathmandu, Gandaki Pradesh, Lumbini p.o., Butwal, KARNALI Pradesh, SUDURPASCHIM Pradesh, with centralized customer care center to be located at Kathmandu to increase the 'customer satisfaction level' and thus is looking forward for implementing a State of art Customer Care Centre.
b) Smart customer care center is envisaged to operate through single unique number for entire Nepal with call landing facility to nearest provinces.

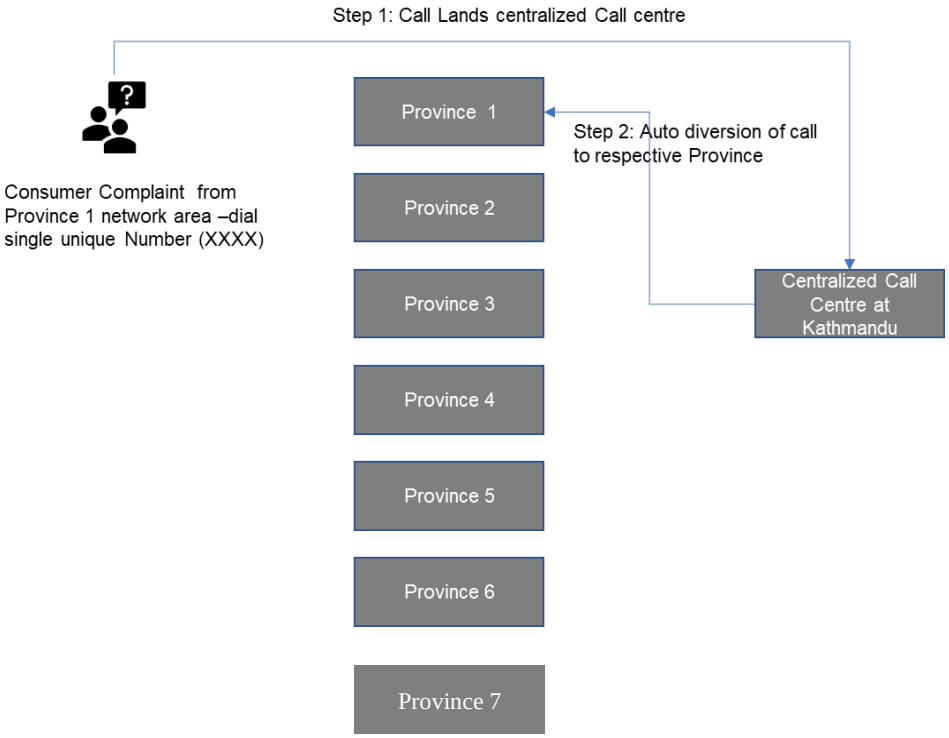


Figure 5 Indicative single number approach

c) It is envisaged that each call center in 7 provinces will have a facility of 3 customer care agents and one supervisor. From pilot roll out until Go-Live declaration CCC operations shall be carried out by System Integrator along with requisite training to the NEA staff. Post Go-Live, CCC operations shall be taken over by NEA. The bidder shall factor the cost of resources to be deployed for CCC under the CCC implementation ahead of the price schedule.

d) Detailed requirements of the CCC

2.3.6.1.1 Indicative Architecture

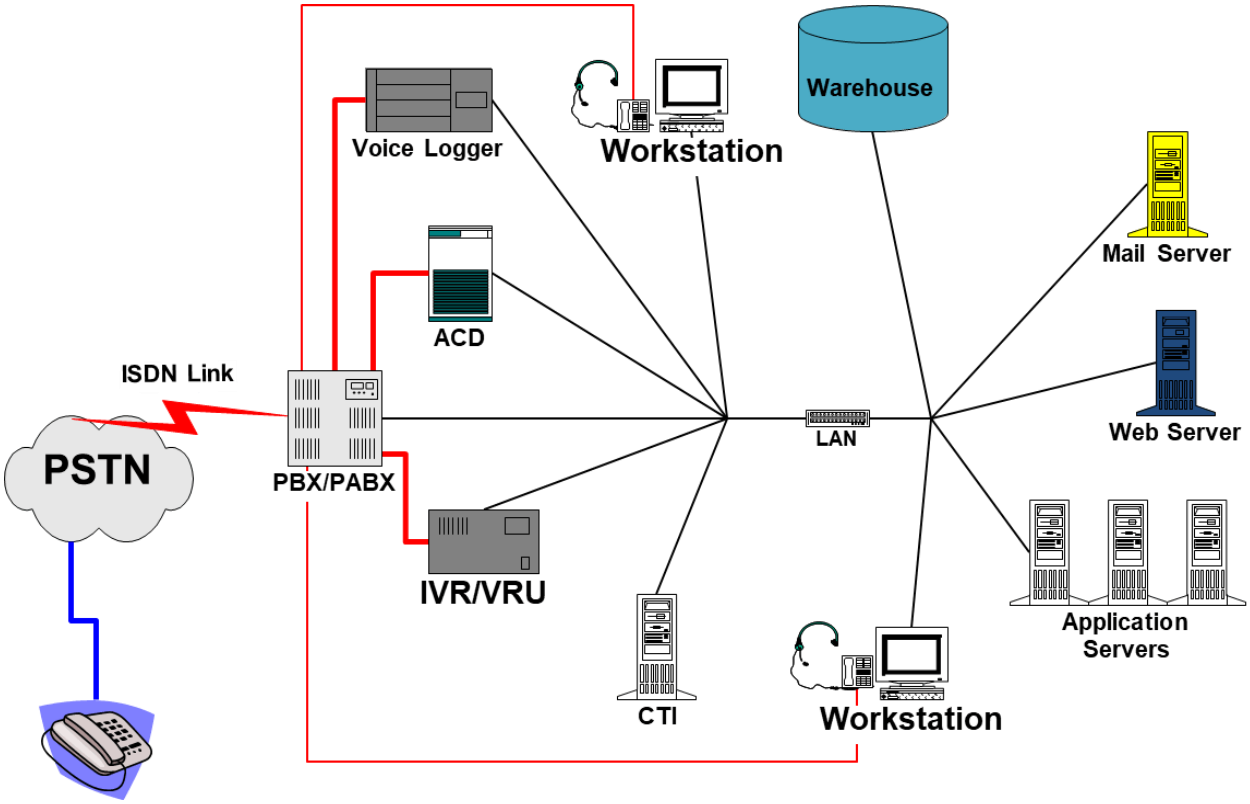


Figure 6 Indicative architecture of CCC

2.3.6.1.2 Integration Requirements

With respect to integration of the system, the SI needs to ensure the following, including but not limited to:

a) Ability to interface with Handheld devices, SBM etc
b) Flexible Interface through API
c) Customizable adapters and interfaces to integrate

a. Integration with Smart metering:

I. NEA has implemented smart metering programs in Kathmandu valley and planning to implement across Nepal. As part of the implementations MDMS has been implemented along with Business intelligence software. SI shall interface with the requisite applications of these implementations to ensure master data sync and reporting homogeneity across systems.

b. Integration with ERP

I. NEA is planning to implement ERP will have following modules with which the SI shall have interfaces/API based integrations.

Module
Financial Management
Material Management

Human Resource Management
Project Management
Maintenance Management
Production Planning
Supporting module
Linear Asset Management
Document and File Management
BI & BW
Mobile Application

II. Detailed use integration use cases shall be discussed with the successful bidder.

c. Integration with Distribution command and control center project

I. SI shall carry out integration with the Distribution management system and Outage management system.

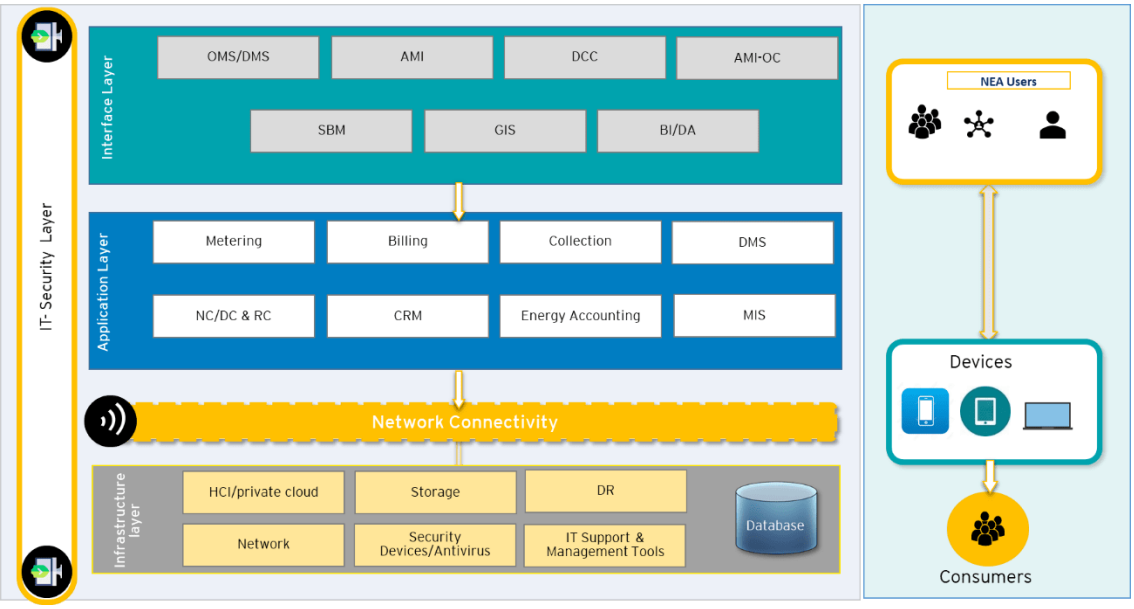


Figure 7: Indicative architecture for interface/integration requirement

The RMS shall be designed considering that NEA is implementing various enterprise level software systems such as GIS, DMS, OMS, ERP Smart metering etc. with a view to bring homogeneity in operations and maintenance of distribution system and hence it is envisaged that the proposed RMS shall be interfaced/integrated with these systems and other systems during the duration of the project. The SI shall consider leading practices while proposing use cases of integration with the systems with an aim to fulfill this objective.

2.3.7 Testing

2.3.7.1.1 Testing

Testing and quality assurance in software development is more rigorous since each component must be more reliable if it is to be reused. A system is tested at various stages of development and deployment. For example, each component is tested as a unit for checking the correctness of its own code. Further, the component is tested with its dependent components. After final release of the entire

set of components, the system is tested for the correctness of system functionality. Finally, the components are further tested in simulated production load for performance and load analysis.

All testing is the responsibility of SI and NEA shall undertake UAT once all testing completion is confirmed by the SI. The SI shall be responsible for the planning of the testing processes which includes preparing test plans and defining roles and responsibilities. The SI will be responsible for the coordination of the test preparation (consists of preparing test specification, test environment, test data, test cases) and execution (includes testing at various levels like unit level, integration level, system level and production). NEA will approve the test scenarios, cases etc. prepared by SI.

Test Plans: The SI is expected to submit the test plans to NEA for approval. Test plans contains following items:

a. Roles and responsibilities of test team
b. Test Scenarios along with entry and exit criteria
c. Test specifications
d. Suspension and resumption criteria

Test scenarios: The SI along with NEA should prepare test scenarios for each business scenario. A test scenario when executed should fulfill a business requirement as per the scope of business functionality. Test scenarios include following:

- **Test Specification** - During the test specification phase, the test cases are specified. It consists of description of the input, process to be executed and a prediction of output results.
- **Test Environment** - The test environment should be different from the production environment. At no instance, during the tenure of the project, production environment be used for testing any case or change. A separate test environment should always be available for testing purposes. Component developer does unit testing and integration testing. Integration testing can be delegated to a specialized testing group. Each of the members in the testing group is provided with a testing environment according to his/her role and responsibilities. Following is sample testing environment for testing:
    i. A workstation
    ii. A set of tools and applications required on workstation like access to user interface, browser etc.
    iii. Access to centralized document database (where all the project related documents are maintained)
    iv. Access to testing tools and defect logging tools
    v. Access to the central database or repository for development and unit testing (this database contains sample test data)
    vi. Access to deployed components

- **Test Data** - Test data is prepared for testing at each stage. The test data should be prepared in such a way that it covers the basic path and every alternate path of the code. The basic path and alternate paths are prioritized to capture relevant data. Tools can also be used to generate test data.

- **Test Execution:** The following testing steps are usually employed in the project lifecycle. The software developer is expected to follow these steps:
    - **Baseline Testing** -The purpose of Baseline Scope testing activities is to plan and conduct testing to validate the Baseline configuration. Baseline Scope testing shall ensure that Baseline configuration is valid and supports the business processes defined in the Blueprint. Baseline Scope Testing shall include:
        - Unit Testing: Testing of transactions and functions within modules
        - Scenario Testing: Testing of business processes and scenarios
    - **Testing of Customized development** - After customization & configuration of the RMS, the SI shall conduct tests to demonstrate that the system meets all the requirements (functional and Non-Functional) specifications as brought out in this RFP and would be in accordance with the procedures detailed in the approved process document. Based on these tests, a report would be submitted by SI for review and approval by NEA. The test results and response times should be demonstrated by SI during the testing phases (System, integration & Stress and Load testing) at each NEA location in an environment/infrastructure as mutually agreed upon by NEA and SI. The development testing shall cover testing of:
        - Unit testing of customer-specific development
        - Conversions
        - Enhancements (User-exits and other code enhancements)
        - Reports

      Development should be tested by NEA to make sure that the test results (output data) are correct and reflect the business processes defined in the Business Blueprint Design.

      After development unit testing is completed, all customer-specific programs and forms shall be included in the Final Integration Test.

      Integration Testing - The purpose of integration test shall be to plan and execute testing of the integrated components, including simulation of live operations, and analyze the results, important for functional verification of the production system. Integration testing shall be accomplished through the execution of predefined business flows, or scenarios, that emulate how the system will run the processes of NEA. These business flows, using migrated data from the pre-existing systems, shall be performed in a testing environment comprising of RMS products, third-party software if any. The integration tests shall build the necessary level of confidence that the solution is complete and will perform the processes of NEA. Integration testing shall focus on cross-functional integration points, as well as end-to-end business processes. The final integration test plan shall start with the testing of cross-functional integration points (touch points) and end with the end-to-end testing of critical business processes identified within the Business Blueprint.

c. **System Testing -** System testing is performed when all the components are delivered to a central repository prior to the release of the software. The testing is done on priority basis of business processes. All the defects are logged and assigned to respective component owners. The component and unit testing are performed after the correction of code. However, it may depend on size and type of individual test specifications. Impact analysis is useful to narrow down testing efforts by identifying critical test cases affected due to code change.

d. **Security/Penetration Testing -** Testing how well the system protects against unauthorized internal or external access, willful damage, etc.

e. **Pre-Production Testing** – Pre-Production testing is done simulating the production load. Test data is either prepared or generated from the tools. This testing is used to evaluate performance, load capacity and concurrency. Load testing tools can also be used for this purpose. Load, scalability and stress testing would be conducted prior to Go-Live, once the System Integration testing of the configured and customized solution has been conducted successfully. SI should use suitable simulation tools in accordance with the agreed test procedures keeping in view NEA's projected future load of transactional users as proposed by SI and agreed by NEA. After successful testing and its clearance with NEA, the solution would then be considered as ready for commissioning. Following special type of testing are done during Pre-Production Testing Phase:

   i. Regression Testing
   ii. Performance testing (stress, volume, back up tests)
   iii. Load testing
   iv. Installation testing
   v. Recover/error testing

f. **User Acceptance Testing -** During the test scenarios definition, for each of the business scenarios, an acceptance criterion is defined. Acceptance criteria include expected behaviour of the s/w component and the expected results (data). Expected results form a part of the Exit Criteria. In addition to expected results and behaviours, some conditions are also specified in the exit criteria. They can be:
   i. Number of bugs to be discovered for a functional module. This depends on the size of the functionality and is an indicator of the amount of testing done.
   ii. If any medium or low-priority errors are outstanding - the implementation risk must be signed off as acceptable by NEA
   iii. All High Priority errors from System Test must be fixed and tested
   iv. Code Coverage
   v. Error (Exception) Handling

SI shall be responsible for creation of test plan, script, environment, scenarios, entry exit criteria for UAT. Same shall be reviewed, discussed and finalized in consultation with NEA.

Upon conduction of UAT, SI shall maintain a monitoring and tracking tool with a dashboard wherein it will be possible for NEA to monitor the progress on development of changes suggested during the UAT and their subsequent releases into the production environment. Upon acceptance and approval of NEA on the UAT, the milestone shall be deemed completed by the SI.

g. Site Acceptance testing (Installation and Functional Test)

The installation tests shall be conducted by the Bidder and include:

i. Functional testing of each equipment after installation on site
ii. Functional test of each interface provided
iii. Point-to-point Test
iv. Communication Integration Test after all interface and connected devices.
v. Functional Testing of application
vi. Test for performance
vii. Any other test felt necessary by Employer.

2.3.7.1.2 Inspections

Factory Inspections: All the hardware, software, Non-IT equipment etc. should have gone through appropriate type testing, factory acceptance test procedures. SI shall be required to furnish certificates from OEM in this regard.

Inspections following delivery: All the hardware and software will be inspected for compliance with the functional and technical requirements as mentioned in the Bidding Document and as agreed between the Purchaser and the System Integrator through contract. SI shall provide a comprehensive list of all the items supplied in accordance with the implementation schedule.

2.3.8 Data Migration and Data Digitization

2.3.8.1.1 Data Archival and retention policy

SI shall ensure the data shall be in active directory for 3 years and data shall be archived for 5 years (shall be exclusive of 3 years active data).

2.3.8.1.2 Data Migration

Data Migration refers to validation and migration of data from the manual/legacy system to the new database schema, linking and Meta tagging the documents to the relevant records Data migration is one of the key activities for successful rollout of the project.

SI shall:

a. Understand the data model of existing MPower billing systems.
b. SI Must digitize all manual data.
c. Design the comprehensive data model for proposed solution in consultation with NEA. Data Migration strategy will be approved by NEA before commencing the process.
d. SI shall design a system that caters to the bilingual requirement of the project. Nepali and English.

e. As part of the data migration strategy, the SI shall consider all live and archived transactions of the existing RMS that are implemented across NEA.
f. Submit the migration report along with the error report & carry out corrective actions after sign off with the concerned division who will be the reconciling and sign-off authority for their respective migrations.
g. At the end of the contract period or Project period, SI shall provide the complete data in the common agreeable format.
h. Data of all consumers of 7 provinces has to be migrated from the old systems and is envisaged to be migrated to the new system.
i. Ensure that, the migration of all the master data, geo data and transaction data pertaining to consumer meter reading, billing, collection, complaints and any other items which may be critical and necessary for being available to run all the proposed applications, efficiently and effectively.
j. Ensure proper validations, tracking and reporting and correction procedures for migration of data from the existing database/ any other format.
k. Migrate a minimum of 5 years existing data and the older data will be archived and be made available for usage at all locations within the same UI in which the Online data should be visible and accessible.
l. The SI shall transfer/upload the existing master data of old consumers / payment details / outstanding details / security deposit details / meter details / previous meter readings / installment details and any other relevant data, which are required to run the proposed RMS solution stack.

SI must adopt following Procedure for data migration:

2.3.8.1.3 Data Assessment

The study of the source/legacy systems must provide comprehensive insights into the content, structure, quality, and integrity of the source/legacy systems.

Risk Identification and Mitigation Plan for Data Migration: The SI shall identify all risks associated with the data migration and enumerate mitigation measures and prepare a Risk Identification and Mitigation plan for Data Migration. The plan must address the contingency measures to be adopted during the event of a data migration failure. It must also clearly specify measures to be taken to prevent data loss. It may be preferable to consider migration of data to a backup system at the same time as the new system to address data loss due to system failures.

2.3.8.1.4 Data Mapping and cleansing

A comprehensive data mapping exercise must be undertaken by the SI before embarking on data migration. A good data map will detail an in-depth cross referencing of all mutual fields across the source system and the target system. It must include the following (but not limited to):

a. Names of applicable fields -to (destination) and from (source)
b. Lengths and data types of these fields
c. Mapping of relationships between entities
d. Check on the constraints, unique fields and integrity checks

e. Any logic involved in mapping such as string truncations or validations against any business rules.

SI shall be responsible for migration of operational data as required, including financial transaction data such as ongoing contracts, employee transaction data etc.

In the event of any gaps in data migration, the SI shall discuss with NEA, document the findings and get it approved from NEA.

a. SI shall run mock data migration tests to validate the conversion programs that have been written.
b. SI shall validate the data before uploading the same to the production environment.

SI shall support in conducting the acceptance testing and verifying the completeness and accuracy of the data migrated from the legacy systems to the proposed solution.

SI should submit data digitization and migration strategy in their bid, detailing all the activities to be performed during the data migration. Indicative broad activities to be performed by the SI are as follows:

a. An assessment needs to be done to identify the database requirements for the application envisaged for this project. The data requirements in terms of master data and transaction data need to be identified, which is required for the envisaged solution.
b. Migration of complete records available in electronic form is required to be performed to acceptable quality and standards as prescribed in this RFP.
c. Development of merged database structure.
d. Porting of all the data into the database.
e. Final updating of the single database.

Additional Requirements for Data Migration

a. The SI shall migrate the data at the implementation sites of NEA.
b. The SI shall formulate the “Data Migration Strategy document” which will also include internal quality assurance mechanisms. This will be reviewed and approved by NEA prior to commencement of data migration.
c. The SI shall incorporate all comments and suggestions of NEA in the Data Migration
d. The SI shall perform mock data migration tests to validate the conversion programs.
e. The SI shall ensure complete data cleaning and validation for all data migrated from the legacy systems to the new application.
f. The SI shall generate appropriate control reports before and after migration to ensure accuracy and completeness of the data.
g. The SI shall convey to NEA in advance all the mandatory data fields required for functioning of the proposed solution and which are not available in the legacy systems and are required to be obtained by NEA.
h. SI shall develop data entry programs / applications that may be required for data migration in order to capture data available with / obtained by NEA in non – electronic format.
i. SI shall conduct the acceptance testing and verify the completeness and accuracy of the data migrated from the legacy systems to the proposed solution.

j. SI shall be responsible for data migration of all electronic and non-electronic forms of data. Templates for data migration shall be finalized during the business blueprinting phase.

2.3.8.1.5 Data Digitization

Data digitization will be carried out to ensure electronic images of paper source documents, where the image is intended to replace the original as the official record, are captured. The data digitization is envisaged to be carried out for existing consumer base. In a way that ensures their reliability, authenticity, and usability over their entire retention period and that allows the images, or copies produced from the images, to be authenticated as true copies of the originals and to be admissible as evidence in legal proceedings.

The entire process of scanning, digitizing and data entry of office documents has been divided into following stages:

Stage 1: Pre-Scanning

Stage 2: Document Scanning

Stage 3: Post scanning, Storage, Search, Retrieval & Backup

Stage 4: Data Entry

Stage 1: Pre-Scanning (Preparation of Document Prior to Scanning)

a) The documents would be handed over in lots as agreed mutually by the SI and NEA. The SI shall provide acknowledgement of the number of documents and the number of pages in each document received from the NEA. Number of documents/ pages in a file shall be checked in presence of the representative of the NEA.
b) SI will maintain a record of the document details in a log register while collecting these documents. This log register should contain at least the following details:
   - Description of the document collected /< file No.>
   - Size of pages in document (A4/legal/Full scale/note-sheet) along with count
   - Total number of pages in the document
   - Collected from (Government Official)
   - Collected by (SI representative)
   - Date of Collection
   - Expected date of return
c) SI will perform all the pre-scanning activities which may include (but not limited to):
   - Numbering of offices to be covered under this project.
   - Collection of documents from record room
   - Creating an inventory prior to taking files, register and other forms of document for SCAN
   - Removal of dust, tags, pins, threads, rubber bands.
   - Application of curative techniques to biologically infected or otherwise damaged documents etc.,
   - Sorting and numbering of pages in the document file in appropriate order.
   - Unfold and flatten the documents to eliminate creases and wrinkles

- Numbering of “FILES” with “BARCODED SERIAL NUMBER” under each department and office sequencing of “FILES” based on “BARCODED SERIAL NUMBER” labels (Transparent tape to be applied on “BARCODED SERIAL NUMBER” to protect it from tampering)
- Preparing the “PAGES” within the “FILE” with “PAGE NUMBERING”

d) SI shall maintain and return the documents in their original form to the NEA. Documents shall be handled with extreme care so that their chronology is not disturbed. For example, Multi-page documents that must be kept together (e.g., a letter with an attachment).

e) SI will take special care in preparing the documents which are too old and that may not be in good physical condition or are very delicate and may not be directly scanned. This may include (but not limited to) pasting of torn pages, straightening of pages, un-binding of files that cannot be scanned directly. Some old documents may require flat-bed scanners too. The SI may use an ironing process to straighten them. Documents should be prepared such that a normal scanner can scan it.

f) SI shall be responsible for any damage caused by them during the process of scanning and digitization of records and ensure that all such records are repaired at their own cost and information is retrieved. In case such retrieval of data or repair of record is not feasible the SI will compensate for the same by making payment to the NEA towards the value of the damaged or lost data/document/record as valued by the NEA.

g) Any damage to the documents by SI may attract a penalty.

Stage 2: Document Scanning

a) SI will perform all the pre-scanning activities which may include (but not limited to):
- Allocating “FILES” for each “SCANNING MACHINE”
- Scanning each page of the “FILE”
- Restoring “FILE” in same sequence (Page & File No. wise)
- Creating an inventory for the scanned “FILES” and Check with “Inward Handing over the physical “FILES” in “AS IS” condition to the respective Single Point of Contact (SPOC) authorized at each office of NEA

b) document /pages shall be scanned at minimum 200 dpi resolution in gray scale and the size should be not more than 100 KB per image for A4/Legal size pages.

c) SI will use tools for end to end production starting from scanning to second level quality check (QC2).

d) SI will design database structure which shall be approved by NEA and thereafter the same database needs to be maintained for storing scanned data at every level of the process including while uploading those data to DMS.

e) SI shall compress the images using appropriate compression mechanisms such that storage space required is saved and at the same time quality of the image does not deteriorate.

f) The scanned documents shall be converted into any of the standard file formats such as TIFF/PDF/JPEG/RTF/ODT/PNG or other standard formats as per the requirement of the NEA. All the pages of a single digital file will have to be stitched together to generate an exact replica of the physical file. The stitched document should be represented in a TIFF/ PDF format or any other standard format as per NEA requirement.

g) SI shall use Group IV lossless compression technique or better for black and white images and LZW lossless compression or better for images in Grayscale. SI shall use a similar

approach for color images also.

h) The compressed PDF files created for viewing are required to be 50-80% compressed as compared to standard CCITTG4/JPEG compression (in TIFF/ JPEG/PDF file format) for Mono/Grey scale images and shall retain search ability, clarity of image and print quality.

i) The SI will be responsible for quality assurance and will go through all documents to see if they are complete and legible. The SI will undertake Quality Assurance processes for all aspects of processing and post-processing of records including image capture, indexing, storage and return.

j) SI's staff will perform quality control checking (QC 1) to ensure that each page is fully rendered, properly aligned, and free of aliasing/ distortions. Inspection and quality control data shall always be recorded on the worksheet accompanying each volume. Whenever necessary (e.g., poor image capture of an illustration), the staff will re-scan from the original text and insert the image(s) into the proper image file sequence.

k) SI shall perform the OCR (Optical Character Recognition) on the applicable documents with 100% accuracy so that the documents can be searched using the text in the documents. The documents to be digitized are in English/Nepali.

l) Searchable PDF shall be created in one single step by processing the input image file(s) thus ensuring that no intermediate manipulation of the contents is possible.

m) SI shall ensure that the quality of scanned images is enhanced to the optimum level and shall perform all such activities required to bring the scanned image to optimal level such as skew, de-skew to make the image straight, cropping and cleaning of images like removal of black noises around the text and providing equal margins around the text etc.

n) In case the documents are not legible, the SI shall scan the documents at a higher resolution or in Grayscale. No extra payment shall be made for the same.

o) All the pages in a document including blank pages (only when such blank pages are numbered in the file/document) shall be scanned to produce an exact replica of the original document. No page shall be scanned more than once.

p) The scanned documents shall be converted into PDF formats as per the requirement of the end user department. Scanning of Green sheets and Correspondences would be done separately and stored in a folder. All the pages of a single file will have to be stitched together to generate an exact replica of the physical file. Scanned Green sheets would be stitched into a single PDF File separately and Correspondence files would be scanned separately into a single PDF File. All the pages that are scanned should become sequential and become individual pages of a single PDF file. All the printed pages should be scanned as searchable PDF not as Image wherever possible.

1. Indexing and Cataloging

a) After documents/images are scanned and stored in digital form, they would be indexed through robust search Engine capable of searching the "FILE" based on at least following indexed fields with full or partial match for example:

- File Number
- Wing /Section
- Created On

- Subject /Title of the File
- File Name
- Employee name (In case of personal file)
- Date

b) SI will create metadata fields required for indexing as per the requirement of the NEA.
c) SI would use suitable technology and software for Indexing and Cataloging of metadata
d) Indexing is to be done by attaching metadata tags to each of the documents.
e) The SI will establish a procedure for checking the accuracy of indexing and making necessary corrections as accurate indexing is required for efficient retrieval of digital documents from digital storage media.
f) Once all documents are verified and passed by the SI's quality assurance phase (QC1), then QC2 will be done on sample basis by NEA side and then the approved images will be stored on final digital media of the user's preference, complete with their indexes including metadata indexing. At the end of the process all paper documents will be returned in their original form to the concerned nominated person of NEA.
g) Scanned file naming convention and folder structure to be used to store the scanned files and would be as per the policies defined and approved by NEA for file naming conventions in English.
h) SI shall perform following image enhancement activities:
   - SI shall ensure that the quality of scanned images is enhanced to the optimum level.
   - SI shall carry out cropping and cleaning of images like removal of black noise around the text, providing equal margins around the text.
   - In case the documents are not legible, the SI shall scan the documents at a higher resolution or in Grayscale.
   - No extra payment shall be made for the same.
   - No document shall be scanned more than once, and no blank pages shall be deleted if they are part of a file.
   - The blank page in a file is a page that is entirely blank, or has only Page number or has only rubber stamp.

Stage 3: Post scanning, Storage, Search, Retrieval & Backup

1. Post scanning
   a) After scanning, the physical document would be pinned together/ tagged in the same form as it was given for scanning by the individual units of any department. At the end of the process all paper documents will be returned in their original form to the department.
   b) Each page shall be serially arranged and shall be counted while giving the documents back to the department
   c) SI must take approval from the user in data completeness and accuracy.
   d) Each page shall be serially arranged and shall be counted while giving the documents back to the department.
   e) Version Control mechanism should be allowed. Version control has to be done in case of addendum to the pre-existing digitized file. SI will have to make this facility available in the capture and indexing module.
   f) The SI is required to use their own MIS tool to generate daily/fortnightly reports for tracking the digitization status. These reports would contain basically a summary of records scanned

and stored. The release of payments is linked to daily/fortnightly submission of these reports.

g) The document will be uploaded in DMS (Document management system) by the SI.
   - The SI shall be responsible for the entire uploading procedure.
   - The document shall be stored in local storage of NEA till creation of necessary storage in the data center and procurement of DMS.
   - The document must be stored in the DMS in a hierarchical manner and with full security controls.
   - The SI will be responsible for creation of folders, subfolders, and database structures in the existing DMS for synchronized digital record keeping purposes. The SI will give access to documents in DMS to respective data owner/ nodal officers and other persons for verification, validation, audit and confirmation.

2. Document Management System (DMS)

The SI shall provide Document Management System (DMS) tools for all the activities related to digitization. This DMS tool will be also used by NEA authorities for related work. The IT hardware for hosting this DMS shall be provided by NEA.

The estimated user base of Document Management System for validation during data digitization and migration activity will be 300 Nos. However, the Document Management System supplied as part of ERP will be accessed by all Full Use - ERP Application users.

Following are the functionalities required in the Document Management System. The SI must submit details of all functionality of his DMS system (Functional Requirement Specification ('FRS') is shared in Section VI of the RFP document).

3. Storage and Backup
   a) The SI should perform hardware sizing for the DMS and Storage requirements. The SI shall also be responsible for the sizing of storage space for archival of data.
   b) A folder structure should be followed while storing the digitized data in the central storage.
   c) Nomenclature of the digitized file should be in accordance with the e-Govt. standard and should be discussed with the NEA.
   d) The scanned documents will be tagged and stored on DMS.
   e) The SI after successfully storing the Scanned and Digitized data on its computer (after QC2) will transfer the same to the existing Document Management System and to access data by NEA staff.
   f) The SI is required to take back-up of incremental data at the end of the day.

Stage 4: Data Entry:

a) Data entry to be carried out by the SI from the data scanned by the SI as per templates provided by NEA. The SI should Link each record with scanned filename/code in the DMS
b) Data already scanned and available in NEA needs to be entered by the SI as per templates provided by NEA in the DMS.
c) Link each record with parent and child barcode documents.

Estimated Volume of Data Digitization

a) Estimated Volume of data for Employees

A brief extrapolation of Number for users/Employees on Payroll available for NEA is as below:

Table 3: Estimated data digitization volume

Description	UOM	Total
No. of offices	Nos	200
No. of consumers	Nos	5040000
Per consumer no. of files	Nos	8
Per consumer data size	MB	11
No. of fields per consumer	Nos	100

Note:

1. The total items estimated may vary based on actuals.
2. SI shall quote the prices based on the Table 3: Estimated data digitization volume. However, payment shall be made on an actual volume basis on pro-rata.

2.3.9 Pilot Implementation of RMS

SI shall carry out the pilot of the customized RMS Application as per the Table 3: RMS Pilot Locations:

Table 4: RMS Pilot Locations

PROVINCE	NAME / PLACE	BRANCH NAME	CONSUMER COUNT
PROVINCE 1	BIRATNAGAR	ITAHARI DC	69500
PROVINCE 2	JANAKPUR	JANAKPUR DC	68000
PROVINCE 3	BAGMATI	RATNAPARK DC	53500
DIVISION 3	HETAUDA	HETAUDA DC	69500
PROVINCE 4	POKHARA	POKHARA DC	91000
PROVINCE 5	BUTWAL	BUTWAL DC	73500
DIVISION 5	NEPALGUNJ	KOHALPUR DC	41500
PROVINCE 6	SURKHET	SURKHET DC	57000
PROVINCE 7	ATTARIYA	DHANGADHI DC	64500
Total			**588000**

with an approximate consumer base of 5.8 lacs which Is subject to revision as per discretion of NEA in consultation with the SI**.** During pilot implementation, System Integrator will run the full functional RMS at above identified locations and support the users to enter 1-month transactions and generate all monthly reports as specified in functional requirement specifications and additional reports, as required by user/management. System Integrator to ensure that all the bugs and defects identified should be fixed during the pilot implementation phase itself before going for rollout of RMS at all other DCS. At the end of Pilot Phase, System Integrator shall submit the “Pilot Implementation Report” including:

- User feedback
- Problems identified and resolution there of etc.
- Pilot Lesson Learnt

Following indicative activities are to be completed before Pilot rollout:

Project Activities	Compliance (Yes/No)
Commission of DC & DRC	
Completion of advance RMS Configuration	
Disaster Recovery plan is available	
Execution of System Integration Testing	
RMS Software Provisioning & Installation	
RMS Installation on DC & DRC	
RMS Testing (Unit Testing etc.)	
User Acceptance Testing (UAT)	

Following indicative activities are to be completed for declaring the Pilot GO Live:

S.No.	Required activities before pilots Live:	Yes/ No
1	Data Centre/Disaster recovery center commissioned including all hardware, software, network components.	
2	All Application Software modules of the RMS solution stack under the scope of SI developed and customized as per business process requirement of utility along with their integration.	
3	Integration with legacy applications (as per indicated list of existing integration/interfaces to begin with) completed.	
4	Functional testing of integrated software completed for acceptance by utility. User acceptance testing, and QA checks are crucial at various stages of development and during deployment of RMS solution stack. Each software component is tested independently and then further tested along with its dependent components. Before final release, an integration testing of the complete system is done to check the system functionality in the presence of the designated utility representatives.	
5	Data migration from existing / legacy system to new system completed and reconciled.	
6	Training has been imparted by SI to end users of RMS solution stack at Pilot locations.	
7	All changes/feedback of UAT are duly captured and reflecting in the software application.	

2.3.10 Rollout of RMS Solution

After successful pilot completion, necessary changes in the System, RMS applications shall be rolled out in remaining DCS of NEA as per terms specified in the RFP. System Integrator shall submit the rollout report and to NEA as specified in the document and deliverable.

Following indicative activities are to be completed before rollout:

Project Activities	Compliance (Yes/No)
Completion of Customized RMS Objects	
Completion of Data Digitization (At all Rollout locations)	
Completion of Data Migration (At all Rollout locations)	
End User Creation with defined roles & authorization	
Execution of System Perform Test (Stress, Load, Disaster Recovery, Backup Tests etc.)	
Helpdesk flow has been finalized	
Master data for all modules uploaded and verified	
Open transaction items have been uploaded and verified	
Operational Helpdesk	
Operational Tools Readiness IVR, ITSM & IT Operations	
Periodic backup has been setup	
Successful Completion of End-User Training	

2.3.11 Stabilization Period

The stabilization period will start from the date of completion of Roll out for a period of 3 months. During the stabilization period following will be ensured.

a. All sites are successfully rolled out and signed off by NEA.
b. The RMS modules/ software should be complete and should not have any missing modules/sections and are in operation without any bugs.
c. The System Integrator shall maintain the necessary log in respect of the results of the tests to establish a complete satisfaction to NEA for the successful completion of the test specified.

2.3.12 Go-Live Criteria and Quality Control / Inspection by NEA

"Go Live" of a particular project area shall be considered only after all the scope of work for that project area is completed. Subsequently, Enterprise wide GO LIVE shall be considered when all the scope of work for all the project areas are completed and accepted by NEA.

In case go-live of any project area is delayed, the entire cost and/or time over run shall be the responsibility of the SI and not NEA.

The SI shall maintain a Quality Assurance/Quality Control (QA/QC) program that provides hardware, software and services under this specification whether manufactured, designed or performed within the organization of bidder or at any sub-Agency source shall be controlled at all points necessary to assure conformance to contractual requirements. The program shall provide for prevention and ready detection of discrepancies and for timely and positive corrective action.

The SI shall make objective evidence of quality conformance readily available to NEA. Instructions and records for quality assurance shall be controlled and maintained at the system levels. The bidder shall describe their QA/QC program in the Technical Proposal, (along with samples from his QA/QC manual) and shall submit his QA/QC Manual for review and acceptance by NEA.

Such QA/QC program shall be outlined by the bidder and shall be finally accepted by NEA after discussions before the award of Contract. A Quality Assurance Program of the bidder shall generally cover but not be limited to the following:

a) The organization structure for the management and implementation of the proposed Quality Assurance Program.
b) Documentation control system.
c) Qualification data for key personnel.
d) The procedure for purchase of materials, parts/components and selection of outsourced services including service provider analysis, source inspection, incoming raw material inspection, verification of material purchases, etc.
e) System for shop manufacturing including process controls.
f) Control of non-conforming items and system for corrective action.
g) Control of calibration and testing of measuring and testing equipment.
h) Inspection and test procedure for development, implementation, and configuration of system.
i) System for indication and appraisal of inspection status.
j) System for quality audits.
k) System for authorizing release of developed and configured systems to SI.
l) System for maintenance of records.
m) System for handling, storage, and delivery.
n) A quality Plan detailing out the specific quality control procedure adopted for controlling the quality characteristics of the product.

The Quality Plan shall be mutually discussed and approved by NEA after incorporating necessary corrections by the SI as may be required. Neither the enforcement of QA/QC procedures nor the correction of work mandated by those procedures shall be cause for an excusable delay. An effective Quality Assurance and Quality Control procedure shall be maintained by the bidder for at least the duration of this Contract. The personnel performing QA/QC functions shall have well-defined responsibility, authority and organizational freedom to identify and evaluate quality problems and to initiate, recommend or provide solutions during all phases of the Contract. The bidder shall be required to submit all the Quality Assurance Documents as stipulated in the Quality Plan at the time of NEAs inspection of equipment/materials.

2.3.12.1.1 Go Live Checklist

Following indicative activities are to be completed for declaring the Enterprise wide GO Live: The list is subject to change as per the discretion of NEA

Sl. No.	Project Activities	Compliance (Yes/No)
1.	RMS Testing (Unit Testing etc.)	
2.	Completion of Customized RMS Objects	

3.	Execution of System Integration Testing	
4.	Execution of System Perform Test (Stress, Load, Disaster Recovery, Backup Tests etc.)	
5.	Commission of DC & DRC	
6.	RMS Software Provisioning & Installation	
7.	RMS Installation on DC & DRC	
8.	User Acceptance Testing (UAT)	
9.	Completion of Data Digitization (At all Rollout locations)	
10.	Completion of Data Migration (At all Rollout locations) a) Master Data b) Transactional data	
11.	End User Creation with defined roles & authorization	
12.	RMS System Accessibility to all End Users	
13.	Completion of advance RMS System Configuration	
14.	Finalize Cutover (Conversion) Plan	
15.	Successful Completion of End-User Training	
16.	Tuning of RMS	
17.	Successful Completion of Stabilization period after RMS Rollout	
18.	Error free operations and running of all RMS modules with real-time data for a period three (3) months.	
19.	Documentation of the all issues/problems that come up during the stabilization period and resolution methodology / solutions	
20.	Operational Tools Readiness IVR, ITSM & IT Operations	
21.	Operational Helpdesk	
22.	User Guide documents for all modules have been created	
23.	Program Logic Control & Phone/Email for operation support (L1-L3) have been published	
24.	Helpdesk flow has been finalized	
25.	Periodic backup has been setup	
26.	Master data for all modules uploaded and verified	

27.	Open transaction items have been uploaded and verified	
28.	Disaster Recovery plan is available	
29.	Establish Service Level Agreements	
30.	Go-Live Approval	

2.3.13 Cyber Security

SI shall provide end-to-end cyber security services to meet IT security challenges for RMS System based on the proven frameworks and security best practices. It is vital that the processes and technology supporting the Information Security function for RMS System are proven and compliant to best practices/ standards. It is envisaged that the cyber security operations shall be centralized, structured, coordinated and responsive resulting in effective cyber threat prevention and detection, thereby securing RMS from attackers. The Information Security functions shall respond faster, work collaboratively, and share knowledge more effectively.

2.3.13.1.1 Security during Development & Integration Phase:

SI shall meet the security requirements listed below (including but not limited to) during the development and integration stage:

a. SI shall address emerging cybersecurity vulnerabilities in their software coding under System Development Life Cycle (SDLC). This should be done by taking into consideration the SANS Top 25 Most Dangerous Programming Errors and the OWASP Top 10 Projects.
b. SI shall propose a legacy data cleansing approach.
c. SI shall propose a security mechanism to be used for API and adopt the best practices such as OWASP guidelines to ensure security.
d. SI shall promptly notify NEA when vulnerabilities are found in their code.
e. SI shall apply security related patches and updates.
f. Remote access by the SI will only be performed using technology authorized by NEA.
g. Any data interfaces implemented or built by the SI will be required to have encryption and authentication (strong authentication when possible.).
h. Files containing NEA information will be transferred using encrypted file transfer techniques agreed upon by both parties.
i. System Integrator shall be responsible for overall design and management of the solution (RMS, Database, Middleware & Other Associated Software's) to meet and comply with RFP requirements including Performance, Security, SLA, Guidelines and policies for entire project duration. Also, any Manpower required to operate the SOC Operation will be provided by RMS System Integrator.

2.3.13.1.2 Security during Operations phase

1 Security Policy

SI will adopt a leading information security framework (such as ISO 27001, ISO 22301) to define, monitor and update security policies (including network, server, application and website/mobile app security).

Incident Response

SI shall do the analysis of application and network incidents, do post-incident reporting and implement practices to ensure rapid response to attacks.

The SI shall do a proactive review of the incident response plan to improve incident response time and implement continuous improvement processes to strengthen overall effectiveness of security.

Distributed Denial of Service (DDOS) Protection

SI should secure RMS against DDoS attacks such as network and application level attacks with minimal business disruption. It must keep the businesses up and running at high performance levels even under attack, avoiding any monetary losses and serious reputation damage.

Malware Analysis

SI shall conduct analysis of newly discovered malware to uncover its scope and origin. Perform dynamic real-time analysis of advanced malware identified and prevent true zero-day and target attacks which can aggressively evade signature-based defenses through various channels such as Web, Email & Files.

SI shall perform the threat analysis of unwanted or suspicious malwares by the behavior or signature-based deduction and take input from the logs, detection, vulnerability or suspicious activities feeds IOC.

User Authentication and Control

SI shall define and implement the highest level of access governance. Access should be permitted to only authorized users with multi-factor or two-factor authentication.

The system should have access control features for controlling the access rights over the system and over the various functions/features available for different types of users. Best practices from enterprise security including password strength, password aging, password history, reuse prevention, etc. must be followed for access control.

Hardening

All unnecessary packages must be removed and/or disabled from the system. Additionally, all unused operating system services and unused networking ports must be disabled or blocked. Only secure maintenance access shall be permitted, and all known insecure protocols shall be disabled.

a. SI shall provide a consolidated view of the availability, integrity and consistency of the Web/App/DB tiers on DC/DR.
b. SI must ensure Database nodes (RDBMS) should be protected with a higher security layer at DC/DR.

2.3.14 Audit

The purpose of the audit will be to assess, evaluate and assure to the management of NEA, that the implemented RMS, process, policy and elements of systems are functioning properly and effectively to achieve the planned objectives. In case, any element of the solution is not functioning in line to the specific requirements and standards, then the audit shall recommend the required corrections and corrective action.

The audit activity shall include verification, examination, and evaluation of the overall solution with an objective evidence to assess that the RMS solution has been designed, developed, implemented and documented in accordance and in conjunction with specified requirements.

The audit and validation activities under this will include but is not limited to, the following mentioned activities:

- **Service Level Agreement (SLA) Audit:**

The quarterly monitoring and performance review of SI against the monthly formulated reports for SLA.

a. A designated third party or personnel from NEA will review the performance of SI against the SLA.
b. The SLA reports shall be formulated based on the automated system generated reports.
c. SI shall submit the system generated monthly SLA report to the designated Nodal officer as per agreed frequency and timeline.
d. For the requirement of SLA audit, the NEA may perform a visit either by internal department or by an external contractor at respective Data Center and Disaster Recovery Center locations.
e. The review / audit report will form a basis of any action relating to imposing penalty on or breach of contract of the SI.

2.3.14.1.1 RMS- OEM Audit

1. This audit activity shall include the validation and assessment of entire RMS including IT Infrastructure and supporting systems through Original Equipment Manufacturers (OEMs). The required activity shall be performed on the entire implemented solution to certify that all necessary standards, precautions and guidelines have been adhered to achieve the optimal performance of the solution.
2. The RMS Solution Stack being deployed as a part of this project, will require an auditing and validation both initially as well as on an ongoing basis. The audit activities are mandatory and shall be carried out periodically based on the timelines captured in audit section. However, in case of any exception the audit and validation activities can be carried out in an ad-hoc basis, at the discretion of NEA
3. System Integrator will be responsible for facilitating and extending full cooperation for audits by any internal or by OEM . For RMS Solution Stack OEM

audit, the cost for first 2 iterations shall be borne by System Integrator including the cost to incorporate any post audit suggestion / recommendations shall be borne by System Integrator.

A. Product Audit:

a. The audit should ensure an examination of RMS Solution stack or its services including hardware, software, spares etc. to evaluate whether it conforms to the parameters like specifications, performance standards, and customer requirements etc.
b. The audit should ensure installation of proper versions of products for hardware and software including, but not limited to its sizing, licensing, firmware, supporting system, software's, patches, any other layer of software, etc.

Process and Policy Audit:

a. The audit should ensure and verify that processes are working within the established limits and guidelines. It should evaluate the operations or methods in place against the predetermined standards or instructions of NEA to measure the conformance to these standards or instructions and its effectiveness.
b. The audit should check conformance to define requirements such as accuracy, responsiveness, management, timeframe, etc. and examine the resource including equipment, solution, expert manpower applied to transform the inputs into outputs, the environment, the methods, the procedures, the instructions followed, and the measures and parameters collected to determine the process performance.
c. The audit shall validate and examine the controls in places for application, security, application access, database access, anti-virus/anti-malware, Network, IT privileges, User access and logs & trails etc. and provide the recommendations for necessary course correction.

