| Description of Request | Feeder Balancing Module (FBM) Project |
|---|---|

## 1. High level background

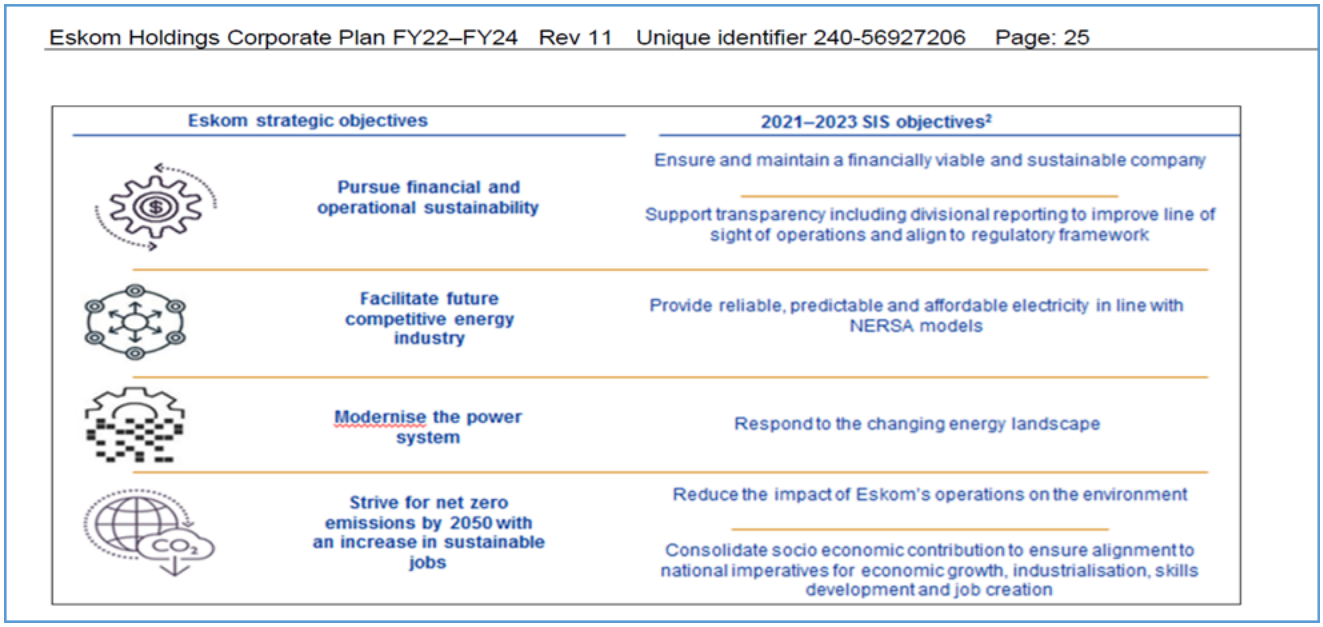
Feeder balancing involves comparing the energy delivered (measured using a stats meter – the data is captured in MV90) against energy consumed (measured by the customer meter – the data resides in CC&B) incorporating the technical losses. The ideal scenario is that the energy delivered, and the energy consumed (including technical losses) reconciliation must balance. Technical losses are losses that occur during the physical delivery of energy (i.e. sending electricity along the line) are referred to as a technical loss.

Eskom's Group IT is rationalising its application portfolio – removing duplicated functionality, switching from bespoke applications developed and maintained by small-scale vendors, to the more robust and sustainable solutions delivered by the mainstream software vendors – such as SAP, SAS, Oracle & IBM.

## 2. Business Requirements

As far as possible automating data imports from all relevant source systems into one centralised data universe enabling the business to use this data in a secondary application to correct and apply network configuration changes as well as allocating unallocated sales to relevant feeders to achieve reliable energy balancing calculation results. The results should be published and report on and the application should also have functionality or integration to create work requests to repair faulty field equipment impacting the balancing results as well as initiating formal audits on identified worst performing networks.