System Audit

a. The system audit shall be conducted to verify, examine and evaluate the objective evidence that elements of the system are appropriate and effective and have been designed, developed, implemented and documented in accordance and in conjunction with specified requirements.
b. The audit should check and evaluate the existing quality assurance procedures to determine its conformance to NEA policies, contract commitments, and regulatory requirements.
c. Shall evaluate the technical documents of solution including but not limited to solution architecture, HLD/LLD, Network, etc. and make recommendations based on best practices regarding capacity, redundancy, security etc.
d. The audit should determine the state of resources, including, but not limited to overused resources, underused resources, etc. and make recommendations regarding issues including but not limited to upgrade of resources, reallocation of unused resources etc.
e. The audit activity should provide details of the resources that are due for obsolescence and provide a plan for upgrade / refresh of resources and plan for disposal of obsolete resources.
f. The audit activity shall evaluate and access the suitability and efficiency of the entire implemented ecosystem as whole including but limited to data, information, code, materials, people, methods, measures and equipment etc.
g. During audit activity, some of the key areas which shall be considered and reviewed are as following:
    - Completeness

- Performance
- Security
- Manageability
- Source Code
- OEM Compliance
- Availability of Services
- Functional and Technical Specifications
- Policy and Procedure
- Service level requirement
- Software and supporting system
- Hardware and other components
- Project Documentation etc.

B. Method of Audit

a. First Iteration of Audit – Blue Printing and Designing of RMS

i. Review of AS-IS, TO-BE, Gap analysis, Solution mapping document and Technical design document along with any other related document;

ii. Prepare module wise detailed observations covering & including but not limited to process coverage, usage of RMS functionalities, risks in customized processes (if any).

iii. Data Migration and Digitization strategy with the proposed data conversion templated and migration strategy for existing IT Solutions, if required.

iv. Shall include recommendations on industry best practices for NEA as appropriate e.g., organization structure, codification, etc.

v. Audit to ensure installation of proper versions and licenses for RMS including, but not limited to RMS Software's licensing, integration middleware, supporting systems, any other layer of software etc.

vi. Verification of standard RMS functionalities including module, sub-module which can be used to meet NEA requirements.

vii. Verification and review of the custom development approach and methodology as per standards recommended by RMS OEM. Further, OEM will also identify risks for NEA in such developments.

viii. Review of all custom developed components / objects / processes etc. with risk assessment, if any.

ix. If any standard RMS functionality, module or submodule is not used by SI, the same needs to be informed to NEA.

x. RMS OEM audit process will include review of solution documents and on-site discussions with SI and NEA.

xi. SI will be required to comply with RMS OEM observations.

xii. After compliance by SI, RMS OEM will verify and confirm that all relevant observations/recommendations are incorporated by and the solution provided by SI is acceptable to RMS OEM considering NEA requirements.

xiii. RMS OEM will prepare a detailed audit report and submit the same to NEA. If required, RMS OEM need to present audit findings to management of NEA.

b. Second Iteration of Audit – Posts Development, Configuration and Rollout of RMS

RMS OEM will verify the specification and configuration to confirm, but is not limited to, the following mentioned activities:

i. The OEM will verify and confirm before Go-live, the technical preparedness of the system is appropriate for Go-live.
ii. The OEM will review technical & operational procedures, system performance, user support documents & structure is as per scope and OEM standards.
iii. Shall verify that the implemented solution is in line with the standard practices.
iv. The OEM will conduct an audit to confirm that the solution is performing as per NEA SLAs. The audit report will be a prerequisite to the completion of the RMS stabilization phase.
v. In case, if there is any variation, OEM will inform that implemented specifications /functionalities etc. will suffice the requirements of NEA.
vi. If the specifications are not enough, OEM will inform and provide a detailed report containing risks and impact on the overall solution to NEA.
vii. SI will have to take corrective actions based on OEM recommendations. Post incorporation of the recommendations the RMS OEM will verify the compliance of the same.
viii. RMS OEM will ensure closure of all audit observations to its satisfaction and provide a final report to NEA.
ix. The duration of OEM Audit shall be maximum 25 days including all audit activities and post audit compliance checks and validation.
x. The following will be the deliverables of such OEM engagements and the mechanisms for follow up actions.
    i. The mechanisms:
    All the reviews by the RMS OEM will occur in collaboration with the NEA and SI team. SI shall be required to participate in the Review program conducted by NEA and the RMS OEM. The SI shall depute their competent persons to participate in the review programs. The Review program will look for best implementation practices while following a prescribed methodology. The extent and frequency of the review shall be determined by RMS OEM in consultation with NEA but shall be frequent enough to validate each of the major project milestones. While some of the review will be required to be done at the project site, some of the reviews of codes or documents can be carried out at the location convenient to the RMS OEM. The RMS OEM team will plan the activities in consultation with SI and NEA and the RMS OEM will report directly to NEA on all the matters related to their activities.
    ii. The deliverables:
    The deliverables of the activities of the RMS OEM will, at the minimum include recommendation reports, suggestions on specific action items, minutes of the meetings and approval certificates.
    iii. The follow up actions:
    The SI is required to incorporate the recommendations arising out of the expert services provided by the RMS OEM. The RMS OEM also will be responsible for

helping NEA to get its suggestions/recommendations implemented. The RMS OEM should validate the incorporation of the review findings on behalf of NEA. The efforts required for incorporation of the recommendations/suggestions/comments etc. arising out of the activities of the RMS OEM expert services, will be part of the normal implementation effort for the project and treated as rework for inadequate quality. NEA will not accept any change requests for these efforts.

2.3.14.1.2 IT /Cyber Security Audit

A yearly audit of IT security and Cyber security practices by a certified Third-party agency to assess and evaluate the implementation of security policy and vulnerability assessment. The report shall include the parameters as per the agreement with NEA and rate the security implementation in three grades i.e. Satisfactory, Requires Improvement and Unsatisfactory.

a. Security Audit shall include but not limited to vulnerability assessment, penetration testing, application security assessment, application assessment for entire infrastructure.
b. Third party agencies shall be responsible for implementation of information security controls and perform periodic assessment.
c. It shall propose ways to enhance the protection of RMS & supporting IT Infrastructure.
d. Secure Configuration Review: Third Party Agency shall review the security configuration of RMS and provide the detailed report that include the recommendations for remedial actions.
e. System Integrator shall provide the declaration of readiness for IT security and Cyber security Audit post successful Go-live of RMS.

2.3.14.1.3 Business Continuity Plan (BCP)

A yearly audit of Business Continuity Plan (BCP) to ensure the adequacy, completeness and appropriateness of plan through various means including availability of technologies, processes, and people to implement the plan that all broadly covered under the umbrella of business continuity and disaster recovery. The audit of business continuity plan shall validate its major components and parameters as per agreement with NEA shall rate the performance of BCP activities in three grades i.e. Satisfactory, Requires Improvement and Unsatisfactory.

The overall audit activities shall be carried out with an intent of "As-Is" assessments to assess the current operational capabilities of Data Center and Disaster Recovery Center Services, Help Desk Service Centres, Services suppliers etc. This activity shall take support of extensive use of data analytics to enhance the audit coverage and focus on "risks that matter". The auditor shall follow the 360-degree approach to identify and mitigate risks related to both operations and legal compliances. To benchmark against industry peers to implement the most efficient practice and policies.

It should be a rigorous program management and quality monitoring mechanism to ensure seamless delivery of assessments despite the large volume of the system. The audit program shall be structured to complete the reviews in minimum time with no disruption to daily business activities.

2.3.14.1.4 Follow-up Audit

Post completion of audit assessments (Internal or external) may have the findings that require corrections and corrective action. Since most of the corrective actions cannot be performed at the time of audit.

NEA may require a further follow-up audit to verify that corrections were made, and corrective actions were taken. The NEA may also conduct the follow-up audits to verify the preventive actions taken because of performance issues that may be reported as opportunities for improvement.

2.3.14.1.5 Reporting

SI shall provide the necessary support and cooperation for overall monitoring of the RMS. For the purpose of monitoring the SI shall provide the system generated reports with a provision of further detailed analysis, if required.

SI shall formulate an exhaustive list of required reports and seek the concurrence of NEA. SI should submit the reports on a regular basis in a mutually agreed format. Each report shall be circulated and submitted to the designated Nodal Officer of NEA in the format mutually agreed upon. An indicative list and frequency of such reports are as following:

1) Weekly reports
   a. Backup and restoration
   b. EMS / NMS Report
   c. New Software Patches
   d. Resource utilization of critical components
   e. Data Migration Report
   f. Changes Made in Database
   g. Changes Made in Middleware
   h. DC and DR Replication Report
   i. DC and DR Access Reports etc.

2) Monthly reports
   a. Summary of resource utilization for all components in DC/DR
   b. Log of preventive / break-fix maintenance undertaken
   c. Summary of usage of storage media provisioned
   d. Summary of major and minor changes undertaken in DC/DR
   e. DC and DR Availability and Operations Report
   f. Database Growth Report
   g. Summary of Incidents reported
   h. Consolidated SLA / Non-conformance Report
   i. Integration Services
   j. Help Desk Services
   k. Project Management
   l. IMAC Services
   m. Resource Attendance
   n. Service Management Controls Report

o. Change and Release Management
p. System Maintenance Reports etc.

3) Quarterly Reports
   a. Asset database report and Asset audit report
   b. Feedback report from users for services rendered.
   c. Inventory of spare parts in Data Center/ Disaster Recovery Center
   d. Security Audit Report

4) Incident Reporting (as and when it occurs)
   a. Any system/component failure with root cause analysis
   b. Peaking of resource utilization on any component
   c. Bottlenecks observed in the system and possible solutions and workarounds.

5) Security Incident Reporting (as and when it occurs)
   a. Detection of security vulnerability with available solutions/workarounds for fixing.
   b. Hacker attacks, Virus attacks, unauthorized access, security threats, etc. — with root cause analysis and plan to fix the problems.
   c. Any hazards or events like Fire, environmental conditions, physical security, etc. at DC/DR.

2.3.14.1.6 Indicative Schedule for Audit

Sl. No.	Activity	Frequency	Audit Agency
1	SLA Audit	At discretion of NEA	Internal/Third Party
2	RMS - OEM Audit	i. Product Audit: ii. Process and Policy audit iii. System audit	RMS OEM/ Third party
3	IT/ Cyber security Audit	Yearly	Internal/Third Party
4	BCP Audit	Yearly	Internal/Third Party

Table 5: Schedule for Audit

2.3.15 Documents and Deliverables

The acceptance procedure of deliverables & overall solution for RMS system shall include:

- Initially, SI will provide draft deliverables for RMS & Overall solution by considering the approved project timelines for review and feedback of NEA within stipulated time frame.
- NEA will provide feedback within the agreed timeframe to make necessary change corrections (if required).

- SI shall be required to re-submit the revised documents/deliverables.

The indicative list of project deliverables which are required to be submitted by the SI shall include, but not limited to the following:

2.3.15.1.1 Key Deliverables

The indicative list of project deliverables which are required to be submitted by the SI shall include, but not limited to the following:

S.No	Project Phases	Tasks	Timelines
1	**Project Initiation**	Project Kick-off with presentation on RMS overview to senior management.	M2
		Project Charter with- a. Detailed project plan with work breakdown structure along with dependencies b. Resource schedule & deployment plan c. List of complete deliverables d. Project Governance structure & escalation matrix e. Stakeholder communication matrix f. Project management templates such as Project reports, SLA monitoring, Attendance etc. g. Detailed Survey Report with Identified End User Base, License Requirement, Network Feasibility, Change readiness Assessment etc. h. Roles & responsibilities	
		Detailed training/Organization change management strategy & schedule	
		Risk Management & Quality Assurance Planning Reports	
		As-Is Study report including existing business process, workflows, reporting requirement, process maps etc.	
		Gap analysis report with identified gaps & areas of Improvement	
		To Be Report	
2	**Business Blueprinting**	High Level Design & Low-Level Design including Updated Bill of Quantity (BOQ)	M5
		Updated Functional Requirement Specifications	
		Non-functional Requirements Specifications Documentation	
		Updated Technical Requirement Specifications	

S.No	Project Phases	Tasks	Timelines
		Business Solution Design Document	
		Requirements Traceability Matrix	
		Module based roles & responsibilities (Authorization Matrix) etc. with Mapped Organogram of NEA	
		Finalized Business blueprint/design documents	
		Data Conversion and Migration Strategy	
3	**Design & Customization**	Baseline Configuration Document	M7
		Customization and Configuration documentation	
		Draft OEM audit report with observations (1st Iteration)	
		Final OEM audit report with compliance (1st Iteration)	
		Integration with existing solutions (Legacy, Other Systems)	
		Approved End-User Training Strategy (along with End-User Training Curriculum, Manuals, and Schedule)	
		Trainings to Core Team/Nodal Officers	
		Implementation & rollout strategy	
		Performance Testing Report	
		Software Testing Report including all requisite tests conducted as per the Software Development Lifecycle (SDLC) including unit, integration, regression, load, stress, performance, user acceptance etc.	
		User Acceptance Testing (UAT) Report	
		Software licenses (supporting certificates/documents)	
		Data archival, retention policy	
		Cyber Security Policy	
		Business Continuity/Disaster Recovery Planning policy	
		Pre – roll out preparedness checklist	
4	**Data Digitization**	Initiation of Data digitization across all provinces	M1
		Completion of 50% of Data digitization	M3
		Completion of quality check for 50% of data digitized	M4
		Completion of 100% of data digitization in all provinces	M6
		Completion of quality check for 100% of data digitized	M7
	Data Migration	Data Migration for pilot locations	M10
		Data migration for other DCS	M14
5		Procurement of IT infrastructure	M5

S.No	Project Phases	Tasks	Timelines
	Setup of IT infrastructure for DC, DRC & Customer care center	Supply of Hardware	M8
		Installation and commissioning of Hardware and its integration/connection with existing infrastructure	
		Site acceptance testing of hardware (SAT)	
		Integration Services for Customer care center	M9
7	**Pilot Rollout**	Supply of licenses for Pilot Rollout	M10
		Roll out for Pilot Locations	M11
		Billing Cutover Testing (BCT)	M11
		Demonstration & Acceptance	M11
		Pilot Go-Live	M11
		Incorporation of changes and observations of Pilot phase	M12
8	**Training and Change Management**	Training for 80% of the trainees	M12
		Training for 100% of the trainees	M14
		Hand Holding and Support for pilot locations	M12
		Hand Holding and Support for other DCS	M18
9\	**RMS System – Enterprise wide roll out**	Supply of licenses for Enterprise-wide Rollout	M12
		Roll out	M15
		Billing Cutover Testing (BCT)	M15
		Incorporation of changes and observations	M15
		Help desk structure, process, and operational manual	M16
		Help Desk setup Initiation	M16
		Demonstration & Acceptance	M16
10	**RMS System - Stabilization Support**	Stabilization Support	M18
		RMS OEM audit report with compliance (2nd Iteration)	
		Release Management and Change Management Strategy Document.	
		SLA and Performance Monitoring Plan	
		Exit Management Plan	
		Pre-Go-Live declaration report	
		Enterprise wide Go-live completion report	
11	**FMS**	System Performance Report (SLA compliance)	Till end of the contract
		Monthly activities report (including Issue tracker, Help Desk ticket analysis, Change Request status and Status of all service requests logged with Offered OEM Product etc.) – Reports shall be tool generated and available for viewing in the tool itself.	
		Solution Usage Reports - Transactions and Users	
		User Manual with necessary revision	

S.No	Project Phases	Tasks	Timelines
		Change Management & Release Management Reports	
		Issue log and resolution report	
		Revised Exit Management Plan	

Note:

1. The Project deliverables mentioned above are indicative and shall be finalized based on discussion and agreement between System Integrator and NEA
2. SI will provide respective deliverables as per the captured schedule for their review and feedback of NEA
3. NEA will provide feedback within the agreed timelines to make necessary changes, corrections, if required. SI will be required to resubmit the revised deliverables.
4. Feedback and revision of documents and deliverables will be an iterative process.
5. Deliverables, Payment terms, Timelines and Activities are to be seen in totality.

2.3.15.1.2 Documentation Requirements

a) End-User Documents

Documentation will be supplied and maintained by SI during the project. The ownership of all documents, supplied by SI, will rest with NEA. The electronic copies shall be submitted along with all the paper documents and manuals required for operating and configuring the system. The documents provided must include at least:

a) User Manual (both online and paper copies) providing detailed instructions on how to use the RMS. In addition, it describes how to access, submit inputs to, and interpret outputs from the application
b) System installation guide including the configuration of the supplied infrastructure.
c) Module wise - RMS Application Training Manuals

b) Technical Documents

SI shall supply operation and maintenance manuals for all deliverables. These shall be in such details as to enable NEA to operate, maintain, adjust and fix the system etc.

SI must ensure that the RMS components being developed are thoroughly documented with comprehensive manuals and adhere to standard methodologies in software development as per ISO and/or CMMI models. The documents including but not limited to are:

a) Product installation and configuration steps;
b) Application access procedures;
c) User screen layout and content;
d) Transaction entry procedures;
e) Batch job setup, processing, and recovery/restart procedures;
f) Error codes with full descriptions and recovery steps;
g) Standard report layout and content;
h) Internal processing controls;
i) Application security;

j) Operating specifications and system flowcharts;
k) Database entity relationships, table formats, and data element descriptions; and Program module descriptions
l) Quality assurance plan documenting the planned and systematic pattern of all actions necessary to assure confidence that the software developed will conform to the NEA functional and technical requirements.
m) Interface Control Document - Documenting the interface characteristics of one or more IT systems and document the Integration & interface agreements between interface owners. It contains information on both physical and data element requirements that are necessary to make the transfer of information between systems feasible.
n) Test Plan Containing information on the software test environment to be used for independent testing, the test cases to be performed, and the overall testing schedule. This includes methodology, schedule, resources, tools, procedures, environment definition, test cases, and software test results.
o) Systems Manual Detailing the data structure, table, forms and report structures.
p) Installation and maintenance manual for the servers and other hardware
q) Operations Manual providing instructions for installing the application, troubleshooting, interpreting message logs, and FAQs
r) Troubleshooting Guide/ Handbook for Helpdesk which describes the various troubleshooting methods.

c) Policy Documentation

a) Data Backup, Archival and retention Policy
b) Security Policy
c) Business Continuity and Disaster Recovery Policy

All the policy and procedure which will always ensure availability and security, these policies must be updated every six months (twice a year) or as per requirements of NEA. SI must design and implement the policy (with NEA inputs) in compliance with the ISO standards (such as Information security ISO 27001). Design of Information Security Policy should necessarily include but not limited to the following policies to ensure IT security:

a) IT Risk Management Policy
b) Information Classification Policy
c) Access Control Policy
d) User ID and Password Management Policy
e) Internet Access Policy
f) Asset Management Policy
g) Incident Management Policy
h) E-mail Security Policy

2.3.16 Minimum Resource Requirements

SI should ensure deployment of enough specialized and experienced manpower throughout the project to complete the successful implementation & stabilization of the RMS in time. At no stage, manpower (with requisite qualification and experience) shall be less than that committed in the bid. Such manpower shall be maintained from start of the project up to complete Go-Live stage and further during Facility Management Support phase. SI must propose a team consisting of experienced and skilled professionals with relevant experience in the proposed areas:

2.3.16.1.1 Team Composition and desired qualification

Sl. NO	Position	Desired Qualification
1.	Team Leader/ Project Management expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification and MBA or its equivalent with at least 8 years of experience and minimum 5 years as Project Manager in implementation of least 2 end-to-end RMS projects
2.	Metering Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in Metering functions/modules.
3.	Billing Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in billing functions/module
4.	Collection Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in collection functions/modules.
5.	Energy Audit Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in Energy Audit/Accounting.
6.	Integration Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in Integration of RMS Application.
7.	CRM Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in CRM functions/modules.
8.	Provincial Managers	Shall possess Bachelor's degree in Electrical /IT/Computer Science/or related field and minimum 5 years of proven experience in the implementation of RMS.

9.	Other Functional Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years in functional domain (New connection, Disconnection, Reconnection and Dismantling; Web portal and Mobile Application; Management information system; Document Management System; Customer Care Centre).
10.	System Administrator	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years as system administrator Technical certifications on Microsoft / Unix / Other OS/ Products etc. shall be preferred
11.	Database Expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 10 years of experience. Shall have relevant experience of 7 years as database expert Database Administration Certification on provisioned Database Solution shall be preferred
12.	ICT infrastructure expert	Shall possess an B. Tech/B.E./MCA/MSc or higher qualification or its equivalent with at least 7 years of experience. Shall have relevant experience of 5 years on Android, IOS, and Windows application design, development, customization Relevant certification from recognized institution shall be preferred
13.	Change management Expert	Shall have preferably bachelor's degree in Electrical /IT/ Computer Science/or related field and at least 5 years of proven experience in RMS in similar nature of work
14.	Helpdesk Co-ordinator	Shall have preferably bachelor's degree in Electrical/Electronics/IT/Computers with Master's in Business Administration and at least 10 years of proven experience in RMS
15.	Helpdesk Staff	Shall have preferably bachelor's degree and at least 3 years of proven experience in similar nature of work

Table 6 : Team Composition

2.3.16.1.2 Team responsibilities

- **Project Manager:**
  The Project Manager will serve as Single Point of Contact (SPOC) and will be responsible for the overall coordination to ensure the satisfactory fulfillment of the requirements. The major responsibilities but not limited to:

a) Scope of work including supply, implementation, roll out, acceptance, change management

b) Overall project planning and discussions with senior management of client
c) Overall review of the tasks and progress of the project
d) Planning, resourcing, and supervision of RMS Solution Stack

- **Functional domain (Module wise) expert:**
  The major responsibilities but not limited to:

a) Study the existing business process
b) Understanding / Identification of NEA Business Requirements
c) Alignment of Software Solution with Utility Business needs and Overall implementation / usability of RMS Software Solution Stack.
d) Mapping the RMS Solution as per the Functional Requirement Specification

- **Integration expert:**
  The major responsibilities but not limited to:

a) Study the existing business process
b) Understanding / Identification of NEA Business Requirements
c) Preparing the interface and integration requirement.
d) Implementation of the interface requirement as per FRS
e) Mapping of Existing Business Process, Alignment of Software Solution with NEA Business
f) Shall support with Leading practices and methodologies for solution integration and Enterprise architecture.
g) Helping NEA officials to accustom with module

- **ICT Infrastructure expert:**
  The major responsibilities but not limited to:

a) Study the existing business process
b) Understanding / Identification of NEA Business Requirements
c) Analyze the enterprise specific requirements, formulate solution framework, technology selection, Overall IT solution development, solution prototype etc.
d) Responsible for planning and implementation of IT equipment at identified locations, installation and maintenance of hardware, software & network, development of business continuity plan, evaluation of system performance and tracking of project deliverables & progress etc. with overall process.

- **Database expert:**
  The major responsibilities but not limited to:

a) Study the existing business process
b) Understanding / Identification of NEA Business Requirements
c) Monitoring and maintenance of databases, installation of database software patches/upgrades, monitoring of database backups, database replication techniques, standardization, and implementation of databases to improve the management of production and test environments.
d) Support users by resolving problems with applications' databases.
e) Monitor and allocate volumes, analysis of utilization and resources, performance tuning,

monitor DB replication, coordination of system upgrades or fixes.

- **System Administrator**

a) Study the existing business process
b) Understanding / Identification of NEA Business Requirements
c) System administrator shall be responsible for all the requisite System Administration & Facility Management work required for central servers, user configurations, account management, network management, and management of software, security and network solutions on 24X7 basis.

- **Change Management Expert**

The major responsibilities but not limited to:

a) Shall assist NEA official in understanding the feature of each module
b) Shall conduct workshops and training at various offices of NEA
c) Shall perform live demo of various module

- **Rollout and Handholding Support staff**

The major responsibilities but not limited to:

a) shall be responsible for facilitating transition to the new RMS.
b) Coordination with different stakeholders
c) Shall explain all the functional requirements to majority of users

- **Helpdesk Coordinator**

The major responsibilities but not limited to:

a) Shall lead helpdesk team
b) Shall SPOC for the helpdesk
c) Shall Submit the monthly report of ticketing and resolution along with resolution time

- **Helpdesk Staff**

The major responsibilities but not limited to:

a) IT Support Staff shall be responsible for facilities management support for software, network and other infrastructure provided to NEA

2.3.16.1.3 Before Go – Live

The minimum resource requirement before Go-Live is mentioned in the table below. SI shall mandatorily depute Project Manager and Provincial managers on site before the Go-Live.

SL. NO	Position	Number of resources
1.	Team Leader/ Project Management expert	1
2.	Provincial Managers	6
3.	Metering	1
4.	Billing	1
5.	Collection	1

6.	Customer relationship management	1
7.	Energy Audit	1
8.	Integration Expert	1
9.	New Connection, Disconnection & Reconnection	SI shall manage the resource requirement before Go-Live to meet the project timelines and objectives. Minimum 1 resource in each category is mandatory to be assigned to the project.
10.	Web portal and Mobile Application	
11.	Management information System (MIS)	
12.	Document management system (DMS)	
13.	Customer Care Centre (CCC)	
14.	System Administrator	
15.	Database Expert	
16.	ICT infrastructure Expert	
17.	Change Management Expert	

Table 7:Resource Requirement Before Go live

Note:

1. SI shall provide the necessary resources to meet the project timelines to attain RMS Go-live. SI shall ensure appropriate support from IT/Subject matter experts through deployment/deputation at sites to help the end users of individual sites before and during the time of Roll Out and Go-Live declaration.
2. CVs of Key experts from SL NO 1 to 8 Table 3: Resource Requirement Before Go live Shall be evaluated as per the evaluation criteria mentioned in Section 3.
3. CVs of resources from SL No 9 to 17 can be submitted post selection of SI. NEA reserves the right to ask for change of resource/s, If the resource/s proposed is not found competent or as per the requirement of scope or any other reasons.

2.3.16.1.4 Post Go-Live

The minimum resource requirement post Go-Live is mentioned in the table below.

Sl. No.	Resource	Min No. of Staff Required at NEA(After Go-Live)
1.	Project Manager	1
2.	Helpdesk Co-Ordinator	1 (for 24X7X365)
3.	Helpdesk Staff	4 (for 24X7X365)
4.	Rollout and Handholding Support staff (for a period of 12 months from date of Operational Acceptance)	3

5.	ICT infrastructure, System Administrator, Database expert, Integration Expert	As when required
6.	Functional Domain Expert	As when required

Table 8: Resource Requirement Post Go live

Note : Any functional customization/upgrade or ticket raised shall be resolved within 1 day

2.3.16.1.5 Initial Composition, Full Time Obligation; Continuity of Personnel

a) SI shall ensure that each member of the Key Personnel devotes substantial working time to perform the services to which that person has been assigned as per the proposal.

SI shall not make any changes to the composition of the Key Personnel and not require or request any member of the Key Personnel to cease or reduce his or her involvement in the provision of the Services during the Term (or agree to any request other than from **NEA** that would have the same effect):

I. unless that person resigns, is terminated for cause, dies, is long-term disabled, is on permitted mandatory leave under Applicable Law or retires; and

II. Without NEA's prior written consent. The clauses of non-disclosure agreement shall always operate in any such case.

i. Replacement

a) In case the resource has resigned, then the SI must inform **NEA** within one week of such resignation.

b) SI shall promptly initiate a search for a replacement and use commercially reasonable efforts (including the expenditure of reasonable sums, such as to engage the services of a recruiting firm) to ensure that the role of any member of the Key Personnel is not vacant for any longer than 30 days, subject to reasonable extensions requested by SI to **NEA**.

c) Before assigning any replacement member of the Key Personnel to the provision of the Services, SI shall provide NEA with:

- ► A resume, curriculum vitae and any other information about the candidate that is reasonably requested by NEA; and
- ► An opportunity to interview the candidate.

d) The SI must provide a replacement resource, who scores at least the same marks as the resource proposed originally on the same evaluation parameters defined in this RFP document. Once this confirmation is received, **NEA** may request for an interview of the candidate and notify SI within mutually agreed timelines. If **NEA** does not request an interview within mutually agreed timelines, then it would be deemed as accepted.

e) If **NEA** does object to the appointment, SI shall not assign the individual to that position and shall seek an alternative candidate in accordance with this Section.

f) The SI must ensure at least 4 weeks of overlap period in such replacements.

ii. High Attrition

If in the first 6-month period from the Contract Effective Date or in any rolling 12 months period during the Term, 15 percent or more of the members of the Key Personnel cease or reduce their involvement in the Services for any reason other than with NEA's prior written consent, SI shall:

a) provide **NEA** with a reasonably detailed explanation as to the reasons for such change, including, where applicable and permitted, notes from any exit interviews conducted by SI with any departing member of the Key Personnel; and
b) if such change to Key Personnel has or is likely to have any material adverse impact on the provision of the Services or any substantial part thereof, undertake, at its own costs, such remediation acts as are reasonably necessary in order to improve the retention of the Key Personnel including making reasonable changes to the human resources policies and procedures applicable to the Key Personnel (including those related to compensation, benefits and other conditions so that they are competitive with the market) as may be necessary to ensure that such policies and procedures comply with Best Industry Practice.

SI must provide the minimum number of resources at the specified locations of NEA. However, the numbers and locations provided below are only indicative, the SI shall carry out an assessment and propose actual numbers required to meet all Service Level requirements with appropriate approval from NEA.

2.3.17 Facility Management Services

The SI shall be required to provide the services to manage the entire RMS solution stack & IT system including all equipment, installations including hardware, software, network and NEA business related modules installed & commissioned by SI for the utility in order that they have maximum availability to enable the utility to realize its desired business objectives.

a. The System Integrator (SI) shall be responsible for 24*7*365 management of all the systems as per scope of work during the implementation of overall solution and Facility Management Service (FMS) period.
b. At the start of contract, the NEA shall provide an adequate setup area with enough sitting space in a neat and clean environment for set up of a centralized help desk at NEA. The locations for centralized help desk setup shall be provided by NEA and will be identified based on the discussion and necessary approval of NEA.
c. Facility Management Services shall be provided by System Integrator (SI) in order that maximum uptime & performance levels of installed IT systems are ensured. As such, System Integrator (SI) is expected to provide services as per ITIL (IT Infrastructure Library) standards with performance levels meeting or exceeding those mentioned in Service Level Agreement (SLA) agreed between utility & SI.
d. The System Integrator (SI) shall develop the centralized help desk with upcoming CRM solution and helpdesk (ticketing) tool for NEA to be able to log and resolve tickets pertaining to the RMS and other solutions.
e. The prime responsibility of providing desired services shall be that of System Integrator (SI) during the warranty and FMS period. The FMS period shall start immediately after the

completion of Go-Live. The Facilities Management would, include following major areas of services:

- Management of RMS Solution Stack
- Management Data Centre / Disaster Recovery Centre
- Management of Centralized Help Desk
- Ticket logging through Help Desk Services etc.

f. The System Integrator (SI) shall provide the adequate resources for supporting the above said services at the utility locations. The help desk agents shall coordinate the assigning of user calls to required resources. An indicative number of resources required is mentioned in the minimum resource requirements section (During implementation and Post RMS Solution Stack Go-Live).

g. The System Integrator (SI) shall provide the Facility Management Services for agreed duration each day coinciding with the business hours of that particular location and System Integrator (SI) shall also make arrangements for handling of emergency calls.

h. The System Integrator (SI) shall submit a comprehensive FMS process, plan and deliverables for the entire RMS Solution Stack including the required activities along with the proposal to the NEA for approval.

i. System Integrator (SI) shall perform periodic health check-ups and troubleshooting of all applications and implement proactive rectification measures as required.

2.3.17.1.1 FMS Team:

The System Integrator (SI) shall deploy an adequate number of personnel as indicated in Post go live resource requirement to successfully carry out the facility management services in the FMS phase. It is imperative for the FMS staff to know the agreed upon requirements and be able to deal with all the queries related to the RMS Solution Stack.

2.3.18 Project Governance Structure and Institutional Framework

For the success of the project, it is imperative to put an appropriate Governance Structure in place. The roles and responsibilities of Governance & implementation are identified to ensure clarity of strategic control through the project implementation and beyond. This would ensure adequate buy in for the project across all levels/ stakeholders of NEA. The below 3-tier project governance structure has been envisaged to monitor and control the project implementation.

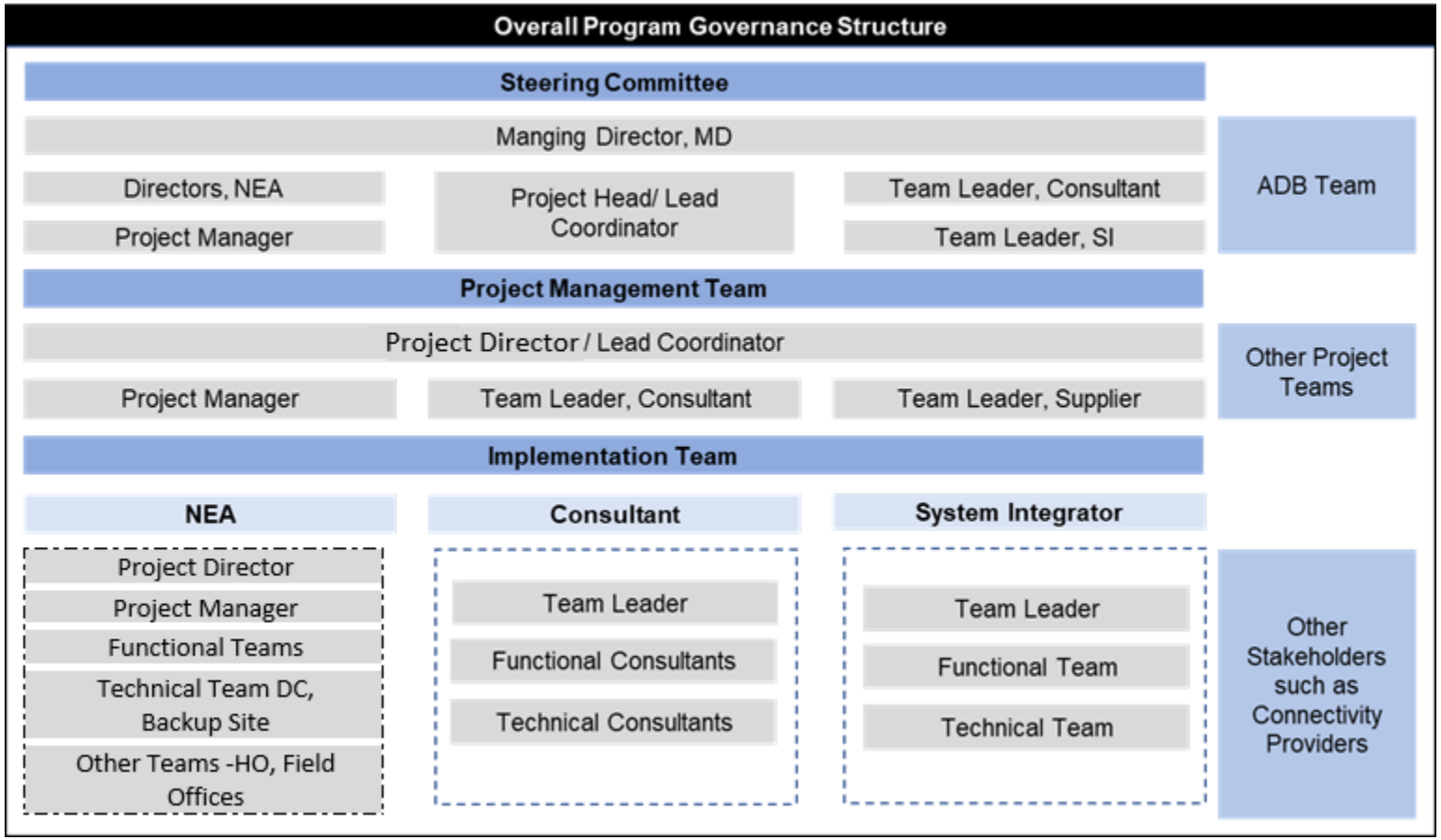


Figure 8 : Project Governance structure

2.3.18.1.1 Steering Committee

The Steering Committee would guide and oversee the assignment. The responsibility of the Steering Committee would include reviewing the reports submitted by the consultants / supplier and making recommendations and suggestions. This Committee should include, inter alia, representatives from;

- Managing Director as Chairman
- Directors of NEA
- Project Managers of RMS
- PMU (Program Leader from Consulting and Implementation Team)
- Representatives of other Stakeholders (as applicable)

The key objectives of Committee are:

- To provide regular and consistent oversight of the program/project at the executive level
- To recommend policy level decision
- To help track, monitor and mitigate risk
- To remove project obstacles such as personnel, budget and facility issues
- To ensure decisions are “value-managed” – aligned with the approved business case

Steering committee meeting should happen at least every month.

2.3.18.1.2 Project Management Team

To ensure the success of the project, a Project Management Team should be formed. This team shall be responsible for end-to-end management of the project. The Board will have senior members from NEA, supervisory team members including full time Program Leaders from Consulting and Implementation teams, and senior members from other stakeholders.

The key objectives of the team are:

- To oversee the progress of the project and timely provide suggestions to the implementation team on resolving the issues/challenges.
- To identify policy level interventions
- To take process level decision
- To track, monitor and mitigate risks

The indicative members and their responsibilities include follows:

Project Manager - NEA

- Overall supervision of the entire project
- Conducting monthly review meetings
- Keep the key stakeholders of the Project, fully informed of key project issues on a fortnightly basis.
- Assist in resolving critical issues.
- Organize Steering Committee meetings as per the agreed frequency.
- Attend all Steering Committee meetings and present an executive summary on the Project
- Resource Planning
- Risk Management pertaining to risk affecting the project progress
- Policy level inputs
- NEA Counterpart Team Management

Project Management Consultant

- Key interface between NEA and SI
- Initiate engagement between NEA and SI
- Conduct meetings with NEA team members and SI to discuss the project progress, issues to be addressed, way forward, review the project milestones, etc.
- Assist NEA in conducting meetings, preparing progress reports, review of the deliverables submitted by SI, monitor project progress, quality monitoring, etc.
- Assist in work plan management
- Assist in scope management
- Assist in project governance and issue management
- Assist in addressing the issues affecting the project progress

Project Manager/Team Leader – Supplier / System Integrator

- Resource mobilization, planning and deployment
- Participation in the regular meetings including steering committee meetings, meetings with the project management team, etc.
- Keep the project on track
- Ensuring timely and quality deliverables
- Making client presentations on these deliverables
- Coordinate with NEA for delivery, testing and acceptance schedules for solution
- Planning and responding to contingencies
- Monitoring/ review project progress and its team members' work
- Managing the entire project end to end.

The Project Management team should meet on a weekly basis to oversee the project.

2.3.18.1.3 Implementation Team

The project would be implemented by the implementation team that shall comprise of resources from NEA, PMU and other stakeholders, as applicable

We propose that NEA will identify a nodal officer for the project who will be a single point of contact from NEA supported by the core team of NEA. Core team should be deployed on the project dedicatedly and have adequate knowledge of business functions of NEA. Core team can be assisted by the support team of NEA. This support team will assist the core team on various aspects such as coordination with other stakeholders. In addition, each location should constitute a nodal person from NEA who would report to the core team at the Head office. Nodal officers from location will monitor the project activities carried out at respective locations as applicable.

The key activities to be performed include the following;

- Analyze the technical and functional requirements
- Design & Customize the solution in line with requirements
- Prepare/Develop the project deliverables
- Impart training and conduct change management workshop
- Implement the project
- Provide operation & Maintenance support
- Escalate to project steering committee, if any issue, in project execution & delivery

2.3.19 Training and Capacity Building

NEA considers implementation of RMS will have significant impact on its business processes and people. Effective change management activities will be required to ensure that NEA employees are aware about the RMS Project and change in work practices. The SI will be required to carry out activities as part of change management initiatives by focusing on the change management and capacity building approach and plan so as to be able to tackle the issues that might arise due to new processes of the RMS solution.

Introducing radical reforms must be necessarily accompanied by efforts to energize and orient the mindsets of the people – both within and outside the department. For instance, the NEA staff should be skilled to operate and work in a significantly newer and different way. A well-calculated and well-designed strategy must be followed for the people to be trained to work effectively in the new environment. It is necessary to formulate a change management plan with appropriate interventions for capacity building, training and stakeholder communications. A successful Change Management Program will ensure:

a. A smooth transition to the new way of working
b. The organization/people support the changes implemented
c. Individuals know how the changes affect them and the role they have to play
d. Stakeholders to understand the benefits of the changes and internalize it
e. The new system and its underlying concepts are understood
f. People are aware of how roles and responsibilities are changing
g. Everyone is motivated and committed to the change program
h. The success and progress of the program is monitored and measured

2.3.19.1.1 Key Change Management Implications

The implementation of a new RMS will have several change implications emanating from the following changes:

a. Process and procedural (necessary introduction of some new process and systems emanating from the need of changing core functional information flow in a few cases)
b. Technical and technological (introduction of new technologies for enabling the new /unaddressed business requirements)
c. Organizational (transformation of existing organizational structure and redefined roles and responsibilities)

2.3.19.1.2 Training Needs Analysis

Conduct a Training Needs Analysis to determine the training and development needs for all the job roles that will be affected by RMS technology initiative at NEA. SI will collect the appropriate data on user groups, functional and process requirements per user group, required skills and knowledge, existing training culture and training resources through workshops and interviews with NEA business owners and key business users. This will result in a Training and Development Plan including:

a. The training requirements per user group.

b. Recommendations on the most appropriate training delivery methods and channels.
c. Identification of the criteria for training success along with any challenges and risks.
d. Plan and responsibilities for the development of the training materials, such as instructor guides, participant guides, media-based training and quick-reference guides.
e. Knowledge sharing strategy to enable future customizations internally.

2.3.19.1.3 Scope of training for RMS End users

a. SI should propose a comprehensive end user training plan for adoption of the applications developed/proposed to NEA.
b. The plan should incorporate a consistent, enterprise-wide user adoption strategy focusing on the following five key areas:
   - Business Alignment
   - Communication
   - User Training
   - Performance and Management
   - Reinforcement
c. As content may vary across key business units, the degree to which the actual process, tools, and rollout strategy are consistent will provide added economies of scale, as well as levels of skill standardization. In summary, the end goal is striving to achieve 100% user adoption of the RMS application through behavioral and technical competencies.

2.3.19.1.4 Change Management Plan

SI will formulate a comprehensive Change Management Strategy built on three key components as mentioned below:

1 Human Resource Plan

The Human Resources Plan will focus on the people in the organization. It will have four main components as illustrated below:

Capacity Building Plan	Appraisal Workshop	Mentoring & Coaching Schemes	Feedback and Review
● Classify all the stakeholders based on roles, education and current skill set and then provide targeted trainings ● Conduct orientation	● To be conducted to gauge the current knowledge of the staff and the status of the service delivery system. ● The senior	● Provide classroom training to the staff members such that each staff member is assigned a mentor who can be approached for help ● Also, the reverse	● Feedback will be obtained through questionnaires prepared in an objective manner from the participants to measure the

workshops to familiarize the staff with the revised processes and new technology	management should interact with all the stakeholders to understand and address any issues	shadow method of teaching will be adopted. The staff member will first observe the mentor at work and then the mentor would observe the staff member at work ● Conduct Interactive quiz at the end of training session	effectiveness of the change management program. ● Based on the evaluation, suitable methodology will be designed to achieve the expected levels of awareness.

2 Operational Plan

The Operational Plan will focus on putting Change Management into action. It starts with a formal appointment of a Change Management Team and defines a Phased Implementation approach.

Appoint a Change Management Team		**Phased Implementation Approach**	
● Identify a team of best performers during the training and nominate them as Process and System Leaders. ● Process Leaders shall gain complete understanding of the change implications and strategies relevant to the process of these services and help the staff members with any process related queries.	● System Leaders shall help the staff members with any technical or system related queries	PHASE I ● Development of training & communication materials ● Identification of creation of Change Management team PHASE II ● Release of official Communication ● Roll out of training and communication plan ● Organize exposure visits	PHASE III ● Monitoring & appraisal of Change Management Strategy ● Organize Feedback Sessions

3 Communication Plan

The Project communication plan outlines the communication regarding the project. This includes reporting of status and change control communications. In addition to providing information on the project status and progress – which will increase the sense of involvement for everybody, the Change Management Communication plan will include material on all other aspects of the program implementation, including technology, process, etc. A high-level sample communication plan is indicated below:

Type	Description / Purpose	Frequency
Project Status Meetings	Purpose – This reports the accomplishments and results of the project at selected milestones in the project. It also gives plans for the next week, status of activities and significant issues for the project. This report provides insight into any delays in the schedule.	Weekly
Internal Project Meetings	Purpose – To discuss progress of project and any issues/concerns Frequency – As required, and at least twice a week	As Required
Change Control Board (CCB) Meeting	Purpose – To review proposed changes to the project scope	As Required

2.3.19.1.5 Change Management Phase Wise Deliverables

Project Preparation

a. Prepare a detailed change management & communication strategy along with plan covering the entire lifecycle of the project
b. Provide support to NEA in identifying change managers and change agents including preparation of key skill requirements

Business Blueprint

a. Prepare change management related materials such as newsletters, booklets, etc.
b. Conduct change management workshops at corporate office and agreed field locations
c. Identify process level changes and/or role level changes due to RMS implementation and support NEA in effectively conveying the same
d. Prepare Key Performance Indicators (KPIs)

Design and Customization

a. Management awareness workshop
b. Risk assessment and Business Impact Analysis
c. Continuous communication & measurement of communication effectiveness.

Pre-Go-Live

a. Train the Trainer on Change Management Activities
b. Measurement of training effectiveness
c. RMS readiness assessment
d. Continuous communication
e. Refresher Training, if any.

Go-Live

a. Cut-over Strategy
    - All transitional data from legacy & physical systems
    - Sunsetting of Operations on Legacy System to RMS System
b. Go-live communications.
c. Help Desk assessment

2.3.19.1.6 Training and Handholding

The primary objective of the training is to achieve 100% user adoption through technical and behavioral competencies covering all end users of NEA. Training shall be provided in both Nepali & English Language as required, mostly in Nepali to Field Staffs. The audience of the training shall vary for each type of training. The basic computer & IT Solution training will cover all employees of the NEA. The end user training for various RMS Modules and Other associated systems shall be for the users of the respective modules of the system.

Training for Employees of NEA in case of RMS System shall be on below areas:

1 **Training Abroad for Higher Management of NEA-**
   a. RMS Sensitization workshop: Sensitization workshop will be provided to members of higher management of NEA. The training would provide a high level understanding of the RMS and its functionalities. The session will also highlight the unique requirement of the proposed RMS.
   b. RMS Management Dashboard Training: This entails training provided to Senior Management of NEA to be able to access and extract reports and other relevant analytical data for quick decision making.
   c. OEM training: SI shall provide the necessary access of OEM training platforms and data repository to NEA
   d. The training will be provided for 14 higher management employees for a period of 7 days.

2 **Training for Core team -** This is the training for the core group of implementation team of the NEA. The Core team will comprise members from the IT domain. Each member would be trained in the relevant function / module. This Training would be required to be given to approximately 100 personnel for RMS. It is the responsibility of the SI to deliver this training. Standard curriculum designed and agreed by the NEA for hardware, software and network training partners shall be arranged for each group.

3 **End User Training -** SI will facilitate the core team to provide training to all end users of RMS Systems. The End Users/Business Users team will comprise members carrying out day to day operation and task at NEA for RMS System. Each member of the End User/Business user group would be trained in the relevant function / module.

The training center facility with seating capacity shall be provided by the NEA. The SI shall arrange the necessary equipment and peripherals to carry out the training of end users.

On instruction & approval of Nodal Officer, the train the trainer approach shall be adopted by the SI for training & handholding. However, SI must carry out the training of the higher management team and minimum 100 Nos from the core team; post completion of required training the trainer approach may be initiated.

2.3.19.1.7 Train-the-Trainer Program

Development and delivery of a Train-the-Trainer program to prepare the Organization for the delivery of the training program. This program will include:

a. Training the NEA Core Team members on the customized version of the RMS applications as it would be trained to an end-user, allowing the training team to model the approach.
b. Opportunity for knowledge sharing in the areas of leading practice, concepts, new business processes and knowledge to the NEA Core Team members.
c. Sharing of leading practices on creating an effective classroom and an appropriate learning environment.
d. Sharing of leading practices on classroom communication to enable the NEA Core Team members to encourage student involvement and student interaction.
e. Each workshop will have at most 30 people. The workshop will be conducted in batches. The SI will award a certificate of completion, after completion of each training workshop.
f. All the training material in soft and hard format will be handed over to the utility and will be treated as utility property.

2.3.19.1.8 Content Development

SI will design the standard curriculum of training as per RFP requirement with necessary inputs and approval of NEA. The Certified Functional, Technical, System administration and Database management training for the core team of NEA should be arranged by SI. Also, it will be the responsibility of SI for delivering this training (Professional & End User etc.) to NEA.

The SI will work together with NEA Core team members and Project team to enable transfer of knowledge. The following materials will be developed:

a. Paper-based classroom participant guides for each identified user group. These guides include hands-on exercises and are based upon 'Day in the Life' scenarios.
b. Paper-based classroom instructor guides including instructor notes with additional background information and points to be highlighted during the training.
c. Media-based training simulations for pre-class preparation, in-class practicing and knowledge and skills validation.
d. SI can also be required to provide context sensitive on-line help, which includes all materials provided in the hard copy manuals. Where possible, users should be able to add their own on-line help documentation.
e. Usage of RMS must be documented in video form and made available/distributed to all users of RMS. All training manuals will be uploaded to RMS software, also as FAQs etc. for ready reference.

2.3.19.1.9 Training Curriculum – RMS Modules

The Training Curriculum along with Calendar need to be included as a part of the technical proposal. The details of minimum training curriculum and important consideration for training is mentioned below:

Category	RMS Modules	Training for Utility						
		Training of Business users (End Users)	Administration Trainings (Core Team)			Application Development & Integration (Core Team)		Cyber/ IT Security (Core Team)
			Server	Database	Network	RMS Modules	Mobile Application	
Basic	Day to Day Business Operations on RMS Modules	√	√	√	√	√	√	√
Network	Basic Network Management	√			√		√	√
	Advance Network Management & Administration				√		√	
Database Systems	Basic Database Management	√		√				
	Advance Database Administration & Management			√				
RMS–Module Stack Software's	Basic Troubleshooting & Operations Training	√				√		
	Advance Troubleshooting & Operation Training					√		

	System Source Code Development, Customization, Integration & other associated activity to develop in-house competency for maintenance & development of RMS Modules					√		
RMS Modules Mobile – Software (IOS, Windows, android)	Basic Mobile - Applications Operations	√					√	
	Basic Mobile - Applications development	√					√	
	Advance Mobile Applications Development						√	
Software Testing Training	Detailed software testing training must be imparted. The course can be finalized in discussion with NEA.	√	√	√	√	√	√	√
Train the Trainers (Super Users		√	√	√	√	√	√	√

Table 9: Training Curriculum RMS

Note:

1. The Training Curriculum for RMS mentions the indicative subjects on which training should be imparted by the SI.
2. The Training Curriculum for RMS Modules mentioned above are indicative and will be finalized based on agreement and discussion between NEA and the successful Bidder i.e. SI.

3. The Business Users and Core users will be identified by NEA and shall be picked from the entire organization and from all levels.

The training activity for RMS shall comprise of the followings:

a. Training material must include documents and videos for usage of Modules (Bilingual - Nepali/English). These materials will be uploaded to the RMS itself and should be available as ready reckoners to the end users.
b. The content should be updated regularly and kept up to date as and when changes take place to the RMS modules.
c. Training sessions shall cover more hands-on training rather than instructive mode.
d. The training and delivery options shall be on-line, CBTs (Computer based training), instructor led classrooms. Training material will be organized by a functional process that will serve as the training documentation for a functional area.
e. NEA plans to adopt a training platform as e-classrooms in future. SI should consider the same for compatibility.
f. Necessary handholding and change management support shall be provided post training.
g. Feedback exercise shall be conducted for each training and accordingly evaluation will be used for improvement of further training.
h. SI in consultation and convenience of the NEA shall work out the training program and all the other modalities of the training, which should be delivered by SI.
i. The SI shall provide associated documentation for all deployed systems to ensure a smooth transition from deployment to post-deployment operations and maintenance of the system.
j. The ideal approach of the training should be formulation and involvement of the core implementation group from the very start of the project to ensure maximum retention and adequate technical competency level.
k. Hand Holding during pre-implementation, implementation, Go Live and Post Go live should be done by the SI.
l. Training calendar should be published to stakeholders and training sessions should be organized either on site or over the web as per the requirement of NEA.
m. Training staff would be deployed at NEA offices during the course of the project as per requirement of NEA.
n. Training shall be planned in stages as required - before the implementation, during the implementation and post implementation depending on the frequency as finalized by NEA.
o. NEA is looking for competence and capacity development by necessary training. The SI will facilitate end users training on customized code development and deployment at NEA.
p. SI shall carry out the capacity building of the core team including functional and technical employees with an intent to create a team of experts capable of independently handling the application operations & maintenance task and issues, if any.
q. SI shall carry out the training of the NEA team on reports development, configuration of application setups and other skill sets as required to create a team of experts capable of independently handling the maintenance & support requirement by NEA.
r. SI shall carry out the hands-on training of core team members & end users on RMS and other associated applications including training on system configuration, database administration, backup & restoration, development and maintenance tasks etc.

2.3.20 Service Level Agreements

The Service Level Agreement (SLA) is the agreement between NEA and SI during the project implementation and further during Facility Management Support phases of the project. The SLA defines the responsibility of SI in ensuring the performance of Project based on agreed performance indicators as detailed in the agreement.

SI shall be responsible for 24*7*365 management of all systems during the implementation of overall RMS solution and Facility Management Service (FMS) period. The NEA would monitor the System Integrator performance and compliance to standards with respect to agreed upon SLA.

SI shall develop service level monitoring tools.

This section defines Service Level Agreement (SLA) for Project. The purpose of this section is to define the levels of service to be provided by SI. The benefits of SLA are as followings:

a) Define a process that applies to the performance related expectations or performance required by NEA regarding the project.
b) Assist NEA to control levels and performance of services provided by the SI.

2.3.20.1.1 Duration of the Service Level Agreement (SLA)

The service levels agreements shall remain valid for the entire tenure of the contract or till such time the SLA have been reviewed and revised by NEA.

2.3.20.1.2 Service Level Agreements and Targets

The service levels agreements shall be agreed by the SI as a key performance indicator for this engagement. These key indicators shall be used while monitoring and measuring performance of SI. The service level indicators have been categorized under:

1. **RMS System - During Implementation SLA Indicators**
    a. Project Implementation – RMS System Go-Live

2. **RMS System - Post implementation SLA Indicators**
    a. Availability related SLA
    b. Performance related SLA
    c. Services related SLA
    d. Help desk activities etc.

System Integrator must supply and implement the Help Desk tools with RMS System. Also, the System Integrator shall be overall responsible for procurement of remaining.

In case, if any of the Supporting Software Solutions & Diagnostic/monitoring tools required for implementation and operation of RMS are missing, then it will be the responsibility of the System Integrator to supply the same to NEA at no additional cost.

The description of indicative Service Level Agreement (SLA) has been presented in the section below. The Service Level Agreement will be finalized and agreed based on the discussion between NEA and the successful bidder at time of signing the contract.

2.3.20.1.3 Service Level Agreements Monitoring

The NEA will carry out the quarterly monitoring and performance review of the SI against the monthly formulated reports for SLA.

a) A designated third party or personnel from NEA will review the performance of the SI against the SLA.
b) The SLA reports shall be formulated based on the automated system generated reports.
c) The SI shall submit the monthly SLA report to the designated Nodal officer as per agreed frequency and timeline.
d) For requirement of SLA audit, the NEA may perform a visit either by internal department or by an external contractor at respective DC/DR locations.
e) The review/audit report will form a basis of any action relating to imposing penalty on or breach of contract of the SI.

2.3.20.1.4 RMS System - SLA Indicators During Implementation

1 RMS System rollout – SLAs & Penalty

The System Integrator will carry out the RMS rollout including other supporting solutions in all identified project areas as mentioned in the RFP document and as per the agreed roll out plan.

Any delay in RMS System roll-out will attract a penalty for delay **subjected to a maximum penalty of 10% of total cost of Implementation.** It will be levied for the duration equivalent to the number of weeks delayed which shall be deducted from subsequent months based on the milestone payments.

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
1	Implementation Phase				
1	**Project Initiation**	Project Kick-off with presentation on RMS overview to senior management.	M2	Upon submission of Project initiation completion report covering listed key deliverables and approval by NEA	0.5% per week or part thereof maximum up to 10% of the Project Initiation Cost and at Prevaili
		Project Charter with-			
		a. Detailed project plan with work breakdown structure along with dependencies			
		b. Resource schedule & deployment plan			
		c. List of complete deliverables			
		d. Project Governance structure & escalation matrix			
		e. Stakeholder communication matrix			

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
		f. Project management templates such as Project reports, SLA monitoring, Attendance etc.			ng tax rates
		g. Detailed Survey Report with Identified End User Base, License Requirement, Network Feasibility, Change readiness Assessment etc.			
		h. Roles & responsibilities			
		Detailed training/Organization change management strategy & schedule			
		Risk Management & Quality Assurance Planning Reports			
		As-Is Study report including existing business process, workflows, reporting requirement, process maps etc.			
		Gap analysis report with identified gaps & areas of Improvement			
		To Be Report			
2	**Business Blueprinting**	High Level Design & Low-Level Design including Updated Bill of Quantity (BOQ)	M5	Upon submission of Business Blueprinting report covering listed key deliverables and approval by NEA	0.5% per week or part thereof maximum up to 10% of the Business Blueprinting phase Cost and at Prevailing tax rates
		Updated Functional Requirement Specifications			
		Non-functional Requirements Specifications Documentation			
		Updated Technical Requirement Specifications			
		Business Solution Design Document			
		Requirements Traceability Matrix			
		Module based roles & responsibilities (Authorization Matrix) etc. with Mapped Organogram of NEA			
		Finalized Business blueprint/design documents			
		Data Conversion and Migration Strategy			
3	**Design & Customization**	Baseline Configuration Document	M7	Upon submission	0.5% per

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
		Customization and Configuration documentation		of Design & Customization completion report covering listed key deliverables and approval by NEA The success of the UAT shall be assessed based on the following criteria; Less than 5% fail test cases – Success Greater than 5% fail test cases – Fail Note: The final decision, however, on the success of the UAT shall be given by NEA.	week or part thereof maximum up to 10% of the Design & Customization and at Prevailing tax rates
		Draft OEM audit report with observations (1st Iteration)			
		Final OEM audit report with compliance (1st Iteration)			
		Integration with existing solutions (Legacy, Other Systems)			
		Approved End-User Training Strategy (along with End-User Training Curriculum, Manuals, and Schedule)			
		Trainings to Core Team/Nodal Officers			
		Implementation & rollout strategy			
		Performance Testing Report			
		Software Testing Report including all requisite tests conducted as per the Software Development Lifecycle (SDLC) including unit, integration, regression, load, stress, performance, user acceptance etc.			
		User Acceptance Testing (UAT) Report			
		Data archival, retention policy			
		Cyber Security Policy			
		Business Continuity/Disaster Recovery Planning policy			
		Pre – roll out preparedness checklist			
4	**Data Digitization**	Initiation of Data digitization across all provinces	M1	Upon submission of Data Digitisation	0.5% per week or part
		Completion of 50% of Data digitization	M3		

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
		Completion of quality check for 50% of data digitized	M4	completion report covering listed key deliverables and approval by NEA	thereof maximum up to 10% of the Data Digitisation Cost and at Prevailing tax rates
		Completion of 100% of data digitization in all provinces	M6	Upon submission of Data Digitization completion report covering listed key deliverables and approval by NEA	0.5% per week or part thereof maximum up to 10% of the Data Digitisation Cost and at Prevailing tax rates
		Completion of quality check for 100% of data digitized	M7		
5	**Data Migration**	Data Migration for pilot locations	M10	Upon submission of Data Migration completion report covering listed key deliverables and approval by NEA	0.5% per week or part thereof maximum up to 10% of the Data Migration Cost and at Prevailing tax rates
		Data migration for other DCS	M14		
6	**Pilot Rollout**	Supply of licenses for Pilot Rollout	M10	Payment can be in two	0.5% per week or
		Roll out for Pilot Locations	M11		

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
		Billing Cutover Testing (BCT)	M11	installments. i. Upon 60% compliance to Roll out checklist ii. Upon 100% compliance to Roll out checklist	part thereof maximum up to 10% of the RMS-Pilot Rollout Cost and at Prevailing tax rates
		Demonstration & Acceptance	M11		
		Pilot Go-Live	M11		
		Incorporation of changes and observations of Pilot phase	M12		
7	**Training and Change Management**	Training for 80% of the trainees	M12	Upon submission of total attendance report and approval by NEA	0.5% per week or part thereof maximum up to 10% of the Training Cost and at Prevailing tax rates
		Training for 100% of the trainees	M14		0.5% per week or part thereof maximum up to 10% of the Training Cost and at Prevailing tax rates
8	**RMS System – Enterprise wide roll out**	Supply of licenses for Enterprise-wide Rollout	M12	Upon submission of RMS -	0.5% per week or
		Roll out	M15		

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
		Billing Cutover Testing (BCT)	M15	Enterprise wide roll out completion report covering listed key deliverables and approval by NEA.	part thereof maximum up to 10% of the RMS - Enterprise wide roll out Cost and at Prevailing tax rates
		Incorporation of changes and observations	M15		
		Help desk structure, process, and operational manual	M16		
		Help Desk setup Initiation	M16		
		Demonstration & Acceptance	M16		
9	**RMS System - Stabilization Support**	Stabilization Support	M18	Payment can be in two installments. i. Upon 60% compliance to Go live checklist ii. Upon 100% compliance to Go live checklist	0.5% per week or part thereof maximum up to 10% of the RMS - Stabilization Support Cost and at Prevailing tax rates
		RMS OEM audit report with compliance (2nd Iteration)			
		Release Management and Change Management Strategy Document.			
		SLA and Performance Monitoring Plan			
		Exit Management Plan			
		Pre-Go-Live declaration report			
		Enterprise wide Go-live completion report			
2	**Hardware Procurement, Supply, Installation, configuration and Commissioning Phase**				
1	**Setup of IT infrastructure for DC & DRC & Customer Care Centre**	Procurement of IT infrastructure	M5	Upon submission of IT Infrastructure (DC, DRC) and CCC completion report covering listed key deliverable	0.5% per week or part thereof maximum up to 10% of the IT Infrastructure
		Supply of IT infrastructure			

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
				s and approval by NEA	(DC, DRC) & CCC Procurement and supply Cost and at Prevailing tax rates
		Installation, Configuration and Commissioning of IT infrastructure Report	M8		0.5% per week or part thereof maximum up to 10% of the IT Infrastructure (DC, DRC) and CCC Installation, commissioning and configuration Cost
		Site acceptance testing of hardware (SAT)			
		Integration Services for Customer care centre	M9		
3	**Software Licenses Procurement, customization and configuration Phase**				
1	**Software Licenses**	Supply, delivery, design, customization, integration, implementation, testing, commissioning of Software of Enterprise wide licenses including CCC and IT infra	M7	Upon submission of Project initiation completion report covering listed key deliverables and	0.5% per week or part thereof maximum up to 10% of the Softwar

SL.NO	Project Phases	Tasks	Timeline	Milestone	SLA
				approval by NEA	e license cost and at Prevailing tax rates
4	**Support Phase**				
	Facility Management Services	System Performance Report (SLA compliance)	Till end of contract	Upon submission of Project initiation completion report covering listed key deliverables and approval by NEA	
		Monthly activities report (including Issue tracker, Help Desk ticket analysis, Change Request status and Status of all service requests logged with Offered OEM Product etc.) – Reports shall be tool generated and available for viewing in the tool itself.			
		Solution Usage Reports - Transactions and Users			
		User Manual with necessary revision			
		Change Management & Release Management Reports			
		Issue log and resolution report			
		Revised Exit Management Plan			

Note:

1) If SI successfully carries out the design customization, data digitization, migration, rollout and Go-live of RMS within the Project Timelines i.e. 18 Months, then the penalty deducted due to delay in implementation of respective phase, shall be refunded post approval from competent authority.
2) No interest shall be paid by NEA for a refundable amount.
3) In case, the SI is unable to implement the RMS within the given timelines and project implementation duration extend beyond the specified period**,** in such case, NEA reserves the right to get the remaining part of project work completed from other agencies at the risk and cost of SI and claim liquidated damages.

Recovery of Penalty

The following procedure shall be adopted for recovery of the 10% penalty amount on total cost of Implementation services and as per prevailing taxes at prevailing rate from the system integrator for delay in implementation of the project.

a) Calculate the penalty recoverable from the system integrator as per contract terms and conditions for the works delayed beyond contractual agreement period.
b) Limit the recovery of penalty to 10% of each bill value admitted.
c) If the total penalty to be recovered is not fully recovered, the balance penalty should be recovered in the running bills of the system integrator.

Note: Procedure for accounting of penalty recovered from system integrator towards delay in implementation of the project and its refund.

i) Agency shall submit a request for condonation of delay if any within 12 (Twelve) months from the date of implementation of the project with valid reasons and documentary proof.
ii) In case no request for condonation of delay is made by the system integrator within a period of 12 (Twelve) months, the penalty amount shall be transferred to Miscellaneous income immediately after completion of such period.
iii) Once any penalty amount is transferred to Miscellaneous Income Account, it shall, under no circumstances be considered for refund.

2.3.20.1.5 RMS System – SLA Indicators Post implementation

1 Calculation for Availability Service Levels

a) Uptime Calculation for the Month

1. {% Monthly Availability = [(Actual Uptime + Scheduled Downtime) / Total No. of Hours in a Month] x 100}
2. "Actual Uptime" means the Total Hours, the aggregate number of hours in any month during which each equipment/service is available for use.
3. "Scheduled Downtime" means the aggregate number of hours in any month during which each equipment/service, is down during total Hours, due to preventive maintenance, scheduled maintenance, IT infrastructure/Other equipment's problems, IT Infrastructure problems or any other situation which is not attributable to SI 's (or Service provider's) failure to exercise due care in performing the SI's responsibilities.
4. The SI will be required to schedule "Planned maintenance time" with prior approval of NEA. This will be planned except the Business hours of NEA. In exceptional circumstances, NEA may allow SI to plan scheduled downtime in the working hours where actual production downtime will be minimal i.e. less than 30 Minutes.
5. The downtime for scheduled maintenance (patch application, upgrades - OS, Database, etc.) would need to be mutually agreed between NEA and SI. To reduce this time, various maintenance activities can be clubbed together with proper planning.
6. "Total Hours" means the total hours over the measurement period i.e. one month (24 * Number of days in the month).

b) Downtime Calculation:

The recording of downtime shall commence at the time of registering the call with SI for any downtime situation for the application/service/equipment. Downtime shall end when the problem is rectified, and the application/service is available to the user.

Down time will not be considered for following:

1. Pre-scheduled preventive maintenance and health checks (Scheduled Downtime).

Typical Facility Management System (FMS) availability and duration of their requirement are tabulated below for reference.

The criticality of the required services is categorized under the four categories/priorities i.e. Critical, High, Medium and Low. Each of the Support Categories is associated with respective response and resolution time.

The criticality definition chart is tabulated below for reference.

Support Category	Criteria	Maximum Response Time	Resolution
Critical	The system is unable to be used for normal business activities. There is certainty of financial loss to NEA.	15 Minutes	60 Minutes
High	There is a problem with a part of the system, which impacts on NEA's decision making. No viable workaround is available. There is a likelihood of financial loss.	1 Hour	4 Hours
Medium	The efficiency of users is being impacted but has a viable workaround.	4 Hours	12 Hours
Low	A fault, which has no impact on processing of normal business activities.	8 Hours	3 Days

Table 10: SLA Criticality Chart

Note: The final decision for categorization of the services and identification of criticality will be based on discussions and mutual agreement by NEA, post on boarding of SI, though for simplicity followings are indicative categorization:

Service	Duration	Criticality
Help Desk ● (Business Hours – High)	24 Hours	High - 12x6 Rest - Medium

● (Non-Business Hours – Medium)		
IT - Asset Management Services	8x6	Medium
AMC/ATS Tracking	12x6	Medium
Data Center/Disaster Recovery Administration	24 X7	Critical
Server Administrator Services	24 X7	Critical
Database Administration Services	24 X7	Critical
Network Management – Network Connectivity between Data Center (DC) and Disaster Recovery Center (DRC)	24 X7	Critical
Storage Management	24 X7	Critical
Backup Management	As Per Schedule	High
Business Unit (i.e. NEA - HeadQuarters /Office Location etc.)	As Per Schedule	High

Table 11: SLA Categorization

The **maximum penalty** in a month/quarter (including the service levels for Resource Management) shall be **10% of Facility Management Services (FMS) charges** for that month/quarter for respective services/components.

2 Availability Service Levels

The below table shows the expected performance from the core services including performance criteria and service level agreements pertaining to the availability of services and activities required from SI during the Facility Management Support period.

Sl. No.	Service	Parameter	Service Level	Measurement Tool/ Validation	Penalty	
1.	Utility Business Applications Software RMS modules	Availability of Utility Business Application Software as mentioned in the Scope of Work	>=99.98 % uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	Less than 0.5% of SLA	1% of the Monthly Payment
					>= 0.5% but <1% of SLA	5% of the Monthly Payment
					>= 1% but <3% of SLA	20% of the Monthly Payment
					>= 3% but <5% of SLA	50% of the Monthly Payment
					>=5% of SLA	No Payment

2.	Sync between RMS application stack and other utility systems viz. MDMS, GIS, OMS, DMS, ERP etc	Consumer and asset details sync of RMS system with other systems	100% sync at all times	At T+1 day of consumer/asset/complaint etc occurrence, sync between RMS and other systems to be ensured(Service level to be monitored for master data sync within purview of RMS)	Less than 100%	0.5% of the monthly payment for reduction in service level
3.	Tariff updation	Timely Updation of tariff in system upon tariff change	Within 7 days	Tariff change effected into the system from the time it has been intimated in writing to the SI	For every day's delay beyond 7 days	0.1 of the monthly payment for the reduction of the service level
4.	Business Supporting Applications (Like EMS/NMS etc.)	Availability of Application and System Software which are required to support the Business Applications as mentioned in Scope of Work	>= 99.5% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	Less than 1% of SLA	2% of the Monthly Payment
					>=1% but <3% of SLA	10% of the Monthly Payment
					>=3% but <5% of SLA	30% of the Monthly Payment
					>=5% but <10% of SLA	50% of the Monthly Payment
					>=10% of SLA	No Payment
5.	Integration Services uptime	Availability of Web Services/ Middleware for Integrating RMS Solution with other utility systems	>99.5% uptime	Availability & Downtime Reports, measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	For every 0.5% decrease of SLA	2% of the Monthly Payment will be deducted
6.	Project Management	Submission of Monthly Project Status reports and Conductin	100%	Minutes of Meetings Approval of Status reports by Engineer-In-Charge	In case, the Monthly meeting is not conducted due to System Integrator	2% of the Monthly Payment

		g Status meetings			(SI) default or in case the report is not produced within first 7 days of the month	
7.	Helpdesk	Resolution of ticket logged as per the Service Availability & Criticality Chart	99% Resolution of ticket logged	Monthly Reports Generated from Ticket Logging system	>99% of SLA	No Penalty
					If >95% but <=99% calls resolved in the given Month	2% of the Monthly Payment
					If >90% but <=95% calls resolved in the given Month	5% of the Monthly Payment
					If below 90% calls resolved in the given Month	20% of the Monthly Payment
8.	Install, Moves, Add, Changes Services (At DC/DR)	Should be part of Monthly project status report	>=95%	Report	For every 0.5% decrease of SLA	0.2% of the Monthly Payment
9.	Asset / Inventory Management	Provide Monthly MIS of Asset Inventory	>=95%	Report	In case the report is not produced	0.2% of the Monthly Payment
		Conduct Annual Physical Asset Verification including installed, repairs, replaced and scrapped assets.	100%	Management approval of Physical Asset Verification Annual report	In case the report is not produced or management highlights critical gap in inventory figures	0.5% of the Monthly Payment
10.	Antivirus Management	Rollout of latest antivirus definition file on Servers on being made	>=98%	Reports generated from Anti-Virus software console	In case, the roll out and installation of the latest patch of antivirus is not found at	1% of the Monthly Payment

		available by Supplier's			endpoint Systems.	
11.	Network Administration for Data Centre & Disaster Recovery Center (Services within the preview of RMS Solution Stack Provider)	Data Centre Network Availability Minimum of 99.98% uptime	>=99.98 % uptime measured on Monthly basis	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis (Measured Monthly) and Validated by Monthly SLA Performance Report.	Less than 0.5% of SLA	1% of the Monthly Payment
					>= 0.5% but <1% of SLA	5% of the Monthly Payment
					>= 1% but <3% of SLA	20% of the Monthly Payment
					>= 3% but <5% of SLA	50% of the Monthly Payment
					>=5% of SLA	No Payment
12.	Data Centre/Disaster Recovery Operations/IT Operations (Services within the preview of RMS Solution Stack Provider)	MIS reporting on physical and environmental conditions controls	>=95%	Report	In case the report is not produced or management highlights critical gap in report	0.2 % of the Monthly Payment
		MIS reporting of health check-up of all systems & modules installed	>=95%	Report	In case the report is not produced or management highlights critical gap in report	0.2 % of the Monthly Payment
13.	Server Administration / Management	Rollout of patches (OS, infra level) on Servers after patch being approved on test environment	>=98%	Report	Roll out of patches & updation report for Servers	0.5% of the Monthly Payment
		Uptime of Application Servers	>=99.8%	Report	Less than 0.5% of SLA	1% of the Monthly Payment
					>= 0.5% but <1% of SLA	5% of the Monthly Payment

					>= 1% but <3% of SLA	20% of the Monthly Payment
					>= 3% but <5% of SLA	50% of the Monthly Payment
					>=5% of SLA	No Payment
		Uptime of Supporting System Servers	>=99.5%	Report	Less than 1% of SLA	2% of the Monthly Payment
					>=1% but <3% of SLA	10% of the Monthly Payment
					>=3% but <5% of SLA	30% of the Monthly Payment
					>=5% but <10% of SLA	50% of the Monthly Payment
					>=10% of SLA	No Payment
14.	Database Administration Services	Uptime of Database	>=99.98 %	Report	Less than 0.5% of SLA	1% of the Monthly Payment
					>= 0.5% but <1% of SLA	5% of the Monthly Payment
					>= 1% but <3% of SLA	20% of the Monthly Payment
					>= 3% but <5% of SLA	50% of the Monthly Payment
					>=5% of SLA	No Payment
		MIS report of database scheme, disk space, storage and user role	>=99%	Report	0.5% of the Monthly Payment	
15.	Management of EMS	Daily MIS of Servers and device health check-ups (CPU, disk space, memory utilization,	100%	Reports generated from EMS system	0.5% of the Monthly Payment	

		I/O utilization, Central Storage etc.)			
16.	Incident Management	Resolution of ticket logged in Incident Management tool	>=99%	Reports generated from Ticket logging system	0.5% of the Monthly Payment
17.	Ticketing Management	Resolution of ticket logged	99%	Reports generated from Ticket logging system	0.5% of the Monthly Payment
18.	Change Management	Resolution of Change Management ticket	99%	Monthly Reports	2% of the Monthly Payment if agreed date for requested change is not adhered
19.	Release Management	Release of approved software version	100%	Release on agreed date	5% of annual FMS charges if agreed software development date for final production deployment is not adhered
20.	Problem Management	SI shall analyze all the incidents and provide a root cause report every month if there are more than 5 incidents of the same type. SI shall take the needed corrective action to prevent further issues due to the same cause.	100% timely submission covering all incidents logged in that month	Root cause Report. Incident Report stating problems faced by the users. Report detailing corrective and preventive actions	5% penalty of the Monthly Payment of that location/site, if the SI does not submit a problem report for that month. 5% penalty of the Monthly Payment of that location/site, if the SI does not perform the corrective action for more than one calendar month.

21.	Security Management	SI shall adhere to the Security policy developed in consultation with NEA	Monthly	100% Compliance.	No Penalty
				Non-Compliance.	0.5% of the Monthly Operations & Maintenance Cost for every day's delay on an incremental basis.
22.	Implementation of Audit Recommendations	Implementation of audit recommendations given by NEA or its auditor which have been agreed by SI to be implemented.	100%	Reports	0.2% of the Monthly Payment for every non compliance
23.	Resource Management	Number of shift days for which resource present at the designated location / Total number of shift days	>=98% averaged over all resources designated for SI services - calculated on a monthly basis	Attendance track Call Log Audit calls/ visits Measured on a monthly basis	If the resource availability is less than 95%, then payment shall be deducted based on the pro-rata basis. (Total FMS cost per day divided by nos. of persons deployed) Further deduction Rs.2,000/- per day(NR) per engineer/shall also be made on account of loss of service
		Resource provided is not as per specified certification / experiences	100% of the resource given	Experience Certificate and CV of FMS personnel submitted by SI to the NEA	Per day deduction = 0.5 * (Monthly value for that manpower) / 30
24.	SLA Monitoring Report	Availability of SLA reports covering all parameters required for SLA	7 working days from the end of the month	Monthly Report	2% of Monthly Payment

		monitoring within the defined time			

3 Cyber security

All events must be monitored, and all incidents should be analyzed/reported and resolved on a 24x7 basis. Security event management should be covered completely but not limited to:

a) Virus/Malware outbreak
b) Reconnaissance attacks
c) Application/Website monitoring

Validate the incident with the guidelines provided and exclude if it is a false positive. Priority is the level of response time identified when the incident ticket is created or updated based on the degree of the impact.

Sl. No.	Measurement	Service	Service Level	Penalty
1	Incident Reporting	Any failure / incident on any part of the solution shall be communicated immediately to NEA as an exceptional report giving details of impact, if any. Monthly measurement.	100% incidents to be reported to NEA within 2 hours with the cause and action for the incident.	No Penalty
			Delay beyond 2 hours	0.5% of the Monthly Payment for every 4-hour's delay on an incremental basis.
			100% incident log to be submitted to NEA that comprises exceptional & normal reportable activities by 5th of every month for the previous month.	No Penalty
			Delay beyond the date of submission	0.5% of the Monthly Payment for every day's delay on an incremental basis.
2		Any failure/ incident on any part of the	100% incidents to be reported to NEA within 2	No Penalty

	Information Security	information security breach shall be communicated immediately to NEA as an exceptional report giving details of impact, if any. Monthly measurement.	hours with the cause and action for the incident.	
			Delay beyond 2 hours	0.5% of the Monthly Payment for every 2 hours delays on an incremental basis.
			100% incident log to be submitted to NEA that comprises exceptional & normal reportable activities by 5th of every month for the previous month.	No Penalty
			Delay beyond the date of submission	0.5% of the Monthly Payment for every day's delay on an incremental basis.
3	Security Change Management	Measurement of quality and timeliness of changes to the solution monthly measurement	100% of changes should follow formal change control procedures. All changes need to be approved by NEA.	0.5% of the Monthly Payment for every non-compliance incident
			All changes should be implemented on time and as per schedule & without any disruption to business.	0.5% of the Monthly Payment for every non-compliance incident
			100% incident log to be submitted to NEA that comprises exceptional & normal reportable activities by 5th of every month for the previous quarter.	No Penalty
			Delay beyond the date of submission	0.5% of the Monthly Payment for every day's delay on an incremental basis.

4 Performance related SLA

a) Business Applications and Portals:

The SI is to quote for appropriate systems with specification to meet the performance requirement of system/application within the Data Center LAN access.

Sl. No.	Measurement	Service	Service Level	Measurement Tool/Method	Penalty
1	Average loading time of Static Page in a Web	Response time is an important factor from the perspective of End User Experience	< 50 m sec	SI needs to ensure capturing of the listed parameters without any manual interventions and submission for approval to NEA.	If the deviation is: ● >=99.90% to <99.00%, then 1% Penalty of the Monthly Payment ● >=99.00% to <97.00%, then 5% Penalty of the Monthly Payment ● >=97.00% to <95.00%, then 10% Penalty of the Monthly Payment ● >=95.00% to <90.00%, then 20% Penalty of the Monthly Payment ● >=90.00% then 50% Penalty of the Monthly Payment
2	Average response time of Dynamic Content Pages in a Web (excluding Human Input time)	Responsiveness would be critical to solution's performance	< 1 sec		
3	Average response time for Utility Business Application (excluding Human Input time)	Responsiveness of Utility Business Application	< 1 sec		

b) Process Operations Response Times

Process operations response times (end to end) are required of no less than:

Sl. No.	Measurement	Service	Service Level	Measurement Tool/Method	Penalty

1	Process operations response times	Update transactions to commit transactions: 2 seconds Simple query: 3 seconds Complex query: 4 to 8 seconds Batch Operations: 15 Mins	>=90%	SI needs to ensure capturing of the listed parameters without any manual interventions and submission for approval to NEA.	0.2% of monthly FMS charges

Note:

1. System Integrator will carry out the Performance monitoring of Business Applications & Operations response via Application Performance Monitoring tools and will identify the root cause of performance & operations issues i.e. Business Application, IT Infrastructure Sizing, Network connectivity etc. for applying the applicable penalty.

5 Help Desk Service Levels Support

SI should set up a centralized help desk at the location mutually decided and agreed with NEA. SI shall arrange and maintain within the contract value and throughout the contract period, all infrastructure necessary for managing the Help Desk.

Resources deployed for providing support services should be equipped with mobile phones and other necessary equipment and solutions. Cost of the same, throughout the contract period shall be borne by the SI within the contract value. SI should provide multiple channels to log a complaint such as Cell phones, landlines, E-mail, Intranet etc. Outage of any component would be calculated as a time between logging the call and closing the call. The complaint Calls and e-mails shall be assigned a priority level on the following basis:

Deviation (% of call not closed) would be calculated based on the formula (1-(calls close/calls logged)) *100

Sl. No.	Parameter	Description	Target	Measurement Tool/Method	Penalty
1.	Critical priority	Has critical impact on NEAs operations. There is	Should be resolved within 60 Minutes	Help desk Feedback and log details	If the deviation is: ● >=99.90% to

		certainty of financial loss.			<99.00%, then 1% Penalty of the Monthly Payment ● >=99.00% to <97.00%, then 5% Penalty of the Monthly Payment ● >=97.00% to <95.00%, then 10% Penalty of the Monthly Payment ● >=95.00% to <90.00%, then 20% Penalty of the Monthly Payment • >=90.00% then 50% Penalty of the Monthly Payment
2.	High priority	The high impact problem with effect on the efficiency of users.	Should be resolved within 4 hours	Help desk Feedback and log details	
3.	Medium priority	The low impact problem with effect on the efficiency of users.	Should be resolved within 12 hours	Help desk Feedback and log details	
4.	Low priority incident	A fault, which has no impact on normal business activities.	Should be resolved within 3 Days	Help desk Feedback and log details	
5.	Re opened incidents	The call logged by NEA user should be resolved on a permanent basis. The call closed by the help desk should not be re-opened by the NEA users within 2 days' time.	Call re-opened should be less than 10% of the total call closed	Re-opened Calls	

2.3.20.1.6 RMS – SLAs for RTO/RPO & DC DR Drill

The System Integrator shall ensure the necessary Recovery Point Objective and Recovery Time Objective, in case of a disaster strike at a data center. It will be the responsibility of SI and to arrange the services in an undisturbed manner.

Following RPO and RTO will be desirable –

RPO & RTO

Recovery Point Objective (RPO) is the maximum amount of time lag between Primary and Secondary storages. NEA intends to maintain RPO as <15 minutes for all application and data at primary site.

Recovery Time Objective (RTO) is maximum elapsed time allowed to complete recovery of application processing at DR site. In case of a disaster, the RTO shall be measured from the time when the decision is finalized & intimated to the SI by NEA to shift the operations to DR site. The SI in association with NEA personnel shall ensure compliance to following RTOs –

Sl. No.	RMS Application	RTO
1	Metering; Billing; Collection; New Connection, Disconnection & Reconnection; Energy Accounting; Customer Relationship Management; Web portal and mobile application; Management Information System (MIS), Document Management System (DMS)	1 Hour

Sl. No.	Service	Parameter	Service Level	Measurement Tool/ Validation	Penalty
1	Recovery Time Objective (RTO) (Applicable when taking Disaster Recovery)	Measured during the regular planned or unplanned (outage) changeover from DC to DR or vice versa.	RPO <15 minutes	Monthly Report	10% of Monthly Payment per every additional 15 minutes of data lag.
2	RPO (Applicable when taking Disaster Recovery)	Measured during the regular planned or unplanned (outage) changeover from DC to DR or vice versa.	• RTO<=1 Hours (For RMS modules)	Monthly Report	10% of Monthly Payment per every additional 1 (One) hours of downtime

The SI shall adhere to the DC-DR drill policy formulated in consultation with NEA the required activity shall be carried out after necessary approval of NEA.

Sl. No.	Measurement	Service	Service level	Penalty

1	DC - DR Drill	SI shall adhere to the DC-DR drill Policy developed in consultation with NEA. Yearly measurement DC-DR Drill Yearly	100% of the time the drill should happen as per schedule.	2% of the yearly FMS Charges. Note - In case, the DC-DR Drill is not conducted as per schedule due to any business obligations / dependency of NEA. No penalty shall be applied.

Note:

In case of any breach in SLA of "Recovery Time Objective" Or "Recovery Point Objective" Or DC-DR Drill occurred due to failure or lack of necessary measures by System Integrator ,then root cause analysis will be carried out by SI to Identify the problem with proper recording and tracking of the problem till its resolution. Also, it will be the responsibility of SI to recover all the utility data and systems without loss of any data and business operation. Such incidents which may result in loss of data, utility business or public image may attract the penalty on the responsible party based on the root cause analysis report.

1. Service Levels for DC-DRC

The below mentioned Service Level Agreement are indicative and for reference of the System Integrator.

Sl. No.	Service	Parameter	Service Level	Measurement Tool/ Validation	Penalty	
1	Requirement of Virtual Machines/ Compute	Provision and Deprovision of Virtual Machines	Within 15 minutes	Report	Within 15 Minutes	Nil
					>15 but <=45 Minutes	5% of the Monthly Payment
					Beyond 45 minutes, for every 30 minutes of delay	5% of the Monthly Payment
2	Overall DC-DRC Solution availability	Availability of DC-DRC Solution Services	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA	>=99.95%	No Penalty
					>=99.45% to <99.95% of SLA	1% of the Monthly Payment
					>=98.95% to <99.45% of SLA	5% of the Monthly Payment

				Performance Report.	>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
3	DC-DRC Virtualization Layer Availability	DC-DRC Virtualization Layer Availability for Hosted Solution & Services	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	>=99.95%	No Penalty
					>=99.45% to <99.95% of SLA	1% of the Monthly Payment
					>=98.95% to <99.45% of SLA	5% of the Monthly Payment
					>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
4	DC-DRC Network Availability	DC-DRC Network Availability for Hosted Solution & Services	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	>=99.95%	No Penalty
					>=99.45% to <99.95% of SLA	1% of the Monthly Payment
					>=98.95% to <99.45% of SLA	5% of the Monthly Payment
					>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
5	DC-DRC HCI infrastructure Availability	DC-DRC HCI Infrastructure Availability for	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool.	>=99.95%	No Penalty
					>=99.45% to <99.95% of SLA	1% of the Monthly Payment

		Hosted Solution & Services		Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	>=98.95% to <99.45% of SLA	5% of the Monthly Payment
					>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
6	Operating System Availability	Operating System Availability for Hosted Solution & Services	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	>=99.95%	No Penalty
					>=99.45% to <99.95% of SLA	1% of the Monthly Payment
					>=98.95% to <99.45% of SLA	5% of the Monthly Payment
					>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
7	Cloud Orchestration layer availability	Cloud Orchestration layer availability for Hosted Solution & Services	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	>=99.95%	No Penalty
					>=99.45% to <99.95% of SLA	1% of the Monthly Payment
					>=98.95% to <99.45% of SLA	5% of the Monthly Payment
					>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
8					>=99.95%	No Penalty

	Cloud Security Layer Availability	Cloud Orchestration layer availability for Hosted Solution & Services	>=99.95% uptime	Availability & Downtime Reports measured using Management Tool. Measured 24*7 Basis and Validated by Monthly SLA Performance Report.	>=99.45% to <99.95% of SLA	1% of the Monthly Payment
					>=98.95% to <99.45% of SLA	5% of the Monthly Payment
					>=96.95% to <98.95% of SLA	20% of the Monthly Payment
					<96.95% of SLA	50% of the Monthly Payment
	HCI Infrastructure, Virtualization software, private cloud orchestration Administration *	Administrator availability Minimum of 99.90% uptime for the complete HCI infrastructure, Virtualization software, private cloud orchestration	>=99.90% uptime measured on Monthly basis	Availability will be measured using the monthly attendance report Performance Report.	>=100% uptime	No Penalty
					>=99.90% to <100% of SLA	1% of the Monthly Payment
					>=99.80% to <99.90% of SLA	5% of the Monthly Payment
					>=99.70% to <99.80% of SLA	20% of the Monthly Payment
					<99.70% of SLA	50% of the Monthly Payment

2.3.20.1.7 SLAs for Customer Care Center

Performance Parameter: Following broad service level parameter along with penalty shall be applicable for monthly payment clearance.

Parameter (Average Monthly Performance)	Target / Compliance Level
Call Answered Level	>99%
Call Quality	>80%
No of Login	>99%

Inverse of Abnormal Low talk time outbound/inbound with monthly average per shift	>90%
Inverse of Hold time with monthly average per shift	>99%
Inverse of Average Incoming Call Handling Time with monthly average per shift	>99%

Penalty

a. Following penalty clause shall be applicable, based on average monthly performance against the SLA:

Penalty Slab*:

Parameter (Average Monthly Performance)	**No Penalty Zone**	**Penalty Zone**
Call Drop	>98	P1: > 96 to 98 P2: > 94 to 96 P3: > 90 to 94
Call Quality	>80	P1: > 77 to 80 P2: > 75 to 77 P3: > 70 to 75
No of Login	>99	P1: > 96 to 99 P2: > 93 to 96 P3: > 90 to 93
Inverse of Abnormal Low talk time outbound/inbound with monthly average per shift	>99	P1: > 96 to 99 P2: > 93 to 96 P3: > 90 to 93
Inverse of Hold time with monthly average per shift	>99	P1: > 96 to 99 P2: > 93 to 96 P3: > 90 to 93
Inverse of Average Incoming Call Handling Time with monthly average per shift	>99	P1: > 96 to 99 P2: > 93 to 96 P3: > 90 to 93

b. The penalty shall be evaluated, separately for each parameter, as per below

Penalty Calculation Formula
P1: 0.50% of Monthly Bill Value P2: 1.00% of Monthly Bill Value P3: 1.50% of Monthly Bill Value

2.3.20.1.8 Change of Service Levels

a) NEA may inform the SI at least one month prior to making a change in the Service Levels.
b) NEA reserves the right to change the criticality, service availability duration, service levels and service level measurements with prior information.
c) NEA may introduce a new Service Level that needs to monitor – but will include the basic aspects like Expected Service Levels, Minimum Service Levels etc.
d) NEA reserves the right, at its sole discretion to waive any penalty being imposed on the SI due to failure to meet service level agreement. Waiver shall be granted as exception by NEA Officials.

2.3.20.1.9 Contractor Performance & Applicable Penalty

The Service Level Performance (Including all Areas/Parameters of SLA) **of System Integration** shall be calculated for each month with applicable penalties (Calculated based on Average of 3 Months SLA Penalty) which shall be deducted from the quarterly payment of Facility Management Services (FMS) phase. **The maximum penalty in a quarter (including the service levels for Resource Management) shall be 10% of Facility Management Services charges for that quarter.**

However, the Penalty calculated (Average of 3 Months SLA Penalty) based on the Service Level Performance (Including all Areas/Parameters of SLA) should not exceed the 30% of Quarterly Payment.

If the total penalty calculated based on Service Level Performance exceeds **30% of Penalty** in any **three Quarters out of any four consecutive quarters** applicable for the entire duration of the contract, the same shall be deemed as non-performance and unsatisfactory services and will result in a material breach. In case of a material breach, the SI will be given a cure period of one month to rectify the breach failing which a notice to terminate may be issued by NEA.

Also, In the event of termination of contract based on non-performance by SI as per SLA, the SI will be solely responsible for risk and cost factor thereon. In such an event, the performance Bank Guarantee furnished by the SI will be en-cashed and will stand forfeited.

However, NEA reserves the right to condone any such act of non-performance and unsatisfactory services considering various circumstances at that point in time. Also, Penalty related to delivery of services may be waived by NEA, if the cause of such delay is not in SI control or the delay is due to NEA written request. The penalty shall be adjusted in case NEA approves such waiver. The penalty recovered shall be adjusted in the subsequent payment and no interest shall be paid on this amount.

2.3.21 Service Delivery Management

SI shall provide detailed description for service delivery management for the complete project plan and deliverables and project management methodology.

2.3.21.1.1 Project Management

i. SI will assign a Project Manager who will provide the management interface facility and has the responsibility for managing the complete service delivery during the contractual arrangement between NEA and the SI
ii. Project Manager will be responsible for preparation and delivery of all monthly/weekly reports as well as all invoicing relating to the service being delivered.
iii. Project Manager's responsibilities should essentially cover the following:
    - Overall responsibility for delivery of the Statement of Work/s (SOW) and Service Level Agreement (SLA).
    - Act as a primary interface to NEA for all matters that can affect the baseline, schedule and cost of the services project.
    - Maintain project communications through NEA's Project Leader.
    - Provide strategic and tactical recommendations in relation to technology related issues
    - Provide escalation to SI's/NEA senior management if required
    - Resolve deviations from the phased project plan.
    - Conduct regularly scheduled project status meetings.
    - Review and administer the Project Change Management with the NEA Project Leader.
    - Identify and resolve problems and issues together with the NEA Project Leader.
    - Responsible for preparation and delivery of all weekly/quarterly/ monthly reports as well as all invoicing relating to the services being delivered

2.3.21.1.2 Help Desk

1. Help Desk shall act as a single-point-of-contact for all service problems pertaining to hardware, software & communication infrastructure. Help desk shall be integrated with the existing AMI system (HES, MDM, Mobile App/Web portal, communication network portal etc.).
2. Help desk should be available for 24x7x365.Performance of help desk shall be determined as per the service level agreement.
3. Users can log the queries/complaints, which should be resolved as per the Service Level requirements. The helpdesk queries/complaints can be related to connectivity, messaging, security, meters, Software, configuration and any other issues that arise in the RMS.

Help Desk software shall take care of classification, automatic escalation, management, and status tracking and reporting of incidents as expected by the service level requirements. Status tracking should be available to users through telephone numbers as well as online through software.

a. The Help Desk will respond to and resolve the problems as per the SLA.
b. Problems shall be classified into various levels of priority mentioned in the SLA. The assigned priority for each problem shall depend upon:
    - The extent of the problem's impact on the usability of the system
    - The percentage of users affected by the problem
c. The initial assignment of priorities is the responsibility of the Help Desk's Problem Manager on the basis of SLA. However, NEA can change the priority assigned to a problem and the procedures that exist for escalating a problem to progressively higher management levels, until agreement is secured.
d. The precise definition of problem priorities should be documented in the Successful SI's SLA.
e. Helpdesk shall troubleshoot on systems, applications (software), network related issues, multimedia related issues, server administration, security policies, 3rd party coordination.

f. After problem resolution, the logged problem in the help desk will be closed and notification will be sent to the user for confirmation and rate the customer service on a defined parameter in helpdesk.
g. Help Desk shall be responsible for change management like schedule up gradation of meters and software components etc. Help Desk will coordinate and take approval from NEA for the same and will inform all users for such an event in advance.
h. Help Desk shall also be responsible for managing problems/incidents related to Communication Infrastructure and Network Link at each node. Help Desk shall ensure timely response and assign the problem/incident on priority basis.

Following are the SI's Responsibilities regarding Help Desk:

A. Providing Help desk solutions application

The Service desk/help desk module shall include the Solutions application. A solution record is a predefined response to a problem or commonly asked question. A solution record consists of a symptom, a cause and a resolution. Solutions can be associated with incident and problem records. Solutions application is used to create, approve, and manage solution records. Search Solutions can be used to search for and view solution records. The Solutions application includes the following features:

a. Ability to specify which solution records should be available to self-service users in the Search Solutions application
b. Ability to specify a Classification for the solution
c. Ability to indicate a Status for a solution. A solution record can have one of the following statuses: DRAFT, ACTIVE, or INACTIVE
d. Ability to attach documents or Web sites to a solution record
e. Ability to use the Solutions application to change the status of a solution record
f. Ability to create, update and delete a solution in Solutions Application.

B. RMS solution Services

a. Provide Level One Support for RMS solution, including incident logging, assigning incident numbers and dispatching the appropriate support personnel or AMC/ATS vendor to remedy a problem.
b. Prioritize problem resolution in accordance with the severity codes and Service Levels specified.
c. Provide system status messages, as requested.
d. Maintain the defined help desk operational procedures.
e. Notify designated personnel of failure of any component of RMS solution, or of an emergency.
f. Initiate a problem management record ("PMR") to document a service outage to include (for example) date and time opened, description of symptoms, and problem assignment (Level Two/Level Three), and track and report on problem status, as required.
g. Monitor problem status to facilitate problem closure within defined Service Level criteria or escalate, as appropriate.
h. Monitor PMR closure, including documented problem resolution.
i. Provide NEA with complete and timely problem status through the problem tracking system, as requested.
j. Maintain an updated help desk personnel contact listing.