According to the requestor the high-level requirements support the following *strategic objective/s*:




- **High level gaps between the "As-Is" and "To-Be" state**

| As Is Statement | To Be Statement | Therefore, the high-level gap is: |
|---|---|---|
| Import source system data into FBM application | Automate the import of source system data into BI FBM universe | Automate the data flow from source systems to BI [This step was achieved during the first solution iteration efforts] Gap is for ACE to automate MV90.EU File into BI and then move all source data from development to production BI. |
| Manually screen data for possible data challenges | Advance source data analytics and data mining | No data analysis/ mining capability. Need to have access to the source data feeding into the FBM system in a single BI universe to enable analysts to analyse data in various configurations/ combinations in order to try and identify enhancement opportunities in the energy losses environment.<br>Data mining and analytics tools (Source data and results from the balancing calculations) to be able to generate custom made reports based on analysis required or new trends to be done by all users of FBM. |
| Upload data into FBM application from BI | Automate data upload into new FBM application | Automate data flow in correct format to be analysed in future FBM tool. Gap is to make new production FBM universe available for importing data to FBM tool. Ensure all data sources is available in BI. |
| Display current meter and feeder status in FBM system | Display all current and historical meter and/ or feeder statuses | Display all current and historical meter and/ or feeder statuses allowing user to filter on various status selections and modify current month statuses as per business rules and rename meters where necessarily |
| Configure network mapping | Automate network configuration ensuring a Statistical meter map correctly to a feeder configuration. | Automating the Stat meter mapping to feeder configuration and status changes is not currently possible due to limited data available to automate the mapping configuration. Need to rely on field/ operating resources to get updated information and to correctly apply it. Gap - Investigate and consider automation with SCADA/ FMS network status change data for automation and consider Historian for possible data source. |
| Manually mapping of unallocated CDU sales to networks with low sales allocations. | The ability to automatically map unallocated CDU sales to the correct networks. | Business do not have the ability to automatically map unallocated meter sales to the correct Customer Network Link (CNL) thus not able to accurately link unallocated sales to feeders.<br>When a customer is not registered on billing system, they should not be able to buy energy until the registration |

| As Is Statement | To Be Statement | Therefore, the high-level gap is: |
|---|---|---|
| | | process is updated. Gap-to motivate for high level business decision to implement Online vending properly – customer not registered should not be allowed to purchase tokens. |
| Manual KWh manipulation adjustments | Automate KWh adjustments on energy delivered and sales | No sales adjustment<br><br>Automate network configuration changes from SCADA/ FMS and operating log results – to be investigated.<br>Assume kWh adjustments could be minimised if the network configuration variables could be automated if an interphase could be established from SCADA/ FMS/ NMC and RMC electronic operating log reports. Historian could also be a data source for the configuration adjustments. |
| Adjust technical losses % | Allow as pre-set default value for technical losses on all feeders as well as having options to change it to something else depending technical advice per feeder. | No gap existing system and new proposed system should allow for this functionality. |
| Calculate balancing results | Automate the energy balancing calculation results. | The balancing results cannot be calculated until the network configuration is complete. |
| View losses per OU hierarchy | Be able to view energy losses per individual OU hierarchical structure as well as having the capability to drill down to feeder, Stat meter and customer meter level. Being a national system in future be able to see total Dx losses drilling up to OU and Dx level with the combined view. | Existing system is OU based with the capability to manually combine OU results into one and publishing national performance reports. System has different user profiles to allow access on different levels. |
| Specific report extracts (pivot grids) | Develop the same reports in the BI environment<br>Exception reports [See list of reports] | Need to develop standard reports used in FBM in the BI environment after data is accepted and published. |
| Heat maps with special representation of losses analysis | Develop the same reports in the BI environment | Need to develop standard reports used in FBM in the BI environment after data is accepted and published. |
| Charts Graphic representation of losses | Develop the same reports in the BI environment | Need to develop standard reports used in FBM in the BI environment after data is accepted and published. |
| Publish reports [OU /business energy protection KPI's] | Develop the same reports in the BI environment | Need to develop standard reports used in FBM in the BI environment after data is accepted and published. |
| Display results nationally and provincially | Develop the same reports in the BI environment | Need to develop standard reports used in FBM in the BI environment after data is accepted and published. |
| Store data and mapping | Store every data iteration saved in BI with a different version/ date and time as well as the network configuration mapping for next month's data configurations | Challenging requirement and need to decide on what iteration of saved data the national/ OU reports will be published. The latest mapping table could be used to next month's performance but should be able to edit it if a physical network configuration changed during the past months. |
| No functionality [enhancement proposals] | Meter reading automation | MV90 stats reading automation + Meter management system (As per the replacement project) - Log WO to maintenance management system to action identified challenge on a meter. |

The "As-Is" purpose of the FBM tool is to:

- Automated data flow from source systems to BI FBM universe [Development side]
- Automated data import to future FBM application [Manual browse function to BI files to be imported in FBM]
- Consolidate relevant data to compare consumption measured with energy sales.
- Effectively identify analyse and report on feeder energy losses.