C. Management Services

a. Provide "ownership-to-resolution" of all help desk calls.
b. Progress of problem resolution confirm resolution of the problem with the End User, and log the final resolution via the problem management system
c. Analyze and report on calls received by the help desk, including

- Call volumes and duration,
- Incident & Problem trends,
- Call resolution time.

d. Assign priorities to problems, queries, and requests based on the guidelines/SLA provided by NEA
e. Monitor and report to NEA on maintenance vendor performance
f. Provide input to NEA on End User training requirements based on help desk call tracking and analysis
g. Update contact list of users initially provided by NEA

D. Install/MAC Services (Install Move Add Change)

a. Act as the point-of-contact for install and MAC requests and status
b. Act as the interface for coordinating and scheduling all installations and MACs

E. User oriented Services

a. Provide an interface for user requests, such as new user IDs, address changes, routing requests, and password changes
b. Advise the End User to take reasonable steps to backup information, if possible, prior to attempting to affect a resolution either by phone or hands-on during Desk Side Support Service

F. NEA's Responsibilities regarding Help Desk

a. Help SI define help desk call prioritization guidelines
b. Provide updated contact listing (as a one-time activity) for use by help desk personnel in contacting appropriate personnel of NEA for assistance/notification
c. Help SI in the integration of Helpdesk with other NEA applications, if required
d. Assist SI, as requested, in the resolution of problems outside the scope of SIs responsibilities or recurring problems, which are the result of End User error
e. Provide an adequate level of system authority for RMS solution and resources for which SI has problem resolution responsibility and communications access
f. Assist SI in the development of help desk operational procedures by providing input to, and review and approval of, such procedures (this shall be a one-time activity).

G. Vendor Management Services

As part of this activity the SI's team will:

a. Manage the vendors for escalations on support
b. Logging calls and coordination with vendors
c. Vendor SLA tracking
d. AMC Tracking
e. Management of assets sent for repair
f. Maintain a database of the various vendors with details like contact person, Tel. Nos., response time and resolution time commitments. Log calls with vendors Coordinate and follow up with the vendors and get the necessary spares exchanged.
g. Analyze the performance of the vendors periodically (Quarterly basis)
h. Provide MIS to NEA regarding tenure of completion of AMC/ATS with outside vendors for the RMS in order that NEA may take necessary action for renewal of AMC/ATS. SI shall also provide MIS regarding performance of said vendors during existing AMC/ATS.
i. NEA shall provide SI with contact details of individual vendors.

H. Anti-Virus Management

This Service includes virus detection and eradication, logon administration and synchronization across servers, and support for required security classifications.

I. Messaging System management

SI will provide management of messaging systems, including administration of messaging servers and monitoring performance.

2.3.21.1.3 Incident Management

The SI must have:

a. Ability to create an incident record to document a deviation from an expected standard of operation.
b. Ability to create other ticket from the incident, if resolving the incident involves creating a service request, problem or work order.
c. Incident could be created automatically from sources such as email, system-monitoring tools.
d. Ability to have a ticket template containing data that agents can automatically insert in common, high-volume records. Instead of manually entering standard information each time, implementing partner can apply a template that contains information such as owner, service group, service, classification, internal priority, activities, labor requirements, and activity owners.
e. The template can add the following information, but can be modified to include: Priority, Owner or Owner Group, Service Group or Service, Classification; for Activities: Activity, Sequence, Job order, Site, Organization, Description, Owner or Owner Group, Priority, Vendor, and Classification
f. Ability to assign ownership of an incident either to a person or a person group who is responsible for managing the work associated with that record.
g. Ability to assign ownership via workflow or an escalation process.
h. Ability to associate an asset for an Incident record, if the issue you are reporting or working on involves an asset.
i. Ability to view a list of related records and view the work and communication logs for all related records on one screen, on the global record.
j. Ability to create a service request from an incident with a relationship between the two records.
k. Ability to create a Problem from Incident application to record an unknown, underlying cause of one or more issues.
l. Ability to create a release in the Incident application when resolving the Incident involves releasing a set of bundled changes to users.
m. Ability to relationships between Incidents
n. Ability to identify a global incident, which is the root cause of many other issues or that is something affecting many users.
o. Ability to automatically assign one or more SLAs via Workflow or Escalation process based on SLA's criteria.
p. Ability to apply an incident template which contains activities that can be viewed and edited
q. Ability to find and attach a Solution record containing information on resolving to an Incident record.
r. Ability to record Solution containing information on the symptom, cause, and resolution
s. Ability to create and submit a draft solution from the Incident application screen which an agent can approve the solution for general use later
t. The communication log stores inbound and outbound messages and attachments sent between users and agents
u. Ability to view communication entries associated with a record.
v. Ability to use a communication template to fill in default data.

2.3.21.1.4 Ticketing Management

a. Ability to specify an Owner or Owner Group and Service Group or Service for the ticket.
b. Ability to specify a Classification for the ticket.
c. Ability to specify both a Reported Priority and an Internal Priority for the ticket.
d. Ability to list related assets on a ticket.
e. Ability to track time spent on a ticket
f. Ability to apply one or more service level agreements (SLAs) to a ticket.
g. Provide Self-Service Service Requests module to allow users to submit and view service requests.
h. Ability to create other tickets from the service request, if resolving the service request involves creating an incident, problem, or work order.
i. Ability to relate existing tickets to the service request.
j. Service requests could be created automatically from sources such as email, system monitoring tools.
k. Ability to add a classification to enable workflow processes, escalations, and service level agreements.
l. Ability to have a ticket template containing data that agents can automatically insert in common, high-volume records. Instead of manually entering standard information each time, agents can apply a template that contains information such as owner, service group and service, classification, and internal priority. The template can add the following information, but you can modify it; Priority, Owner or Owner Group, Service Group or Service, Classification, Vendor, and Organization.
m. Ability to assign ownership via workflow or an escalation process.
n. Ability to select related assets by hierarchical view.
o. Ability to filter the related asset list by value list: All, Public, or User/Custodian. The default User/Custodian is the affected person specified on the record.
p. Ability to show similar tickets to search for and relate other tickets to the current record. The purpose is for information only.
q. Ability to automatically assign one or more SLAs via Workflow or Escalation process based on SLA's criteria

2.3.21.1.5 Problem Management

SI must develop an effective problem management system to reduce the impact of problem that occur and minimize its reoccurrence. It should help in identifying the root cause of the problem and proper recording and tracking of the problem till its resolution. In order to systematically capture, record, track and resolve the calls, robust application tools with following functionalities / features should be provided. The tools shall have following features:

i. Ability to apply a template to a Problem. The template contains common data such Priority, Owner or Owner Group, Service Group or Service, Classification, Vendor, and Organization.
ii. The Problem template also can contain activities, labor requirements, and activity owners.
iii. The Problem template also can contain Problem activity common data such as, Sequence number, Job Plan, Site, Organization, Description, Owner or Owner Group, Priority, Vendor, and Classification.
iv. Ability to associate an asset for a Problem record, if the issue you are reporting or working on involves an asset.
v. Ability to select related assets by hierarchical view.
vi. Ability to relate other tickets and work orders to a Problem.
vii. Ability to show similar tickets to search for and relate other tickets to the current record

viii. Ability to show similar tickets, Problems to search for and relate other tickets, Problems to the current record.
ix. The similar ticket search results only list service requests, incidents, and problems having the same Classification. Records are not included in the results if they either are global records or history records..
x. Ability to identify a Problem as a global record. A global record captures information about an issue affecting many people. The record might be a created for a shared asset i.e. the root cause of many other issues, such as a failed network server
xi. Ability to relate a Problem to a Global record.
xii. Ability to create a service request from a problem, creating a relationship between the two records.
xiii. Ability to create a Release in the Problem application when resolving the Problem involves releasing a set of bundled changes to users. The created Release will be related to the originating Problem.
xiv. Ability to identify a global Problem, which is the root cause of many other issues or that is something affecting many users. A global record might have many other records related to it
xv. Ability to automatically assign one or more SLAs via Workflow or Escalation process based on SLA's criteria.
xvi. When you apply an SLA that includes a response commitment to a Problem, value in the Target Start date field is set based on that SLA.and when an SLA that includes a resolution commitment to a Problem, value in the Target Finish date field is set based on that SLA.
xvii. Ability to relate existing service requests, incidents and problems to a global record and manage them via the global record.
xviii. Ability to manage the tickets via the global ticket, when linked with global relationships, so the statuses of related tickets can be changed by changing only the status of the global record.
xix. Ability to change the status of each activity individually.
xx. Ability to apply a template, which contains activities that can be viewed and edited.
xxi. Ability to select labor for activities on a Problem
xxii. Ability to report labor time either for a Problem as a whole, for activities on the Problem, or for both types of labor time.
xxiii. Ability to enter start and stop times
xxiv. Ability to select an owner for each Activity individually
xxv. Ability to find and attach Solution record containing information on resolving to a Problem record
xxvi. Ability to record Solution containing information on the symptom, cause, and resolution.
xxvii. Ability to create and submit a draft solution from the Incident application screen which an agent can approve the solution for general use later
xxviii. Ability to use the Work Log in the Problem application to document work that needs to be done or that was done to resolve the issue
xxix. Ability to modify or delete Work Log with authorization protected
xxx. Ability to create Communication action in Problem application to send communications about a record to a requestor or other user
xxxi. Ability to use a communication template to fill in default data, such as the identifier, subject from the originating record when create a communication

2.3.21.1.6 Change Management

The primary objective of change management is to:

i. Manage each change request from initiation through to closure
ii. Process change requests based upon direction from the appropriate authority
iii. Determine the Roles and Responsibility of the accountable personnel
iv. Communicate the impact of changes to appropriate personnel
v. Allow small changes to be managed with a minimum of overhead

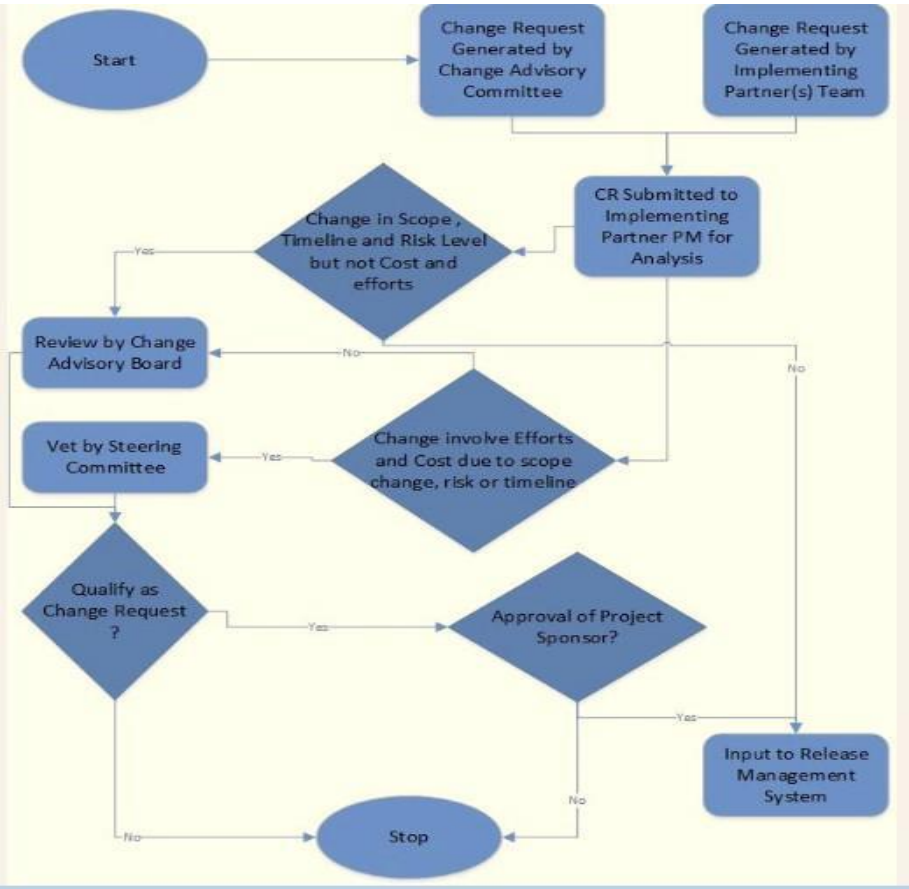
The change control and management process shall be followed by the stakeholders constituting the 'Change Advisory Committee (CAC)'. This committee shall comprise of the key stakeholders who shall be involved from the stage of identification of a Change Request to its closure. SI shall detail its change management methodology and activities for RMS implementation in its proposal. SI shall be evaluated based on its dedication to methodology and ability to stay focused on the business process change and expected outcomes / benefits.

In case the NEA defines additional requirements or changes in a functionality, the SI and the NEA shall mutually decide the price to be paid to the SI for the services to be rendered. In addition, a maintenance window shall be provided to the SI for incorporating the additional requirement or changes in a functionality.

Change Order describes the labor, materials, tools, services, and tasks that the SI needs to complete a Change. The SI is expected to be able to carry out the below functionalities under change management;

i. Ability to enter, modify the change order
ii. Ability to select a predefined change order (job order) and modify it as needed. The job order shall have all details of the change order copied to it
iii. Ability to create a ticket or work order from an existing ticket or work order (or change order)
iv. Ability to create follow-up work orders. A follow-up work order is for when you complete a job but notice that additional work is needed on the same asset or location.
v. Ability to create a change from a change. It is needed when, for example, a technician completing a change discovers that additional work not specified on the change, such as a software upgrade, is required to solve a problem.
vi. Ability to create an Incident, problem, release & work order from a change.
vii. Once a change is approved, it cannot be deleted or modified.
viii. Ability to change the status of the Changes to complete which indicates all the physical work is finished.
ix. Ability to execute the move or modification of assets under change order.
x. Ability to view information about previous status changes.
xi. Ability to change the status of the Change order's task.

Indicative change management process is depicted below:



2.3.21.1.7 Release Management

The primary objective of Release Management procedure is to deliver, distribute and track one or more changes for/during release into the live environment and;

i. O1 – To plan and oversee successful rollout of software releases
ii. O2 – To communicate and manage expectations of the NEA during the planning and rollout of new releases
iii. O3 – To ensure that software being changed is traceable, secure and that only correct, authorized and tested versions are installed.
iv. The policy or procedural requirements arising out of the agreements signed or agreed between the implementing partner and NEA would supersede the procedural requirements stated in this document. The applicability of the current procedure is for personnel or process deploying releases of software and/or RMS components into the production or live environment. While the responsibility to provide staffing (roles used as per rate card, effort required by role, effort by months or weeks as applicable) and timeline for a change request rests solely with the SI.

This is a broad level of scope of work of SI with respect to the software applications.

i. Release of new software, hardware, systems and services into live environment
ii. Release of changes to RMS solution and services in the live environment

iii. Quarterly release of functionalities
iv. Publishing calendar for release – to be published by SI in consultation with the NEA
v. Decision on packaging and distribution of releases
vi. Implementation of changes to software, hardware, systems and services
vii. Building the change request.
viii. Provide staffing (roles used as per rate card, effort required by role, effort by months or weeks as applicable) and timeline for a change request.
ix. NEA will absorb the added/modified functionality from operational perspective which are implemented as part of Release Management in 15 days from the date of release if there is no major issue reported by NEA

Any change which is not as per the specifications mentioned in the RFP or as per the agreed design of the RMS and not a bug fix in the system would result in commercial implication and the implementing partner would submit the commercial proposal for the same. Development of this change would be taken up only once revised DWA approving the change is issued to the SI.

2.3.21.1.8 Performance Management

The recording, monitoring, measuring, analyzing, reporting, and forecasting of current levels, potential bottlenecks, and enhancements of performance characteristics for the services, networks, applications, system software, and equipment within the scope shall be required. System tuning, and optimization is an inherent part of this contract. Where warranted, the SI will utilize capacity management data in combination with performance management data to identify ways to improve performance levels of the resources, extend their useful life, and request NEA to approve revisions/upgrades to the computing and communications hardware, software and other equipment such that higher levels of performance of the resources are obtained.

2.3.21.1.9 Capacity Management

The continuous monitoring, periodic analysis, and forecasting of the changes necessary to quantify capacity and configuration of finite resources comprising the computing and hardware/software infrastructure supported under this initiative by the implementing partner. Categories of resources to be capacity managed include but are not limited to servers & system software.

2.3.21.1.10 DC DR Operations

SI shall:

i. Monitor, log & report entire equipment & module operation on 24x 7 x 365 basis
ii. Perform periodic health checkup & troubleshooting of all systems & modules installed by consortium members & implement proactive rectification measures

2.3.21.1.11 Server Administration/ Management

SI shall:

i. provide the server administration and monitoring service to keep servers stable, operating efficiently and reliably.
ii. provide administrative support for user registration, creating and maintaining user profiles, granting user access and authorization, providing ongoing user password support, and providing administrative support for print, file, and directory services.

SI's responsibilities shall include the below but are not limited to:

i. Setting up and configuring servers
ii. Installation of the server operating system and operating system utilities
iii. reinstallation on event of system crash/failures
iv. OS Administration for IT system
v. Manage Operating system, file system and configuration
vi. Ensure proper configuration of server parameters, operating systems administration and tuning
vii. Regularly monitor and maintain a log of the performance monitoring of servers including but not limited to monitoring CPU, disk space, memory utilization, I/O utilization, etc.
viii. Regular analysis of events and logs
ix. Apply OS Patches and updates
x. Monitor & verify logs files and periodically clean up log files
xi. Ensure proper running of all critical services on the servers. Schedule and optimize these services
xii. Maintain lists of all system files, root directories and volumes
xiii. Resolving all server related problems
xiv. Escalating unresolved problems to ensure resolution as per the agreed SLAs
xv. Responsible for periodic health check of the systems, troubleshooting problems, analyzing and implementing rectification measures
xvi. Logical access control of user and groups on system
xvii. Responsible for managing uptime of servers as per SLAs

2.3.21.1.12 Database Administration Services

SI shall:

i. Undertake end-to-end management of the database on an ongoing basis to ensure smooth functioning of the same.
ii. Undertake tasks including managing changes to database schemes, disk space, storage, and user roles.
iii. Setting and tuning system parameters
iv. Building appropriate indexes, specifying large enough buffers and caches, aligning the database implementation with IT infrastructure, monitoring databases and applications, reorganizing databases, etc.
v. Manage database upgrade or patch upgrade as and when required with minimal Downtime

2.3.21.1.13 Backup/Restore management

SI shall perform backup and restore management in accordance with mutually agreed to backup and restore policies and procedures, including performance of daily, weekly, monthly quarterly and annual backup functions (full volume and incremental) for data and software maintained on Servers and storage systems including interfacing with NEA's specified backup media storage facilities; SI shall ensure**:**

i. Backup and restore of data in accordance to defined process / procedure
ii. 24 x 7 support for file & volume restoration requests
iii. Maintenance and Upgrade of infrastructure and/or software as and when needed
iv. Performance analysis of infrastructure and rework of backup schedule for optimum utilization

v. Generation and publishing of backup reports periodically
vi. Forecasting storage requirements for backup
vii. Ensuring failed backups are restarted and completed successfully within the backup cycle
viii. Monitor and enhance the performance of scheduled backups
ix. Real-time monitoring, log maintenance and reporting of backup status on a regular basis
x. Management of storage environment to maintain performance at optimum levels
xi. Periodic Restoration Testing of the Backup
xii. Periodic Browsing of the Backup Storage
xiii. Management of the storage solution including, but not limited to, management of space, volume, RAID configuration, configuration and management of disk array, SAN fabric / switches, etc.
xiv. Interacting with Process Owners in developing / maintaining Backup & Restoration Policies / Procedures
xv. To provide MIS reports as per agreement

2.3.21.1.14 Business Continuity Services

i. Provide business continuity services in case the primary site becomes unavailable due to any unforeseen circumstances.

2.3.22 Exit Management and Knowledge Transfer

SI shall prepare an Exit Management Plan for transfer of operations to NEA or its nominated agency or its replacement SI. In the event of termination or expiry of contract with NEA, without affecting services to stakeholders adversely. The SI shall get this process approved by NEA. The Exist Management Plan shall include, but not be limited to, the following:

i. A detailed program of the transfer process that could be used in conjunction with a replacement SI including details of the means to be used to ensure continuing provision of the services throughout the transfer process or until the cessation of the services and of the management structure to be used during the transfer;
ii. Plans for the communication with such of the SI's sub OEM, sub-contractors, staff, suppliers, customers and any related third party as are necessary to avoid any material detrimental impact on Project’s operations as a result of undertaking the transfer;
iii. Plans for provision of contingent support to NEA and Replacement SI for a reasonable period after transfer.
iv. The SI shall re-draft the Exit Management Plan annually thereafter to ensure that it is kept relevant and up to date.
v. Each Exit Management Plan shall be presented by SI to and approved by NEA or its nominated agencies.
vi. In the event of termination or expiry of Agreement, Project Implementation, or Service Levels, each Party shall comply with the Exit Management Plan.
vii. During the Exit management period, the SI shall use its best efforts to deliver the services.
viii. Payments during the Exit Management period shall be made in accordance with the Terms of Payment Schedule and Contractual conditions or as mutually agreed between SI and NEA.

ix. An Exit Management plan shall be furnished by SI in writing to the NEA or its nominated agencies within 180 days from the date of signing the contract.

2.3.22.1.1 Transfer of Assets

i. NEA shall be entitled to serve notice in writing on the SI at any time during the exit management period requiring the SI and/or its subcontractors to provide the NEA with a complete and up to date list of the assets and System configurations, License details, Customized Code within 30 days of such notice.
ii. NEA shall also be entitled to serve notice in writing on the SI at any time prior to the end of exit management period requiring the SI to transfer the overall control to NEA or its nominated agencies.
iii. In case of a contract being terminated prematurely by NEA, the NEA reserves the right to ask SI to continue running the project operations for a period of 3 months after termination orders are issued. In case of a contract being terminated by SI, NEA reserves the right to ask selected SI to continue running the project operations for a period of 6 months after termination notice is served by SI.
iv. Upon service of a notice under this Article, the following provisions shall apply:
    i) All title to the assets shall be transferred to NEA, on or before the last day of the exit management period.
    ii) Payment to the outgoing SI shall be made to the tune of the last set of completed services/deliverables, subjected to the approval and compliance on contractual and SLA terms & conditions.

2.3.22.1.2 Cooperation and provision of information

During the exit management period:

i. SI will allow the NEA or its nominated agency to access the information reasonably required to define the then current mode of operation associated with the revision of services to enable NEA to assess the existing services being delivered.
ii. Promptly on reasonable request by NEA, the SI shall provide access to and copies of all information held or controlled by them which they have prepared or maintained in accordance with this agreement relating to any material aspect of the services (whether provided by the SI or sub-contractors appointed by the SI). NEA shall be entitled to copy of all such information. Such information shall include details pertaining to the services rendered and other performance data. SI shall permit the NEA or its nominated agencies to have reasonable access to its employees and facilities to understand the methods of delivery of the services employed by the SI and to assist appropriate knowledge transfer.

2.3.22.1.3 Confidential information, security and data

SI will promptly on the commencement of the exit management period supply to the NEA or its nominated agency the following:

i. information relating to the current services rendered and customer and performance data relating to the performance of sub-contractors in relation to the services.
ii. documentation relating to the Project's Intellectual Property Rights.
iii. documentation relating to sub-contractors.

iv. all current and updated data as is reasonably required for purposes of NEA or its nominated agencies transitioning the services to its Replacement SI in a readily available format.

v. all other information (including but not limited to documents, records and agreements) relating to the services reasonably necessary to enable NEA or its nominated agencies, or its Replacement SI to carry out due diligence in order to transition the provision of the Services to NEA or its nominated agencies, or its Replacement SI (as the case may be).

2.3.22.1.4 Transfer of certain agreements

On request by the NEA or its nominated agency the SI shall effect such assignments, transfers, licenses and sub-licenses as NEA may require in favor of the NEA or its Replacement SI in relation to any equipment lease, maintenance or service provision agreement between selected SI and third party lessors, service providers, and which are related to the services and reasonably necessary for the carrying out of replacement services by the NEA or its nominated agency or its Replacement SI.

2.3.22.1.5 General obligations of the SI

i. SI shall provide all such information as may reasonably be necessary to effect as seamless a handover as practicable in the circumstances to the NEA or its nominated agency or its Replacement SI and which the SI has in its possession or control at any time during the exit management period.

ii. For the purposes of this Schedule, anything in the possession or control of the SI or associated entity, or sub-contractor is deemed to be in the possession or control of the SI.

iii. SI shall commit adequate resources to comply with its obligations under this Exit Management Schedule.

Section III: Functional And Technical Requirements

3 Functional & Technical Requirements Specifications

3.1 Functional Requirement Specification

3.1.1 Functional requirement specification evaluation methodology

- Availability of full functionality as part of the solution proposed through in-build features/functionality or software configuration (i.e. no customization) would be given higher weightage.
- The proposed RMS should have minimum 85% “Standard” functionality against each of the Functional Requirements.
- Whereas a part of functionality is available, or the required functionality is met with the customization OR an add-on/bolt-on software including any bespoke development would be given a lower weightage.
- The response against each mentioned requirement will be evaluated as following:

Response	Points
Standard(S):	3 Points
Customization(C):	2 Points
Third Party (T)/ Workaround (W):	1 Points

- FRS must be demonstrable. Random sample verification may be conducted during demonstration.
- All line items as mentioned in FRS would be considered along with weightage as mentioned above.
- The total marks will be awarded based on the cumulative response and total points for each requirement.
- Reclassifying or Reordering or altering the FRS compliance in any form is not permitted and shall render the bid as non-compliant

3.1.2 General Mandatory Requirements

1. Offline Mode: Modules like metering, Spot billing, Web portal and mobile application, billing and collection should support in offline mode. In case of non-availability of internet connectivity or any other technical glitch modules should queue and store the functions in the local system and update in the central server once the internet connectivity or technical glitch is resolved.
2. NEA is currently facing a bill skip problem in an existing billing solution. SI should ensure a similar problem doesn’t arise in the new RMS solution. SI should detail out this issue in AS-IS study and propose the solution in RMS solution.
3. SI should follow the double accounting system for all the accounting processes.
4. The Functional Requirement Specifications (FRS) have following sections with the detailed functionalities, which needs to be earmarked responses as following:

3.1.3 Metering Module

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
M1	Collecting meter readings/meter reading data in the metering database from remote meters	1. The System should be capable to collect/process meter reading data from the meters installed within the jurisdiction of NEA : ● Feeders Distribution ● Transformers ● HV Consumers ● LV consumers		
		2. It should be capable of uploading and downloading for a set/group of consumers. ● Meter reader book ● Smart phones/PDAs with or without latest technology for real time updating of data ● Spot billing machine (SBM) ● Common Meter Reading Instrument (CMRI). ● Manual uploads of readings for individual consumer or group of consumers on a single screen say for example:- set of consumers of one Meter Reader for one reading date, ● Automatic online meter reading devices viz modems and smart meters. ● Capability to read Meters which supply connections to Electric Vehicles.		
M2	Data Validation	1. System should be designed to minimize data error. 2. It should incorporate NEA supplied logics to check variations in meter reading data/ parameters and generate exceptions. 3. After data entry, the system should generate Exception Reports for non-reading, erroneous reading of meters due to any reason. 4. After handling of exceptions by the respective officials, the system should be updated with the result of exception handling. 5. System should be able to initiate a work queue for meter read validation & subsequent actions.		
M3	Data Review	1. The system should provide the facility for the designated officials to review the present and past		

		metering data as per utility defined criteria. 2. In case any discrepancy is found, the system will allow the data to be edited, with proper access rights and audit trails.		
M4	AMR/AMI/Smart Meter Compatibility	1. The system should be able to interface with multiple AMR/AMI systems (on-going & upcoming projects) schedule and download meter readings.		
M5	Validations for the spot metering and billing data updated	1. The system should have the flexibility of validating the data uploaded from the meter reading instruments/mobiles/SBM. 2. The system should be able to accept other data like coordinates, photograph of meter in case of future deployment. 3. System should prompt the meter reader from entering wrong readings.		
M6	Meter reading plan generation & Monitoring	1. System should generate a meter reading plan for day / week/ fortnight/month by meter readers and provide it to the respective authorities. 2. System should be able to create new meter readers and meter reading dates in the system. 3. System should be able to create download and upload files for android based downloaded mobile devices, SBMs, for spot reading, billing, disconnection etc. 4. The system should generate optimum route plans using the logic shared by NEA. This should also be possible through integration with GIS. 5. The System should be able to update the route plan for any addition/deletion of connection 6. The system should track the progress of meter reading & generate exceptions for monitoring. 7. System should be able to generate MR wise performance reports. 8. Real time Meter Reading monitoring viz., real time alerts through SMS & email to meter readers & other hierarchies about download, upload, reminder/alerts for download & upload,		

		9. Meter Reader tour plan reports should have number of trips operated in sub-division to Zonal level in detail and summary wise format.		
M7	Monitoring customer exceptions	1. Exception reports (repeated meter changes, MBOs, Door locks, Prejudicial usage etc.).		
M8	Support Meter Reading on Trust	1. Provision to capture meter reading over phone. 2. Provision to capture meter reading over fax. 3. Provision to capture meter reading over web. 4. Incorporation for billing. 5. Generation of exceptions reports.		
M9	Overdue alert	1. In case a meter reading becomes overdue (NEA specified criteria), the system should generate the necessary exceptions and alerts.		

M10	Accept Change metering	1. The system will support accepting meter reading change. 2. The system should be able to accept stock unit, MF/DF of old meter after meter change. 3. Single phase to 3- phase and vice versa to AMI ● ET to Non –ETV ● Prepaid to regular and vice versa ● Manual to AMI ● Old with new meter		
M11	Capability to store data for a specified period	1. The system should keep past metering data online for a period specified by the NEA guidelines from time to time.		
M12	Interfacing with spot billing and MRI instruments	1. The system will support data downloading to and uploading from handheld devices used for Spot metering & billing and MRI. 2. The system should be able to interact with android based mobile devices for accepting meter reading.		
M13	Meter reading for temporary connections	1. The System should be capable of accepting opening, closing and intermediate meter readings for temporary connections for generation of bills for such connections and generation of renewals. 2. Should generate bills after closing or before completion of the month.		
M14	Meter reading for Multiple connection/Multi storey buildings	1. The System should be capable of capturing, storing and processing meter readings of multiple connections and multi storey buildings. Logics required to compute meter readings shall be readily available for such connections.		
M15	Final meter reading for closure of connection	1. For all kinds of disconnections (whether a customer requests for termination of connection or utility disconnects due to non-payment), the system should accept the terminating meter reading (which will be out of cycle in most cases) for generating the last bill. 2. In case of meter replacement, the system should be able to accept the final read. This shall be applicable for mass replacement of meters as well.		

		3. There should be support billing and support for updating of ratings results and meter change details.		
M16	Lifecycle monitoring and testing plan for meters	1. System must be capable of capturing complete meter history throughout the meter's lifecycle, starting from arrival in stores to type, Make. Model, Batch, Catalog Number of meter, its place of installation, cycle and record of calibration/testing till it is being scrapped or destroyed. 2. System should be able to track meter location. 3. System should track the status.		
M17	MIS generation	1. System should be capable of monitoring and tracking and generating MIS reports in consultation with NEA.		
M18	Tracking other relevant information regarding meter	1. Tracking & reconciliation of meter seals i.e. date, type no. of seals, sealed by condition of meter etc. including meter boxes, meter position(final list to be prepared in consultation with NEA).		
M19	Interfacing with Smart meters/net meter/solar generation meters	1. Should have Interfacing capabilities with existing or upcoming smart meters/net meters/generation meters.		
M20	Prepaid metering	1. The system should have an inbuilt prepaid metering module. 2. The system should have capabilities to interface/integrate with legacy/existing prepaid metering systems.		
M21	Summation metering	1. There are many consumers where it is required to bill on the basis of multiple meters installed at their premises - example may be a large industry where two connections are required to be provided due to technical reasons, and it is required to raise a single bill to such consumers. System should provide		

		summated reading/ consumption and demand of each time block of virtual summated meter (which is sourcing data from 2 meters) to know maximum demand and consumption in the month for the consumer in any time block. It should be an MRD based summation metering from which the summated consumption and demand will be sent to billing.		

3.1.4 Billing Module

The SI is expected to provide a comprehensive billing system configured as per NEA's General Conditions of Supply regulations and its amendments to ensure that the utility efficiently bills their customers for the services rendered. It should support the continuous billing to reduce the outstanding dues. Ensure the timely and accurate billing. The system will support the complaints handling functionally by providing short turnaround times for billing related customer queries. The SI will ensure that the solution should comply with conditions of the supply code and its amendments, Tariffs and order of GON and all orders released by NEA or Govt. from time to time for the entire project duration.

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B1	Unique Bill No	1. All bills generated by the system should be given a unique number as per logic shared by NEA. However, the system shall also have the capability to maintain the legacy billing number along with the new unique number.		
B2	Customer lifecycle management	1. Billing engine should be able to manage customer information and processes associated with the customer lifecycle including; Customer information for residential, commercial, and industrial customers; including, complex premise management like multi storey, multiple connection, sub-metering, empty layout etc. , umbrella agreements, and quotations proposals. 2. Starting and stopping service; including, order entry for eligible products and services. 3. Customer care interactions for inbound communications (such as phone calls), outbound communications (such notifications), and case		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		management (configurable customer processes). 4. Advanced rating rules. 5. Financial management for billing, budget plans, deposits, loans, and payment processing. 6. Credit and collection for overdue receivables management. Enable sending Bill Correction details to Consumer along with Bill. 7. Program management for promotional activities like energy efficiency products, demand management, cheaper electricity in certain periods. 8. Billing Engine should act as a detailed sub ledger for accounts receivables with the ability to send results to a general ledger (in ERP of NEA). 9. It should provide a Central portal that increases productivity by providing a comprehensive view of the customer and their related account information so that most questions can be quickly answered without having to navigate through the system.		

B3	Bill Calculation –Billing Logic flexibility	1. NEA would provide the billing logic for generation of bills. This calculation logic will be flexible and the utility should be able to revise the billing logic from time to time depending upon the modifications in regulations, tariffs, etc. It should be possible to make these changes from a central location. 2. It should be possible to manually modify the billing logic on a case-to-case basis, with alerts and within specified limits. The system should follow the same for computing the final bill amount and should generate bills in soft and hard forms for all type of requisite customers with certain pre-defined periodicity. 3. The billing logic should be flexible for changes to billing cycle. 4. The system should have the flexibility of defining the periodicity in bill processing. The system should have the capability to generate the bills either in batches (mass bill generation) or individually. The periodicity may also vary from generating continuous bills for spot billing to bills once a year for particular type of customers. 5. System should also accept billing logic for consumer purchased meters. Suitable rebate as per rule be provided for consumer purchased meters. 6. System should have provision of - ● Auto-credit of penalty specified by Regulator for Utility in case of deficiency of service to the consumer ● Putting a certain bill amount under deferral due to stay order from court till the matter is decided 7. The system should be highly configurable to manage changes in billing logics & tariff code. 8. Billing Multimeter accounts:- Ability to subtract consumption on sub meters from the consumption on the master meter and only		

		charge the difference to the master meter account. 9. Billing public lamps (street lights accounts) and connections which are billed by NEA as per fixed rate of power supply and usage. 10. Ability to perform group/summary billing for Accounts that are configured to be billed and paid as a group. 11. Ability to bill consumers who have procured Electric vehicles. The billing logic should be able to be configurable as per the program that NEA choses to implement for EV(Electric Vehicle) consumers. 12. The system should have provision for accounting of Departmental employees and pensioners electricity charges and energy accounting. 13. The system should have provision for adjustment and accounting of centralized government consumer payments. 14. The system should support prepaid metering and billing system and should permit seamless transfer of existing customers from – ● post-paid to prepaid regime and vice versa ● Unmetered to metered regime ● kWh based billing to KWh & kVArh based billing regime and back 15. The system should support billing of old meter according to stock unit and MF/DF in meter change case scenario.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B4	Transfer in billing logic	1. Should support Non-TOD to TOD and vice versa 2. Allow transfer of logics from Temporary to Permanent connection. 3. Allow transfer of logics in event of inter category changes. 4. System should have inbuilt pre paid metering module and also support CTS and STS prepaid metering and billing system and should permit seamless transfer of existing customers from – ● post-paid to prepaid regime and back ● Unmetered to metered regime KWh based billing to kWh & kVAh based billing regime and back		
B5	Meter data validation	1. The system shall be capable of identifying meter tampering data as per utility defined criteria and generate flags for operator intimation and further investigation. 2. The billing system shall be capable of identifying faulty meters and preparation of bills considering a defined algorithm for estimation of consumption during such periods of meter faults. 3. The bills shall indicate the estimated consumption separately. The system should incorporate the estimate for consumption from the metering module. The system should be able to perform consumption analysis based on data received from substation, feeder, transformer, pole, etc. 4. System shall also incorporate multiple meter changes in a single billing cycle, properly accounting old meter final consumption based on final reading (or assessment if functional reading is not available).		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B6	Billing Data Validation	1. It should incorporate NEA supplied logics to check variations in billing data and generate exceptions. 2. System should be designed to minimize data error.		
B7	Billing Error	1. Supports bill creation error recording and management for segments and complete bill. 2. Supports bill error correction and regeneration from multiple causes. 3. Supports bill cancellation and rebilling with credit notes for correction 4. Supports Cancellation Details on a Separate Bill 5. Supports Correction Details on a Separate Bill 6. Functionality to override the commodity amount in a bill segment for rare circumstances when, due to missing or incorrect data, the quantity calculated by the system is not what you want to charge the customer		
B8	Bar/QR Code Generation	1. Use code 39 or any other universal code i.e. QR 2. Support alphanumeric & other special characters. 3. Output in the local language preferred.		
B9	Billing logic download	1. System should be capable to download the billing logic to CMRI/Smart Phones/SBM to facilitate spot billing at consumer premises using SBM/CMRI/Smart Phones as and when required.		
B10	Bill printing flexibility	1. System must support bill processing and printing either at workstation location or at the base billing center (Individual & Bulk as well) i.e a group of consumers with same billing date , bill of multiple premises on a single bill.		
B11	Billing reconciliation	1. The system must be capable of running a single billing operation with more than 6000000 of bills by reconciling customer accounts with payments and invoices.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B12	Use of pre-printed stationery	1. System must be able to print the bills either on pre-printed stationary or plain paper in Nepali/English as per directions of Utility.		
B13	Interfacing with manual billing	1. The system should have the flexibility of capturing inputs manually to update the customer database on bills that have been manually generated, with a reason for the same. Such updates should be limited to specific logins.		
B14	Bill on demand	1. The system should be capable of generating bills on demand. 2. The system should have the provision of generating duplicate bills on demand and have the provision for accepting payment details for the same. 3. The system shall have provision to print duplicate bill of any past bill up to the last 3 years (applicable after the software is rolled out). 4. Operators may choose to extend a bill cycle without finalizing the bill. At the beginning of each cycle, system creates a new bill for the new period and finalizes the bill for the old period. If there is no need to send out a bill for a period, enable the extension of the existing bill into the next period and continues in this manner until the bill is finalized. 5. Supports bill cycles of various frequencies i.e. Multiple options for when the system attempts to create bill segments for the account's service agreements. 6. The Off Cycle Bill Generator portal may be used to create an off cycle bill for an account where you control which financial transactions are linked to the resultant bill. For example, you can create a bill for a specific adjustment or billable charge		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B15	Bill correction/ amendment provisions	1. The system should have provision for Bill correction/amendment auto/manually to update/ modify the customer billing database, with a reason for the same. 2. To maintain the history of frozen and canceled bills. Should not be allowed to cancel in between the month's bill. If any of the past bills is to be canceled, it shall be ensured that all the bills in sequence up to the current month should be canceled. Then System to support rebill either individually or individual monthly bill duly incorporating the consumption and applying slabs and tariffs in force. Reversal of canceled bills of past months shall reflect in the DCB under relevant columns (Consumption, Rev, Tax, LPC etc). 3. Support separate accounting for past and current month/year. 4. Reversal of sales (consumption & amount). 5. Retrospective and prospective revision of bills with or without levy of interest/LPC as per the requirement of NEA. Calculation and auto debit of tariff difference with or without interest in the next bill when tariff is implemented retrospectively. Flexible to implement Tariff changes viz., rate changes, structural changes etc., 6. Should have provision to calculate part bills with variable bill period 7. Should not allow after bill paid of same month.		
B16	Change of billing cycle	1. The system will have the capability to change the billing cycle of a consumer and also in reading dates.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B17	Interfacing with special drives	1. If there is some special scheme for payments (e.g. Installments, trust etc.), then the system will generate the bills taking into account the special scheme provisions. 2. There would be codes for all the Schemes, so that the system can track their usage. There would be codes for all the Schemes so that the system can track their usage. 3. The system will keep a record, as to who authorized the scheme (e.g. installment) and capture the details of the scheme		
B18	Penal Billing for unauthorized use of electricity	1. System should have provision to compute penal billing for unauthorized use of electricity, as per Electricity distribution regulation and based on parameters defined by Regulator a. Assessment based on sanctioned load / connected load / MDI b. Assessment based on error in meter accuracy due to tampering c. Penal tariff for theft / misuse d. Assessment should be auto calculated by the system		
B19	Linking consumer to appropriate tariff	1. The system should link the customer to the tariff applicable to his category based on fixed charges, consumed energy, capacity (power consumption limit), taxes applicable, subsidy or support from the government, etc. 2. System shall also have provision to account for retrospective changes in tariff / discount / subsidy announced by Govt. with effect from back date. In case of subsidized customer the system should calculate amount of subsidy payable against each bill and if utility wants the subsidy amount can be printed on the bill for information of customer. 3. System should have provision for accounting for NEA Employee Subsidy Configuration.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B20	Inclusion of past dues and surcharge	1. The system should calculate other dues for the customer (e.g. late payment charge, electricity duty surcharge, assessed amount, etc.) and add them to the regular bill amount. 2. If there are past dues, the system should calculate both the past dues and the fines on past dues as applicable. 3. The system should allow flexibility to define and modify the logic for fine/ penalty calculation for different types of arrears as per the prevailing norms of the utility. 4. All past dues are there; the generated bill should include past dues. In case of any post facto extension of due date, system to have provisions to automatically waive late payment surcharge.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B21	Management of Security Deposit (SD):	1. Shall capture and maintain separate account heads for each of the types of deposit, Capture deposit Type, Receipt No. Receipt date, Amount under different groups viz. Initial security Deposit (ISD)/Advanced security deposit/Security deposit applicable as per NEA tariff regime, New Connection charges as certain payments based on interest bearing and non-interest bearing /refundable and non-refundable will be used to calculate additional charges during additional load cases. Deposit portal should clearly show Demand, payments, IOD, Transfers and adjustments similar to Bank Pass Book. 2. Auto-debit of Additional SD in bills (ASD) after annual auditing of SD during the first quarter of every year or such interval as prescribed by the Regulator. 3. Refund of excess SD after annual auditing of SD by way of adjustment in the current or future bills or cash refund through approval chain. 4. Refund of SD by way of adjustment in the final bills on termination either consumer initiated or NEA initiated. 5. Transfer of partial or full SD against current or future energy charges due to reduction of load. 6. Annual Interest payouts on SD through auto credit in bills duly after deducting TDS as per prevailing Income Tax rules Interest payout on SD as lump sum payouts separately. 7. Adjustment of SD as prepaid charges for any consumer (ACC) shifting from postpaid to pre-paid regime. 8. Shall be flexible to incorporate rate of interest and TDS centrally year on year.		
B22	Billing with pre-payment credit	1. If there is any credit on account of prepayment, adjustment etc., the system should be able to adjust		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		the credit against the amount payable for the month and generate a zero or a negative bill.		
B23	Estimate billing	1. In case meter data is not available owing to multiple reasons, the system should generate an estimated bill based on the past consumption pattern of the customer. ● It shall also be possible to generate an Estimate Bill for theft/enforcement cases. ● The system should also provide for change in the estimation logic that may happen from time to time. ● The system should incorporate the estimate for consumption from the metering module. 2. The system should have a list of all standard reasons for estimate billing. 3. Supports multiple bill segment creation algorithms and service agreement types 4. A bill segment to be created for each service agreement linked to the account. The system generates bill segments in the order of the billing processing sequence on each service agreement's Service agreement type.		
B24	Reasons for estimate billing	1. The system will have a list of all standard reasons for estimated billing. The list will be compiled based upon the NEA and Regulator's guidelines, which may change from time to time. 2. The system should be capable of generating bills for all instances of exceptional readings. 3. The scenarios under which exceptional readings are taken are temporary connections, voluntary termination, forced termination etc. The system will allow the bill amount to be modified by the designate authorities through their login ids only. All such changes along with		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		the corresponding login ids will be tracked by the system.		
B25	Electronic dispatch of bill/ availability of bills on internet portal of utility	1. The system should be capable of dispatching the generated bill electronically to customer/payment portals to which customer is registered if desired by customer. 2. The bill in actual format must also be available on the utility's internet portal for customers. 3. System must be able to inform customers regarding the new bill along with due date & amount via SMS and email automatically.		
B26	Discontinuing billing after dismantling	1. The system should have the provision of stopping the generation of bills and taking the arrears as bad debts, after a NEA or Regulator specified period of time, say 6-12 months after dismantlement.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B27	Billing for temporary connections.	1. The system should have the provision of preparation of Temporary Connection Energy Bill, with DISCOM defined Category and Charges. 2. Provision for – ● Final Bill Proportion ● Fixed amount calculation (In case of first bill) ● Amount Shifted to next bill (if next bill is prepared in same month) ● Debit/Credit Adjustment (Unit or Amount) ● fixed charge temporary connections 3. The system should have provision for automatic job creation for disconnection and final billing of temporary connections one day prior to the expiry of the duration for which the temporary connection was granted. 4. The system should also have option to extend such temporary connections based on utility defined authorization		
B28	Creation of monthly ledger	1. The system should provide the monthly ledger of the assessment and realization in format finalized in consultation with NEA.		
B29	Ledger adjustment	1. The system should have the provision for Debit/Credit Adjustment in ledger		
B30	Final reconciliation	The system should have the provision for Final Bill Reconciliation, in case of permanent disconnection and provision for final amount adjustment.		
B31	Monthly report generation	1. Module can close Ledger monthly and generate assessment and realization report.		
B32	Last bill generation	1. In case a customer requests for termination of connection, the system should accept the terminating meter reading (which will be out of cycle in most cases) for generating the last bill.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B33	Bill Printing	1. Generates invoices—soft or hard copy as configured 2. Invoices can be generated automatically or manually after a bill run 3. The format of the invoice can be changed using a custom invoice template. 4. Generate content-rich invoice documents in various formats: PDF, RTF, HTML, XML 5. The system should have provision of printing Bar Code/QR Code on the bills as per the required configuration and data details. 6. The system must enable the re-printing of historic bills from its active database. For getting bills more than 36 months older, system should capture its request online. This request will be sent to corresponding NEA DCS office user to process and share the bill. 7. The system must be able to label a printed bill as “original” when its printed for the first time and “copy” for subsequent printing 8. The system must allow for re-printing of receipts and electricity tokens 9. System must be able to automatically select and print those bills together in a desirable sequence for ease of distribution, which are under same reading cycle/group, convenient for bill distributors. 10. When a bill is completed, the system creates a bill routing for each person linked to the account who receives a copy of the bill. The bill routing record contains the information that controls how, where and to whom a bill is sent 11. System has functionality for bill route types control the information merged onto bills 12. System has functionality for technical implementation of online bill images 13. System has functionality for technical implementation of printing bills in batch The system		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		must enable printing of re-adjusted bills 14. The system must allow for massive and individual rebilling if errors are identified 15. The system must be able to print bills on pre-printed forms 16. The system must enable users to easily specify messages that can be printed on bills including season's greetings and promotions, etc. 17. The system must also enable decentralized printing of bills at stations 18. The system must be able to generate and enable printing of an aged customer statement that shows the real time status at any one point		
B34	Provision for holding bill printing till checked	1. System should have the provision of not allowing to print any bill of a cycle unless cleared by the bill quality check group. 2. System shall have post billing filters to sort out abnormal bills based on logic, so that such bills are not printed/sent to consumer by any mode.		
B35	Bill distribution route plan generation	1. The system should have provision to generate optimal bill distributor route plan based on bill distribution jobs in a given area in a given cycle.		
B36	Enforcement and Legal Module: Logging of leads	1. Provision to log leads of theft / misuse by: ● Creating automatic leads based on consumption analysis and tamper analysis ● Accepting lead through mail, website, phone calls, call center or any other mode 2. Capturing the details of the lead contributor person, whether employee/outsider.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
B37	Enforcement and Legal Module: Lead processing	1. The system shall have provision of lead processing- workflow and life cycle tracking for: ● Assessment billing ● Public Hearing and bill revision ● Payment and Settlement ● Escalation & Legal proceedings ● Recovery of installments ● Case closure		
B38	Dispute management	1. Capable to Handle Dispute Management with Court/Appellate Authorities/ Forums Etc.,) , To maintain life cycle of the case Ex:- admission, Pre-deposit, keep the dispute amount under hold, retrospective calculation of interest revisions, refunds, withdrawals, support accounts.		.
B39	Bulk Billing	1. Ability to provide bulk billing options for consumers to front end users. (manual billing)		
B40	Auto Billing	1. High performance yielding auto billing jobs to clear current upload & delayed uploads on same day without any spill over.		
B41	Real Time spot billing	1. Real time Spot Billing through Spot Billing Device (SBD), Hand held Equipment (HHE) through advanced technology features.		
B42	Solar Roof top billing	1. Solar Roof top billing- Net metering and Gross metering as per Regulator/NEA norms (End to end process).		
B43	LED billing	1. The billing process should cater for payments of LED bulbs, tube lights, purchased by customers and track the payments through EMI facility, direct payment towards the same.		
B44	Billing Interval	1. The interval billing functional area is responsible for managing the following: • Collecting interval data. Any time increment can be supported. For example, electrical meter read data might be recorded in 10 minute, 15 minute, 30 minute intervals.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		• Maintaining interval prices. Again, any time increment can be supported. • Deriving billable interval consumption from multiple • interval consumption sources. For example, actual interval consumption can be compared against a customer-specific "maximum demand" profile to derive an "excess demand" profile. • Deriving time-of-use consumption by applying time-of-use maps to a customer's interval consumption		
B45	Interest Calculation	1. Dynamic calculation of interest as per norms instead of adjustment through auto job.		
B46	Interfacing capabilities with Prepaid	1. Prepaid functionality support should be available within the module.		
B47	Flexibility for holding/blocking/release of bills	1. Ability to hold the release of bills (post bill calculation) prior to approval and send bill notification to specific users. 2. Ability to prevent bill calculation/creation until after specified date (i.e. - waiting on a new read, etc.) 3. Ability to prevent bill calculation/creation, on an exception basis, until a user allows (i.e. - a user needs to add manual data prior to bill calculation).		
B48	Trust Billing/Self meter reading	1. Shall have ability to capture the self meter reading and issue trust bill whenever required by NEA. 2. The process shall be designed in consultation with NEA.		
B49	Double Metering (Main and Check Meter)	1. NEA may install double meters on consumer premises where one meter acts as main meter for billing and another meter acts as check meter. The system should provide time stamped matching energy accounting of consumers		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		for both meters. The system shall also provide exception reports on a monthly basis for mismatches beyond prescribed limits set by the NEA.		
B50	Digital signature	1. In some locales, billing software is required to generate and store digital signatures for each bill. Digital signatures are used to secure bills that are stored in the database, and the digital key for the bill will be known only to the vendor.		
B51	Service Credit	1. "Service credits" is a term used to describe a special program designed to reward a customer for service along with benefits related to such a program. For each program that a customer participates in, there is a service credit membership record. Service credit events are used to record the "points" earned and redeemed for the membership. The topics in this section provide further details related to the service credit functionality.		
B52	Meter Read Snapshot	1. Determines the Bill Period and consumption period for Metered Service 2. Determine the Service Agreement's Billable Service Points 3. Determine the Service Points' Meters 4. Determine the Meters' Start And Stop Meter Reads 5. Service Quantity Snapshot or the total amount consumed for each unit of measure referenced on the bill		
B53	Service Agreement	1. On setting up a customer in the system, system creates a service agreement for every service that the customer uses. The most important information specified on a service agreement is the rate. The rate controls: • How the service's charges are calculated. • How the charges are described on the customer's bills.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		• How the general ledger is affected by the charges. While most service agreements are associated to a rate, system may have service agreements that don't use a rate to calculate their charges; for example, you may have billable charge service agreements to bill a customer for charges that have been calculated in an external system. Whether or not a service agreement uses a rate and the list of rates that can be specified on a service agreement are controlled by the service agreement's SA Type. In addition to calculating charges for service, implementation can also use rates to calculate adjustments. 2. A quote allows you to show a customer how their bill segments will look if a given set of pricing terms is applied to a given amount of consumption. If the customer accepts a quote, one or more real service agreements are created		
B54	Bill Frequency	1. Supports various non-cyclic billing scenarios 2. Allows service providers to perform billing independent of the billing cycle. 3. On-Demand Billing. Allows service providers to create bills and invoice customers automatically at the time of purchase, enabling the Collection of large purchase sums without waiting for the end of the billing cycle 4. Supports bill cycles of various frequencies i.e. Multiple options for when the system attempts to create bill segments for the account's service agreements. 5. The Off Cycle Bill Generator portal may be used to create an off cycle bill for an account where you control which financial transactions are linked to the resultant bill. For example, you		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		can create a bill for a specific adjustment or billable charge.		
B55	Offline Billing	1. System should be capable of generating bills in offline mode also. the bills shall be queued for updating to the central server and shall be updated once network is available in background.		
B56	**Additional Features**	1. A non-billed budget (NBB) is a payment plan used to level out a customer's payments over time. Non-billed budgets are typically used when your company bills on an infrequent basis and you want to provide your customers with a mechanism to make smaller payments more frequently. For example: • Rather than receive a bill once a quarter, a customer could set up an non-billed budget to pay fortnightly • Rather than pay two large bills a year, the customer could set up an non-billed budget to pay 10 out of 12 months (sparing themselves during the holiday season) Non-billed budgets can cover one or more service agreements linked to the same account. You can have multiple active non-billed budgets for an account, but any given service agreement can only be covered by a single non-billed budget at any point in time. 2. The sales and marketing functionality satisfies many diverse requirements. For example, you can use this functionality to: • Enrol new customers using a single transaction (i.e., you don't have to use the person, premise, service point, and start / stop transactions to enrol a new customer who resides at a new premise). • Sell new products to existing customers.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		3. The solution shall have a feature to capture Building wise meter data to perform power analysis of buildings		
B57	**Interface with Spot Billing System**			
1.	Downloading of data in spot billing system	1. The Spot Billing system shall enable meter reading activities by transferring relevant consumer information database from Billing system, like service numbers, address, area code, meter number, phase, load, MF, old meter reading, old status, category, arrears if any etc. 2. The download data model will be finalized in consultation with NEA		
2.	Uploading of data in spot billing system	1. At the end of data collection and billing operation in the field, the information recorded in the spot billing machine should be uploaded into the Base Billing system for updating the master database in the system. 2. The information would contain the service number, present meter reading, present status of the meter, billed date and time, units consumed, average units, billed amount, due date, disconnection date etc. 3. The upload data model will be finalized in consultation with NEA.		
3.	Tariff revision cases	1. The system should provide the necessary data set for considering the case of tariff revision.		
4.	Skipping of meter reading entry	1. The system should accept the data for no reading case with comments only.		
5.	Entry of meter status	1. The system should update the meter status in accordance with i/p from SBM/HHE & authorization by competent authority.		
6.	Billing with charges / adjustments	1. The system should identify any charges/adjustment in case of any difference between SBM/HHE bill amount & system generated bill. 2. Such charges/adjustments should be part of input data for next month's billing.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
7.	Error checking	1. Extensive error checking shall be provided to assure data integrity during communications between the HHE and the PC		
8.	MIS	1. The system should generate reports configured as per discussions with NEA		