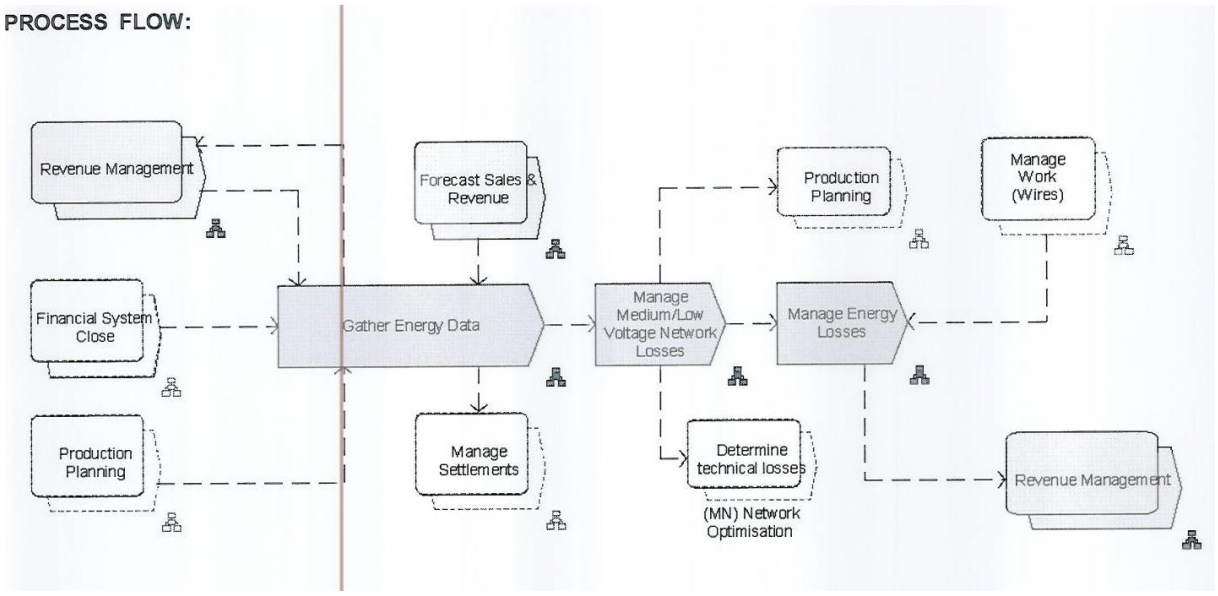
- To assist the business in planning targeted audits especially in areas of high losses.
- Perform analysis and data mining to enable business to drill down to the origin of energy losses to enhance the performance as well as the data challenges experienced.

Replace the existing tools with a like for like with some enhancement and integration possibilities.

- Automate data flow from source systems to BI FBM universe [Production side]
- Automate data import to future/ existing FBM application.
- Automate as far as possible the network configuration from integrated systems e.g. SCADA/ Historian.
- Manual allocation of unallocated PP sales to relevant feeders with dense PP customer bases or require high level business decision to implement pure online vending principles in business to prevent sales to be unallocated due to disconnect between customer meter installations and source systems.
- Develop standard performance reports for energy losses management in the business.
- Create integration to work/ asset management systems to log faults on metering equipment from FBM application.
- Develop an export to mobile devices functionality to export worst performing feeders for audit and field inspection activities. These devices should have data validation and when returning data be able to upload and update source systems.
- Provide data mining functionalities for Energy advisors to analyse data sets empowering them with historical data sets to mix and match different scenarios in order to identify improvement opportunities.

## 3. AS IS AND TO BE BUSINESS PROCESS ACTIVITY MAPPING

### 3.1. As-is business process



## 3.2. To-be Business Processes

- Need to automate the process of gathering the Energy data required for the balancing analysis.
- All activities to ensure the network is properly configured to enable accurate balancing calculations should be as far as possible be automated [Network configuration as well as allocation of unallocated sales]
- Manage medium and low voltage network losses need enhancements to integrate to work / asset management to enable advisors to create work requests on faulty metering assets as well as to initiate formal audits on worst performing feeders.
- Manage energy losses activities will include detail reporting and analysis on worst performing networks to identify improvement opportunities.

No expectations to change the business process just need to enhance the systems supporting the process.

## 4. Business/Functional Requirements

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Priority / phasing |
|---|---|---|---|---|
| Source system data imports | BRS 1 | Need capability to Import and Consolidate all relevant source systems data in one data warehouse e.g.BI FBM universe. | Need capability to Import and Consolidate all relevant source systems data in one data warehouse e.g.BI Feeder Balancing Module universe.<br><br>Automate the data from the following source systems into one BI universe:<br><br>Metering system data<br>Billing system data<br>Works order data (network data)<br>Customer network link data (CNL Data)<br><br>Metering system data OU files converted into consumption files,<br>Billing system sales<br><br>Unallocated billing system sales<br>Network data from Small World or Maximo/CNL<br><br>Automate the data from the following source systems into one BI universe:<br>• CC&B sales [FBM_EBM table = allocated PP sales + FBM_FBM table = allocated conventional sales]<br>• Unallocated CC&B sales [FBM_EBP table = unallocated PP sales]<br>• Network data from Small World or Maximo [FBM_NET]<br>• CNL [FBM_CNL Table = CNL table] MV90.EU file [Not yet fully automated to BI]<br>• The data is already in BI production platform except for MV90 data which is yet to be moved – need to be moving to production platform in BI. | |

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Priority / phasing |
|---|---|---|---|---|
| Data mining | BRS 2 | Advance source data analytics | Identify specific business rules with standard filter options between different source systems data base tables to identify anomalies. Visibility of anomalies and Interaction of the user follow up corrective action of the anomalies. | |
| Upload source system data for calculation analysis | BRS 3 | Upload data from BI FBM universe into a user-friendly application where users can ensure feeder configuration is correct and sales are allocated. | Need tools in the application to configure a network by mapping Stats meters to different feeder configurations as well as manually allocated unallocated Pre-Paid Unit sales to identified feeders. | |
| | BRS 4 | Manage statuses | Display all current and historical meter and/ or feeder statuses allowing user to filter on various status selections and modify current month statuses as per business rules and rename meters were necessarily | |
| | BRS 5 | Configure the network | Need tools in the application to manually configure a network by mapping Stats meters to different feeder and substation configurations. CNL will assist in linking the meters with their sales consumption to a specific feeder comparing sales against consumption measured by STATs meter resulting in energy losses. | |
| | BRS 6 | Map CDU unallocated sales | Need tools in the application to manually allocate percentages of unallocated sales to different feeders by identifying networks with high pre-paid customer bases | |
| | BRS 7 | kWh Adjustments | Need to be able to adjust the energy delivered KWh and/ or the total customer consumption KWh upwards or downwards. | |
| | BRS 8 | Adjust technical losses % | The default technical losses are currently 10% and applied across all feeders balanced unless a calculated technical loss % is available it will be applied to the specified feeder. The new technical loss will become the feeder new default going forward. Changes should be able as and when required. | |
| | BRS 9 | Calculate balancing results | Summate all sales per feeder and compare with consumption measured on the mapped feeder. This will give first version of losses and still need possible enhancement adjustments. | 6 |
| | BRS 10 | Display losses per OU hierarchy | View the calculated results with drill down functions per OU hierarchy down to feeder and stats meter level. | |
| Reporting requirements | BRS 11 | Specified reports extract requirements | 1. Stats meter analysis per meter (Meter/fdrs)<br>2. Feeder mapping Scenarios<br>3. Feeder Consumption Analysis (FDR/Trfm/Cust)<br>4. Feeder Consumption Analysis (Fdr/Cust)<br>5. New Stats Meter Imported<br>6. Stats meters previously imported now missing<br>7.New network locations imported | |

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Priority / phasing |
|---|---|---|---|---|
| | | | 8. Network locations previously imported now missing<br>9.Network locations previously mapped no longer mapped<br>10. stats meters previously mapped no longer mapped<br>11. Compare the current stats meters import with the previous stats meter imported<br>12. transformers in engineering not in CC&B<br>13. premises with kWh with no Account ID<br>14. Conventional transformers in CC&B –not in Engineering<br>15. PPU transformer in BB&B – not in Engineering<br>16. Feeders not mapped<br>17. Feeders with no consumption<br>18. Worst performing feeders<br>19. Transformers_bulk on feeder<br>20. Trfms_bulk/consumption on feeders<br>21. Indicators(business) – Current vs Previous<br>22. Indicators (Meters/Fdrs) – Current vs Previous<br>23. LPU status- current vs previous<br>24. CNL- LPU's in engineering not linked to CC&B<br>25. CNL- LPU's in CC&B not in engineering<br>26. CNL – Trfs and Bulk with no Sales<br>27. CNL – Duplicate premises<br>28. Fdrs and Meters not mapped | |
| | BRS 12 | Heat maps (special representation of loss analysis) | Display losses with conditional formatting in color coding. E.g. The greater the losses the more red it displays the results. Parameters for the conditional formatting should be adjustable for non-technical loss % and KWh's. The display is graphical per feeder and per OU hierarchical structure. | |
| | BRS 13 | Charts (Graphic representation of losses) | Display losses with Balancing bar/ line charts per OU hierarchy down to Substation level. Display in both:<br>• KWh delivered versus KWh Used<br>• Non-technical loss Kwh/ %.<br>Bar show on current month and line display historical performance. Durations could be selected as required. | |
| Publish results | BRS 14 | Publish balanced energy loss results | Publish calculated results to the online database or BI warehouse<br>Publish the balancing results to corporate:<br>• Set corporate shared folder<br>• Set meter statuses<br>Losses Reduction Potential tool using past OU performance and other inputs from the business reporting | |
| | BRS 15 | Display results | Display KPI results consolidated nationally and with options to drill down per Cluster/OU/ Zone/ Sector/ CNC/ Meter | |