3.1.5 Collection Module

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
C.1	Decentralized payment processing & centralized reconciliation	1. Systems must be capable of handling centralized or decentralized payment processing. 2. System must be capable of centralized reconciliation of the collection 3. Should able to collect non-revenue payment like miscellaneous collection		
C.2	Linking payment to log in id	1. The system should capture all the customer and payment details as specified by the Utility time to time. 2. All payments should be associated with the login-id of the personal receiving them and the collection center codes at which they were received. 3. All collections should be made against consumer accounts which shall be reconciled against raised bills to generate credit/debit advice for the next cycle. 4. It should accept advance payments on customer requests. 5. There should be provision of accepting non-revenue payments viz. misc. receipts, compounding charges, assessments etc. from non-consumers.		
C.3	Mandatory reason code	1. In all Instances of collections without bill/ form the system should make it mandatory for the user to specify a reason from the predefined reason codes embedded in the system, and defined by the Utility time to time		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
C.4	Code based Classification of collection	1. All collections will be classified against standard codes of payments that would be specified by the Utility from time to time		
C.5	Receipt generation	1. The system should generate a receipt whenever money is collected. Each receipt should have a unique receipt number. The system will allow payments to be collected under the payment categories indicated by Utility. 2. The system must enable receipting of customer payments for electricity including but not limited to the following details: • Customer name • Account number • Customer type • Meter number • Region • District • Station • Consumed Units • Amount paid • Outstanding amount • Revenue source • Payment reference • Payment type • Date		

C.6	Adaptability to different mode of collection	1. System shall be capable to receive payments made by the consumer in the following modes : - a. Cash/ Cheque/ Bank Draft/ Credit Cards/ Debit Cards/ Internet Payment Gateway or Payment made by direct debit from bank accounts on authorization by the consumer b. Any other mode as may be specified by Utility from time to time. 2. The system must allow for charging of different penalty amounts onto customer accounts e.g. bounced (RD) cheque penalty, consumption malpractice penalty, etc. 3. In certain cases (e.g. Advance Payments) collections can be accepted without the bill as well. 4. System should have support for accepting payment through a single cheque against multiple bills and keep proper track against respective bills. 5. Further, the system shall also allow the consumer to pay one single bill through multiple modes i.e. through multiple cheques of different banks, by cash & cheque etc. 6. The payments made by the consumers are to be acknowledged and accounted for in the respective databases. 7. For payment made by the consumers at Collection Counter through Cheque/ Bank Draft computerized acknowledgement shall be issued to the consumers. 8. System must be able to generate & send SMS automatically to customer for every payment received 9. Real time spot collection through SBM, HHE using advanced technology features 10. Single DD multiple payment type acceptance (Revenue, Non-Revenue and Deposit) 11. Ability to validate the adjustment types with available balance		

		(should not allow to pass a credit adjustment with greater available balance) 12. Configurable payment offset logic using regular expressions 13. Supports Tender Management and Workstation Cashiering 14. Ability to collect payments of EV consumers made through various channels facilitated by NEA. 15. The system should generate reports configured as per discussions with NEA • Standard Reports of Metering Module as per NEA requirement. • Add on reports can able to generate by the user.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
C.7	Handling of cheque payments	1. The system should have following functionalities: a. Holding recovery proceedings based on cheque submission, but recognition of payment on cheque clearance only. b. In case of cheque dishonor ● Reversal of any payment recognized by the system ● Levy of handling charges ● Generation of Notice under Prevalent law ● Blocking of further payment by cheque till a defined timeframe/logic with appropriate message on bill for same.		
C.8	Daily reconciliation of cash and bank	1. The system should generate a daily total for the receipts issued for the day. This would enable the daily reconciliation of the cash collected with the amount entered in the system as 'payment received'. The system should also capture all bank remittance details. At the end of a period, the system should reconcile them with the bank statements 2. The system should be able to generate a reconciliation report at the end of the day.		
C.9	Acceptance of part/ advance payment	1. The system should have the flexibility to accept full, partial or advance payments. The system should also have the facility to centrally change these settings from time to time (e.g. – not accepting partial payments during the last few months of a financial year). There should be total management of advance payment.		
C.10	Interfacing with special drives	1. In certain cases (e.g. during special collection drives, collection by spot billing agent etc.) collections are made in the field and receipts issued there. The system will have the provision for accepting the collections and receipt details for such field collections		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
C.11	Generation of reminders/ disconnection notice	1. The system should allow generation of reminders by SMS/ letters at specified dates – before the payment due date, and notices for disconnection, dismantlement		
C.12	System ability to keep track of canceled receipt	1. System shall be capable of canceling receipt at cash counters due to wrong punching etc. The details of canceled receipt to be kept in the system and the same may be printed on the new receipt also. System should also provide to reverse the payment applied to a particular account in case errors are detected at a later stage, e.g. payment getting applied to a wrong customer		
C.13	Finance & Accounting	1. The system should have provision for providing data for (not limited to) in prescribed format by NEA a. Balance Sheet & P&L b. ARR		
C.14	Interfacing with smart meters/net metering/solar roof top/pre-paid meters	1. System should have Interfacing capabilities with smart meters/net meters/pre-paid meters solar roof top		
C.15	Pre-Paid Metering	1. System should have the inherent ability to collect revenue from prepaid smart meter through various channels as provided by NEA to the customers.		
C.16	Interfacing with Web self service	1. System should have provision to accept non-revenue payments like Service charges, development charges etc. through web portal and mobile application 2. Configurable business rules and onscreen user bound ageing analysis with various parameters to identify the defaulter Configurable debt actions for every customer class like Out bound calling, email notification, manual notification etc., End to end work flow to handle the various Disconnection / Debt management processes. 3. Integration with costing and AM/MM systems for handling the asset devolution process.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
C.17	Offline Collection	1. System should be capable of accepting payment in offline mode and the collection details shall be queued for updating in central server		
C.18	Financial year accounting	1. System should have provision of locking the data after the reports have been generated and finalized at the financial year closing 2. Statements allowing to set up a person to receive a consolidated report of the financial activity for one or more accounts and/or service agreements. This allows modelling complex account scenarios 3. An appointment is an agreement with a customer to perform one or more field activities at a given premise on a specific date / time band.		
C.19	Default Management	1. Enables customers to pre-process delinquent accounts in-house and, as a last resort, to sell the debt to outside Collections agencies. 2. The system must be able to identify all customers whose debt exceeds a user defined amount and number of unpaid bills exceeds a user defined number 3. The system must enable the definition and effective implementation of rules and related operation to be set for debt recovery, e.g. type of customer, debt amount, payment history of customer, etc. 4. The system must be able to generate a customer statement showing the billing and payment history details of a customer and this must be available to the Customer Services Management module through interface 5. The system must be able to generate a report showing outstanding balances of customers aged for 30 days, 60 days and 90+days per tariff. 6. The system should be able to send reminder to consumer on different interval with outstanding dues.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		7. The system should be able to configure the intervals for the reminders. 8. The system must allow for the control and management of bad debt 9. The system should be able to automatically flag 10. customers who have outstanding balances for more than 30 days or as defined 11. The system should be able to automatically generate reminder letters for customers who have defaulted for more than 30 days or as defined. 12. The system should enable the automatic sending of reminders to defaulting customers by e-mailing and text messaging 13. The system must automatically generate a disconnection order for customers who have defaulted for a specified period 14. The system must enable printing of disconnection orders to customers 15. The system must automatically charge a reconnection fee of a user-defined amount against a customer when a disconnection order is generated. 16. The system must be capable of preventing the charging of default-related penalties to customers who have special payment agreements with NEA 17. The system must enable the capture of penalties and other administrative charges, and keep a history of these against each customer account 18. When a customer is disconnected for defaulting or otherwise, the status and reason for disconnection must be shown against the customer account in the system 19. The status of a customer should be shown on the customer account in the system, including when the customer has been disconnected, referred to debt collectors.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		20. The system should have provision for blacklisting a consumer who has been disconnected for period more than user specified time duration 21. The system must be able to generate statistics of service disconnections and reconnections per different criteria, e.g. region, tariff, etc. 22. The system must be able to analyse different Collection records, for example, per agent or cash Collection centre.		
C.20	Integration/Interfacing with ERP	1. System should be able to integrate/interface with the ERP module.		
C.21	Payment History/Tokens	1. The system must keep the payment history of a customer online for at least 3 years (or as defined by NEA) such that a payment receipt slip or electricity token can be reprinted if required. This functionality should be configurable 2. The system must allow authorized users and terminals to give free-issue electricity tokens 3. The free issue tokens must be labelled “free issue” by the system 4. The first receipt slip or electricity token to be printed must be labelled “original” and the subsequent ones must be labelled “copy” by the system automatically 5. The system must enable the sending of electricity tokens for prepaid customers by text messaging and email for payments by telephone and internet respectively 6. The system must automatically instantly reconcile any payment made to the customer account to reflect the true customer balance, first offsetting any outstanding amounts. 7. The system must be capable of producing a list of both post- paid and pre-paid customers 8. The System should have deposit controls exist to give administrative control over cash		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		drawers (and all other tender sources) and the subsequent deposit of funds at banks 9. The system periodically monitors how much customers owe to ensure they haven't violated Collection criteria. 10. When a violation is detected, the system generates the appropriate events (e.g., letters, disconnect field activities, To Do entries, write-off outstanding debt, etc.).		

3.1.6 New Connection, Disconnection, Dismantling and Reconnection

New Connection

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
NC.1	Standardized formats and issue of form	1. The system should be able to generate and issue different application forms for New connection, Temporary connection, Load extension/ reduction, Name change, meter shifting etc. for different categories of users, and the same forms should be available across all delivery channels (DCS/ Province/Zones/corporate office/ customer service center, over the web, etc.)		
NC.2	Accepting application form	1. The system should be able to accept the form over the web and request the customer to make a payment at one of the Utility's collection centers or online before a specified date. 2. The system should also be able to accept forms at customer care centers and manual / automatic input (through scanner and OCR software) of customer data from application forms. System should check before accepting a form that all mandatory details as mentioned in the forms are filled 3. The system should be able to accept new service connection		

		applications through the NEA customer mobile application.		
NC.3	Accepting registration fee details	1. The system should be able to record the registration fee payment details and issue a receipt to the customer. 2. The payments of registration fees may also be accepted through secure online payment gateways over the web using latest version of SSL and in such cases receipt and application no will be displayed on the customer browser and the same will be emailed to customer		
NC.4	Generation of unique application no	1. The system should generate a unique application number for every application form received and registered. The customer should be able to track application status based on this number.		
NC.5	Reconciliation of collection	1. All types of collections should be reconciled with the collections for the day with MBC system		
NC.6	Accepting customer details	1. The system should be capable of capturing the details of the customer from the Application form		
NC.7	Checking customer details	1. The system should accept the customer details and then check the applicant's particulars against the set of existing customers, defaulted customers, disconnected and rejected applications. 2. In case of a match in records, an exception should be raised. This exception should be flagged off to the relevant approving authority. After clearance from approving		

		authority, the application will be processed further or the same will be rejected		
NC.8	Handle special drives	1. The system should, based on a minimum set of data requirements and approvals specified by the utility, accept applications fulfilling the new connections or load enhancement need posed by special connection/ regularization drives		
NC.9	Checking system capability for issuing connection	1. The system should accept the field verification report & do the necessary check for feasibility. 2. The system should also have provision to accept installation test reports of licensed electrical contractors and to consider the load mentioned as the sanctioned load as per the regulations. 3. The system will have to interface with GIS to ascertain the loading at the relevant feeder and raise an exception when this assessment fails.		
NC.10	Inspection report generation	1. The system should provide the functionality of generating an intimation letter to the customer informing him of the customer premise inspection. The corresponding section office would also be informed of the premise inspection		
NC.11	Waiver of inspection	1. The system should have the flexibility of bypassing the premise inspection requirements for customer below a particular connected load		
NC.12	Accept inspection report and capture all details	1. The system should accept the customer load details, the category assigned etc. from the section officer, once the field test has been performed and add these to the customer database. It should also facilitate capturing the information regarding customer's planning to provide the service line himself etc,		

		so that the development charges can be adjusted to reflect the same.		
NC.13	Estimate preparation	1. The system should be able to prepare an estimate for new connection, temporary connection, load extension/reduction, shifting of meter and / or service line with details as per utility defined criteria which may change from time to time. The system should be able to estimate the development cost after field inspection and the cost data provided by the utility. This database will be modified by the utility from time to time. In case of availability of online stores and materials management module, system should be able to check materials availability and generate exceptions accordingly.		
NC.14	Updating application status	1. The system should update the applicant log with his status (Accepted / Rejected / under process). Information to be made available on mobile application and web portal.		
NC.15	Generating rejection letter	1. In case the application is rejected, the system should generate a dues settlement statement, and print a cheque for dispatch to the applicant.		
NC.16	Generation of unique Service connection no. consumer ID, Account number	1. The system should generate a unique Service Connection Number ("SCN") for the customer. The logic for generating SCN shall be provided by the utility.		
NC.17	Generation of bill for issuing new connection	1. When the Service Order for the' New Connection Approval is generated, the system should trigger the billing module to generate a bill inclusive of the development charges and security deposit.		
NC.18	Generation of intimation letter	1. The system will generate an intimation letter informing him the bill amount etc. and last date of payment. It should also have a facility to send information through email.		

NC.19	Multiple contract formats	1. The system should also have the flexibility of storing multiple contract formats (between the utility and the customer) catering to the different customer categories		
NC.20	Accepting testing details	1. In response to the Service Order for new connection installation, the test report details should be entered into the system as a confirmation of the connection installation.		
NC.21	Interfacing with stores for meters	1. The system should have the feature of integrating with inventory and material management systems to accept meter details.		
NC.22	Generation of first bill	1. System should monitor generation of first bill of the consumer and raise exceptions after predetermined period.		
NC.23	Route plan and monitoring of Meter installation	1. Based on the allocation and the service levels defined, the system should be able to provide meter installation route plans. System should also monitor installation reports of the meters. 2. System should be able to interface with the crew management system.		
NC.24	Integration with GIS and updating of database	1. This module shall be integrated with GIS database and GIS based network analysis module for allowing a new connection for the purpose of checking the network capability for adding additional load, the necessity for capacity augmentation and for generating work order with material requirement. At the time of adding a new customer the updating of the GIS database is mandatory. The system should have the provision for tagging connections to the property i.e. identifying all connections in the same building/plot/premises, along with indication of their share of built up area. The tagging of connection with property should be superimposed on GIS maps to facilitate accurate dues transfer and facilitate site survey.		

NC.25	Block Wise Service	1. Business Process for Block wise service Of Multi storied buildings/Multiple connections in phases shall be available. 2. Ability to handle MC/MSB scenarios from within the system covering parent child relationship with block wise energization.		
NC.26	Prepaid Meters	1. Interfacing with New Prepaid Meters		
NC.27	Smart Meters	2. Interfacing with Smart Meters for future need.		
NC.28	Solar RoofTop, Net Metering & Smart Meters and other upcoming technologies of smart grid	1. Interfacing capabilities with Solar Top, Net Metering/Gross metering, Smart meters and Electric Vehicles in existing/New connections. End to end process.		
NC.29	Geographic Data Management	1. Provision to Capture Geographical data for the consumer premise and to integrate the same for field operations.		
NC.30	Document Management	1. Integration with DMS for document handling.		
NC.31	Photo Upload	1. Photo Upload option to be made provision for New Applications.		
NC.32	Offline Application	1. System should be capable of accepting applications in offline mode. Application shall be queued for updating in central server on availability of network.		
NC.33	Integration/Interfacing with ERP	1. The system should generate reports configured as per discussions with NEA.		

Disconnection, Dismantling and Reconnection

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
Dis.1	Generation of defaulting consumer list.	1. System should be capable of generating the list of bill payment defaulter consumers as per various criteria on need basis. 2. System should be capable to accept report of action taken on such consumers and remind further action required to be taken during specified period as decided by NEA.		

Dis.2	Generation of disconnection list	1. System should have the provision of automatically generating a list of disconnection and reconnection notices as per utility defined criteria in utility defined template and have facility for bulk updation on a single screen on real time basis. After the expiry of the due date of disconnection notice, it should print disconnection advice for disconnection by field staff. 2. On receiving the disconnection notice, if any customer approaches and requests for help like getting some more time for payment, then the system should have provision for payment extensions or accepting payment in installments.		
Dis.3	Process of dispatching disconnection notices	1. The system shall have provision of dispatching the disconnection notices to the consumers by post, through email wherever available or any other information channels. E-mails should be sent automatically by the system and printed notices shall be dispatched by the NEA's staff.		
Dis.4	Capturing of Non-disconnection reasons	1. The system should capture the reason for non-disconnection from amongst the reasons predefined by the Utility from time to time. System should also have provisions for maintaining(Adding/Updating/Deleting) non-disconnection reasons to designated persons.		
Dis.5	Creation of exception report on disconnection	1. The system should recognize payment received on a real time basis and shall be able to raise exceptions accordingly, so that the field staff can be informed on payments made after the disconnection list has been generated, to avoid unnecessary trips to the customer premises. 2. System should also have provision for such cases, where the field staff receives the payment (Cash/Cheque) from the customer while visiting customer premise for disconnection and update the disconnection status or call the		

		designated person to update the same.		
Dis.6	Updation of customer status	1. The system should be able to provide updates on the customer status – disconnected / dismantled/ live.		
Dis.7	Updation of dismantlement status for deduction from SD on auto	1. The system should be able to update the dismantlement status, triggering an automatic deduction from the security deposit of the customer.		
Dis.8	Linkage with New Connection module	1. The dismantlement information should be available to the new connection approval process, so that dismantled customers are not provided new connections till the dues have been cleared.		
Dis.9	Tracking and escalation of disconnection failures	1. The system should be able to track reasons for failure of disconnection/dismantlement and escalate the case to a user-defined higher authority.		
Dis.10	Generation of optimal route and plan	1. The system should be able to generate the optimal route and plan for dismantlement, such that the people, transport as set (vehicles) and meter utilization are optimized. The system should be capable of accepting business logic to take care of such optimization.		
Dis.11	Termination of connection	1. In case a customer requests for termination of connection, the system should accept the terminating meter reading (which will be out of cycle in most cases) for generating the last bill.		
Dis.12	Integration/Interfacing with ERP	1. The system should generate reports configured as per discussions with NEA.		

Dis.13	Integration with GIS	1. This module shall be integrated with GIS database and updating of GIS database is mandatory in case of dismantling of existing customers.		
Dis.14	Exception reports on payment by disconnected consumers	1. The module shall generate exception, if the disconnected consumers not paying the dues after disconnection within a period specified by utility.		
Dis.15	Transfer of dues from one connection to other connection(s)	1. The system shall have provisions to transfer dues from one connection to another connection(s) including transfer of dues of disconnected connections to other live connections of the same owner.		
Dis.16	Reconnection	1. Auto generation of reconnection list, and facility to bulk updation on a single screen as per the requirement of company and auto levy of Reconnection fee.		
Dis.17	Disconnection	1. Ability to provide Bulk dismantling process to release bulk meters from the consumers whose agreement with NEA is terminated. 2. Generation of dismantling list for removal of meter and service line, support bulk Updation of dismantlement status for deduction from Security Deposit automatically. 3. Consumer requested/utility forced permanent disconnection. Handling of unauthorized reconnection – Temporary Disconnection on account of Low Power Factor.		

Dis.18	Recovery process	1. Support Automatic Recovery process viz., termination of notice, Final bill with adjustment of deposits and write-off of arrears once the installation is disconnected for payment default and auto cancellation of recovery process on receipt of payment before the expiry of termination notice. 2. Support to carry forward the recovery process to all migrated inactive installations from the stage where it is left over. 3. Payment recognition to happen on real time basis.		

3.1.7 Energy Audit

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
EA.1	Collection of Energy data from metering module	1. The system must collect data from the metering module in an automated fashion.		
EA.2	Ability to add consumptions	1. The system should be able to add consumptions of all the consumers connected to a particular DT and the consumptions of all the DTs in an 11 KV feeder. The necessary data for this regard will be available from the Customer indexing, asset coding database and billing data base.		
EA.3	Ability to read data	1. The system should provide a mechanism to read data provided through a Web service / Modem from a DTC meter/smart meters/feeders meters/boundary meters etc. through a GPRS network or an intermediate server.		
EA.4	Ability to support reconfiguration	1. In case of change in power flow logic due to network reconfiguration the system should be able to regroup the DTC/ Feeders based on		

		changed network configuration. The energy consumption data at the time of network reconfiguration should be recorded by a system for energy accounting.		
EA.5	Integration/Interfacing with other modules for loss calculation	1. The system should be able to calculate the estimated technical and commercial losses in every part of the network via integration with GIS,AMI,AMR, DMS, OMS and other modules of the RMS solution stack. 2. The module shall facilitate import or consumption related details from any existing or upcoming third party existing systems and the AMI/SCADA systems that may be deployed by NEA during the contract tenure.		
EA.6	Bus bar and Transformation loss calculation	1. The system should be able to check the energy balance between HV and LV of any substation and calculate bus bar and transformation losses of the substation. 2. Ensure DTC wise /Feeder wise/Substation wise energy audit and support consumer indexing including creation of stations, feeders, DTRs and mapping feeder to stations, DTC to feeders, Poles to DTCs and installations to poles single or bulk from the front end and also support transfers between stations, feeders, DTCs, poles and installations.		

EA.7	Energy Audit reporting	1. The data obtained for all the monitoring points shall be consumed for energy audit and the audit details shall be made available for display of the same in dashboards, pre-defined reports, graphs, pushed to mobile apps, published on portals, exchanged with central and other state agencies as and when authorized and intimated by NEA. 2. The energy audit parameters and details shall also be displayed on google maps/GIS maps with various options and filters for display. 3. The Drill down Energy Dashboard shall facilitate drill down up to DTC from the Corporate Level. Further drill down shall be possible for configuration upon requirement of NEA. 4. The module shall have various standard and adhoc reports for displaying the energy losses at various levels as required by NEA. 5. The module should have provision for accounting of (Departmental employees and pensioners) electricity charges and energy accounting. 6. The system should generate reports configured as per discussions with NEA Standard Reports of Metering Module as per NEA requirement. Add on reports can able to generate by the user. 7. The system should have intelligent data analysis feature to asses & raise alarm/alert against possible malpractices by comparing with the previous statistics of consumption.		

3.1.8 Customer Relationship Management

Customer Relationship Management

- The CRM System should have strong sales capabilities with built in campaign management, performance tracking, convergent pricing and packaging; supports complex customer relationships and enhanced call center support.
- The CRM system should be web and mobile based.
- The CRM system should have a strong workflow engine to ensure that cross-functional task can be accomplished as dynamically and seamlessly as possible.

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
CRM.1	CRM	1. Should have automated workflows for contact management, case management, Activity Management, shared contacts, appointment management, document and file management etc. 2. Case management functionality to manage a variety of situations, including but not limited to: • Power Outage complaint • a high-bill complaint, • a bankruptcy, • an inspection of a premise, • a customer's request for literature, • a contractor's request to extend a line, • a customer's rejection of a quote, • a customer's request to change information		
CRM.2	CRM	1. Should have client interaction tracking features like customer segmentation, customer profiling, interaction management, payment management etc.		
CRM.3	Notification	1. Notifications to reference the electronic transactions that exchange with third parties when: • They need information about a customer		

		• They need to change something about a customer When a notification is received by the distribution company, the system responds by creating a workflow process. The workflow process contains workflow events. These events perform the processing necessary to execute the notification. 2. The system periodically monitors how much your customers owe to ensure they haven't violated overdue rules. When a violation is detected, the system creates an overdue process. The overdue process contains the events meant to prod the customer to pay (e.g., letters, disconnect field activities, To Do entries, write-off outstanding debt, etc.).		
CRM.4	CRM	1. Should have comprehensive marketing and campaign management including but not limited to ; campaign design, batch email marketing, auto responder, email tracking, triggered email, customer targeting, campaign analysis, campaign delivery etc.		
CRM.5	CRM	1. Should have workflow automation and employee management capabilities including but not limited to ; group calendar, task scheduling and tracking, performance tracking, employee records, organizational hierarchy, workflow management, social CRM etc.		
CRM.6	CRM	1. Should have strong analytical capabilities including but not limited to; sales intelligence, sales reporting, sales forecasting, activity dashboard, revenue cycle modeling, business intelligence etc.		

CRM.7	CRM	1. Should have knowledge management capabilities such as document creation, knowledge creation workflows, advanced search capabilities etc.		
CRM.8	CRM	1. System should be able to integrate business processes involving customer touch points from various systems such as ERP, OMS,RMS, GIS, Web, Mobile, Field workforce management etc. act as central repository for customer information, analyze the data using data mining and other technologies to feed actionable insights to operations and business teams.		
CRM.9	CRM	1. System should be able to predict call center volume from 1 day to 14 days in advance to inform scheduling.		
CRM.10	CRM	1. Should be able to predict times and conditions of customer complaints down to the individual customer and address them proactively with automated notifications.		
CRM.11	CRM	1. Should have an inbuilt web-based bot tool which uses Artificial intelligence to answer customer questions as they type.		
CRM.12	CRM	1. The system should be linked through mobile SMS in a “closed user group” to breakdown / mobile maintenance staff. Immediately upon receipt of a no-supply complaint, an SMS will be sent by CC centre to the breakdown/ mobile maintenance staff for fault restoration. After restoration of the fault, the breakdown staff will close the complaint at the CC centre.		
CRM.13	CRM	1. System should be able to maintain various complaints types along with the escalation		

		matrix. The system should allow configuration of SLAs.		

3.1.9 Web portal and Mobile Application

Web Portal

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
WP1	Home	1. This page provides a brief description about the site, the various functionalities it provides and promotional features or any kind of advertisement for special programs can be placed in this page. 2. Login Component is provided, and registered users may login using their username and password. 3. New Users can also register by clicking on the Register user tab. 4. First Time Users Register link. The Forgot Password link helps the user to retrieve their password.		
WP2	Log In	1. The Log In page asks the registered users for their username and password while the new members can also register through this page.		
WP3	Registration	1. The user is asked for personal, security and account information in this page before registering. 2. The system must enable the creation of a customer account including but not limited to following details: • Customer Account Number (auto-generated) • Customer Account Title • Customer ID • Customer name • Customer Group • Customer Type • Reference Number • Region		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		• District • Station • Address • Tariff • Substation • Walk • Supply Connection • Plot/House number • GPS Latitude Coordinates • GPS Longitude Coordinates • Meter Number • Seal Number • Route Number • Pole Number or ID • Transformer Number/ID • Status • Last billed month • Description of Premises • Comments • Date Registered • Credit terms		
WP4	Forgot Password	1. The user is asked for his first name, last name, zip code, birthday and his primary email address before being provided with the security question.		
WP5	Security Question Answer	1. The new password is sent to the user by email (his primary email address as in his profile) on answering the question correctly.		
WP6	Change Password	1. Once the user has logged in, he can change his credentials i.e. Username and Password by clicking on the Change Credentials link.		
WP7	My Accounts	1. This is the landing page for the users with multiple accounts. The screen contains a brief summary of all the accounts such as the account name, address, balance, due date and the account status.		
WP8	Single Account	1. This is the landing page for the customers. The screen contains a description of the account. Any status messages pertaining to the account involving immediate user action is also presented here. 2. The system must enable the definition of the customer status field values and		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		must have an option for suspending an account but not necessarily closing it		
WP9	Consumption History	1. The page provides an account of the usage for the last 12 months graphically. A more detailed analysis is provided in a tabular format listing the meter reading date, the reading, consumption, number of days, charges etc.		
WP10	Consumption Calculator	1. The consumption calculator popup is provided to help the user calculate the usage between any two given dates.		
WP11	Bill Summary	1. The Bill Summary page gives a record of the Billing amounts and Payments made by the customer over the last few months.		
WP12	Online Billing Registration	1. The user is provided with the options of registering in Online Billing and also continues with paper bills.		
WP13	View and Pay Bill	1. The View and Pay Bill page presents a short summary of the bill. The user can also view the bill in PDF format by clicking on the link View Bill as PDF.		
WP14	Pay Bill	1. The user is provided with Multiple Mode of payment viz Credit Card/Debit Card/Net banking etc as available. On providing the valid credentials payment can be made directly from the site. The online payment shall be processed through secured payment gateways.		
WP15	Multiple Pay Bill	1. Payments for all the accounts can be directly made from this page. For each of the accounts the user is provided with multiple modes of payment made available by the Nepal government. On providing the valid credentials payment can be made from the site directly.		
WP16	Manage Accounts	1. The page lists all the accounts for the user and the preferences for the accounts.		
WP17	Complaint	1. Under this page user can log his complaint using a drop down menu and also enter some text.		
WP18	Complaint Status	1. This is a read only screen in which user can view the complaint status.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
WP19	Report Power Failure	1. This screen contains static data related to the power failure. The contact number is mentioned in case any power failure occurs. 2. The user calls up the number and reports the power failure and necessary action is taken to restore the power connection. 3. Workflow driven rectification process for various type of complaints / commercial requests		
WP20	Update Profile	1. This screen enables the user to update his/her profile information. The user can edit the personal information and click on Update Changes button to save those changes.		
WP21	Commercial Information	1. This screen displays the applicable policies, acts and rules prescribed by the utility, regulator and the law, which are helpful for customers.		
WP22	Associated Sites	1. This screen provides the link to all the associated sites such as Regulator, Ministry of water resources and energy, NEA etc.		
WP23	Contact Us	1. This screen displays the information of the contact persons, who should be contacted for any information or for providing any feedback.		
WP24	Privacy Policy	1. This screen shows the different privacy policies to which the web site adheres. This screen displays only static content. The user can navigate to other pages by clicking on the bread crumb or the left navigation.		
WP25	Prepaid Meters	1. Ability for the system to receive and forward Prepaid connection requests and facilitate recharges and other facilities related to prepaid metering.		
WP26	Photo Upload	1. Photo Upload option to be made provision for New Applications.		
WP27	Smart Meters and other smart grid enabled features	1. Should be able to cater to smart metering requests and provide other smart grid features viz. AI based Chatbots, Electric vehicle requests, Solar rooftop etc.		

Mobile Application

Basic features require meter reading and billing App-(hand held spot billing)

I. The SI will provide meter reading and billing and payment of customers at the customer site through Android based APK.

II. Billing APK shall function in following modes –

- Offline Mode – Billing will be based on the basis of pre-downloaded billing data residing in the mobile using manual or direct meter-downloaded read input. With facility of Bill Printing through hand-held blue-tooth printer. The Billing logic shall reside in the APK and shall be an exact replica of logics implemented in the main RMS billing application. Meter Readers will be provided billing data Sync-In services and billed data Sync-Out Services on daily basis, to and from the mobility servers. APK shall also have Pull services to pull the bills from the Android Devices when they are in network enablement.
- Online Mode – Billing will be on the basis of direct secured connection from APK at customer site to the main billing application. The meter read input will be using manual or direct meter-downloaded read input. Billing will be done by the main application billing engine and the outcome bill will be presented on the APK interface with facility of Bill Printing through hand-held blue-tooth printer. The Online APP mode shall have payment collection and receipt generation facility at customer site by way of integration of the APP with e-Wallet platform which enables prepaid wallets for the meter readers.
- Reading modes –Manual Entry/ Meter Downloading APP will be integrated with various categories and make DLMS and non DLMS meters using communication protocols and API and reading and demand will be downloaded into APP from Optical Port of meter using Optical Probes. In addition to this the APP will have an interface to manually input the readings and Demand.

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
MA1	Platform	1. The platforms used for development of mobile apps should support development of Hybrid Applications/Native Apps. 2. Delivery of consumer App and Officers mobile applications should be in the form of a published mobile application on each platform in the marketplace (Google/ Android Play store, Apple store and MS Windows etc.) and should run on all types of handsets/TAB/Smart phone existing as well as new handsets coming in the market. The SI shall provide upgrades/patches etc. 3. The platform should provide the means to manage subscriptions of push notification service set.		

MA2	User Interface and Design	1. User Interface and User Experience of mobile App is to be designed to ensure that the service is user friendly. 2. Design of consistent visual elements and Mobile Apps architecture that is scalable and expandable. 3. Resolution independent Mobile Apps that will automatically expand/compress itself as per the device screen resolution and should be as per standards of W3C. 4. Mobile applications to be implemented in pursuance to the International & industry standard implementation standards and procedure for successful implementation of the project.		
MA3	Architecture	1. The complete solution proposed must be SOA compliant and preferably based on secured open standards.		
MA4	Documentation	1. The solution Framework, tools, technology of mobile App Development platform should be submitted along with technical proposal and should be able to address the future scalability requirements, in terms of both application (to add new services) and infrastructure and backend.		
MA5	Role based access	1. Proposed mobile app should be developed with role-based access users (Consumers, Official and Feeder In charge & Meter Reader).		
MA6	Security	1. Data communication between downloadable mobile applications and various subsystems like payment gateway, XMPP server, any other third party authentication server, and application server should be in encrypted form. 2. Mobile Apps installed in smart phones should be able to access the device database securely.		
MA7	Secured Hosting Environment	1. Hosting environment to be provided by the bidder should be secure enough and behind the Firewall and as per prevailing security standards		

MA8	Integration	1. Integration with any existing applications through Microservice architecture -Web services/API/ JSON, Social Media platform etc. 2. Integrate with the backend systems (user profile and registration, authentication, application processing, push notifications etc.). 3. Mobile Application should be able to communicate with payment Gateway API for integrating various bank payment gateways.		
MA9	Data Fetch	1. The data must be fetched from predefined data in the central database and all the data should be directly updated to the central database. The data access should be granted as per authorization and access.		
MA10	Default Language	1. English will be the default language. Application should support both English & Nepali language.		
MA11	Mobile app for consumers	1. Access of 'Quick Bill Pay' where the consumer may pay the bill on the go by furnishing only the consumer id and branch id; multiple bills may be paid by this option. 2. Consumer may apply for and check the status of New Connection/ Additional/ reduction load application. 3. Consumer may access his personal details like Assessment, consumption & bill paid for the last 3 years and so on; more than one customer id (if any) may be added to a registered account. 4. Consumers may access the consumption calculator to check the energy consumption patterns. 5. Fresh complaints can be lodged and previous complaints tracked via the app. 6. Consumer may also request for: ● Request Duplicate Bill ● Augmentation of load/ regularization for installation of AC ● Informing non-usage of electricity during a certain period of time due to absence ● Registration of mobile no., email-id, DOB ● Energy calculator		

		7. One touch call / e-mail facility 8. Reporting of cases of theft through the App. 9. The consumer can stay updated with regard to the company, new launches, services, outages, useful tips, through social media tabs for Facebook, Twitter, and WhatsApp which are available in the App. 10. HV consumers can get the following through the App: ● A summary of their account details are available here ● Latest Bill along with the amount to be paid and the due date can be viewed ● Payment History of the last 12 months are available in the app 11. Consumption history of the last 12 months are available in the App. 12. All the features of the consumer web self-services shall be available on the mobile app. 13. Communication between Consumers and NEA using Messaging Utility to be provided for access to CRM for grievance redressal, Instant Messaging, Evidence sharing using Picture, Announcements, Promotional Schemes, Bill generated and Payment Due reminder, Tariff change update, Power Outage Schedules etc. 14. Mobile applications should have functionality to allow payments using the payment gateway or as agreed by the NEA.		

		15. Mobile applications should have tools like Load calculator and generate estimated bills as per the consumption input by consumer. 16. Mobile applications should have single click access to get the number for the nearest call center and “No light” for addressing their No-Power Complaints. 17. Mobile Application should allow complaint registration and search for status of the complaint anytime. Complaints using photograph/videography of the damaged equipment/meter/cable etc. to customer care for problem resolution. 18. Consumer should be able to take the self-meter reading by sending attaching the photograph of meter reading attached. 19. Application would work only in online mode.		
MA12	Mobile app for Field work force	1. Monitor billing progress, revenue realization, consumer billing history, payments and location on Google map. 2. Instant alerts (Group Messaging) feature to the individual/group, Supply alerts on selected criteria 3. For Feeder In charge & Meter Reader- ● Data capturing (Feeder wise GPS location of DTC, Pole, Consumer & indexing with feeders). ● Meter Reading directly from Meter through Optical Port and generation of billing and cash collection at spot. ● On spot updating of activities such as Meter Change, Disconnection, Reconnection and photographs as proof of completion of activity.		

		4. Disconnection and reconnection module giving information about the arrears pending and route map for tracing the location of consumer premises. 5. Capturing the Disconnection and Reconnection details. 6. Capturing of Field inspection details in the new connection process. 7. Capturing the location wise asset details during asset replacement/repair for assets like Feeders, Meters, CT/PT, Transformers, etc. 8. Tracing the location of Meter reader /Feeder In-charge by sub division officers on real time basis 9. Capturing details of asset replacement like Meter, Transformer, CT/PT etc. 10. Estimation of bill of material during new connection process 11. Consumer complaint and theft / unauthorized use, recording/photography 12. Ability to provide mobile fieldwork solution that allows field services representative ability to update field service workflow steps on a handheld device / application and have the updates reflected in the RMS in real time. 13. Ability to provide mobile fieldwork solution that allows field services representatives to complete/cancel field service requests on a handheld device / application and reflect updates in the RMS system in real time. 14. Application should be capable of working in Online as well as in Offline mode. 15. Ability to integrate with CRM and CCC to provide real time updates on consumer complaints involving filed works. 16. Ability to integrate with other utility systems on real time including but not limited to ERP, RMS, GIS, DMS, OMS etc. to optimize field works.		

MA13	Mobile App for billing	1. Mobile Application should be able to access the Metering, Billing and Collection applications installed at NEA so that NEA authorized users can process these commercial services to serve the customers of NEA and Central Platform should be desktop and Mobile based for monitoring and control at Administrative level. The various MIS reports should be generated from the Central Platform. 2. Applications should support both online and offline billing as per the tariff regulations of NEA for KWH, KVAH and KVA based billing. Online means the mobile application will be used to access the billing application installed at the Data Center through the GPRS network and process all the transactions on a real time basis. For offline access the data is transferred to the mobile device and stored in the mobile memory for billing and then after the bill process the data is transferred back to the Data Center either through direct connection with the system or through GPRS network. In case of offline billing the mobile device processes the bills similar to the Spot Billing Machine. 3. Applications should have interfaces / APIs for synchronization of tariff from time to time. 4. Application should support printing of bills in plain paper/preprinted paper as per the agreed format and size and support printing through direct connection, Bluetooth and Wi-Fi technology. 5. Application should support capturing of meter photographs, printing on bills for selected consumers or all and synchronize the data to central location for review and store with min space requirements. 6. Application should track the GPS coordinates of meter readings taken and should synchronize with the back-end billing system. 7. Application should facilitate easy navigation and search functions like search by consumer no, name, meter no etc for easy and fast retrieval of demographics / Billing / Payment information related to customers.		

		8. Application should have facility to capture meter readings, processing of bills, printing of bills, capture the meter observations (readings not visible, meter running slow / fast, inaccessible meter etc as per the NEA requirements and should be configurable in the application which can be changed by Administrative login.) 9. Application should have facility to capture only meter readings and photographs without any requirement of bill processing. System should facilitate search by meter no and validate with back end application for any such meter changes in case there is variation in meter no at site and the data. 10. Application should allow capturing of notes/remarks wherever required. 11. Application should have functionality to synchronize the data to and from back end billing system using GPRS connectivity. The data so synchronized should be stored securely inside the device and should not have access to users. 12. Application should have built in rules / validations to eliminate abnormal readings and bills to reduce the billing complaints there on as per NEA defined criteria/regulations. 13. Applications should be able to bill the customers based on the actual consumption or average consumption depending on the status of the meter as per regulations/tariffs. 14. Application should have functionality capturing of premise information, network hierarchy information like feeder code, DT code, Pole code etc., Such data should be stored safely and should allow extracting of data in desired format for integration requirements. Application should allow capturing of asset details based on the connection number and allow synchronization of data to the backend server.		

		15. Application should provide functionality to capture the information related to unauthorized users as well provide any such information on using the current connection for any such other purposes. Back end dashboard application should be able to provide the list or report of all such cases reported under any such division office. 16. The Geo coordinates should be tagged to the data and should allow over laying of data on any such geospatial maps like that open street maps or any such freely available open technology maps for tracking the meter readers on map etc. The central location dashboard provided should be used for monitoring of the same. 17. Application should facilitate day end printing of reports like bills processed for the day, demand raised for the day, anomalies identified during the day etc., for due submission to the NEA staff. MIS reports as per the requirement should be developed in consultation with NEA 18. Applications should have NEA defined validations for taking the consumer payment by different modes and provide separate authentication for taking collection. The payment facility should allow restricted access to the data for realization of payment by authorized representatives as per the books defined to them for meter reading activity. Application should provide functionality for assigning the group of consumers to the third-party agents also. There should be a facility to limit the amount to be collected by the mobile application users. The application should have facilities to generate the collection reports. Application should have facility to print the receipt of collection and reports etc.		