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Priority / phasing |
|---|---|---|---|---|
| | | | | |
| | BRS 16 | Store latest data mapping | | |
| Device management | BRS 17 | Meter reading automation | Automated meter readings. Log WO to maintenance management system to action identified challenge on a meter. | |
| FBM Enhancements | RQ2 | The Stats meter readings used by FBM to be managed via online database (ORACLE) | The Stats Meter delivery data is currently manually updated in a spreadsheet template. A Stats Meter Management Module (to support the Energy Balancing process) is required to automate the import of MV90 data and to manage the Stats Meters, visually, on a continuous basis. | |
| | RQ 4 | Upgrade local database to SQL Server/MySQL/PostGreSQL | The requirement for FBM to cater for Eskom PPU customer detail as well demanded that a new local database being implemented | |
| | RQ5 | FBM CNL Data mapping and validation module | CNL data mapping application based on predefined business rules is required to ensure reliable customer network linking that is not currently available in the existing Eskom CNL application. CNL validation to be done on continuous basis and feedback into business process accommodated. A graphical overview is required to monitor and show CNL non-conformances (Network supply points/Customer detail) | |
| | RQ 7 | FBM data validation module | A data validation module is needed to monitor and identify FBM data non-conformances on a continuous basis based on predefined business rules for the purpose of automated communication between business units Data validations must be automated and support pre-checking and actions before energy balancing<br>Data exceptions must be linked to the various key role players in the business processes for corrective actions<br>A statistical overview is required to monitor impact and contribution on Loss calculations (e.g. NTL) | |
| | RQ 8 | FBM meter status flagging | Automate FBM meter status flagging based on MV90 status (implement the required predefined business rules as required by business). Implement multi-level status | |
| | RQ10 | Add Exception - Feeders with no energy delivered | All the Feeders with no Energy Delivered must be listed/reported as part of the exceptions | |
| | RQ12 | Add Report - List all Supply Points (Trfs/Bulks) in Feeder Consumption Analysis | A detailed report is required to list all the Feeder Supply points in one view. The current Feeder Consumption Analysis report must be extended | |
| | RQ13 | Add Report - Detailed Customer/Feeder Linking | A Report is required to extract all customers linking to each feeder (irrespective of if the feeder is linked to a meter or not) | |
| | RQ16 | Add Report - All CC&B Customers | A Report is required to extract all customers for the specific OU | |

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Priority / phasing |
|---|---|---|---|---|
| | | | (irrespective of if the customer linked to a feeder or not) | |
| | RQ17 | Add Business levels based on Feeders and NOT Substations | Currently the FBM system allocates the Statistical Meters in the Business Area based on the linked Substations. The system must be modified to use the Feeders instead to determine the Business Areas. RQ18 has to be implemented to make this affective. Note: No need to map Feeders to incorrect substations in the OU anymore | |
| | RQ18 | Substations to be shared across OU's boundaries | All substations must be available for Meter/Feeder mapping per OU. This enhancement is required for RQ17 to be affective | |
| | RQ19 | Dx Substation Balancing | Although the current system facilitates energy balancing on Substation level, all balancing reporting is geared towards Feeders. Functionality is needed to visualize and report on Substation level. The functionality is required to publish energy balancing on Substation level | |
| | RQ20 | MTS Balancing | Establish/Develop a table (currently non-existent) which defines the relationship between the incoming feeders from Tx and Dx Substations. Reconcile Energy Delivered from incoming feeders and outflowing energy from Dx Substations. MTS Balancing will also incorporate bulk feeders from Tx | |
| | RQ21 | Produce 3 Reports (i.e. Bulk feeders, Reticulation feeders and Consolidated Report) | Currently energy balancing consolidated results are published to corporate which include all the Reticulation Feeders (with more than 1 customers connected) as well as the Bulk Feeders (with dedicated bulk customers e.g. Municipalities) Separate reports are also required for the Bulk Feeders and the Feeders with more than 1 customer | |