		19. Application should be able to connect with the meter using the meter communication port. NEA will provide the desired API of meters installed and should also be able to capture the meter reading directly from the meter and should be able to process the bills. 20. Applications should be able to take care of the tariff changes and other regulatory changes released from time to time during the contract period and should be seamlessly transferred to the offline system using GPRS, Wi-Fi or any other communication technology. 21. The tariff structure should be designed in the back-end billing application running at the Data Center and the same should be transferred to the mobile application through web services in a secure environment. 22. Application should be able to match the tariff version and should be able to immediately prompt / stop the bill processing through mobile application in case of any such variation in the tariff within the back end billing application and mobile application. 23. Application should be able to print the duplicate bill if required at any instance. 24. Application should have the features to view the billing history, payment history, complaint history and meter changes history of any consumer by entering the Connection No, Mobile No or Account no. This should be enabled to only authorized users of Utility. 25. Application should have the facility to update the mobile no of consumers. 26. The mobile application should be such that users can also access it with desktop or laptop and through which various MIS reports could be generated. 27. The Mobile application should have a password based login system for meter readers and the central platform should also have a user and password based system. 28. Application should be able to track the consumer based on Service Connection Number, Account No, Mobile No etc and should also have search facility based on selected parameters. 29. It should be able to fetch account numbers from a printed QR Code/Serial Number (pasted on the meter) lab number of the meter to fetch customer details before entering meter reading.		

MA14	Technical Requirements	1. The mobile applications should be safe and secure. System which should allow centralized control of devices and monitoring of devices used for mobile billing / payments on real time over a web based interface. 2. Each message exchanged between mobile device and server: • Should be encrypted using 3 DES standards. • Should support DUKPT so that the 3 DES key is changed after each message, automatically. The same security measures must be adhered to for meter reading and bill generation. Any change in client side, whether handset or Mobile Numbers forces field representatives to change password to ensure that device is handled by the right person. IMEI no of each mobile handset in use shall be registered in the system. Only those handsets whose IMEI No is registered can be integrated with the system. 3. System should not communicate with any unregistered mobile handset. 4. The meter reading and billing mobile application should allow authentication and authorization of Users controlled through centralized / easy to use Web based applications. 5. The centralized web application should be able to fully control the devices and activities to be performed by the user. 6. The billing mobile application should be compatible with android 6 and above. 7. Should have readily available APIs / Web services for interfacing with the back-end applications. 8. Should allow application / data access over a secured GPRS network. 9. Should allow synchronization of data securely over the hybrid networks like GPRS/ WAN and Utility provided private SIM cards. 10. The mobile applications should be built using the currently available mobile application development standards and UI of the application should be flexible enough for multiple themes.		

		11. The application developed should be the property of NEA and the successful bidder has to hand over all the source code and necessary information to NEA after completion of the development with all detailed documents and consideration done to build the same. 12. Mobile Application should run on GPRS or 2G or 3G or 4G or 5G or VPN or Wi-Fi connections.		
MA15	Mobile application for New Connection	**Registration for New Consumers** Category: Domestic, with load 1. **Application Form:** input Service Type, Office Details (Province ,DCS , Pole Type, etc), Personal Details (Name, Address, contact details, etc.), Service Details (Supply type, Load Type), Fee Details (Applicant fee/ Processing fee), **Mobile Number/ Email,** GPS. Documents: Required documents to be uploaded/ submitted along with the application form ● ID proof cum Address proof: Voter ID card/ PAN number, others ● Premises ownership: Rent agreement / Self Declaration. ● Photo 2. After submission of the above documents and details, an order Number/ Reference Number will be generated and that will be send to Applicant and Respective Authorities 3. Reference number – send to Applicant through SMS/Email. – SMS implemented.		

MA16		**Inspection and Estimate generation – Site Inspection** 1. TFR [Technical Feasibility Report]: Authorized officials of NEA will receive the Reference number and GPS location of Applicant with the TFR link. Authorized officials of NEA can open the respective TFR form and if the requested **load is <5KW** then NEA personnel can approve and sanction the connection request. **a.** If all TFR details are Ok, then NEA Personnel will send it to respective TKC/ Field Staff to prepare for Meter release and Installation. b. If all details are not feasible then TFR will be send to NEA office for further decision. **2.** If TFR is verified: Demand Note (Estimate Details) will be prepared and sent to the consumer via Mail/ Mobile number. Applicant can make payments through following options – **Payment option:** Pay Online / Counter Payment, Wallet payment. ● Intimation to Applicant **Meter installation** Install meters and send information to Consumer/ NEA personnel. ● Update New Service Connection in Billing, Account Number Created ● Intimation to Consumers. ● First Bill generation. ● Intimation to Consumer		
		Following activities are envisaged; **Activities** **1. Application Submission** Service Type, Office identification, nearest Landmark, Pole details, Personal details, Images (Applicant, Signature), Service details, GPS data, Electrified/ Non-Electrified Area, Document Submission Generate Internal Reference number Data Submission Get System Reference number Application Fee Submission Submit Data Generate Registration Number Activity handled by: Mobile app		

		2. Site Inspection (TFR) Submit Site Inspection Report Activity handled by: Mobile app		
		3. Estimate Preparation Material name, Rate, Quantity, Amount, Applicable to Applicant Material list available including applicable rates – Estimate to be prepared based on the same. Additional Charges applicable on the generated Cost sheet to be calculated. Activity handled by: Mobile app		
		4. Estimate Approval Go to approving authority configured in the system Approval Interface: [Approve] [Reject] <Accept Remarks against each action> Activity handled by: mobile app		
		5. Receive Payments (against estimate) Payment modes: 1. Cash collection 2. <Wallet Integration> (Third party owned Wallet) 3. Online PG integration Activity handled by: Mobile app		
		6. Meter Feeding Accept Registration Number Installation Date, Meter Make, Meter Serial number, Test lab Number, Meter Reading, Number of digits, seal number, Meter Type, Voltage, CTR, Meter Sealing Certificate, Meter MF, GPS, etc. Activity handled by: Mobile app		
		7. Service Release Generate Account Number in the RMS Intimate Applicant Activity handled by RMS.		

MA17	Mobile device management	1. Ability to find & track devices ● Track the routes of employees to ensure they are using the most efficient routes when visiting the task locations and send them pinpointed locations via Maps. ● In case a phone is lost or stolen, it can be located.		
		2. Role-based access control (RBAC) for device management ● Enforcing a strong password policy. ● Being able to remote lock phones when they are being misused. ● Wiping corporate data off phones when they are lost or the employee leaves the company. ● Deleting corporate email accounts and the associated attachments downloaded and stored on the phone. ● Deleting corporate Wi-Fi networks and associated credentials stored on the phone.		
		3. Policy-driven device and profile management for security, data, and device features (Camera, Password Policy).Deploy policies over-the-air.		

MA18	Mobile application management	1. Provides granular control to administrators at the application level to manage and secure app data. ● App approval process through a lifecycle ● Provision and de-provisioning apps to enrolled devices ● Provision apps to enrolled devices based on roles ● Provision apps to multiple enrolled devices per user ● Retrieve list of apps ● Discover mobile apps through an Enterprise App Store ● Self-provisioning of mobile apps to devices ● Rating and sorting applications ● Password resets ● Enterprise play Store ● Adding/Deleting app ● Version controlling ● App Retirement ● Implementing maker-checker concept ● Automatic Updations for policies ● If policy is not defined the user should have the facility of selecting user or group for installing the App ● Whitelist / Blacklist Public App		

3.1.10 Management Information System

The list of analytics use cases are indicative and non-exhaustive. The final list of use cases will be discussed with the successful bidder.

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
MIS1	Generation and maintenance of various MIS reports	1. The specification covers maintenance and generation of various management information reports required for top management, middle level management and respective unit offices. These are generally based on the data generated under different modules which are part of RMS solution stack. The MIS Module should include a. Information capturing b. Information processing c. Information management d. Information based decision making & reporting		
MIS2	Study of existing business process to finalize MIS formats	1. Based upon business process & discussion with NEA, Detailed MIS requirement has to be finalized.		
MIS3	Provision to generate MIS on regular basis	1. The system should be able to generate reports on a regular basis. Utility will finalize the periodicity and the format of report.		
MIS4	Creation of different formats for different level	1. The format for same report prepared for different levels will be different, e.g. Monthly collection report for DCS head, Province head, DMD & MD will be different.		
MIS5	Elimination of human intervention in data acquisition	1. Data acquisition for MIS should preferably be without human intervention as far as possible. The data should be collected only at the lowest level and from the same source and in the standard formats.		
MIS6	Type and periodicity of reports	1. Type of report and periodicity of such reports are indicative only and final requirement will be spelt out by NEA as per requirement. 2. MIS should be customizable as per the user requirement. 3. Details and level of customization shall be discussed during the design and blueprinting phase.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
MIS7	Dashboarding	1. The system should provide configurable dashboard for monitoring, Revenue, complaints, request status, & other key statistics.		
MIS8	Provision to generate reports for all modules in user defined formats	1. The system shall generate reports for all the modules in user-defined formats. 2. The system will have a graphical user interface with a capability for generating customized reports, apart from the regular ones mentioned above, as per the requirement of management and operations staff.		
MIS9	Reporting	1. The system must be able maintain the tariff rate history for the previous 36 billing months in order to facilitate the recalculation and re-billing at any time		
MIS10	Support for information of govt schemes	1. The mechanism for monitoring of Government Schemes shall also have to be done in discussion with NEA which means formats of these schemes and filling of information for these schemes.		
MIS11	Business Intelligence	1. SI shall have to design the proper analytic computations for various other fields and should have following features not limited to; ● Root Cause analysis for repetitive customer complaints ● Analytical capabilities for supporting in regulatory filing. ● Monitoring and predictive modules for Losses. ● Analytics for effective control over material consumption for faults / new connections etc. ● Analytics for effective reduction in customer footfalls. ● Dashboard to analyze customer growth, complaints & its duration etc. and operator shall be able to analyze this on map.		

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
		● Dashboard for daily / monthly monitoring by Management of configurable KPIs ● Dashboard for high-level overview of arrears, collectibles, write offs data, pay plans, and payment arrangements for the selected period. ● Custom forms for gathering information and publishing on the system for periodical review by management and for displaying on the VDU & Video Wall. The various forms shall be designed, developed and deployed from time to time and published for entry/key in at various levels. The system shall also have facilities for custom form building. ● The information collected from the various published forms shall be stored hierarchically and consolidated reports automatically formed at various hierarchy levels of Province, DCS etc. ● The reports and dashboards shall have drill down features to drill down to the nth level. ● The forms shall be responsive and shall be accessible from any device like Mobile Phone, Tablets, Desktops, etc. ● BI should perform master data reporting dynamically i.e. , it should be possible to generate reports and dashboards in real time on relevant data sets.		

		● Predicting high bill notifications -- Predicting the high usage of customer details and send notifications to them. ● Neighborhood energy consumption comparative analytics -- Provide comparative analytics of energy usage between the same category of customers or different zones/areas etc. ● Missing reads (interval / scalar) analysis -- Analyses the root cause of missing meter reads up to DTR level by checking the meter reads flags, communication status for particular duration, etc. ● Prescriptive analytics for ToU based tariffs -- Prescribe the tariff rates based on defined ToU or based on historical usage during on/off peak duration. ● Prescriptive analytics for prepaid vs postpaid analytics -- Prescribe the better options between prepaid and postpaid for NEA to provide to its customers. ● Time of Day (TOD) / Time Of Use (TOU) metering -- Analysis based of Time of Day (TOD) or Time of Use (TOU) to optimize the usage and load demand for customer/DCS/Province etc. ● Remote connection / disconnection at defined / on demand conditions – Analysis of the customers connection/disconnection on monthly/quarterly or yearly basis to optimize the energy/load demand. ● Pre-paid Metering/ System -- Analysis of energy/load demand during on/off peak duration for pre-paid customer(s).		

3.1.11 Document Management System

S.No	Module	Description	Compliance (S/C/T/W)	Comments (if any)
DMS.1	**Document Scanning Features**	1. Should provide an integrated scanning engine with capability for centralized and decentralized Scanning & Document Capturing. The scanning and document management solution should be from same OEM so as to provide an integrated solution right from capture to archival of documents. 2. The mobile based document capture application and scanning solution should be from the same OEM. 3. Should have a well-defined capture module for support of document processing, validation, index building, and image enhancements. 4. Should be able to support the capture of digital records of at least the following formats: ● Emails and attachments ● OCR documents ● Images - .tiff, jpeg, gif, PDF etc. 5. The proposed solution should provide for automatic correction of parameters like format/ compression not proper, skew, wrong orientation, error in automatic cropping, punch hole marks etc. during scanning. The scanning solution should provide support for automatic document quality analysis so that any bad quality document doesn't get uploaded to the repository. There should be an independent software quality check service available as part of the overall scanning solution which can be used to audit scanned documents for resolution, format/ compression, orientation etc.		

		6. Support all the special image enhancement functionality offered by the scanner through the driver interface. 7. Solution shall support Bulk Import of image and electronic documents. 8. Should have capability of automatic segregation of documents/records based on Barcode, Blank page, Fixed page and auto Form recognition. 9. Should have the capability of scanning on Linux platform. 10. Provide Image processing libraries that support image enhancements such as changing contrast, zoom in/out, cleaning etc and other imaging features like compression and extraction etc. 11. The software solution should include the Rubber band feature for the extraction of the data using OCR technology so that users can mark a zone on image at runtime during scanning stage & map the extracted data with the indexing field. 12. The mobile capture should support image compression, B/W conversion from color images, G4 compression for B&W, JPEG for color and gray scale, multiple page document capture, auto cropping, auto orientation, perspective correction, noise removal and geo capture.		
DMS.2	**Architecture and Scalability**	1. System should be platform independent and should support both Linux and Windows for application server. 2. Solution should have been built using server-side java and J2EE technologies. 3. Solution should be multi-tier, web-based solution (having web-based front-end for users and as well as for system administrative functions) having centralized database, web and application server with support for clustering. 4. The system should store only index information in the database while images should be stored in a separate file server. 5. Solution should be compliant to ODMA, WebDav open source standards.		

DMS.3	**Archival of Electronics documents**	1. The System shall support categorization of documents in folders-subfolders just like windows interface. There should not be any limit on the number of folders and levels of subfolders. The system shall support multiple databases i.e. MS SQL, Oracle and PostgreSQL etc. 2. The System shall provide facility to link cross-related documents like Application form and Field report, Grievance and reply sent etc. 3. The system shall provide search facility too in the same interface, so that users are able to search the documents to be linked. 4. The system shall support versioning of documents with facility to write version comments. 5. The system shall allow Locking of documents for editing and importing it back into the system through check-in/Check-out features 6. Repository should be format agnostic. 7. While processing a file, all the data and images for each transaction should be displayed to processing users and processing users should be allowed to accept, reject or send the files for review.		

DMS.4	**Document View**	1. The System shall support Applet for viewing Image documents- No third party viewers should be there for viewing of scanned images. Please specify if third party applets are used and the licensing terms together with cost implication. 2. The system shall facilitate zoom-in/zoom-out, zoom percentage and Zoom lens to zoom in on a part of image and other image operations like Invert, rotate etc. 3. Support archival & view of PDF/A format documents (open ISO standard for long term archival of documents). 4. Document view shall have the provision to draw a line, insert arrows etc over image document. 5. The system should support viewing and rendering of PDF/A documents in an inbuilt viewer. 6. Document view shall have the provision to highlight or hide certain text by drawing line rectangle and solid rectangle. 7. The System shall support viewing documents in native application. 8. The system shall provide facility of putting text, graphic and image annotations on scanned document pages. 9. The system should have mobile application for retrieval and archiving of documents.		
DMS.5	**Annotations**	1. The Image applet shall support comprehensive annotation features like highlighting, marking text, underlining, putting sticky notes on documents, and support for text and image stamps etc. 2. The system shall support automatic stamping of annotations with user name, date and time of putting annotations. 3. The system shall provide facilities for securing annotations for selective users. 4. The system shall store annotations as separate files and at no time, the original image shall be changed. The system shall provide facility of taking print outs with or without annotations etc.		
DMS.6	**Indexing**	1. The system shall facilitate manual and automatic indexing using OCR functionality or from other applications. 2. The System shall support Automatic full text indexing for Text search.		

DMS.7	**Search & Retrieval**	1. The system shall provide extensive search facility to retrieve documents or Folders/Files. 2. The system shall support saving of search queries and search results. 3. The system shall support search for documents or folders on document or folder on profile information such as name, created, modified or accessed times, keywords, owner etc.		

DMS.8	**Security and User Management**	1. The Document management system shall support definition of Users, Groups and Roles relation in the system. 2. The system shall support access permissions on Folders, documents and object level. 3. The system shall support multiple levels of access rights (Delete/ Edit/ View/ Print/ Copy or Download). 4. System shall support for application based rights. 5. The system shall support system privileges like Create/Delete Users, Define indexes etc. 6. The system shall support secure login id and passwords for each user and passwords shall be stored in encrypted format in database. 7. The system shall have a facility to define password policy with extensive password validations like passwords must be of minimum 8 characters, shall be alphanumeric, locking of user-id after three unsuccessful attempts, password expiry, password history so that passwords are not same as previous passwords etc. 8. The system shall provide LDAP support for integrating with directory services and shall support single sign on. 9. The system shall support Extensive Audit-trails at document, Folder and for highest levels for each action done by particular user with user name, date and time. 10. The System shall support integration with database-based authentication. 11. The system shall support integration with PKI infrastructure as well as biometric solution for enhanced security.		

DMS.9	**Administration**	1. The system shall support a web-based administration module for the complete management of the system. 2. The Admin module shall support Users/Groups/Role definition and granting Access Rights to them and set password expiries. 3. The Admin module shall provide an easy to use interface for Index structure definition that can be used by different users. 4. The Admin module shall provide an interface for purging old audit trails and do selective logging i.e. select the system or application features for which the audit trails have to be generated. 5. The Admin module shall provide facility to take complete and incremental backups and shall be able to integrate with third party backup solutions.		
DMS.10	**Reports & Audit Trail Features**	1. The System shall support extensive Reports and audit trails and shall also provide data points and facility to design new reports. 2. The system shall support Extensive Audit-trails at user, Folder and Cabinet levels. 3. The system shall provide facility to generate Audit trails on separate actions, and between specific date/times. 4. The system shall support extensive reporting facilities at document, folder and user level. Please specify all inbuilt reports available in the system and also provide effort estimates for new Custom reports to be designed. 5. The System shall have an audit trail to maintain history of all transactions performed on the system. 6. The system shall give flexibility to administrators to do selective logging i.e. suspend and resume audit trail generation for specific system and user activities. 7. The application shall log all the actions done by individual users with user name, date and time and the administrator shall be able to generate detailed audit logs and history of the process instance.		
DMS.11	**Reminders and Alarms**	1. The system should have the capability to set automatic reminders and alarms to concerned users.		

DMS.12	**Integration and Web Services**	1. Should be based on open standards and have API support for data import & export. 2. The System shall provide support to invocation of external programs to perform activities of a process like legacy application screen for data entry. 3. The System shall support integration based on standards such as XML. 4. The System shall support message-based collaboration based on protocols such as HTTP, FTP and SMTP. 5. The System shall support integration with Email Servers. 6. The System shall provide fully functional APIs for Integration. 7. The System shall support Web based interfaces.		

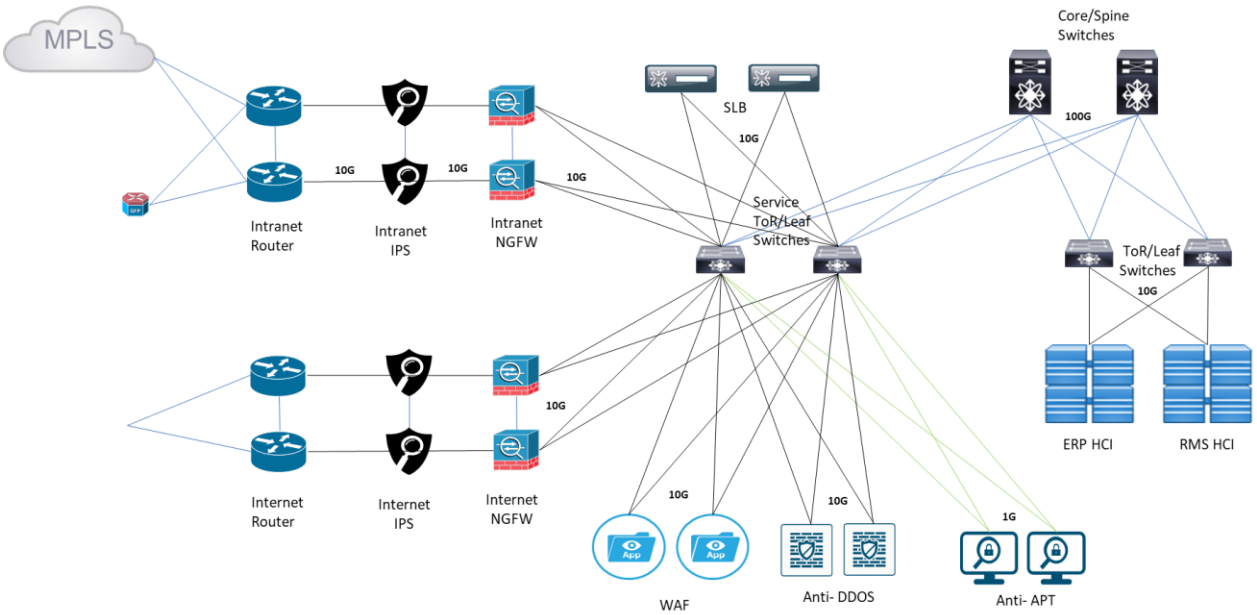
DMS.13	**Record Management System**	1. The system should be certified to Record Management standard like DoD 5015.02 or equivalent standard. 2. Solution should include Records Management component to comply with regulatory and legal policies for long-term archival of content. 3. Solution should manage the lifecycle of documents through record retention, storage, retrieval and destruction policies. 4. Solution should support managing and tracking of physical location of documents. 5. Solution should have facility to export / import electronic record with metadata in XML format 6. Solution should provide the configurable capability of record classification as per the record keeping structure (File Plan) of the department. 7. Solution should have a provision to define physical location of record management facility. 8. Solution should have a facility to define disposition schedule / policies for record. 9. Solution should provide the capability for only authorized individuals to view, create, edit, and delete disposition schedule components of record categories. The complete schedules would be as per the organizational policies. 10. Solution should have a provision to move & track a record among users within office/across locations. 11. When record is moved out of the facility, system should have a capability to capture the transport / courier detail. 12. Solution should provide report on the Records in the selected file plan component such as number of records present, number of record folder, Record creation date, etc. ● Report on activities of the selected user. ● Report on the Request/Return activities. ● Report on overdue items. ● Report on items borrowed. ● Reports on records, whose retention period are getting over in specified time. ● Reports on disposition schedule.		

3.2 IT Infrastructure Specifications

3.2.1 Design Consideration for Proposed Solution

The design considerations for the deployment of proposed IT Infrastructure at the Data Center and Disaster Recovery Center of NEA.

1. It is to be emphasized that NEA is looking to have a holistic RMS system implementation and not just the supply of hardware and software. The mentioned Bill of Material (BOM) indicated in the Bid Documents are minimum requirements. The SIs are expected to focus on the objectives of the Project and should consider both performance and scalability along with SLAs of this project and formulate their solution offering in a manner that enables achieving those objectives both in letter as well as in spirit.
2. SI shall provide system integration services along with supply, installation and commissioning of the required hardware, software etc. at the NEA Data Centre and Disaster Recovery Centre to deploy the Advanced Metering Infrastructure including the applications and integrate with both Legacy, Internal and external agencies as specified in the functional scope. SI's scope would include procurement of hardware and relevant software licenses, additional licenses for existing RMS System, their installation and commissioning at NEA's DC and DRC. The following services will be made available to the SI at the NEA Data Centre by NEA:
    - Space for Racks
    - Power and Cooling
    - UPS, DG set power backup



- Internet Connectivity at DC.
- Fire prevention
- Physical security surveillance
- Network Operation Centre
- DC facility maintenance and support

3. Bidders are required to visit the NEA's Data Centre Site to understand the deployment scenario along with Physical, Civil Electrical & Cooling Solutions available to them for the proposed services and understand key requirements and develop the required solution with respect to the functional requirements, configuration and customization specific to NEA.
4. SI is required to consider the proposed services and must consider the key requirements of NEA and develop the required solution with respect to the functional requirements, configuration and customization specific to NEA .
5. The proposed solution must have the highest degree of interoperability and the solution components should be standard based and adopt an open approach rather than support a specific technology or vendor.

3.2.1.1.1 Microservices Architecture

RMS solution components must follow microservice principles to provide specific services using well defined Advanced Message Queuing Protocol (AMQP). Identify opportunities for cross-functional components or subsystems and implement them in such a way that there is an opportunity for reuse. This defines integration architectures based on the concept of a service and becomes relevant especially when there are multiple applications in an enterprise and point-to-point integration between them involves complexity.

3.2.1.1.2 Integration Support

NEA envisages RMS System as a system API driven architecture at the core of it. RMS system features can be accessed via any user interface (internal or 3rd party applications) which shall work on top of these APIs. Adoption of open API, open standards are of paramount importance for the NEA RMS system. Data access must be always through APIs, no application will access data directly from the storage layer or data access layer. For every internal data access also (access between various modules) there will be APIs and no direct access will be there. This will ensure the RMS system is scalable and secure. Openness must be supported by open standards and vendor neutral APIs and interfaces for components.

a) The integration middleware should be based on Microservice architecture and other forms of Application Program Interfaces (API) and use publish / subscribe mechanisms.
b) The integration mechanism adopted must have minimal impact on the existing systems
c) The access to data will only be through business rules i.e. the applications will not access data directly without going through APIs managed by business rules/validation/workflow.
d) The integration middleware/interface must validate the data to be integrated
e) It must maintain integration logs that confirm the success or otherwise of the interface, complete with control totals

3.2.1.1.3 Ease of Management

The solution must factor capabilities and features that allows for ease of management and trouble-shooting. The underlying technology needs to be user friendly. By having an easy to use principle, training can be kept to a minimum thereby aiding IT change management and the risk of using a system improperly can be minimized. The solution should provide support:

a) Support maintenance, enhancement and refactoring the solution without architectural changes
b) Administering the solution with minimal user intervention and using role-based administration, well defined user interfaces and access policies.
c) Implementation of Changes should be done quickly even if architectural / DB Schema changes are required.
d) Ability to log and report at a sub-system level state, health of the solution. It shall also log different events encountered by the subsystem.

3.2.1.1.4 N-Tier / Modular Design

The application user interface, logic, and data must be separate. The logical design of components, subsystems, application systems and databases will be ideally partitioned. These partitions shall have well-defined interfaces established. Logical boundaries are needed to separate components from each other. Modular design is more adaptive to changes in internal logic, platforms, and structures. It is easier to support, is more scalable and supports interoperability.

3.2.1.1.5 Scalability

Scalability is the most important aspect of DC and DRC. It is envisaged that the users and geographic locations may increase over the coming years with further enhancement. The system architecture and the network design should have the ability to handle the growth with respect to functions, users, load, and geographic sites. Also, applications must evolve to support new business requirements and make use of new technologies. SI must factor both vertical and horizontal scalability in the design and deployment of AMI solution.

3.2.1.1.6 High Availability, Failover, and Load Balancing at DC and DRC

The solution shall be hosted at Data Center & Disaster Recovery sites or at a location approved by NEA. The solution tier for critical applications should consist minimum of two nodes clustered on a fail-over configuration for the critical components like Web, application & database servers at the Data Center site. Proposed components shall have adequate redundancies with no single point of failure for the solution at the Data Center site. On failure of the primary application server, the 'failover' server shall take over the processing. Similarly, on failure of a database server, the other server shall continue seamlessly, thus providing the desired availability.

All network & security equipment / devices shall have the capability to failover to a redundant or secondary unit upon failure of the primary unit. Likewise, the load on the primary unit shall be shared with a secondary unit upon the primary unit reaching its capacity.

3.2.1.1.7 Business Continuity & Disaster Recovery

In case, if the primary site / DC fails, the business should continue from the DR site. Connectivity between primary site and DR site should be redundant. In case of Failures of Storage at DC, DR Backups shall be used to restore the Database from the last backup taken. This shall be defined in Backup policy during project execution. Service providers should propose the backup strategy and any other additional BoM if needed to meet this requirement.

Service Providers should propose a solution where the Recovery Point Objective (RPO) should not be more than 30 minutes and Recovery Time Objective (RTO) should not be more than 4 hours.

SIs is expected to keep the above issues in mind and propose technically best alternatives to ensure that the system is available for the users at all times by conceptualizing various scenarios and explaining how their solution addresses all the possible scenarios. While the Bill of material proposed is the bare minimum required to be supplied, SI should propose additional solution components as may be required to meet the above objectives.

3.2.1.1.8 Zoned Deployment

The IT Infrastructure will have multiple security layers to secure the infrastructure from threats. The proposed deployment has different security zones as briefed below and all zones should have separate firewalls in addition to the external (Perimeter security appliances). The firewall policies should be configured based on zone-based requirements.

i. Militarized security Zone for Production Servers (Database and Application Server Farm (MZ):
Militarize Zone (MZ) will securely host all critical applications, Database server, Storage etc. The Zone shall not be accessible from the Internet directly. All user traffic will enter in this security zone after the firewall only. The proposed solution will have provision of dedicated Internal Firewall to secure the critical production (Data base and Application) environment.

ii. Demilitarized Security Zone (DMZ) Web server Farm Zone:
This security zone will host all servers that can be accessed from external users after authentication and traffic filtering. This zone shall host the Web servers, Access control & sign on servers, Antivirus Server etc.

iii. Test, development & Staging zone (TDSZ):
This zone will host all servers required for test and development for applications. This zone will have limited access and it will not have any direct access to the Production zone (PZ) and the activity shall be monitored.

iv. IT Infra Management Zone:
The technical manpower proposed by Service Provider for DC & DR infrastructure will use this facility and will be able to access the infrastructure from this zone only. This can be based at NEA Head Quarters or DC/ DR site. Traffic for this zone will be virtually segregated / zoned by firewall.

3.2.1.1.9 Information Security: Log monitoring

All Servers / sub systems / network devices / appliances as proposed by SI should have capability and throw logs to the log server. The Logs and events generated by network & hardware components / devices of the system shall be monitored. Service Providers would

need to ensure the IT security compliance and therefore monitor the threats/logs generated by various equipment's / sub systems.

3.2.1.1.10 Backup and Recovery

Data is an asset, just as personnel, physical resources, and financial resources are assets. Data and information are resources that are extremely valuable for the organization; hence data management processes must be in place to maintain the data. SI needs to prepare a backup policy which shall be approved by NEA. SI would be required to design detailed backup and recovery policies which shall be implemented at the time of deployment. The responsibility of taking backups and testing the backups as per the backup policy shall be of SI for the entire project period. Service Provider shall ensure that the data is replicated at the backup site at DR Site. Service Provider shall be responsible for safe & secure storage of complete data.

3.2.1.1.11 Virtualization

SIs should use virtualized deployment and all the Servers should be virtualized from day 1. SI is requested to propose a deployment strategy keeping in mind both logical and physical segregation of Application, Database & other services without any overlap and compromising design parameters like High Availability etc.

a) Virtualization Design Considerations

- SI should separate and Isolate Management and De-Militarized network zones.
- SI should utilize partition trust zones as: Core application zone, Public Interface services & Database Zone.
- SI must use Harden the virtual Infrastructure according to security best practices for virtualization and should secure virtual machines like physical servers. (such as Antivirus etc.)
- SI should strictly control administrative access (such as Use roles-based access control to limit administrative capabilities) and enforce separation of duties.

3.2.1.1.12 Utilization of Hardware

SI must propose hardware sizing considering that Hardware utilization should never cross **70%** at the peak load during the entire project period.

3.2.1.1.13 Technical Obsolescence

SI should not provide any solution in RMS which is at the verge of sun set and becoming obsolete. The RMS including ancillary stack, which are at a risk of technical obsolescence over the next few years and over the operating life of the system should be identified and reported. The compatibility between the various elements of the system need to be considered and mitigation options, not be limited to periodic updates from OEM/system supplier/SI, shall be indicated in detail.

3.2.2 IT Equipment: Technical Specifications

Bidders is responsible for implementation of the complete solution any item/solution which is not covered in BOQ but still require for desired performance, the same shall be included by the bidder in the bid form/commercial. No change request will be accepted in this regard

3.2.2.1.1 Hyperconverged Infrastructure, Software Defined Network and Cloud Orchestrator

Hyperconverged Infrastructure, Software Defined Network and Cloud Orchestrator		
S. N	**Product Names/Items**	**Description of requirements**
1	Brand	To be mentioned by the bidder
2	Model	To be mentioned by the bidder
3	Country of origin	To be mentioned by the bidder
4	Manufacturing Country	To be mentioned by the bidder
5	Quantity	**As per the Solution Minimum 3 Nodes at DC and 3 Nodes at DR**
Technical Specifications for DC and DR Virtualization		
S. N	**Requirements**	**Compliance (YES/NO)**
Hardware Specifications		
1	Proposed Infrastructure Solution should come with fully redundant field replaceable components.	
	Proposed Infrastructure Solution should have independent hot swappable components which can be replaced and serviced without having the need to power down.	
	Proposed Infrastructure Solution should include x86 Nodes of following specifications.	
Computing and RAM Pool		
2	**Total useable cores: Database compute (24 core, 3.0 GHz). Latest Generation processor across Cluster Web Application & others (144 core, 2.1 GHz)**	
	Total RAM: Database Compute with 24 GB per CPU Core and for Web, Application and Other Compute with 8 GB per CPU Core DDR4 3200 MHz across Cluster	
Storage Pool		
3	Boot Device for hypervisor: Mirrored 200GB or higher Flash Modules per Node. Each flash module should be no less than 200GB.	
	Storage: **40 TB Useable across Cluster (20% should be SSD)** Note: Should be hot swappable and field replaceable. NAS Storage: 62 TB	

Power Supplies and RU		
4	Redundant power supplies and Fans to be proposed.	
Network Interface		
5	Network Interface: 4*10G SFP+ per node	
Warranty and Maintenance		
6	The bidder should provide 5 Years comprehensive 24 x 7 x 365 Warranty for all equipment and software included in the proposed solution.	
Reports to be included		
7	Proposed OEM should be a brand listed once or more than once in the Latest Gartner's magic quadrant's leaders, Visionaries and Challengers Quadrant (2019, 2020, 2021) for Hyperconverged Infrastructure.	
Hyper Converged Solution Requirements		
8	The proposed solution should come with preinstalled various software including SDS with management and associated hypervisor. It should include all hardware and software necessary to ensure high availability mode of operation. The proposed solution should have a Single Management Console to manage integrated Compute, Storage and Hypervisor. The solution must come with a bundle/customer license, which must be clearly mentioned in OEM's license portal. The platform and environment should be customizable as per the requirement of User. The proposed HCI solution should be able to leverage SSD not only for caching but for capacity also to optimized read IO's and there should not be any limitation on SSD overall caching on software defined storage. The proposed solution should be completely software defined and should not rely on any hardware RAID controller.	
	The HCI solution should include Hypervisor License and should support minimum 3 of the industry leading hypervisors.	
	Dashboard to manage and provision virtual machines, network, storage, monitor performance and manage events & alerts. It should also contain a dashboard for monitoring & generating reports. The solution should provide a log analytical tool which will show all the logs available in one single management console and a single location to collect, store, and analyze unstructured data from OS, apps, storage, network devices, etc. to make troubleshooting easier. Solution provider OEM should be able to provide the Virtualization software for Server.	
	Technology must be software defined and the solution should provide enterprise-class storage services using latest x86 server infrastructures without dependence on a separate Storage Area Network & associated components such as SAN Switches & HBAs. The solution should have data locality.	
	The solution must be able to survive single node failures and it should in no way affect/degrade the production services & usable resources to the end user application. Solution must support all the mentioned industry Leading protocols NFS, iSCSI & SMB.	

	Solution should include an application and infrastructure performance management tool quoted as part of the solution to improve operations and provide deep infrastructure performance insight.	
	Proposed solution should cater virtualized core based licensing for products like (but not limited to) Oracle, MSSQL etc. The solution must natively support RDMA for better performance.	
	It should be possible to use different storage policies in the storage LUNs/Container with Storage QoS	
	Solution should support live migration of running virtual machines from one physical node to another with zero downtime and continuous service availability.	
	The solution should provide enterprise data services such as de-duplication, encryption & compression without dependence on any proprietary hardware. This should be delivered in both all flash as well as hybrid solution. These functionalities should be part of the proposed solution and licensed. The proposed HCI solution should be able to create multiple logical unit (LUN's) for storage with multiple policy for deduplication and compression across storage logical unit. The Proposed HCI solution should support Erasure Coding for archival data storage.	
	The proposed solution must support connectivity (Storage extension) to 3rd party bare metal servers (for optimized DB licensing on physical servers) to storage cluster & use the cluster capacity like (but not limited to) iSCSI, NFS target.	
	The proposed solution should support Hybrid and All Flash Nodes in the same cluster. Proposed SSD should be used for both storing Data and Caching. (If OEM uses SSD/NVMe dedicatedly for caching then additional SSD should be proposed). It should be possible to Pin IOPS hungry VMs on SSD only	
	Proposed solution should have inbuilt Data at Rest Encryption (DARE) and should also include a Key Management Solution. (OEM should not depend upon 3rd party key management solution or specific hardware to achieve the same)	
	The solution should support to connect external storage devices (like NAS, SAN etc.) and should be useable as part of the Solution, for the purpose of Backup. There should not be any hardware vendor locking while connecting the external storage/s and this can be accessed over IP (No proprietary protocol should be used).	
Scalability		
9	Proposed solution shall support unlimited nodes in a same cluster without any federation	
	The solution should be able to scale by support of adding additional nodes to the cluster at a later point of time to handle compute, Memory & Storage requirements. Solution should support cluster expansion with zero down time. The proposed solution should support hybrid and all flash nodes in same cluster for future scalability. HCI solution must have capability to support HCI nodes with different models, different CPU Generations & Memory, Disks configurations in the same cluster without any impact on enterprise-class storage services/functionalities	

	Data compression, deduplication, erasure coding techniques should be available with licenses (if applicable) in the Software Defined Storage (SDS) layer for use without additional cost.	
Data Protection		
10	Ability to provide Replication of Virtual machine backup locally and in Disaster Recovery site. (VM level Mirroring) to protect selected VM's. If licensing module is there, bidder should provide licensing details. Should come with solution and should implement from Day 1 of operation.	
	Solution should be able to take App and database consistent snapshot and should be able to schedule the same.	
	Shall be able to restore VM from the backup.	
Remote Replication		
11	HCI solution should support file level recovery of user's data from VM's without Storage/VM's admin involvement	
	HCI solution should support unlimited VM's snapshot at storage level, it should not impact guest OS performance during snapshot.	
	HCI solution should be able to take VM's snapshot/Storage snapshot at any time irrespective of VM's state (Power ON/Power OFF/Suspended) with retention policy	
	HCI solution should support crash consistent and application consistent backup within cluster	
	HCI solution should support VM's backup on leading cloud providers, AWS, GCP, Azure	
	HCI solution must support two copies of data across cluster and should have capability for supporting three copies for critical data and it should be available on workload level.	
	HCI solution should support data replication across sites with customized RPO i.e. 0 mins/5 mins/15 mins and grouping of Virtual machine as per application architecture	
	HCI solution should support WAN Bandwidth optimizer along with defined schedule across two sites and only increment data should be replicated post one time data sync	
	HCI solution should have license for three way DR for active-active configuration on MetroCluster, near sync, async replication with defined RPO, some of VM's are working from Primary (Site-A) and their DR at DR sites (Site-B) and Some of the VM's are working from Site-B and their DR's is at Site-A. It should have feature to change VM IP's on the fly without manual intervention in case the DR site has different subnet from DC Site. The Replication software should provide DR Orchestration and should be able to do VM power up sequencing. License should be provided for unlimited VMs	
Hypervisor		
12	The solution shall provide a purpose-built hypervisor with minimal footprint that installs directly on the 64 bit bare metal x86 dual socket servers	
	Hypervisor should support container and openstack integration for cloud native application	

	Virtualization Manager should have integrated Physical Host/ Node and Virtual Machine performance monitoring with high availability construct. No single point of failure for Virtualization Manager	
	Single view of all virtual machines, allow Monitoring of system availability and performance and automated notifications with alerts. Monitor, analyze virtual machines, server utilization availability with detailed performance graphs and greater visibility into object relationships	
	High Availability capabilities for the VMs in the sense if in case one server fails all the Virtual machines running on that server shall be able to migrate to another physical server / node running same virtualization software	
	Ability to thin provision disks to avoid allocating all storage space upfront. Full monitoring capabilities & alerts to prevent from accidentally running out of physical storage space should be there	
	Hypervisor should support virtualization guest tools inside guest for optimzied performance for video/network/performance and disk reclaim options from guest OS's	
	Hypervisor should support OVA/OVF image import and export	
	Hypervisor must have capability for OS Catalogue/template and OS provisioning with role-based access to virtual machine	
	Capability for creating Virtual machine templates to provision new servers and also allow taking point in time snapshots of the virtual machines to be able to revert back to an older state if required	
	Hypervisor should have integrated snapshot-based backup, schedule backup/restore and configure multiple copies of backup on periodic interval	
	Proposed hypervisor should support standard features like non-disruptive migration of workload across hosts, High Availability and Distributed resource scheduling during resource constrain	
	Hypervisor shall provide automated live migration for initial placement and balancing of available resources with the rules to define affinity and / or anti-affinity of workloads	
	Hypervisor solution must allow seamless migration across different CPUs with Enhanced Compatibility mode per-VM during migrations across hosts in a clusters and during power cycles	
	Hypervisor shall provide the ability to hot add CPU and memory, hot-plug disks and NICs (provided the same is supported by guest OS)	
	Hypervisor should provide ability to grant / ensure resources to virtual machines as they need for hosting critical workloads. Also the initial placement of workloads should consider CPU, Memory and Storage contentions / hotspots	
	Hypervisor shall provide zero downtime host patching with maintenance mode to move running workloads to other hosts on the platform with a consistent audit trail of the patching process	
	Hypervisor should support UEFI bios along with legacy BIOS for supported virtual guests OS	
	Virtualization Manager should automatically check cluster components, hosts, storage, network, hardware and cause of	

	performance issue on configurable schedule with results on designated email.	
	Virtualization Manager should be able to identify out of the box top 10 VM's basis on their high resource utilization(CPU/Mem/Storage/Network) on single dashboard	
	Virtualization Manager must support Directory based/OpenLDAP and SAML based authorization for management	
	Virtualization manager should keep at least 90 days historical performance data for VM's/Storage and partnering host	
	Hypervisor/management must should be able to disable SSH based login to cluster for security and should have support for ssh key based login	
	Hypervisor and Management must support SNMP version 3 and SMTP for proactive alerting and email configuration	
	Hypervisor must provide centralized interface from which virtual machine access switching for the entire virtual datacentre can be configured , monitored and administered	
	The Virtualization manager should provide a virtual switch which can span across a virtual datacentre and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual-machine networking in virtualized environments and enables those environments to use third-party distributed virtual switches	
	Virtualization Manager should provide feature which can perform quick, as-needed deployment of additional virtualized hosts. When the service is running, it can push out update images, eliminating patching and update without impacting production	
	3rd party support for endpoint security to secure the virtual machines with offloaded antivirus, antimalware, firewall and hips solutions	
	Hypervisor should support Rest API and Command line management along with GUI interface.	
	Required Hypervisor License and Hypervisor Management should be included into the solution	
HCI Management		
13	HCI solution should support automated and zero touch upgrades from single management pane/console for hardware/storage/hypervisor with no major impact on production	
	HCI solution should provide all key operation management and performance management from a single console for Hardware/Storage/Hypervisor and VM 's management using HTML 5 internet browser	
	HCI solution management pane should integrated with Active Directory /LDAP	
	HCI solution must support monitoring via SNMPv3 and email alerting via SMTP	
	HCI solution should have analytics on capacity behaviour and should have capability of showing all under and over utilized VM's with their right sizing information after current VM's usages	

	HCI solution should be capable of creating custom dashboard with reporting as per customer ease and requirements, solution should be able to scan/search objects with advanced search option for faster access to require information for troubleshooting	
	HCI solution should have capability for finding object anomalies from standard behaviours and report this before major bottleneck for solution.	
	HCI solution should have codeless automation native engine to create troubleshooting for alert and remediation as per policy	
	HCI solution should have capability for managing multiple sites/clusters from one HTML5 based browser with single sign on	
	HCI solution should support rest API for third party integration and customized workflow for automation using rest API	
	HCI solution should have call home capability for remote log collection and proactive support for predictive failure hardware component	
	HCI solution should provide seamless upgrade for Firmware, Hypervisor, Storage OS, BIOS and other such functions which are required in the HCI platform. The upgrade should be online and should not be done from one single pane of management	
	Offered solution should have inbuilt analysis for VMs and should be able to give report of VM performance for minimum 90 days. It should be possible to view constraint and overprovisioned VM from single GUI, it should be possible to create Customized Dashboard as per requirement.	
Networking		
14	Solution should provide Virtual Network visibility with application-centric protection from network threats and automation of common networking operations	
	Solution should be able to integrate with provided orchestration layer and cloud management platforms using programmable REST APIs/OpenFlow/Netconf to provide end to end automation of network and security services .	
	Solution should integrate with 3rd party physical network & security solutions (or their managers) from leading OEMs using programmable REST APIs/OpenFlow/Netconf/Device packages to provide integration with proposed Spine-Leaf switches and existing Perimeter devices (network & Security)	
	Solution should offer comprehensive flow assessment, analytics, security groups and firewall rules suggestion for the purpose of implementing micro level segmentation to achieve zero trust security within the datacentre	
	Solution should provide micro segmentation (Restricted access between VMs in the same VLAN/ VXLAN as well as across VLANs/ VXLANs) using integration with proposed stateful virtual firewall	
	Solution should support integration with Hyper Converged Infrastructure (HCI) hypervisor, Containers (running on Docker, Kubernetes) and any of public cloud	

	Solution should provide a single centralized dashboard for managing, monitoring and provisioning of entire network & security infra inside Hyper Converged Infrastructure (HCI) cluster	
	Solution should provide creation of security groups and security policies/rules based on parameters like virtual machine name/OS type/IP addresses/Security Tags etc.	
	Solution should provide granular control and governance across VM to VM traffic or VMs pre defined Group/Department	
	Solution should Support for layer-2 VLAN for networking and integrated VM IP's Management capabilities	
	Solution must ensure that only permitted traffic between application tiers or other logical boundaries is allowed and protects against advanced threats propagating within the virtual environment	
	Solution must leverage virtualized network functions from third-party software (eg. virtual firewalls, load balancers, threat detection, and application performance monitoring etc.), which can be inserted in-line or in tap-mode with VM traffic, and can be easily enabled for all traffic, or deployed only for specific network traffic.	
	Solution should integrate with L2/L3 network device with API call function for all required network configuration(L2/L3) with VM Life cycle.	
	Solution should support VM's life cycle policy based firewall rules for east west traffic across VM's through one management console without any third party software	
	Solution should integrate with third party network function software like virtual load balancers, virtual firewall etc	
	Solution should provide a single centralized dashboard for managing, monitoring and provisioning of entire network & security infra	
	Solution should have zero trust policy model for connected systems or hosts.	
	Should offer control and tracking of operational user activity to meet audit and compliance requirements	
	Solution should support traffic flows visualization with context of end-to-end Network Visibility. from the VM, to the virtual NIC all the way to the top-of-rack switch port with health and performance of the network	
	Solution should provide network analysis solution to collect and analyze network flows in real time and put them in the context of the VMs and applications which are originating from or terminating to. Users should easily understand who is talking to whom and what flows need to be allowed or blocked.	
	Solution should respond faster to security incidents and breaches by automating remediation processes, such as quarantining suspicious applications by integration with leading security vendors.	
	Solution should provide the functionality to remove all the network & security policies assigned to an application/VM whenever that application is decommissioned.	
	Solution should integrate (send, receive events, alerts to & from) with existing Network and Security monitoring tools like Network Management System (NMS), SIEM etc.	

	Solution should integrate with SMTP for sending appropriate email related to different type of events/alerts for the cluster environment	
Private Cloud Orchestrator		
15	The solution should have catalogue of private cloud services, and should support self-service provisioning capabilities	
	The solution should provide authentication, authorization and accounting (AAA) out of the box	
	The solution should have Life Cycle Management Work flows: Provisioning	
	Central administrator must be able to manage/control the marketplace view for the tenants. Any authorised user must be able to deploy the application using the published VMs in his application marketplace.	
	The solution should provide capability of generating reports for usage & performance	
	Ability to integrate with industry standard authentication like AD etc.	
	The model should include at least three user levels for the Platform (Admin/User/Monitor)	
	The solution shall provide a single pane of glass for automated provisioning with model-based orchestration of compute, network, storage through a unified multi-tenant IT service catalogue	
	The solution shall allow authorized administrators, developers or business users to request new IT services and manage specific cloud and IT resources, while ensuring compliance with business policies	
	The solution must be able to provision VM's on ESXi or AHV hypervisor	
	The solution must allow restriction of vCPU, Memory and Disk resources to each project or group of users	
	The solution must allow management of existing/already provisioned VMs and perform automation task	
	The solution must provide full audit governance on who launch the blueprint, output log of each action and script used to run the action.	
	The solution must allow/support disk image of Windows, Windows Server, all variant of Linux.	
	The solution must allow single management console to view the capacity, performance of the infrastructure and the blueprint designer without logging in to different url.	
	The solution must support HTML5	
	The solution must provide a marketplace to allow user to consume the creation of infrastructure easily	
	The designer can define the vCPU & memory for each virtual machine	
	The software must be able to integrate with monitoring software.	
	The software must be able to integrate with application security vulnerabilities detection software	
	The Software should have user management capabilities to support the following:	

	a) Highly configurable user role model	
	b) Mass maintenance of a group of users	
	The Software should support AD authentication, and synchronization of user list and profiles between Software and Active Directory setup.	
	The solution must provide machine intelligence to continuously provide optimization recommendations. Operator should be able to easily fix security vulnerabilities and right-size resources with just one-click. The solution should provide 250+ audit checks to ensure compliance with industry standard regulatory policies and best practices are met.	
	The application must be able to support separation of account creation and role assignment.	
	The application must be able to support Inactive session auto logout.	
Private Cloud Database Life Cycle Management Tool		
16	The tool must provide automated provisioning of standalone or clustered databases.	
	The tool must support all the leading databases, like Oracle, SAP HANA, MS SQL, My SQL, Postgress, Maria DB etc.	
	The offered DB tool must support online copy data management, with a simplified snapshot and cloning process.	
	The Database provisioning tool should be capable of handling Database schema deployment post /pre provisioning of Database.	
	It must allow provisioning of customized images which are tailor-made as per organization need.	
	The integrated copy data management must eliminate any wasteful copy data cost, as in automated deletion of old snapshots and clones as per retention policy.	
	must provide customizable database profiles for software, compute, networking, and database parameters	
	The tool must provide the ability to define recovery SLA's as per customizable RPO.	
	The tool must be able to recover the DB copy from the past point-in-time to the granularity of any second, minute and hour of the day from the past. There must be daily, weekly and monthly point-in-time copies also available beyond this continuous "per-second" recovery as per the defined schedule.	
	This point-in-time DB image must provide user the ability to restore the database on an existing DB server, or automatically create a new VM(s) and restore the DB. This must be an automated process, and user should not go through VM creation process manually.	
	The user must be able to manage multiple DB engines, like Oracle, MS SQL, MySQL etc using the same interface and tool.	
	The DB tool must alert the operator with any new DB patch availability, and provide an easy way to test and implement the patch on the production DB.	
	The tool must maintain the event logs of any major activity and changes and auditing.	
	The tool should have integration with AD/identity management.	

	The tool must be able to integrate with the user preferred self-service tool using the API's.	
Firmware Code and Patch Management		
17	The solution should provide seamless upgrade for (but not limited to) Firmware, Hypervisor, Storage OS, SDS software, BIOS and other such functions which are required in the solution.	
	All patches for the complete hardware and software solution must come from a single validated source. It should be possible to apply and upgrade all software and Hardware related firmware and patches from the same GUI that is used to manage the HCI (It should not use the hardware management console for doing firmware upgrade of hardware)	
Proactive Maintenance and Support		
18	Proposed Appliance should come with a single proactive incident reporting and alerting which covers both Hardware components and full Software stack.	
	Proactive Maintenance feature should automatically have the ability to alert all hardware and hypervisor related alerts to the 24 x 7 Call centre of the vendor.	
	Original Equipment manufacturer should have online 24 x 7 support for any hardware or software related issue	
	Proposed solution should have one window support solution for all the components including hardware, firmware and software used. The support should be from OEM.	
	HCI solution must have direct OEM, L1, L2 and L3 support, 24x7x365 days with unlimited incident support (Telephonic/ Web/ Email) and technical contacts/contract with 60 mins or less response time including the unlimited upgrades and updates.	
19	**Warranty and Maintenance**	
	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.	

3.2.2.1.2 Internet Next Generation Firewall

SL. No.	Technical specifications
	General
1	The vendor must attain ISO 9001:2000 certification that covers scope of the Quality Management System which includes the design, development and manufacturing of network security products and the delivery of associated security services and support
2	The device should be from a family of products that attains ICSA Labs Certifications for Antivirus, Corporate Firewall, Ipsec and SSL VPN
3	The proposed system must attain Phase-2 IPv6 Ready Logo Certification and successfully fulfilled all requirements for IPv6 Phase-2 Core Support as a router product.

4	The proposed system shall support dual hot-swappable power supplies.
5	The proposed solution must be recognized as a Leader/Challenger in the latest Gartner Magic Quadrant for latest Network Firewalls (2019 or 2020 or 2021).
6	The proposed OS must Resided on flash disk for reliability over hard disk and Allow dual booting.
7	Upgradeable via Web UI or TFTP
8	Be easily backup or restored via GUI and CLI to/from local PC, remote centralized management or USB disk
9	Provide CLI to troubleshoot.
10	Have option for encrypted backup file
11	The proposed system shall have option to implement local administrator password policy enforcement including:
12	a) Minimum length
13	b) Character requirements - Upper case, lower case, numbers and special character
14	c) Disallow password reuse
15	d) Password expiration
16	The administrator authentication shall be facilitated by local database, PKI & remote services such as Radius, LDAP and TACACS+
17	The proposed system shall support profile base login account administration, offering gradual access control such as only to Policy Configuration & Log Data Access
18	The proposed system shall be able to limit remote management access:
19	a) From certain trusted network or host with corresponding administrator account
20	b) To certain (virtual) interfaces
21	The proposed system shall allow GUI configurations to external services that includes External threat feeds: URL list, IP list, domain name list and malware file hash
	Firewall
22	The Firewall should be Hardware based, Reliable, purpose-built security appliance with hardened operating system that eliminates the security risks associated with general-purpose operating systems
23	Firewall appliance should have at least 16 x 1GE RJ45 interface, 8 x 1GE SFP slot 4 x 10G SFP+ slot, 4x25GE SFP28/10GE SFP+ and 2x40 GE QSFP+.
24	Firewall Throughput should be 80 Gbps
25	Firewall should have minimum 40 Gbps of VPN throughput
26	Firewall should have 50000 site-to-site & client to site VPN Tunnels.
27	Firewall should have minimum 8000 concurrent SSL VPN users.
28	Firewall should have 450,000 new sessions per second
29	Firewall should have 8 Million concurrent sessions
30	The solution should have minimum 9 Gbps of NGFW throughput for Mix / production traffic

31	The solution should have minimum 7 Gbps of Threat Prevention throughput for Mix / production traffic
32	The Firewall solution should support NAT64, DNS64 & DHCPv6
33	The proposed system shall be able to operate on either Transparent (bridge) mode to minimize interruption to existing network infrastructure or NAT/Route mode. Both modes can also be available concurrently using Virtual Contexts.
34	The proposed system should have integrated Traffic Shaping functionality.
35	The proposed system should support
36	a) IPSEC VPN
37	b) PPTP VPN
38	c) L2TP VPN
39	The device shall utilize inbuilt hardware VPN acceleration:
40	a) IPSEC (DES, 3DES, AES) encryption/decryption
41	b) SSL encryption/decryption
42	The system shall support the following IPSEC VPN capabilities:
43	a) Multi-zone VPN supports.
44	b) IPSec, ESP security.
45	c) Supports NAT traversal
46	d) Supports Hub and Spoke architecture
47	e) Supports Redundant gateway architecture
48	The system shall support 2 forms of site-to-site VPN configurations:
49	a) Route based IPSec tunnel
50	b) Policy based IPSec tunnel
51	The system shall support IPSEC site-to-site VPN and remote user VPN in transparent mode.
52	The system shall provide IPv6 IPSec feature to support for secure IPv6 traffic in an IPSec VPN.
	Virtualization
53	The proposed solution should support Virtualization (Virtual Firewall, Security zones and VLAN). Minimum 10 Virtual Firewall license should be provided.
	Antivirus
54	Firewall should have integrated Antivirus solution
55	The proposed system should be able to block, allow or monitor only using AV signatures and file blocking based on per firewall policy based or based on firewall authenticated user groups with configurable selection of the following services:
56	a) HTTP, HTTPS
57	b) SMTP, SMTPS
58	c) POP3, POP3S
59	d) IMAP, IMAPS
60	e) FTP, FTPS
61	The proposed solution should be able to detect and prevent advanced Malware, Zero-day attack, spear phishing attack, drive by download, watering hole and targeted Advanced Persistent Threat without relying on just Signature database.

62	The proposed solution should be able to perform dynamic real-time analysis of advanced malware on the appliance itself to confirm true zero- day and targeted attacks. Cloud infrastructure system for analysis and detection of Malware.
63	The proposed system should be able to block or allow oversize file based on configurable thresholds for each protocol types and per firewall policy.
	Web Content Filtering
64	The proposed system should have integrated Web Content Filtering solution without external solution, devices or hardware modules.
65	The proposed solution should be able to enable or disable Web Filtering per firewall policy or based on firewall authenticated user groups for both HTTP and HTTPS traffic.
66	The proposed system shall provide web content filtering features:
67	a) which blocks web plug-ins such as ActiveX, Java Applet, and Cookies.
68	b) Shall include Web URL block
69	c) Shall include score-based web keyword block
70	d) Shall include Web Exempt List
71	The proposed system shall be able to queries a real time database of over 110 million + rated websites categorized into 70+ unique content categories.
	Application Control
72	The proposed system shall have the ability to detect, log and take action against network traffic based on over 2000 application signatures
73	The application signatures shall be manual or automatically updated
74	The administrator shall be able to define application control list based on selectable application group and/or list and its corresponding actions
	Data Leakage Prevention
75	The proposed system shall allow administrator to prevent sensitive data from leaving the network. Administrator shall be able to define sensitive data patterns, and data matching these patterns that will be blocked and/or logged when passing through the unit.
	High Availability
76	The proposed system shall have built-in high availability (HA) features without extra cost/license or hardware component
77	High Availability Configurations should support Active/Active or Active/ Passive
78	The proposed system shall support high availability by setting up a cluster with the following characteristics:
79	Supports up to 4 cluster members
80	Supports 2 HA modes; active-passive (failover HA) and active-active (load balancing HA)
81	Cluster units communicate with each other through their heartbeat interfaces
82	Uses a combination of incremental and periodic synchronization to make sure that the configuration of all cluster units is synchronized to that of the primary unit
83	Provides device failover in the event of hardware or software failure
84	Provides link failover when a direct link is not available on one/more monitored interface(s)

85	Provides remote link failover when connectivity with IP addresses of remote network devices, for example, a downstream router is not available
86	In the event of a failover, log messages about the event and can be configured to send log messages to a syslog server. The cluster can also send SNMP traps and alert email messages
87	Supports session failover (also called session pickup) which during cluster operation the primary unit informs the subordinate units of changes to the primary unit connection and state tables, keeping the subordinate units up to date with the traffic currently being processed by the cluster. during cluster operation the primary unit informs the subordinate units of changes to the primary unit connection and state tables, keeping the subordinate units up to date with the traffic currently being processed by the cluster.
88	Supports the option to automatically failback in the event the original unit recovers
89	Supports widely separated cluster units installed in different physical locations
90	The proposed system shall support active-passive virtual clustering that uses virtual unit partitioning to send traffic for some virtual units to the primary cluster unit and traffic for other virtual units to the backup cluster units. If a failure occurs and only one cluster member continues to operate, all traffic fails over to that physical unit, like normal HA.
91	The proposed system shall support full mesh HA configuration where one can connect an HA cluster consisting of two or more cluster members to the network using 802.3ad Aggregate or Redundant interfaces and redundant switches
92	The proposed system shall support out-of-band management for each cluster member where a management interface is reserved with its own configurations and are not synchronized to other cluster units.
93	The proposed system shall support the upgrade of the firmware without interrupting communication through the cluster
	Logs and Report
94	Should have 900 GB of Hard Drive Capacity for logging and reporting if not please quote separate appliance
95	Real-time display of information allows you to follow real-time trends in network usage such as the source IP address and the destination URL for HTTP traffic.
	Warranty and Maintenance
97	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.

3.2.2.1.3 Internet Intrusion Prevention System

Sl. No.	Technical Specifications
	General
1	The vendor must attain ISO 9001:2000 certification that covers scope of the Quality Management System which includes the design, development and manufacturing of network security products and the delivery of associated security services and support

2	The device should be from a family of products that attains ICSA Labs Certifications for IPS.
3	The proposed system must attain Phase-2 IPv6 Ready Logo Certification and successfully fulfilled all requirements for IPv6 Phase-2 Core Support as a router product.
4	The proposed system shall support dual hot-swappable power supplies.
5	The proposed OS must Resided on flash disk for reliability over hard disk and Allow dual booting.
6	Upgradeable via Web UI or TFTP
7	Be easily backup or restored via GUI and CLI to/from local PC, remote centralized management or USB disk
8	Provide CLI to troubleshoot.
9	Have option for encrypted backup file
10	The proposed system shall have option to implement local administrator password policy enforcement including:
11	a) Minimum length
12	b) Character requirements - Upper case, lower case, numbers and special character
13	c) Disallow password reuse
14	d) Password expiration
15	The administrator authentication shall be facilitated by local database, PKI & remote services such as Radius, LDAP and TACACS+
16	The proposed system shall support profile base login account administration, offering gradual access control such as only to Policy Configuration & Log Data Access
17	The proposed system shall be able to limit remote management access:
18	a) From certain trusted network or host with corresponding administrator account
19	b) To certain (virtual) interfaces
20	The proposed system shall allow GUI configurations to external services that includes External threat feeds: URL list, IP list, domain name list and malware file hash
	Hardware
21	The Solution should be Hardware based, Reliable, purpose-built security appliance with hardened operating system that eliminates the security risks associated with general-purpose operating systems
22	Hardware appliance should have at least 16 x 1GE RJ45 interface, 8 x 1GE SFP slot, 12x25GE SFP28/10GE SFP+ and 4x40 GE QSFP+.
23	IPS throughput should be minimum 12 Gbps for Mix / Production traffic
24	IPS should have 450,000 new sessions per second
25	IPS should have 8 Million concurrent sessions
26	The proposed system shall be able to operate on either Transparent (bridge) mode to minimize interruption to existing network infrastructure or NAT/Route mode. Both modes can also be available concurrently using Virtual Contexts.
	Virtualization
27	The proposed solution should support Virtualization (IPS). Minimum 10 Virtual IPS license should be provided.

	Intrusion Prevention System
28	The IPS detection methodologies shall consist of:
29	a) Signature based detection using real time updated database
30	b) Anomaly based detection that is based on thresholds
31	The IPS system shall have at least 12,000 signatures
32	IPS Signatures can be updated in three different ways: manually, via pull technology or push technology. Administrator can schedule to check for new updates or if the device has a public IP address, updates can be pushed to the device each time an update is available
33	In event if IPS should cease to function, it will fail open by default and is configurable. This means that crucial network traffic will not be blocked, and the Firewall will continue to operate while the problem is resolved
34	IPS solution should have capability to protect against Denial of Service (DOS) and DDOS attacks. Should have flexibility to configure threshold values for each of the Anomaly. DOS and DDOS protection should be applied and attacks stopped before firewall policy lookups.
35	IPS signatures should have a configurable action like terminate a TCP session by issuing TCP Reset packets to each end of the connection, or silently drop traffic in addition to sending a alert and logging the incident
36	Signatures should a severity level defined to it so that it helps the administrator to understand and decide which signatures to enable for what traffic (e.g. for severity level: high medium low)
	Application Visibility
37	The proposed system shall have the ability to detect, log and take action against network traffic based on over 2000 application signatures
38	The application signatures shall be manual or automatically updated
39	The administrator shall be able to define application control list based on selectable application group and/or list and its corresponding actions
	High Availability
40	The proposed system shall have built-in high availability (HA) features without extra cost/license or hardware component
41	High Availability Configurations should support Active/Active or Active/ Passive
42	The proposed system shall support high availability by setting up a cluster with the following characteristics:
43	Supports up to 4 cluster members
44	Supports 2 HA modes; active-passive (failover HA) and active-active (load balancing HA)
45	Cluster units communicate with each other through their heartbeat interfaces
46	Uses a combination of incremental and periodic synchronization to make sure that the configuration of all cluster units is synchronized to that of the primary unit
47	Provides device failover in the event of hardware or software failure
48	Provides link failover when a direct link is not available on one/more monitored interface(s)
49	Provides remote link failover when connectivity with IP addresses of remote network devices, for example, a downstream router is not available

50	In the event of a failover, log messages about the event and can be configured to send log messages to a syslog server. The cluster can also send SNMP traps and alert email messages
51	Supports session failover (also called session pickup) which during cluster operation the primary unit informs the subordinate units of changes to the primary unit connection and state tables, keeping the subordinate units up to date with the traffic currently being processed by the cluster. during cluster operation the primary unit informs the subordinate units of changes to the primary unit connection and state tables, keeping the subordinate units up to date with the traffic currently being processed by the cluster.
52	Supports the option to automatically failback in the event the original unit recovers
53	Supports widely separated cluster units installed in different physical locations
54	The proposed system shall support active-passive virtual clustering that uses virtual unit partitioning to send traffic for some virtual units to the primary cluster unit and traffic for other virtual units to the backup cluster units. If a failure occurs and only one cluster member continues to operate, all traffic fails over to that physical unit, like normal HA.
55	The proposed system shall support full mesh HA configuration where one can connect an HA cluster consisting of two or more cluster members to the network using 802.3ad Aggregate or Redundant interfaces and redundant switches
56	The proposed system shall support out-of-band management for each cluster member where a management interface is reserved with its own configurations and are not synchronized to other cluster units.
57	The proposed system shall support the upgrade of the firmware without interrupting communication through the cluster
	Logs and Report
58	Should have 900 GB of Hard Drive Capacity for logging and reporting if not please quote separate appliance
59	Real-time display of information allows you to follow real-time trends in network usage such as the source IP address and the destination URL for HTTP traffic.
	Warranty and Maintenance
60	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.

3.2.2.1.4 Web Application Firewall

Sl. No.	Minimum Technical specifications
1	Proposed appliance should be deployed in HA (High Availability) mode and protect the web applications from attacks. WAF solution should filter the HTTP/S traffic based on the rules set defined. Proposed WAF should be able to address top 10 OWASP vulnerabilities.
2	Proposed solution shall prevent the following attacks (but not limited to): Brute force, Access to predictable resource locations, Unauthorized navigation, HTTP request format and limitation violations (size, unknown method, etc.) and File upload violations

3	Solution should be able to inspect web application output and respond (allow, block, mask and/or alert) based on the active policy or rules, and log actions taken.
4	Support dynamic source IP blocking and should be able to block attacks based on IP source.
5	Support automatic updates (if required) to the signature database, ensuring complete protection against the latest application threats.
6	Proposed WAF should be from different OEM than Firewalls or IPS vendors for better surface security
7	Should have positive security model with behaviour learning capabilities to detect and prevent anomaly in application traffic and unknown attacks. Behavioural learning should be based on true behaviour algorithms, and not just static signatures.
8	Appliance Should have 4-10Gig ports, 64 GB RAM and storage capability of 4 TB.
9	Proposed solution should have integrated Redundant power supply
10	Proposed WAF should be future ready and have capability to install CentOS and Ubuntu based VNF for adapting to suture security requirements on the same appliance.
11	Proposed WAF should be ICSA certified.
12	The solution should protect against web page defacement
13	The solution should support Page Prefetch management and Server Offline takeover
14	The solution should have license upgrade feature on same appliance to support machine authentication based on combination of HDD ID, CPU info and OS related parameters i.e. mac address to provide secure access/authentication to corporate resources.
15	The solution should support standard VRRP for HA interconnection over network.
16	**Warranty and Maintenance**
	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.

3.2.2.1.5 Anti-DDoS

Sl.No.	Minimum Technical Specification
1	Bidder to propose a Dedicated Appliance for DDoS Solution (NOT a part of Router or Application Delivery Controller or Proxy based architecture or NGFW). It should be from different OEM than NGFW and IPS vendors
2	The Anti DDoS module is expected to constantly monitor the behaviour of the application visitors and prevent common application layer attacks.
3	The proposed solution should detect and mitigate both traditional network- layer DDoS attacks and more advanced application layer attacks.

4	The proposed solution should have the capability to be configured in detect as well as protect mode. The proposed appliance should be hyperconverged network function appliance should have capability to install CentOS/ Ubuntu and other open source virtual network functions and have adequate resources to ensure complete DDoS protection
5	The proposed solution should prevent suspicious outbound traffic for threats and blocking malicious traffic. Proposed appliance should have capability to install open source and 3rd party network functions for incorporating zero day features in the same appliance.
6	The proposed solution must support the ability to blacklist a host, domain, URL. Proposed appliance should support all deployment modes like inline and out of path deployment
7	The proposed solution must provide the ability to block bot -originated traffic according to system- supplied signatures
8	The DDoS solution should be a dedicated hardware with dual power supply . The appliance should have 4 X 10GE SFP+ ports
9	Devices should be proposed in high availability using standard VRRP Protocol. No proprietary protocol should be used
10	It shall defend against zero-day network-flood attacks, detect traffic anomalies and prevent zero-day, unknown, flood attacks by identifying the footprint of the anomalous traffic. Automatic Real Time protection for Zero Day attack based on Rate Variant, Rate Invariant algorithms or equivalent mechanisms without human intervention.
11	**Warranty and Maintenance**
	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.

3.2.2.1.6 Anti-APT

Sr No.	Technical Specifications
1	The solution should be able to communicate bi-directionally with the NGFW etc solution for automatic blocking/threat update
2	The solution should support deep packet inspection of SSL encrypted traffic (including HTTPS) for both incoming and outgoing
3	The solution should provide detection, analysis and remediation capability against APT & SSL based APT attacks.
4	The solution must employ an on premise (not on cloud) analysis engine using virtual execution to detect zero day and unknown threats and must not be signature based.

5	The proposed solution should be able to detect and prevent advanced Malware, Zero-day attack, spear phishing attack, drive by download, watering hole and targeted Advanced Persistent Threat without relying on just Signature database.
6	The proposed solution should perform dynamic real-time analysis of advanced malware to confirm true zero-day and targeted attacks. No file should be sent to third party systems or cloud infrastructure system for analysis and detection of Malware
7	The proposed solution should automatically detect and confirm multistage zeroday malware and targeted attacks without prior knowledge of the malware.
8	The proposed solution should utilize a state-full attack analysis to detect the entire infection lifecycle, and trace the stage-by-stage analysis of an advanced attack, from system exploitation to outbound malware communication protocols leading to data exfiltration.
9	The proposed solution should analyze advanced malware against a cross-matrix of different operating systems and various versions of pre-defined applications.
10	The solution must support pre-populated Licensed copies of Operating systems and applications/softwares (like Microsoft Office). There should be no requirement for the customer to buy additional licenses.
11	The system should be able to support file sizes upto 100MB or more
12	The proposed solution should have the ability to analyze, detect and block malware in common file formats including but not limited to executables, JAVA, PDF, MS Office documents, common multimedia contents such as JPEG/GIF/BMP/WMF and ZIP/RAR/7ZIP/TNEF archives to prevent advanced Malware and Zeroday attacks.
13	The proposed solution should capture and store packet captures of traffic relevant to the analysis of detected threats.
14	The proposed solution should have the ability to display the geo-location of the remote command and control server(s) when possible.
15	The proposed solution should have the ability to report the Source IP, Destination IP, C&C Servers, URL, BOT name, Malware class, executable run, used protocols and infection severity of the attack.
16	The proposed solution should be able to send both summary notifications and detailed per-event notifications utilizing the protocols (SMTP, SNMP, or HTTP POST).
17	The proposed solution should have the ability to be deployed in out-of-band mode (also SPAN/TAP) & inline mode
18	The proposed solution should be capable to block inbound malicious exploits delivered via a web channel and outbound call-back communications when deployed in inline, or out-of-band mode.
19	The proposed solution should be able to analyze email attachments and malicious links for static and dynamic analysis
20	The proposed solution should support SMB / CIFS / NFS protocol for sharing and transferring files
21	The proposed solution should provide visibility into scan histories of each file scanned that are aborted, completed, or in progress.

22	The solution should provide reports in (but not limited to) PDF/CSV formats.
23	The solution should have anti-evasion capabilities to prevent malwares detection from being run/executed in the virtualized environment.
24	The solution should protect the endpoints against advanced threats including zero-day attacks, which target application vulnerabilities that have yet to be discovered or patched.
25	The solution should protect the endpoint by monitoring the host memory to detect and block various memory techniques like return-oriented programing, heap spraying, etc.
26	The solution should support SIEM log integration.
27	The solution should be able to schedule reports and also provide the flexibility to generate on-demand reports like daily/weekly/monthly/ yearly/specific range (day and time) etc.
28	Minimum number of Interfaces - 4x GE
29	The proposed solution shall support 8 VM and upgradable upto 14 VM in future if required.
30	It should support Sandbox Analysis for multiple operating systems like Windows 7, Windows 8.1, Windows 10, macOS, Linux etc.
31	The APT appliance should be able to process minimum of 160 files/hour or 115,000 files/month (either web or mail or client or all) on VM sandboxing
32	High Availability & Maximum Scalability
33	The solution should have dual AC power supply fully populated (within box) from day one
34	The proposed solution shall at least supported by OEM for next 5 years.
35	**Warranty and Maintenance**
	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.

3.2.2.1.7 Antivirus Solution for Servers

S.No	Technical Specification
1	Should offer comprehensive customer/server security by protecting enterprise networks from which includes virus protection, spyware, rootkits, bots, grayware, adware, malware and other computer borne threats or mixed threat attacks or any emerging cyber-attacks or zero-day attack protection.
2	Solution Should clean computers of file-based and network viruses plus virus and worm remnants (Trojans, registry entries, viral files) through a fully-automated process.
3	Should be able to reduce the risk of virus/malware entering the network by blocking files with real-time compressed executable files.
4	Should include capabilities for detecting and removing rootkits
5	Should provide Real-time spyware/grayware scanning for file system to prevent or stop spyware execution

6	Should have capabilities to restore spyware/grayware if the spyware/grayware is deemed safe
7	Should have Assessment mode to allow first to evaluate whether spyware/grayware is legitimate and then take action based on the evaluation
8	Should clean computers of file-based and network viruses plus virus and worm remnants (Trojans, registry entries, viral files)—through a fully-automated process
	To address the threats and nuisances posed by Trojans, the solution should be able to do the following but not limited to:
9	a) Terminating all known virus processes and threads in memory
10	b) Repairing the registry
11	c) Deleting any drop files created by viruses
12	d) Removing any Microsoft Windows services created by viruses
13	e) Restoring all files damaged by viruses
14	f) Includes Clean-up for Spyware, Adware etc.
15	Should be capable of cleaning viruses/malware even without the availability of virus clean- up components. Using a detected file as basis, it should be able to determine if the detected file has a corresponding process/service in memory and a registry entry, and then remove them altogether.
16	Should provide Outbreak Prevention to limit/deny access to specific shared folders, block ports, and deny write access to specified files and folders on selected customers in case there is an outbreak
	Behaviour Monitoring:
17	a) Should have behaviour monitoring to restrict system behaviour, keeping security related processes always up and running
18	b) Enable certification that a software is safe to reduce the likelihood of false positive detections or equivalent
19	Should provide Real-time lock down of customer configuration allow or prevent users from changing settings or unloading/uninstalling the software
20	Users with the scheduled scan privileges can postpone, skip, and stop Scheduled Scan.
	CPU/memory (physical or virtual) usage performance control during scanning:
21	a) Checks the CPU usage level configured on the Web console and the actual CPU consumption on the computer
22	b) Adjusts the scanning speed if:
23	c) The CPU usage level is Medium or Low
24	d) Actual CPU consumption exceeds a certain threshold
25	Should have a manual outbreak prevention feature that allows administrators to configure port blocking, block shared folder, and deny writes to files and folders manually
26	Should have Integrated spyware protection and clean-up
27	Should have the capability to assign a customer the privilege to act as a update/master relay agent for rest of the agents in the network
28	Shall be able to perform different scan Actions based on the virus type (Trojan/ Worm, Joke, Hoax, Virus, other)

29	shall be able to scan only those file types which are potential virus carriers (based on true file type)
30	Should be able to detect files packed using real-time compression algorithms as executable files.
31	shall be able to scan Object Linking and Embedding (OLE) File
	Should provide Web threat protection by the following ways:
32	a) Should be able to protect the endpoints from Web threats by blocking access to and from malicious sites based on the URL's reputation ratings
33	b) Should extend Web threat protection to the endpoints even when they disconnect from the network, i.e. regardless of the location
34	c) Should have the capabilities to define Approved URLs to bypass Web Reputation policies
35	d) Should provide real-time protection by referencing online database with millions of rated Web domains
36	e) Configure Web reputation policies and assign them to individual, several, or all end users machine.
	Should provide File reputation service
37	a) Should be able to check the reputation of the files hosted in the internet
38	b) Should be able check the reputation of the files in webmail attachments
39	c) Should be able to check the reputation of files residing in the computer
40	Should protect customers and servers on the network, high performance network virus scanning, and elimination.
41	Should provide the flexibility to create firewall rules to filter connections by IP address, port number, or protocol, and then apply the rules to different groups of users
42	Should have smart feedback to enable feedback from the customer agents to the threat research Centers of the vendor.
	Uses any alternate method other than the conventional pattern based scanning with the following features:
43	a) Provides fast, real-time security status lookup capabilities in the cloud
44	b) Reduces the overall time it takes to deliver protection against emerging threats
45	c) Reduces network bandwidth consumed during pattern updates. The bulk of pattern definition updates only need to be delivered to the cloud or some kind of repository and not to many endpoints
46	d) Lowers kernel memory consumption on endpoints. Consumption increases minimally over time.
	Should be able to deploy the Customer software using the following mechanisms:
47	a) Customer installation Package (Executable & Microsoft Installer (MSI) Package Format), should support silent installer, unmanaged customers, specific installer for servers
48	b) Web install page
49	c) Login Script Setup
50	d) Remote installation
51	e) From a customer disk image

52	Should provide a secure Web-based management console to give administrators transparent access to all customers on the network
53	The management server should be able to download updates from different source if required.
54	Should reduce network traffic generated when downloading the latest pattern by downloading only incremental patterns.
55	Should have the flexibility to roll back the Virus Pattern and Virus Scan Engine if required via the web console
	Should have role based administration with active directory integration
56	a) To create custom role type
57	b) To add users to a predefined role or to a custom role
58	Should have integration with the Active directory 2008/2012 or higher
59	Shall support grouping of customers into domains for easier administration & Endpoint security solution should provide vulnerability protection, which should scan the machine and provide CVE number visibility and accordingly recommend rule for virtual patch against vulnerability.
60	Establish separate configuration for internally versus externally located machines (Policy action based on location awareness)
61	Should be capable of uninstalling and replacing existing customer antivirus software and to ensure unavailability of any residual part of the software.
62	Security Compliance should leverage Microsoft Active Directory services to determine the security status of the computers in the network
63	Should have a feature similar to Firewall Outbreak Monitor which sends a customized alert message to specified recipients when log counts from customer IPS, customer firewall, and/or network virus logs exceed certain thresholds, signalling a possible attack.
64	Should be able to send a customized notification message to specified recipients when firewall violations exceed certain thresholds, which may signal an attack
65	Should perform Boot & Rootkit scan and cleaning, Endpoint security solution should have capability of AV, Zero day threat protection, Vulnerability protection, HIPS, Firewall, Device control, virtual Patching and integrated DLP with pre and post machine learning execution for malware analysis.
66	Virus definition files should be lighter so that same can be transmitted to remote locations having minimum of 64kbps link or the update pattern size should be less than 200Kb
67	System should be configured in such a way that at no case no endpoints/remote agents will be able to communicate with OEM cloud for obtaining updates through internet.
68	In case of bot infection, bot removal tools also to be facilitated to clean the infected machine
69	The solution should have latest machine learning technology in built from day one.
70	The solution should have the option of the endpoint vulnerability shielding in the network.
71	The solution should have ransomware protection in built.
72	Solution should have URL and web filtering at gateway level for web security
75	Solution should support IPv4 and IPv6 from day one

	Warranty and Maintenance
76	The bidder should provide comprehensive warranty till end of contract period with 24 x 7 x 365 for all equipment and software included in the proposed solution.

3.2.2.1.8 Multifunction printer cum scanner

SL NO.	Technical Specification	
1	PRINT	
	Print speed, black	Minimum 10-20
	Print output	Black and white
2.	CATEGORY	
	Product type	Laser printers
3.	FEATURES	
	Functions	Print, copy, scan
4.	CONNECTIVITY AND COMMUNICATIONS	
	Connectivity, optional	None
	Modem	33 kbps
	Connectivity, standard	Hi-Speed USB 2.0; Fast Ethernet 10/100Base-Tx network port; Wireless 802.11 b/g/n
	Network capabilities	Via built-in 10/100 Base-TX networking
	Wireless capability	Yes, built-in Wi-Fi 802.11b/g/n
	Mobile printing capability	Apple AirPrint™; Google Cloud Print™; Mobile Apps; Mopria™ Certified; Wi-Fi® Direct Printing
	Network protocols, supported	Via built-in networking solution: TCP/IP, IPv4, IPv6; print: TCP-IP port 9100 Direct Mode, LPD (raw queue support only), Web Services Printing; discovery: SLP, Bonjour, Web Services Discovery; IP Config: IPv4 (BootP, DHCP, AutoIP, Manual), IPv6 (Stateless Link-Local and via Router, Stateful via DHCPv6); management: SNMPv1/v2/v3, HTTP
5.	PRINTING MEDIA HANDLING	
	Finished output handling	Sheetfed
	Envelope input capacity	Up to 10 envelopes
	Output capacity	Up to 100 sheets
	Maximum output capacity (sheets)	Up to 100 sheets

	Media type and capacity, tray 1	Sheets (75 g/m²): 150; envelopes: 10
	Paper handling input, standard	150-sheet input tray
	Input capacity	Up to 150 sheets
	Paper handling output, standard	100-sheet output bin
	Standard output capacity (envelopes)	Up to 10 envelopes
	Maximum input capacity (sheets)	Up to 150 sheets
6.	CARTRIDGES AND PRINTHEADS	
	Technology	Laser
	Number of print cartridges	1 (black)
7.	COPY SPEED	
	Copy speed (black, normal quality, A4)	Up to 20 cpm
	Copy speed black (normal, letter)	20 ipm
8.	BATTERY AND POWER	
	Power	110-volt input voltage: 110 to 127 VAC, 50/60Hz and 220-volt input voltage: 220 to 240 VAC, 50/60Hz
	Power Consumption	Active Printing: 300 watts, Ready: 38 watts, Sleep: 1.9 watts, Manual off: 0.2 watts
	Power supply type	Internal (Built-in) power supply
9.	DIGITAL SENDER SPECIFICATIONS	
	Digital sending standard features	Scan to WSD; WSD Scan; PC Scan
10.	PRINT TIME	
	First page out black (letter, ready)	minimum 10 sec
	First page out black (A4, ready)	Minimum 10 sec

11.	PRINTER SPECIFICATIONS	
	Duty cycle (monthly, letter)	Up to 10,000 pages
	Duty cycle note	Duty cycle is defined as the maximum number of pages per month of imaged output.
	Functions	print,copy,scan,fax and wireless
	Duty cycle (monthly, A4)	Up to 10,000 pages
	Paper trays, standard	1
	Recommended monthly page volume	100 to 2,000 minimum
	Print technology	Laser
	Duplex printing	Manual (driver support provided)
	Warm-up time	35 sec
	Automatic paper sensor	No
	Printer management	None
	Print colours	No
12.	SCANNER SPECIFICATIONS	
	Scan size (ADF), maximum	216 x 356 mm
	Scan file format	Windows Scan SW supports file format: PDF, JPG, TIFF, PNG, BMP
	Color scanning	Yes
	Auto document feeder capacity	Standard, 40 sheets
	Scanner type	Flatbed, ADF
	Scan size, maximum	216 x 297 mm
	Levels of grayscale	256
	Scan input modes	Front-panel copy,user application via TWAIN or WIA
	Scan size ADF (minimum)	145 x 145 mm
	Bit Depth	8-bit (mono); 16-bit (color)
	Twain version	Version 1.9
	Scan technology	Contact Image Sensor (CIS)

13.	ENVIRONMENTAL	
	Operating humidity range	10 to 80% RH (non-condensing)
	Storage temperature range	-20 to 40°C
	Operating temperature range	10 to 30°C
	Acoustic power emissions	6.5 B(A) (printing at 20 ppm)
	Recommended operating temperature range	15 to 27°C
	SYSTEM COMPONENTS	
	Control panel	2-Line LCD; 30 Buttons(Power, Cancel, Start, Navigation(Menu, OK, Back, Left, Right), ID_Copy, Contrast, Scale, Wireless, Numeric & Tel(1~9, 0, *, #, Address Book, Redial, On hook), Mode(Fax, Copy, Scan to); LED indicator lights(Power, Status, Wireless, Mode)
14.	PROCESSOR	
	Processor speed	600 MHz
15.	SCAN RESOLUTION	
	Scan Resolution, Hardware	Up to 4800 × 4800 dpi
	Enhanced scanning resolution	Up to 4800 x 4800 dpi
	Scan Resolution, Optical	Up to 600 × 600 dpi
16.	MEMORY	
	Memory	Minimum 128 MB
	Memory, maximum	Minimum 128 MB
17.	BOX CONTENTS	
	Cable included	Yes, 1 USB; 1 USB PC to Printer
18.	SUPPORTED PRINTING MEDIA	

	Media sizes supported	A4; A5; A5(LEF); B5 (JIS); Oficio; Envelope (DL,C5)
	Media size, tray 1	A4; A5; A5(LEF); B5 (JIS); Oficio; Envelope (DL,C5)
	Media weight, supported	60 to 163 g/m²
	Media types	Plain, Thick, Thin, Cotton, Color, Preprinted, Recycled, Labels, CardStock, Bond, Archive, Envelope
	Media sizes supported, key	10 x 15 cm; A4; Envelopes
	Media size (ADF)	B5
19.	SYSTEM REQUIREMENTS	
	Minimum System Requirements	Windows 7 or newer, Intel® Pentium® IV 1 GHz 32-bit or 64-bit processor or higher, 1 GB RAM, 16 GB HDD
20.	SOFTWARE AND APPLICATIONS	
	Driver updates	Latest supported operating systems
21.	SUPPORTED OPERATING SYSTEMS	
	Compatible Operating Systems	Windows®: 7 (32/64 bit), 2008 Server R2, 8 (32/64 bit), 8.1 (32/64 bit), 10 (32/64 bit), 2012 Server, 2016 Server, macOS v10.14 Mojave, macOS v10.13 High Sierra, macOS v10.12 Sierra, OS X v10.11 El Capitan
	Compatible network operating systems	Windows®: 7 (32/64 bit), 2008 Server R2, 8 (32/64 bit), 8.1 (32/64 bit), 10 (32/64 bit), 2012 Server, 2016 Server, macOS v10.14 Mojave, macOS v10.13 High Sierra, macOS v10.12 Sierra, OS X v10.11 El Capitan
	Operating system (supported note)	Windows 7 or higher
22.	PRINT RESOLUTION	
	Print quality black (normal)	Up to 600 x 600 dpi
	Print quality black (best)	Up to 1,200 x 1,200 dpi
23.	RACK AND POWER SPECIFICATIONS	
	Typical electricity consumption (TEC) number	0.876 kWh/Week (BA), 0.924 kWh/Week (ES)

24.	ADVANCED FEATURES	
	Scanner advanced features	Scan to WSD(network support only);Book Scanning; Poster Stitching for multiple scan; Text Converting; Scan to E-Book; Existing File to E-Book
	Copier smart software features	Automatic document feeding; Automatic adjusting background; Extended layout (2-up, 4-up, ID copy); expanded contrast adjustments (11 different settings);Scale from one paper size to another (Letter>A4, AutoFit);
	Printer smart software features	Manual duplex and booklet print, N-up printing, skip blank pages, poster print, watermarks
	Energy savings feature technology	Power save
25.	COPIER SPECIFICATIONS	
	Copies, maximum	Up to 99 copies
	Copy reduce / enlarge settings	25 to 400%
	Copier scaling (ADF)	25 to 400%
	Copier settings	Copies; Original Size; Reduce/Enlarge; Darkness; Original Type; Collation; 2-Up; 4-Up; ID Copy; Adjust Background; Auto Fit Copy
26.	SECURITY MANAGEMENT	
	Security management	Password-protected network embedded Web server; enable/disable Network ports; SNMPv1 community password change; SNMPV2&V3; IPSec; Filtering : MAC, IPv4, IPv6
27.	Warranty and Maintenance	
	Total Contract duration	

3.2.3 Customer care center

S.No.	Particulars	No. of locations	Units per location
1	VM base License for ACD	1	2
2	IVR+ Dialler+ Recording+ reporting	1	1
3	PRI- Gateway	1	1
4	Agent License	7	3
5	Supervisor License	7	1
6	Server with OS for ACD + IVR	1	2
7	Workstations and PCs – 4 for each province – with soft calling and headphones	7	4
8	Network devices (firewall +Switch)	7	1
9	Multi-function printer	7	1
10	Furniture	7	5
11	IP Phone	7	5

3.2.3.1.1 Customer Care Contact center system

Description/ Function	Compliance (Yes/No)
Contact Centre solution (ACD, CTI, Dialer, Recorder etc) should be from same OEM as the telephony.	
Contact Centre Hardware Server should be server based and from Gartner magic quadrant listed provider	
Contact Centre Equipment should support minimum 200 agents without changing the contact center hardware.	
Expansion to 200 agents should be performed by just adding licenses only.	
It must have the latest released Operating System version available by the manufacturer. The supporting documentation of this requirement must be attached in the vendor technical proposal.	
Proposed Contact Centre system should support Inbound, Outbound, Email, Chat, Webchat call back etc	
Proposed System should have complete blend solution for agents	
Proposed System Should handle up to five simultaneous contacts like Voice, Email, Chat	
System should have the capability to route call/contact to best skilled agents.	
System should support geographic redundancies.	
System should have the capability to support multichannel agents across up to 30 locations from day of implementation.	
System Should have inbuild progressive and preview outbound dialing with campaign manager.	
system should support remote agents to work from different places.	

System should have built in Graphical call flow designer.	
System should have the capability to prioritize customers based on business strategies.	
System should support multiplicity feature which allows an agent to handle multiple concurrent multimedia contacts. At any one time an agent can be active on a voice and multimedia contact.	
Proposed System should support 50 Supervisor without changing the hardware.	
Call center hardware should be 1U Rack Mountable, 2 x Intel Xeon 14 Core 2.6 GHz CPU, 256 GB RAM, Minimum 2 TB useable SSD Hard disk with RAID 5, with duplicated power supply or better	
Solution include Agent sending video URL for Video Conference / 1-to-1 Video Calling	
Support video joining by multiple party from desktop/laptop browser without downloading any application/Client or Plug-in	
Support 400 or more video joining in multiple party when required	
Support video joining from mobile through mobile application	
Support File Sharing and Screen Sharing while in video call	
Support Recording of video call	
Complete Contact Centre System, IP PBX and IP Phone should be from same OEM for easy integration and better experience for customer	
Inbound ACD: Proposed System Should Have the below mention features	
Caller ID	
Hold	
Hold Music (Music on Hold)	
Transfer	
Incoming Call Routing	
Conference Calls	
Make Call	
Supervised Transfer	
Complete Transfer	
Join Conference	
Get Status	
Get Call Capabilities	
Get Data	
Delete Data	
Get/Set UUI	
Consult	
Call routing based on the caller CLI	
Skill based Agent Routing	
Configurable Call Tree	
IP Based Softphone	
Screen Popup	

Outbound: System Should Have the below mentioned features for Outbound Functionality	
Proposed outbound system should support progressive, preview dialing	
Web based GUI for easy enable/disable agent's skills.	
Route calls to the most appropriate resource.	
Should support 'Preview' customer information before placing call.	
Should support Defined Agent scripts	
Should support Campaign creation/scheduling/priority	
Should Have Monitor real time progress functionality	
Should Support Review and update customer information	
Should have End a call and assign a disposition code	
Email: System should have the below mentioned features for Email Functionality	
Complete blend features should be available	
Email should be routed to agent based on address where the contact is received, the text in the email message or the sender.	
Email message will be assigned to a skillset with a priority and then to an agent who can handle the contact based on the received criteria.	
System Should Have the capability to view real-time traffic reports for email messages	
System should have the capability to configure the Supervisor Email approval feature so that supervisors can approve email messages before they reach the customers.	
Some or all the email messages can be sent for supervisor approval	
Email messages targeted for supervisor approval on a per skillset basis or per agent basis.	
System Should support different rules for email routing to agents	
System should send automatic initial email response when the email arrives at the contact centre.	
The email response should contain the email address to which the customer sent the original email message.	
System should support auto-rejection of email messages from all skillsets based on keyword	
Chat: System Should Have the below mentioned features for Chat Functionality	
Complete blend features should be available	
Should provide welcome messages for all contacts	
Should have specialized messages for each skillset	
Should have labels in the text-based conversation to identify the text written by the customer and agent	
Should be able to send a copy of the transcript of the Web communication contact to the customer when the contact is complete	
Alert should be there to indicate when the agent or customer stops responding in the Web communication contact	

System should have automatic phrases to configure text for agents to automatically insert in the text-based conversation	
System should have feature of page push URLs, a predefined URL that is commonly sent to customers	
An agent-supervisor can observe or participate in any currently active agent-customer Web communications chat session	
Should support transfer the chat communication to different skill set agents	
Agent-supervisors using Agent Desktop should display of all such applicable Web communications and Voice contacts currently active	
Voice Recording Solution	
System should have in-built capability to automatically as well as manually record and store calls into any voicemail box or a central database, for later retrieval, sorting, searching through a web-based browser interface	
Recordings should be able to be made based on:	
User ID	
Account code	
Hunt Group	
Caller ID	
Incoming call route	
Time profiles	
System should support automatic deletion of oldest recordings, if needed	
Recorder Should have Search and replay for the calls recorded	
Reporting Solution	
Should have Web-Based Administrator and Supervisor Application	
Should provide Realtime and historical reports	
Inbound Call History	
Inbound Call Received by Agents & Call Duration	
Outbound Call History	
Outbound Call Dialled Number with Duration	
Agent Call Received History	
Day/Month Wise Inbound/Outbound Call Details	
Total Dropped call Details	
Abounded call report	
Reporting, Real Time Displays	
Should have Time-Line Display in Realtime reports	
Should have Agent MAP	
Should have Interactive Dashboard	
should provide Contact Summary Report	
should provide Activity Codes wise report	
should provide Source of Disconnect of the calls	
Should provide agent based, skill-based reports	

System should have minimum 30 predefined reports	
Report should be exported to word, XLS and PDF format	
Customizable Graphical Wallboards	
Should have Browser based Administration	
Should have Remote Agent Logout	
Agent Performance	
Multimedia Reports	
Outbound Reports	
Contact Summary Reports	
Call-By-Call Reports	
Configuration Reports	
Agent Desktop Client: Agents front end interface should have the below mentioned features and functionalities	
Agent Login	
Agent Logout	
Ready	
Not Ready	
ACD Set Activity Code	
ACD Set Not Ready/Reason code	
Observe call	
Barge In	
Call Supervisor	
Emergency Key	
Redirect to another group	
Agent Desktop flags any Web Communications contacts where certain intrinsic values exceed the defined threshold	
Agent Desktop should display live skillset-related statistics as below	
Refresh: Reloads and resets the skillsets list in the skillset	
Statistics should show in pie or bar chart	
It should display the number of Agents available and not ready	
Should Displays the maximum time the customer has to wait before being connected to an agent.	
Should Displays the number of calls waiting	
Should provide alerts for skillsets, whose Service Level falls below the threshold defined	
It should Display Agent statistic chart	
Should allow to enable service level alerts	
It should display assigned skillsets, contacts waiting	
Supervisor should be able to change Agent status from ready to not ready and vice-e versa	
Agent Desktop should have be able to perform the below mentioned telephony task	
Accept and decline incoming contacts	
Enter an Activity code	

Enter an After-Work Call Item code	
Place and release a call on hold	
Transfer a call to another party	
Conference a call	
Join two calls (if available)	
End a call	
Call a supervisor	
Enter DTMF Digits	
Handle an emergency	

3.2.3.1.2 IP PBX SYSTEM

Description/ Function
TECHNICAL SPECIFICATIONS FOR IP PBX SYSTEM
The system should be based on server-gateway architecture running on Windows/Linux OS supporting Analog, IP, SIP and Wireless Extensions.
No card-based systems, only server and gateway architecture-based systems needed
The Linux Version used for the server shall be optimal for the call processing and operational demands of real time communication system.
System shall be non-blocking and open standard (based on H.323 and SIP). The call control system should support fully redundant solution (optional 1:1 redundancy)
The servers should be of industry standard makes like DELL/HP/IBM/Huawei only. The proposed server should be capable of supporting at least 3000 extensions in future. The expansion should not require any additional hardware.
The server should have the following minimum specifications: 2 x Intel 10 Core 2.2 GHz CPU, 128 GB RAM, 2TB usable SSD HDDs in at least RAID 5 hot-swappable, hot-swappable power supplies, 6 x 1G LAN ports. The vendor may provide better specifications available at the time of bidding.
The system should be capable of deployment on virtualized platforms like VMWare/Hyper-V etc.
System should support mobility, IM and presence, Web-Collaboration, Messaging, and centralized licensing.
The system should support standards-based multi-site networking, using QSIG, H.323 trunks or advanced networking, to interoperate with other PABX's, allowing feature transparency.
Voice CODEC support G.711, G.729, G.729a & G.722 or any less utilization bandwidth across WAN and LAN
Video CODEC: H.264 or Equal
System should have built-in SIP and H.323 gatekeeper functionality without the need to put any additional hardware
System should support SIP trunking to Internet Telephony Service Providers, allowing non-SIP phones to make SIP calls
The system should support at least 100 remote sites on the same platform through gateways for branch connectivity

The system should provide complete inbuilt encryption capabilities or features without any external firewall, with the ability to encrypt all traffic (media and call control signalling) between IP phones, soft phones, call controllers and all other associated endpoints via a strong encryption algorithm like IPsec or SRTP etc.
System should be able to provide centralized voicemail with the option of Distributed centralized voicemail in case of connectivity failure.
The communication server should offer BHCC (Busy Hour Call Completion) of at least 20000 per server to ensure superior traffic handling capacities.
The offered system should be modular in design. The architecture of IP PBX should be capable of seamless migration to its maximum capacity by simply adding licenses/peripheral cards on the set of control server without compromising on any functions/ features of this system or any degradation of service.
The proposed communication system should have a highly secured, encrypted IP supporting hybrid Trunks e.g. Analog CO, Digital Trunks (PRI), IP Trunks (H.323/SIP)
System should have in built-in DHCP Server, which should be able to give IP Addresses to the endpoints.
System should support built-in Remote access server (RAS) functionality.
System should support Diffserv for QoS (Quality of service) for the voice packets traveling over data networks
System should support standards-based CTI integration with 3rd party applications
System should support WebRTC based application for Web Collaboration users for Windows and Mac OS
Should support Active Directory integration for directory synchronization and user authentication.
The equipment quoted by bidder must be SIP compliant
The system should support a mobile client (on cell phone)
DESIRED FEATURES & FACILITIES OF IP PBX:
The offered solution should provide the following features as a part of its telephony functions.
Call Coverage
Call Forwarding
Call Hold
Call Intrude
Call Park
DND
Ring Back When Free
Suspend Call Waiting
Distinctive and Personalized Ringing
Toggle Calls
Account Codes
Call Barring
Bridged Appearance
Group Paging

Hot Desking
Mobile Twinning
Multiple Appearance Directory Number (MADN)
Intrusion Warning Tone
Alternate Route Selection
Flexible numbering Schemes
Time of Day and Date Routing of Calls
Call Recording
PIN Restricted Calling
Time Profiles
Queue announcements
Call Detail Recording
SMDR (Station Messaging Detail Record)
Fax on demand integration
Station Call – User can dial any extension anywhere in central location and other distributed location by dialling simple extension number.
Support Tone dialling from an extension.
Authorization Codes - 5-7-digit authorization code to make outgoing toll calls for ensuring no misuse of the system.
Automatic Call Back – User can register ACB feature to any extension of the offered system.
Call pickup within the group as well as outside the group
Alternate Routing – Automatically re-route calls which encounter a busy trunk on the initial route. Automatic digital translation is carried out by the system. Provides the possibility of reaching external destinations via different routes.
Call Detail Recording – Records detailed call information on all incoming and outgoing calls on specified trunk groups and stations, including those administered for intra-switch recordings, and send this information to any printer of time/duration as and when required. Necessary hardware and software if required to be quoted separately.
Class of Service – Defines whether voice terminal users may access the following features and functions:
Automatic Call-back, Call Forwarding, Call Forward, Busy/Don't Answer, Data Privacy, Extended Forwarding, Extended Call Forward Busy/Don't Answer, Priority Calling, Restrict Call Forwarding Off-Net, Personal Station Access, Trunk –to-Trunk, Transfer Restriction Override, Off-Hook Alert & Console Permission.
DID/DOD (Direct Inward/Outward Dialling) – The proposed system must support direct inward dialling for external parties to call in.
Direct Inward Station Access – This feature must be optionally available, allowing an outside caller to access switch features by dialling a special telephone number without attendant assistance, it should permit access to the server and long distance facilities from off-premise stations. For security, there should be the option of turning off this feature.
Day/Night Trunk Control – To reduce cost and improve system security it should be possible to restrict the access to certain trunks depending on time of day.