## 5. Non-Functional Requirements:

### 5.1 Non-Functional Security:

The following are security requirements for the cloud service:

a) External Third-Party Attestation Reports (Note: SOC reports are only applicable to Cloud Services such as SaaS, PaaS, IaaS and iPaaS, not systems hosted on Eskom's Azure tenant/virtual private cloud (VPC) and on-prem on the Eskom corporate local area network (LAN)/business information network (BIN): SOC 1 Type II and SOC 2 Type II is an attestation standard put forth by the Auditing Standards Board of the American Institute of Certified Public Accountants (AICPA) that addresses engagements undertaken by a service auditor for reporting on controls at organizations that provide cloud services to user entities. The Cloud Service Provider (CSP) shall:

i. For all cloud services that store and process financial information and personal identifiable information (PII) including intellectual property (IP), the CSP shall have a valid Service

Organisation Control (SOC) 1 and SOC 2 Type II reports, such attestation reports shall be submitted to Eskom for review.

ii. Up to once per period of twelve (12) months, the CSP will provide comprehensive summaries of its latest SOC 2 report at no cost upon Eskom's written request.

iii. if the SOC Reports indicate any deficiencies or matters requiring attention, the CSP shall use commercially reasonable efforts to address all such items without any costs to the Eskom.

iv. Subject to Section 1.ii, if vendor's reporting cycle is not aligned with the financial year, and/or the SOC report is older than six (6) months, the CSP shall submit a bridge letter to the Eskom at no cost, and such bridging letter shall not cover a period exceeding three (3) months.

b) For all cloud and on-premises systems that store and process financial information, PII and IP, a valid International Organization Standardization (ISO) 15408 certificate is required.

c) For all cloud and on-premises systems that store and process financial information, PII and IP, a valid International Organization Standardization (ISO) 27001 certificate is required.

d) For all cloud and on-premises systems that store and process financial information, PII and IP, a valid International Organization for Standardization (ISO) 27034 certificates are required.

e) For all Cloud Services that store and process financial information, PII and IP information, a valid International Organization for Standardization (ISO) 27017 certificate.

f) For all Cloud Services that store and process financial information, PII and IP information, a valid International Organization for Standardization (ISO) 27018 certificate.

g) The privileged accounts shall be onboarded onto Privileged Access Management (PAM) system, such as CyberArk but not limited to CyberArk to securely manage, rotate passwords, monitor, record sessions, enforce access to privileged accounts, auditing and reporting capabilities.

h) The cloud service shall be able to integrate with existing Eskom's on-prem identity provider (IdP), and Multi Factor Authentication (MFA) to enable Single sign-on (SSO).

i) Role base access control (RBAC) shall be employed.

j) Data at rest (using AES-256) and in transit or in motion (using TLS 1.3, or later version) shall be encrypted.

k) Data shall be secured at minimum using a Secure Hash Algorithm (SHA)-256 for data integrity, securing transactions, and messages.

l) Audit trails, logs, user administration and user activity logs shall be enabled, encrypted, and securely kept with limited access to administrators.

m) Sensitive information such as personal identifiable information (PII) data in Sandbox/development (DEV) environment shall be masked.

n) Incremental daily back-ups shall be done, encrypted, and securely kept offsite.

o) Real-time data synchronization or data replication to a secondary or disaster recovery (DR) site, located in different region shall be employed.

p) Disaster Recovery Plan (DRP) shall be defined, annually tested and such DRP test results shall be submitted with Eskom Cyber Security team.

q) Back up Restore Plan and Procedure shall be defined, annually tested and such test results shall be shared with Eskom Cyber Security team.

r) Patch Management Process shall be defined. The software updates and patches shall be tested on Sandbox or development (DEV) environment prior being deployed into production (PROD) environment.

s) The static application security test (SAST) and dynamic application security test (DAST), vulnerability assessment and penetration test shall be conducted prior deploying the cloud system and on-prem systems to PROD, all critical, high, and medium vulnerabilities shall be addressed prior deploying PROD, and the summary of the test results shall be submitted to the Eskom Cybersecurity team for review and acceptance.

t) The CSP shall comply with applicable privacy and protection of personal information Acts such as GDPR in European Union (EU) and POPIA in South Africa (SA) where the cloud service is hosted, and the region where the data subjects are physically located.

u) The CSP shall notify Eskom immediately or not less than 24 hours when any cyber security breach has occurred. Although the GDPR and the South African Cybercrimes Act 19 of 2020 states that the notification shall be sent within 72 hours, Eskom shall be notified sooner to allow Eskom to notify the information regulator and take necessary actions to minimize the impact on Eskom.