Distinctive Ringing – To provide audibly different ringing patterns between internal, external, and special feature calls.
Flexible numbering plan – Support up-to 2-15 Digit for an extension number and allow phone number assigned to a station to a station to be changed through software.
System Abbreviated Dialling - To have the ability to store a list of frequently called numbers that will be available on a systemwide basis to all users.
The system should support internal MOH (Music on Hold), which should be uploaded using the .Wav file and should have an audio input port for external MOH connectivity.
CLI (Caller Line Identification) facility (CLIP/CLIR) - Calling Numbers (internal & external) should be displayed on all Analog extensions (FSK support phone).
Should support Web collaboration for desktop and application collaboration, whiteboarding and document sharing. It should be possible to escalate from an audio call to web collaboration. It should provide a document library possible to upload documents, presentations, and pictures to a document library for quickly sharing during a web collaboration session.
Voicemail Features
System should have inbuilt voice mail system
Voicemail to email option should be available
System should support unified messaging with Microsoft Exchange or any IMAP compliant email application.
System should support voicemail access through web-browser
External Fax server integration should be possible.
Voicemail should support Auto Attendant
IVR functionality should be available
Conferencing Features
The system should have built-in 10 x 50 party Ad-Hoc or Meet-Me audio conferencing bank from day 1.
Multiple conferences with variable number of users should be possible within each of the conferencing banks.
System should be able to generate detailed reports about the conference.
System should be able to send emails to all the participants giving them the conferencing details
System should support PIN based security for conference calls.
System should support scheduling of conference call.
Management Interface
System should be able to be configured and administered using a GUI based application
System should support SNMP based network management
In case SNMP management is not available, system should be capable of sending event notifications to up-to 3 email addresses, each with a different set of alarms
UC Functionalities
System should support below UC functionality and can be added if required in future
Same Unified Communications (UC) client that provides users with real time collaboration capabilities

Support for Windows and MaC OS
Support for Android and iOS devices Smartphones
The Softphone should provide full call control from an iPhone or Android powered smartphone.
Make and receive phone calls and instant messages, host and attend audio conferences.
The Softphone application should be downloadable from Google Playstore or Apple iTunes without any additional cost for any number of device.
Solution should provide a "presence" application for users, so that they can see the availability status of their contacts in their contact list.
The common supported status for this application should be available, busy, idle, away etc.
The instant messaging application should support manual setting of user status to: Available, Away, Do Not Disturb (DND) etc.
Shall provide support for open protocols like XMPP.

3.2.3.1.3 IP Phone

Specification
Soft Operator Console with IP Phone
SoftConsole should be PC-based operator console that provides a visible display of call information and PC-based call handling
SoftConsole should enables phone operators/receptionists to answer, route and manage incoming calls from the screen of their PCs
SoftConsole users can simultaneously view caller information, directory information, held calls and company-wide phone status.
Color display – 2.8 inches x 2.1 inches (7.0 cm x 5.3 cm) – Diagonal width: 3.5 inches (8.8 cm) Color display
8 buttons with LEDs and 4 softkeys
Hard buttons for phone, messages, contacts, history, home, navigation cluster, headset, speaker, volume, mute
LEDs for speaker, mute, headset, message, history
Phone should be supplied with two color expansion modules of 24 configurable feature/line buttons with each feature/line button has LED indicator
Wideband audio in handset and headset
Full duplex speakerphone
Message waiting indicator
Mute indicator with optional mute alerting
Rich, classic, alternate, and downloadable ringtones
Should have integrated 2-port 10/100/1000 RJ45 primary Gigabit Ethernet (10/100/1000 Mbps) PoE LAN port RJ45 secondary Gigabit Ethernet (10/100/1000 Mbps) port for a computer
PoE Class (IEEE 802.3af) and supports 802.3az.
Support/supplied with AC to 5-volt adapter
SIP & H.323 protocol support

Standards-based codec support: G.711, G.726, G.729A/B, G.722
Support Wireless Module for Wi-Fi
IP Phone shall be of same make as that of IP-PBX for better quality of voice experience

3.2.3.1.4 Desktop PC

Component	Description
Processor	9th Generation Intel Core i5 9500 or better, with 6 core, 9MB cache 3.0GHz
Chipset	Latest Generation business class Chipset (B360/H370/Q370) compatible with the above processor.
Motherboard	Motherboard make from the same Desktop OEM (OEM logo must be embossed in the motherboard)
Memory	Minimum 8 GB with support for expansion up to 32 GB or higher.
RAM Type	DDR4 with 2666 MHz or higher.
DIMMs & Expansion Slots	2 DIMM slots or higher and minimum 4 PCIe series expansion slots .
Hard Disk Capacity	At least one single disk of Min 1 TB with 7200 rpm or higher.
Graphics	Integrated Graphics (UHD / 4K).
Network	10/100/1000 on-board integrated Network Port.
USB / HDMI / VGA Ports	Integrated USB Port : Minimum 8 nos. (Min 4 nos. of 3.1 Gen-1), out of 8 ports minimum 4 ports in front
	Integrated HDMI Port : Minimum 1 no.
	Integrated VGA / Display Port : Minimum 1 no.
Audio	Integrated Audio controller with Internal speaker
Cabinet	Should be 15 litters or lesser in volume
SMPS	Minimum 230 W or above. Should be capable of supporting fully configured PC.
Operating system	Preloaded Windows 10 Professional and Latest Antivirus with 5 years subscription.
Warranty	3 Year Onsite

3.2.3.1.5 Switch

S.No	Specification
1	**Hardware Specifications:**
2	Switch - 7x GE RJ45, 1x GE/POE-PD RJ45 and 2x GE SFP
3	RJ-45 Serial Console Port- 1
4	Form factor- Desktop
5	Should be manageable from Central Switch controller.
6	**System Specifications:**
7	Switching Capacity 20 Gbps

8	4K Vlan supported
9	Link Aggregation Group Size- 8
10	MAC Address Storage support for 8K
11	Packet Buffers- 512 KB
12	ACL -750
13	Mean Time Between Failures- more than 10 Years
14	**Layer 2 Features:**
15	Jumbo Frames and Auto-negotiation for port speed and duplex
16	Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP) and Multiple Spanning Tree Protocol (MSTP)
17	Should support 802.1Q VLAN Tagging, Port Fast
18	VLAN and 802.3ad Link Aggregation with LACP.
19	Dynamic Relay
20	Admin Authentication Via RADIUS and 802.1X authentication with auto VLAN assignment
21	The switch shall be configured from OEM Firewall which will work as switch controller
22	**Management:**
23	Should support Telnet / SSH, HTTP / HTTPS, SNMP v1/v2c/v3 and SNTP.
24	Standard CLI and web GUI interface and Software download/upload: TFTP/FTP/GUI
25	**Warranty:**
26	It should cover under Limited Lifetime warranty or 5 Year warranty from the day 1
27	**Certification:**
28	FCC Part 15 Class A, C-Tick, VCCI, CE, UL/cUL, CB, RoHs (Any 3 at least)
29	**Environment:**
30	Power required is not more than 100-240V AC - 50-60Hz
31	Operating temperature: 0-45 o C
32	Storage Temperature: -40-70 o C
33	Humidity: 10-90% non-condensing

3.2.3.1.6 Firewall

S.No	Specifications
1	Proposed Firewall Vendor must be in a Leader/Challenger quadrant of Gartner Enterprise/Network Firewall in 2019 or 2020 or 2021
2	The Firewall must be appliance based and should facilitate multi-users environment which should support current network traffic as well as future growth
3	The Firewall should be ICSA/NSS Labs certified
4	Firewall appliance should be supplied with at least 8x1GE RJ45, In addition, it should have dedicated 1GE RJ-45 interfaces for Management and High Availability, 1 x USB Port. 2 Dedicated port RJ45.

5	The Firewall should support throughputs of 10 Gbps or better
6	The Firewall Threat Prevention (FW + AVC + IPS+ Antivirus +Anti Malware) throughput should be at least 700 Mbps for mix / production traffic. Throughput under Ideal Testing Condition won't be considered
7	Firewall should support at least 35000 new sessions per second
8	Firewall should support at least 700 000 concurrent sessions
9	The Firewall should support integration for Authentication via Active Directory and RADIUS
10	The Firewall solution should support dynamic NAT,PAT, NAT46, NAT64, DNS64 & DHCPv6
11	The proposed system shall be able to operate on either Transparent (bridge) mode to minimize interruption to existing network infrastructure or NAT/Route mode. Both modes can also be available concurrently using Virtual Contexts.
12	The Firewall should be able to manage MFA Tokens to be used for user authentication.
13	The physical interface shall be capable of link aggregation, otherwise known as the IEEE 802.3ad standard, allows the grouping of interfaces into a larger bandwidth 'trunk'. It also allows for high availability (HA) by automatically redirecting traffic from a failed link in a trunk to the remaining links in that trunk.
14	The proposed system should have integrated Traffic Shaping functionality.
15	The proposed system should support
16	a) IPSEC VPN
17	b) PPTP VPN
18	c) L2TP VPN
19	d) SSL VPN
20	The proposed Firewall should have license for 200 user for SSL VPN from day 1.
21	The proposed Firewall should support 200 site to site IPSec tunnel and 500 client to site Ipsec tunnel.
22	
23	NGFW should have a configurable actions like terminate a TCP session by issuing TCP Reset packets to each end of the connection, or silently drop traffic in addition to sending a alert and logging the incident
24	Should support automatic ISP failover as well as ISP load sharing

25	Firewall should have capability of intelligent routing and failover of traffic on ISP links based on Application Visibility and link Performance SLAs.
26	The Firewall should support Static, Policy Base, Identity based, Multicast routing and Dynamic routing for RIP1 & 2, OSPF, OSPFv3, BGP4, ISIS, RIPing
27	**Antivirus and Anti-Spam**
28	The proposed system should be able to block, allow or monitor only using AV signatures and file blocking based on per firewall policy based or based on firewall authenticated user groups with configurable selection of the following services:
29	HTTP, HTTPS, SMTP, SMTPs, POP3, POP3s, IMAP, FTP etc
30	The proposed system should be able to block or allow oversize file based on configurable thresholds for each protocol types and per firewall policy.
31	The NGFW solution must have capability to bidirectionally integrate with Anti-APT solution to scan for zero day malwares from Day 1 and sharing of threat intelligence for mitigation of zero day attacks. Proposed solution should have capability of cloud sandbox from same OEM.
32	Should have Anti-Spam Capability to detect and block Spam Emails over IMAP, SMTP, POP3, MAPI
33	**Web Filter & Application Control**
34	The proposed Firewall device should provide Web filtering inspection based on real-time URL categorization database of at least 250+ million URLs with 75+ categories.
35	At least 2500+ application signature must be there & it should able to understand well-known application like P2P, Voice, etc without any dependency on the ports
36	Firewall should have Safe Search capability to transparently inserts Safe Search parameter in request for at least Google, Bing, Yahoo etc . It should support YouTube Education Filter.
37	Web filtering should support local categories & category rating override to customize the filters.
38	The application signatures shall be manual or automatically updated
39	The administrator shall be able to define application control list based on selectable application group and/or list and its corresponding actions
40	**Data Leakage Prevention**

41	The proposed system shall allow administrator to prevent sensitive data from leaving the network based on File Type and Extensions. Administrator shall be able to define sensitive data patterns, and data matching these patterns that will be blocked and/or logged when passing through the unit.
42	**High Availability**
43	The proposed solution should support HA
44	The device shall support stateful session maintenance in the event of a fail-over to a standby unit.
45	High Availability Configurations should support Active/Active or Active/ Passive
46	The Firewall device should have internal redundant power supplies.
47	**Intrusion Prevention System**
48	The IPS detection methodologies shall consist of:
49	a) Signature based detection using real time updated database
50	b) Anomaly based detection that is based on thresholds
51	The IPS system shall have at least 12000 + signatures
52	In event if IPS should cease to function, it will fail open by default and is configurable. This means that crucial network traffic will not be blocked and the Firewall will continue to operate while the problem is resolved
53	IPS solution should have capability to protect against Denial of Service (DOS)/DDOS attacks. Should have flexibility to configure threshold values for each of the Anomaly. DOS and DDOS protection should be applied and attacks stopped before firewall policy look-ups.
54	IPS signatures should have a configurable actions like terminate a TCP session by issuing TCP Reset packets to each end of the connection, or silently drop traffic in addition to sending a alert and logging the incident
55	Signatures should a severity level defined to it so that it helps the administrator to understand and decide which signatures to enable for what traffic (e.g. for severity level: high medium low)
56	**Logging & reporting**
57	OEM should provide on-box or atleast 7 days of Cloud Log Storage option with standard reporting template
58	Should support Log Forwarding to an external device/syslog server
61	**Virtualization**
62	The proposed firewall shall support 10 logical firewalls
66	**Warranty and Support**

67	The proposed solution should be quoted with 3 year support from OEM for regular Signature Updates and 24x7 TAC Support

3.2.3.1.7 Multi-Function Network Laser Printer

Parameters	Specifications
Display	2-line monochrome LCD display
Print Speed:	Black: 35 ppm (Laser)
Scan Speed	Color: 5 ppm
Time to First Page:	Black: 10 seconds
Print Resolution	Minimum 600 x 600 dpi
Memory / Processor	Minimum 256 MB / 1 GHz Dual Core
Maximum Monthly Duty Cycle:	30000 pages per month
Paper Handling	250-Sheet Input, 150-Sheet Output Bin, Integrated Duplex, Single-Sheet Manual Feed
Media Types Supported	Card Stock, Envelopes, Paper Labels, Plain Paper, Refer to the Paper & Specialty Media Guide
Media Sizes Supported	10 Envelope, 7 3/4 Envelope, 9 Envelope, A4, A5, B5 Envelope, C5 Envelope, DL Envelope, Executive, Folio, JIS-B5, Legal, Letter, Statement, Universal, Oficio, A6
Standard Ports	Ethernet 10/100BaseTX (RJ-45), USB 2.0 Specification Hi-Speed Certified (Type B), 802.11b/g/n Wireless
Noise Level: Operating	Print: 53 dBA

3.2.3.1.8 Furniture

Item	Specifications

Chair	Material: Fire retardant breathable mesh for backrest and Polyester fabric for seat. Black colour on seat and back (TW 182 Mesh & 5060 fabric seat) Base: 700 mm diameter Nylon base with 50 mm castors for stability and easy movement. Seat cover: Casement cloth protection for seat under structure Adjustable Arms: Moves up or down for shoulder and upper body support. The firm polyurethane arm pads adjust vertically to accommodate different arm lengths from the shoulder to the elbow (TSA012 – value lab pad) Seat Contour: Seat pan depth is designed so that the forward most point on the lumbar support is placing gentle pressure on the lower 5 vertebrae on the spine. Lumbar Support: “S’ shaped backrest follow’s the natural curve of the back for lower back support. Additional support by static polypropylene lumbar pad on back rest. Synchro tilt with single lock: Chair Back reclines synchronously to a 2-to-1 ratio to seat angle. Allows user to recline while keeping seat cushion relatively level to floor. Use the tilt lock for upright posture like keyboarding. Pneumatic height: Change the height of the chair relative to the floor by 100 mm.
Table	Product Dimensions: Main table: Total height = 750mm, Length = 1200mm, Depth =600mm Pedestal: Total height = 600mm, Length = 450mm, Depth = 450mm Tabletop: 25mm Prelimited Engineered wood with 2mm Machine Edge banding Gable Ends: 25 mm Prelimited Engineered wood with 2mm Machine Edge banding Drawer unit: 18 mm Prelimited Engineered wood with three drawers and single lock systems Modesty Panel: 18 mm Prelimited Engineered wood with 2mm Machine Edge banding

4 Annexures

4.1 Annexure 1: Mpower System

The MPower has following functional specification :

Module 1: New Service Registration.
M1.1. Configuration
1. Category Type Configuration (This link to Add/View/Delete/Update Categories Types) Ex: categories like Domestic, Commercial, Water Supply, Industrial etc.
2. Add or View or Update Categories (This link to Add/View/Delete/Update Sub Categories) Ex: categories like Domestic 5AMP, Domestic 15AMP, Commercial, Non-Commercial, Industrial like Rural & Cottage, Sana etc.)
3. Add or View or Update Appliances (This link to Add/View/Delete/Update Appliances) Ex: Appliances like Fan, Bulb, Heater etc.,
4.Add or View or Update Units (This link to Add/View/Delete/Update Units) Ex: categories like watts, kilo watts, KVA,AMPS etc.,
5. Add or View or Update Consumer Statuses (This link to Add/View/Delete/Update Consumer Statuses.) Ex: categories like Individual, Public Sector, Government etc.,
6. Add or View or Update Documents (This link to Add/View/Delete/Update Documents) Ex: categories like Proof of Ownership, Citizenship Card, Map Certificate etc.,
7. Request Document Details (This link to Add/View/Delete/Update Relationship between Categories and Required Documents) Ex: categories like Proof of Owner Ship for any Category etc.,
8. Add or View or Update Social Statuses (This link to Add/View/Delete/Update Social Statuses) Ex: categories like SC, ST etc.,
9. Add or View or Update Activities (This link to Add/View/Delete/Update Activities.) Ex: activities like Pending for Dispatch, Pending for Inspection etc.
10. Add or View or Update Load Metrics (This link to Add/View/Delete/Update Metric Types.) Ex: metrics like HP, KWH,KVA etc.,
11. Add or View or Update Holidays (This link to Add/View/Delete/Update Holidays) To Add Government Holiday for Rebate, Penalty Calculation
12.Add or View or Update Material Type (This link to Add/View/Delete/Update Material Type) Ex: material types like Materials, Wages etc.,
13. Add or View or Update Materials (This link to Add/View/Delete/Update Materials) Ex: materials like Poles, Junction Box, Meter Box, MCB etc.,
14. Add or View or Update Connection Type Details (This link to Add/View/Delete/Update Connection Type Details.) Ex: New Connection etc.,

15.Add or View or Update District Names (This link to Add/View/Delete/Update District Names) Ex: District name etc.,
16.Add or View or Update Municipality Names (This link to Add/View/Delete/Update Municipality Names) Ex: Municipality name etc.,
17. Add or View or Update Wire Details (This link to Add/View/Delete/Update Wire Details.) Ex: Type of Wire Details, Size of Wire etc.,
18. Add or View or Update Structure of House (This link to Add/View/Delete/Update Structure of House) Ex: Tile, Concrete etc.,
1.2. Registration
The New Service Registration module is enables the management of entire cycle of new services registration process. - Payment Details - Personal Details - Service Details - Office Details - Electrical Contractor Details - Neighbour Details - Applicant Signature
1.3.Pending Service
1. Inbox (This link to view Inbox Report)
2.Pending for Dispatch Process (This link to view Pending for Dispatch Process Report)
3.Pending for Inspection Process (This link to view Pending for Inspection Process Report)
4.Pending for Load Approval (This link to view Pending for Load Approval Report)
5.Pending for Estimation Process (This link to view Pending for Estimation Process Report)
6. Pending for Estimation Approval (This link to view Pending for Estimation Approval Report)

7.Pending for Payment Intimation (This link to view Pending for Payment Intimation Report)
8.Pending for Consumer Payment (This link to view Pending for Consumer Payment Report)
9.Pending for Wiring Inspection (This link to view Pending for Wiring Inspection Report)
10.Pending for Service Release (This link to view Pending for Service Release Report)
1.4. View Status
1.Registration Number (Enter Registration Number and click on 'go' button to view the status of New Service Request)
2.Registration Fee PR Number (This is useful to generate Registration Fee Receipts (duplicate) upon customer request)
3.Estimation Fee PR Number (This is useful to generate duplicate Estimation Fee Receipts upon customer request)
1.5. Reports
1.Office Wise Exceptional (Click on to the above link to view Office Wise Exceptional Report)
2.New Connection Register Details Report (Click on to the above link to view New Connection Register Report)
3.New Connection Released (Click on to the above link to view New Connection Released Report)
4.Pending New Connection Register (Click on to the above link to view Pending New Connection Register Report)
5.Rejected Connections (Click on to the above link to view Rejected Connections Report)

6.Status Wise Report (Click on to the above link to view Status Report)
7.Documents Pending Report (Click on to the above link to view Documents Pending Report)
8.Service levels Deviation Report (Click on to the above link to view Service levels Deviation Report)
9.DTR Load Deviation Report (Click on to the above link to view DTR Load Deviation Report)
1.6. Released
- To display the number of New consumer released between the given date.
Module 2: Customer Service
- This Module enables them to manage the customer services related processes. It has following functional Features:
2.1 Configuration
1. Add a new Request/Complaint type or update existing Request/Complaint type details (Click on the above link for adding new Request/Complaint type or updating or deleting an existing Request/Complaint type) Ex: SUPPLY RELATED, BILLING RELATED, METERING RELATED etc.
2. Add a new Request/Complaint or view and update an existing Request/Complaint (Click on the above link for adding a new Request/Complaint or updating or deleting an existing Request/Complaint) Ex: Supply failed- Total area, MCCB Trip, Meter Fuse Off, no power etc.
3. Post Fuse and Seal Charge (Click on the above link for Posting Fuse and Seal Charge)
4. Office, Employee, Area and DTR Configurations (Click link for adding or updating or deleting an Office, Employee, Area or DTR Details) - Employee Master (Branch Employee Configuration) - Designation Master (Branch Employee Designation configure) - NEA Employee Subsidy Configuration (Employee Subsidy Configuration) - Office Type (ex: DISTRIBUTION CENTER, REGIONAL OFFICE, BRANCH OFFICE, SUB-BRANCH etc.)

- Office Master (Ex: WESTERN REGIONAL OFFICE, CENTRELNORTH OFFICE etc.) - Area Master (Number of Area of Branch Office Configuration) - Area-DTR Relation (Branch Office Area and DTR relation) - DTR Master (Branch office Transformer Configuration) - Pole Master (Branch Office Pole Configuration) - Feeder Master (Branch Office Feeder Configuration)
5. Status Configurations (To Configure Customer Complain Status) Ex: PENDING, PAYMENT DUE, INVALID etc.)
6. Consumer Changes - Category Change Request (Click on the above link updating Consumer Category Change Request) - Load Change Request (Click on the above link for updating Consumer Load Change Request)
6. Observation Details (To Configure Meter Condition Observation Ex: Normal Condition, Glass Broken, No Meter etc.) 7. Meter Type Details (To Configure Type of Meter Ex: Whole Current, Demand Meter, TOD Meter etc.) 8. HHT Data configuration (To Configure Handheld Terminal Data Configuration) 9. HHT and Meter Reader Relation (To Configure HHT Device and Meter Reader Relation) 10. Meter Status Details (To Configure Consumer Meter reading Status. Ex: NORMAL, DOOR Lock, NOT UESD etc.) 11. Common Meter Reader Holidays Entry
3.2 Meter Stock
- This module is used to enter in single or Bulk New Meter in stock for assigning new consumer. 1. Meter Stock Entry Screen (To enter new meter in single) 2. Consumer Wise / Meter Wise History (To search by consumer wise or Meter wise) 3. Meter Stock Bulk Entry Screen (To enter meter in bulk)
3.3.Routing & Scheduling
-Route Map Creation (To Create Meter reading Route of consumer) -Assigning Meter Reader (To Assign Route to Meter Reader) - Meter Reader Walk-Order (To assign Meter reader walk order) -Area Split (Area has to break down due lot of consumer in one area or one route)
3.4. HHT & Meter Reading
(To enter consumer meter reading, modify consumer reading and data Preparation for HHT Device) - Whole Current Meter Reading Entry (To enter Domestic consumer Single Meter Reading Entry) - Demand Meter Reading Entry (To enter demand consumer single Meter Reading Entry) - TOD Meter Reading Entry (To enter TOD Consumer single Meter Reading Entry) - Whole Current Meter Reading Bulk Entry (Domestic Consumer Bulk Reading entry) -Demand Meter Reading Bulk Entry (Demand Consumer Bulk Reading Entry) -Whole Current Meter Reading Modification (Domestic Consumer entered reading Modification) - Demand Meter Reading Modification (Demand Consumer entered reading Modification) -TOD Meter Reading Modification (TOD Consumer entered reading Modification) - Cancel Meter Reading (cancel reading of Domestic and Demand Consumer)

-HHT Data Preparation (Data Preparation for HHT Device) -HHT Uploading/downloading (Upload data prepare to HHT Device and Download from HHT Device for mPower)
3.5 Reports
(To View Report about status of Meter and Meter Reading) -Metering Reports (To View Meter change, No. of Door Lock, Meter Stocks reports)
3.6. Other Activities
(The consumer Meter change, Meter Details modification and Meter Testing information) - Meter Change Details (Whole Current, Demand Meter and TOD Meter) - Meter Change Details Modification. - Demand Meter Test Details. - Whole Current Meter Test Details. - Pole/Consumer Transfer. - Meter Rent Configuration.
The disconnect report who have certain month dues amount
6) Re-connection of disconnected consumer The disconnected consumer has to pay dues amount in branch counter only and the re- connection charge has to pay in miscellaneous counter. Then only the disconnected consumer will be reconnected.
7) Consumer Ledger Display Consumer ledger is displayed on the request of consumer to know the paid amount and dues amount.

4.2 Annexure 3: Kathmandu Valley Smart metering Project

NEA has a separate MDM system along with the AMR/RMR capability for approx. 10,000 Industrial metering points, the System Integrator shall carry out the integration of AMI system along with the proposed AMR/RMR system to generate any outputs as sought by the utility.

NEA has implemented End-to-End Integrated AMI solution and architecture clearly depicting integration between Electricity Meters, Data Concentrators, Head-End System (HES), Meter Data Management System (MDM) and other Distribution applications. NEA already finalized the implementation vendor for implementation of Smart Meter Project. System Integrator needs to integrate with Meta Data Management of Smart Metering Project. Details of Smart Metering Project is provided in Annexure-3: Details of Smart Metering Project.

The Proposed system and overall software solution should be capable of SOA or any other open source integration methodology based integrating with external systems (BI, Reporting System, Other MDM/RMR etc.). The integrated systems should be capable of communicating and sharing data with each other or any other external system as required by NEA to generate the following benefits:

a) Data Analytics
b) Alert and Alarm
c) Dashboard
d) BI Reports
e) Any other external system

NEA has started the modernization of Distribution network of Kathmandu Valley. Under this new system, NEA has planned to implement Distribution Management system (DMS), Outage Management system (OMS). The new system is planned with RTUs with FRTUs and Motorized SCADA enabled GO switches, which will be connected through the Fiber optics backbone network.

a. NEA will also implement other smart grid solution in coming future.
b. Therefore, the proposed system and overall solution shall be capable to support the vision of modern/ smart grid. It shall be capable to integrate with modern distribution center and support latest grid automation technologies as well.

Brief About Smart Metering Project

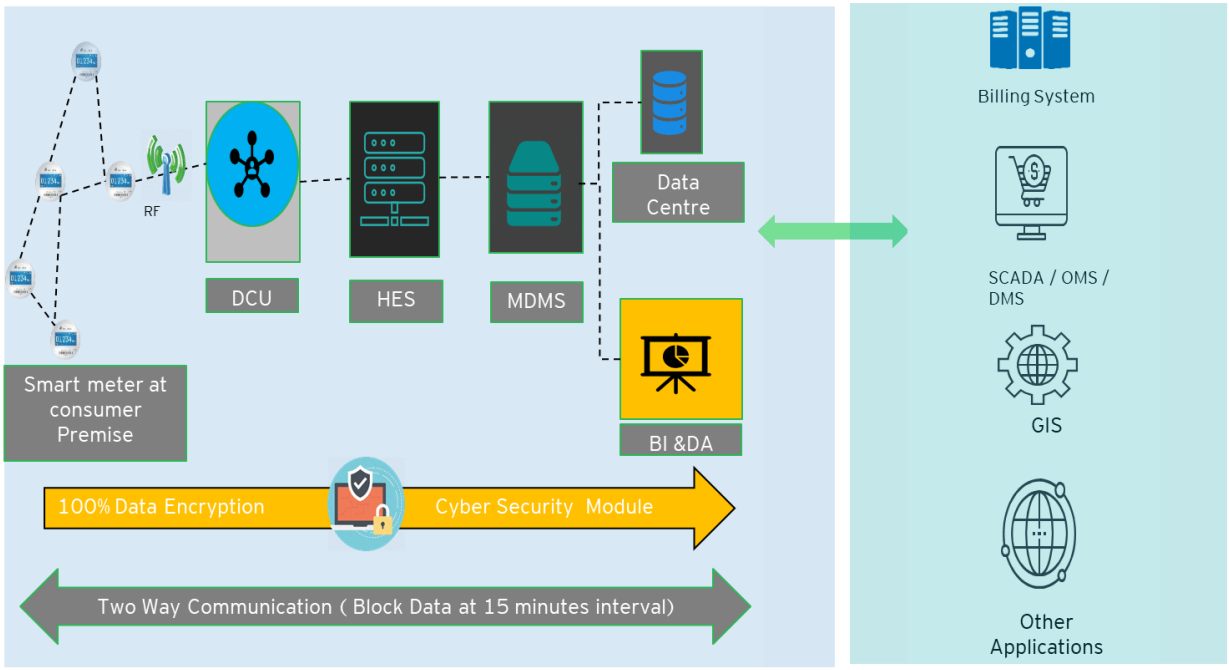
In Phase -I of smart Metering Project of Kathmandu NEA has appointed the System integrator (Pinggao Wisdom) for implementing the Smart metering solution. The brief scope of work of this system integrator is to design, supply, establish, install, testing, commissioning, operate and maintain the Advanced Metering Infrastructure (AMI) for consumers equipped with Single Phase and Three Phase Whole Current meters. The system integrator is responsible for deploying the AMI system for all across 2 DCS (Maharajgunj and Ratnapark) which shall include the 98,000 metering. For this phase Pinggao & Wisdom JV has proposed the HES and MDM from Wisdom along with Middleware and database. From the Infrastructure side Pinggao & Wisdom JV has proposed blade chassis and blade server for compute infrastructure along with SAN storage and SAN switches at DC and SAN storage at NLDC, Both DC and NLDC will be connected of fibre by NEA. Pinggao & Wisdom JV has also proposed firewalls, Load balancers and Network L2 and L3 switches for connectivity and for management and monitoring of the Applications, Servers, Storage, Network and Databases proposed under Smart Metering Phase- I system integrator has also provisioned for EMS software.

Integration scope with other Applications

As per the Smart Metering Phase-I RFP integration point are covered under the scope of the system integrator and MDM solution is Service Oriented Architecture (SOA) enabled. MDM integration with other systems shall include but not limited to the following:

a. HES for data exchange from other AMI/ AMR solutions
b. Utility Administration
c. Existing other Data Collection Systems
d. IVR system, CRM, Consumer Portal
e. Billing and collection system
f. GIS/NA Systems integration with CIS and with MDM system including network up gradation, load change, DT shifting, line shifting, HT consumer feeder shifting, etc.
g. Support of interface with Hand Held Units (HHU) or manual reading system etc.
h. Provide the ability to interface with a web portal. The interface will show customer consumption data, historical data and analytical data regarding consumption.
i. Bidder should provide suitable number of HHUs to read and update the data in MDM in case of any communication failure between meter and HES/MDM.

Indicative Solution Architecture



4.3 Annexure 4 :Consumer Count Branch Wise

S.N	Branch	Domestic	Non. Commercial	Commercial	Industrial	Others	Total
A	**PROVINCE NO. 1, BIRATNAGAR**	**7,78,174**	**5,163**	**5,326**	**10,352**	**62,412**	**8,61,427**
1	TAPLEJUNG DC	5779	119	55	53	59	6,065
2	PANCHTHAR DC	7775	87	38	9	72	7,981
3	ILAM DC	44312	475	274	437	604	46,102
4	KHADAWARI DC	23304	293	113	200	111	24,021
5	TERHATHUM DC	16423	238	76	120	62	16,919
6	DHANKUTA DC	28800	426	155	248	162	29,791
7	BHOJAPUR DC	17214	289	75	108	47	17,733
8	DIKTEL DC	19273	233	70	153	48	19,777
9	SOLUKHUMBU DC	1045	9	12	4	-	1,070
10	OKHALDHUNGA DC	11533	146	70	90	53	11,892
11	UDAYAPUR DC	42020	316	198	571	3,047	46,152
12	DHULABARI DC	34962	120	200	467	1,028	36,777
13	BHADRAPUR DC	25095	186	135	487	3,716	29,619
14	ANARMANI DC	66844	180	630	1111	9,919	78,684
15	DAMAK DC	47420	148	497	730	11,941	60,736
16	GAURADAHA DC	20907	88	84	286	11,828	33,193
17	RANGELI DC	44664	193	142	600	6,787	52,386
18	URLABARI DC	35397	125	425	436	5,757	42,140
19	BELWARI DC	48434	236	288	559	1,695	51,212
20	BIRATNAGAR DC	70646	338	695	1474	1,507	74,660
21	DUHABI DC	23697	74	98	456	990	25,315
22	INARUWA DC	43918	278	197	546	1,699	46,638
23	ITAHARI DC	63247	284	539	877	974	65,921
24	DHARAN DC	35465	282	260	330	306	36,643

S.N	Branch	Domestic	Non. Commercial	Commercial	Industrial	Others	Total
B	**PROVINCE NO. 2, JANAKPUR**	**8,54,534**	**3,938**	**3,757**	**13,753**	**68,166**	**9,44,148**
25	KANCHANPUR DC	27593	149	94	328	3,275	31,439
26	RAJBIRAJ DC	49357	293	267	778	5,258	55,953
27	BODEBARSAIN DC	25151	116	79	312	4,080	29,738
28	LAHAN DC	51650	213	299	1008	10,475	63,645
29	MIRCHAYA DC	32664	128	189	480	3,286	36,747
30	SIRAHA DC	36187	228	114	557	4,603	41,689
31	YADUKUWA DC	28708	59	39	328	960	30,094
32	JANAKPUR DC	60546	248	453	904	2,385	64,536
33	DHANUSHADHAM DC	29454	96	70	376	3,560	33,556
34	SAKHUWA DC	23424	97	128	397	2,433	26,479
35	GAUSALA DC	45355	161	215	746	4,433	50,910
36	JALESHWOR DC	61504	237	144	878	1,152	63,915
37	BARAHATHWA DC	18641	66	97	288	851	19,943
38	MALANGWA DC	51083	252	148	830	1,165	53,478
39	LALBANDI DC	42407	226	213	632	2,423	45,901
40	CHANDRANIGAHPUR DC	25,804	123	139	371	776	27,213
41	MAULAPUR DC	17,759	70	47	272	2,197	20,345
42	GAUR DC	45,363	251	131	699	2,201	48,645
43	SIMRAUNGADH DC	15,641	57	29	219	4,579	20,525
44	KALAIYA DC	51,846	279	139	697	4,087	57,048
45	BIRGUNJ DC	46,823	197	395	1,642	690	49,747
46	POKHARIYA DC	35,497	169	73	502	1,101	37,342
47	SIMARA DC	32,077	223	255	509	2,196	35,260
C	**PROVINCE NO. 3, KATHMANDU**	**10,36,223**	**6,342**	**11,482**	**15,627**	**24,626**	**10,94,300**
a	**PROVINCE NO. 3, KATHMANDU**	**7,73,447**	**4,829**	**9,421**	**11,421**	**7,695**	**8,06,813**
48	RATNAPARK DC	46,766	486	1,823	648	1,061	50,784
49	BANESWOR DC	65,930	220	1,416	674	1,137	69,377

S.N	Branch	Domestic	Non. Commercial	Commercial	Industrial	Others	Total
50	KULESWOR DC	57,118	252	835	1,101	273	59,579
51	MAHARAJGUNJ DC	47,423	250	844	550	336	49,403
52	JORPATI DC	26,933	108	206	419	112	27,778
53	LAGANKHEL DC	69,018	283	829	1,418	417	71,965
54	BHAKTAPUR DC	40,948	290	328	841	479	42,886
55	THIMI DC	30,171	120	294	498	145	31,228
56	PULCHOWK DC	24,235	242	670	300	255	25,702
57	KIRTIPUR DC	20,386	212	236	194	230	21,258
58	KAVRE DC	45,933	297	334	770	527	47,861
59	NUWAKOT DC	58,991	297	286	941	374	60,889
60	DHADING DC	55,079	292	338	911	606	57,226
61	SINDHUPALCHWOK DC	36,425	349	190	476	130	37,570
62	DOLAKHA DC	36,436	252	177	328	109	37,302
63	RAMECHHAP DC	33,276	325	113	214	195	34,123
64	MELAMCHI DC	22,105	158	88	332	70	22,753
65	DHUNCHE DC	9,140	163	98	75	31	9,507
66	BALAJU DC	29,320	101	245	367	122	30,155
67	PANCHKHAL DC	17,814	132	71	364	1,086	19,467
b	**DIVISION OFF. HETAUDA**	**2,62,776**	**1,513**	**2,061**	**4,206**	16,931	**2,87,487**
68	HETAUDA DC	64133	354	404	936	866	66,693
69	BHARATPUR DC	54,927	277	792	1,154	3,200	60,350
70	TANDI DC	56,699	170	436	1,083	5,911	64,299
71	SHINDHULI DC	41,593	435	186	491	1,339	44,044
72	CHANAULI DC	31,754	186	145	464	5,535	38,084
73	PALUNG DC	13,670	91	98	78	80	14,017
D	**GANDAKI PRADESH**	**3,84,725**	**3,389**	**3,395**	**5,853**	**5,924**	**4,03,286**
74	ARUGHAT DC	3718	36	23	41	30	3,848
75	GORKHA DC	43559	473	196	495	690	45,413

S.N	Branch	Domestic	Non. Commercial	Commercial	Industrial	Others	Total
76	LAMJUNG DC	842	6	18	6	40	912
77	TANAHAU DC	38366	424	302	629	777	40,498
78	LEKHANATHA DC	50994	335	374	758	458	52,919
79	POKHARA DC	85100	628	1466	1562	400	89,156
80	PARBAT DC	18572	250	122	362	181	19,487
81	SYANGJA DC	27030	295	114	335	343	28,117
82	MYAGDI DC	19021	224	122	280	100	19,747
83	TATOPANI DC	1273	32	16	13	16	1,350
84	MANANG DC	3	7	3		-	13
85	BAGALUNG DC	29004	330	156	399	194	30,083
86	KAWASOTI DC	67243	349	483	973	2,695	71,743
E	**LUMBINI P.O., BUTWAL**	7,95,793	6,232	5,956	11,309	27,736	8,47,026
a	**LUMBINI P.O., BUTWAL**	**4,62,596**	**3,532**	**3,612**	**7,037**	10,026	**4,86,803**
87	BUTWAL DC	67572	555	1241	992	793	71,153
88	BHAIRAHAWA DC	73357	577	702	1290	1,860	77,786
89	PALPA DC	35405	234	154	381	721	36,895
90	TAULIHAWA DC	54550	435	227	808	1,051	57,071
91	KRISHNA-NAGAR DC	41592	352	182	772	895	43,793
92	ARGHAKHANCHI DC	34230	302	136	360	365	35,393
93	GULMI DC	30956	305	117	379	455	32,212
94	PARASI DC	41828	286	203	622	1,295	44,234
95	NAYAMILL DC	31642	199	325	757	1,008	33,931
96	AMUWA DC	19003	126	150	231	645	20,155
97	BARDAGHAT DC	32461	161	175	445	938	34,180
b	**NEPALGUNJ DIVISION OFF.**	**3,33,197**	**2,700**	**2,344**	**4,272**	**17,710**	**3,60,223**
98	RUKUMPURBA DC	522	8	13	12	3	558
99	ROLPA DC	21184	264	89	254	59	21,850
100	PYUTHAN DC	25478	229	87	260	98	26,152

S.N	Branch	Domestic	Non. Commercial	Commercial	Industrial	Others	Total
101	GHORAHI DC	41251	288	370	483	521	42,913
102	LAMAHI DC	21432	166	143	376	1,718	23,835
103	TULSIPUR DC	44562	265	181	514	496	46,018
104	KOHALPUR DC	37752	222	292	435	1,915	40,616
105	NEPALGUNJ DC	55177	523	678	1010	6,043	63,431
106	GULERIYA DC	64356	547	391	750	6,423	72,467
107	RAJAPUR DC	21483	188	100	178	434	22,383
F	**KARNALI PRADESH**	**1,04,320**	**1,511**	**702**	**1,294**	**871**	**1,08,698**
108	RUKUMPASCHIM DC	12210	185	59	132	12	12,598
109	SALYAN DC	15592	202	82	173	55	16,104
110	DOLPA DC	1477	69	16	12	8	1,582
111	GAMGADHA DC	2781	72	16	15	11	2,895
112	HELDUNG DC	1920	73	26	23	12	2,054
113	KALIKOT DC	2517	84	18	66	5	2,690
114	JUMLA DC	1859	64	37	20	9	1,989
115	JAJARKOT DC	3671	64	20	24	11	3,790
116	DAILEKH DC	9858	189	58	118	37	10,260
117	SURKHET DC	52435	509	370	711	711	54,736
G	**SUDURPASCHIM PRADESH**	**2,68,648**	**2,858**	**1,854**	**2,840**	**10,452**	**2,86,652**
118	DHANGADHI DC	60,007	396	602	668	1,662	63,335
119	MAHENDRANAGAR DC	56397	467	439	697	4,980	62,980
120	DADELDHURA DC	19247	382	100	222	170	20,121
121	TIKAPUR DC	22256	102	206	254	1,237	24,055
122	DOTI DC	20640	392	113	159	86	21,390
123	ACHHAMA DC	11536	292	55	110	45	12,038
124	BAITADI DC	16533	308	69	182	158	17,250
125	DARCHULA DC	10450	201	54	59	27	10,791
126	BELAURI DC	25349	135	102	258	628	26,472

S.N	Branch	Domestic	Non. Commercial	Commercial	Industrial	Others	Total
127	BAJHANG DC	4935	102	21	46	14	5,118
128	BHAJANI DC	21298	81	93	185	1,445	23,102
Grand Total		**42,22,417**	**29,433**	**32,472**	**61,028**	**2,00,187**	**45,45,537**

5 Appendix

5.1 List of figures

5.2 List of Tables

5.3 List of Abbreviations

S.No	Abbreviation	Full form
1.	API	Application Programming Interface
2.	BCP	Business Continuity Plan
3.	BI BW	Business Intelligence Business Warehouse
4.	BI & DA	Business Intelligence and Data analytics
5.	CCC	Customer Care Centre
6.	COTS	Commercial Off the Shelf
7.	CRM	Customer Relationship Management
8.	DC	Data Centre
9.	DCC	Distribution Command and Control Centre
10.	DCS	Distribution and Consumer Services
11.	DCSD	Distribution and Consumer Services Directorate

12.	DCU	Data Concentrator Unit
13.	DMS	Document management system
14.	DMS	Distribution Management System
15.	DRC	Disaster Recovery Centre
16.	FAT	Factory Acceptance testing
17.	FMS	Facility Management Services
18.	FRS	Functional Requirement Specification
19.	GIS	Geographical Information System
20.	GoN	Government of Nepal
21.	HES	Head End System
22.	ICT	Information and Communication Technology
23.	IT	Information Technology
24.	IVR	Interactive Voice Response
25.	LAM	Linear Asset Management
26.	MDMS	Meter Data Management System
27.	MIS	Management information System
28.	NEA	Nepal Electricity Authority
29.	OEM	Original Equipment Manufacturer
30.	OMS	Outage Management System
31.	QA/QC	Quality Assurance/Quality Control
32.	RFP	Request for Proposal
33.	RMS	Revenue Management System
34.	RPO	Recovery Point Objective
35.	RTO	Recovery Time Objective
36.	SCADA	Supervisory Control and Data Acquisition
37.	SDLC	Software Development Life Cycle
38.	SI	System Integrator
39.	SLA	Service Level Agreement
40.	UAT	User Acceptance Testing