v) The CSP shall notify Eskom within one (1) month if there are any significant changes to the business, platform and hosting service provider or any change that could have an impact the security assessment conducted and the auditor's opinion on the SOC audit.

w) The database shall be placed within Eskom corporate LAN/BIN network (if hosted on premise) and partner private network (If hosted in the cloud) behind the perimeter firewall.

x) Database Security Management tool shall be employed to provide regulatory compliance, encryption, key management, granular access controls, flexible data masking, comprehensive activity monitoring, and sophisticated auditing capabilities.

y) Distributed Denial of Service (DDoS) protection mechanism shall be employed for all databases.

z) Web Application Firewall (WAF) for all internet facing applications and/or web-based applications shall be employed.

aa) The Cloud Service shall support the prevailing enterprise services bus (ESB), application programmable interfaces (API's) and Integration Platform as a Service (iPaaS) platforms for security, logging and monitoring for both on-prem, hybrid-cloud and multi-cloud environments such as IBM App Connect, TIBCO Cloud Integration (including Business Works and Scribe), WSO2 Carbon, Software AG web Methods, Neuron ESB, Apache Camel, WebSphere Message Broker, RSSBus Connect, Azure Service Bus and Oracle Service Bus, Saleforce Mulesoft, IBM DataPower, Oracle API Platform, Cyclr, DreamFactory JDBC, Microsoft SQL Server Integration Services (SSIS), SAS Data Integration Studio, Integration Adaptor DirXML, Oracle X AI Services, SAP Business Process Automation, SAP NetWeaver, Oracle Fusion Middleware, Connect Direct, HP Data Protector, WINSCP, FreeFileSync, SAP PI/PO, SAP CPI, HP SOA Systinet, JCAPS, Cloud Pak for Data, K2, Microsoft Power Automate and Zapier but not limited to these listed.

bb) The Cloud Service shall provide e-Discovery capability to identify, collect and produce electronically stored information (ESI) in response to a request for production in a lawsuit or investigation as part of the cloud services offered.

cc) The Cloud Service shall be able to integrate with Security Information and Event Management (SIEM) standard technologies such as Syslog, Windows event logging, Simple Network Management Protocol (SNMP) and Application Programming Interface (API) but not limited to these technologies listed.

## 5.2 Non-Functional – Architecture:

Eskom aims to accelerate its digital transformation roadmap by adopting (amongst others) a revised cloud policy and cloud strategy, allowing for a multi-cloud journey and innovative new technologies to improve market agility and drive business growth. In support of this vision statement, Eskom Holdings and all its current and future subsidiaries require a highly scalable, innovative and elastic Feeder Balancing Module (FBM) platform.

The Service provider shall submit a detailed solution design proposal, addressing as a minimum all the following architectural and design aspects.

### 5.2.1 Cloud service model: Eskom Azure Tenant (Preferred)

Note: The cloud offering must enable configuration where required. It should also be flexible enough to cater for all specific FBM business or discipline.

### 5.2.2 Cloud deployment model and location of deployment

The cloud deployment solution must be deployed to a wide range of local and global cloud service provider which is secure with flexible network connection within the borders of South Africa (data sovereignty).

### 5.2.3 (c) Architectural approach and style

Modern IT and architectural approaches such as a composable and modular architecture, which in turn uses microservices and containerisation etc must underly the system architecture, to ensure updates and new configurations / services could be deployed independently and with minimal disruption to the whole ecosystem.

### 5.2.4 Open Architecture and Standards

The system architecture and implementation should follow Open Architecture and Standards principles to ensure greater flexibility, interoperability, and portability.

### 5.2.5 Logical Access Control

- **Authentication**

Authenticate against Eskom's central identity management system (currently Active Directory, but Azure Active Directory will also be used going forward to allow for multi-factor authentication etc). OAUTH2 or SAML2 can be used.

### 5.2.6 Authorisation

Utilise the principle of Least Privilege by allowing each user the minimum amount of access necessary for their work and role to be performed.

### 5.2.7 Network Connectivity and Security

A secure, end to end encrypted data gateway connection must be deployed between the cloud model offering and Eskom's private network. The principle of Zero Trust must be applied e.g., dedicated, secure landing zones for workloads.

### 5.2.8 Data security – Information Protection and Governance

The design must be done according to industry security best practices and regulatory requirements such as NIST, ISO and OWASP, providing a robust framework for secure and responsible cloud consumption. The same levels of security and controls must be applied across all platforms and data centres.

Refer to **Error! Reference source not found.** for a data classification of subject area data (highest confidentiality classification taken for all use cases). Information and information resources must be classified as per the relevant Eskom policies and standards. (The categories are public controlled disclosure, confidential, secret, and top secret). The classification labelling to be implemented on Cloud/CSP via governance guardrails.

Eskom's data must be protected via encryption and key management. All data at rest and in transit must be encrypted. Data in transit must be protected with TLS (Transport Layer Security) 1.3 encryption. Eskom is in the process of establishing its own key management (PKI) system. Once this becomes available (if not already available at the inception of the project), the solution must be able to switch over to Eskom's key management capability.

Data of different disciplines to be retained could potentially be governed by different regulatory and legislative requirements, which the solution must cater for, to assist Eskom in automatically retain, archive, delete and store records in a compliant manner.

The Principle of Least Privilege must be applied to prevent accidental oversharing of sensitive information.

The Fail-Safe Architecture principle recognizes the importance of designing resilient cloud architectures that can withstand the failure of individual security controls. By implementing fail-safe measures, the integrity and confidentiality of Eskom's system and data even in the event of control failures can be maintained. This principle ensures continuous protection and reduces the risk of security breaches or unauthorized access.

All Eskom data/information governance controls and procedures must be adhered to and maintained. Information will be shared upon on-boarding.

### 5.2.9 Portability

The cloud model must be designed for portability as far as possible. The Service provider should state / explain how this is achieved (or not), e.g., can be deployed on more than one hyperscaler, which services used in the product are vendor agnostic etc.

### 5.2.10 Business Continuity

The solution design must cater for unforeseen events and maintaining operational resilience to mitigate the impact of disruptions, minimize downtime, and ensure the ability to transition workloads between environments when required. The solution must provide appropriate redundancy and resiliency. The solution's connectivity should be optimised with High Availability (e.g., Built-in ability to restore the workloads across other landing zones) and Disaster Recovery capabilities (e.g., to other geo-regions within the SA borders), to address the criticality of the system (Mission Critical to Safety & Revenue Critical), ensuring uninterrupted operations in the case of unforeseen events. The preliminary impact analysis is summarised in **Error! Reference source not found.**.

Table 1 depicts Eskom's current recovery objectives, such as Recovery Time Objective (RTO) and Recovery Point Objective (RPO), with the needs and priorities of the organisation. It should be noted however, that these RTOs and RPOs need to be revised, in view of the FBM platform having to support a real-time incident management and emergency response.

**Table 1: Eskom system criticality and business continuity guidelines**

| System Importance | Safety and revenue Critical | Mission Critical | Business Critical | Normal Business Essential | Normal non-essential |
|---|---|---|---|---|---|
| **Impact Rating** | High | High | Medium | Medium | Low |
| **Tier** | Tier 0 | Tier 1 | Tier 2 | Tier 3 | Tier 4 |
| **Definition** | Failure of system may result in injury or death and/or significant loss of revenue | Vital to the functioning of the organisation and accomplishment of its mission | Without which the business can continue operations for a predefined time period- | Without which the business can continue operations for after 5 days | Without which the business can continue operation for up to a month |
| **Time Loss/ RTO** | <8 hrs | <24 hrs | <48 hrs | <5 days | >5 days |
| **Data Loss/ RPO** | 0 | 0 | <24 hrs | <24 hrs | >5 days |

A Business Impact Assessment (BIA) review must be done as part of the solution design, together with the business stakeholders and IT Business Continuity team.

Eskom must have a restorable backup copy of the data that can be recovered independently from a cloud service provider.

### 5.2.11 Ease of Consumption

The solution should provide a seamless and user-friendly experience, enable super users and support staff to accelerate the delivery of configured FBM application and empower end users with self-service capabilities as far as possible.

### 5.2.12 Application workload placement

The diverse nature of workloads must be considered in the design. Different application workloads have unique requirements and considerations. Appropriate placement of workloads must take into consideration factors such as workload characteristics, performance requirements, data sensitivity, and business objectives.

### 5.2.13 Resource optimisation and continuous monitoring

The solution and all components, and workloads and configurations must be continuously monitored. The service provider shall assist to implement the necessary financial management and monitoring processes and enforce agreed limits through available cloud provider policies and governance (e.g., automated business rules, monitoring dashboards). Resource efficiency, optimization, and right-sizing, not only ensure optimised operational expenditure, but also would assist to reduce energy consumption, and contribute to a more sustainable future.

### 5.2.14 IT Standards

The tenderer is to ensure adherence to Eskom architectural standards as far as possible and where applicable. The following base ICT standards apply – refer to especially the grey shaded standards below:

| | |
|---|---|
| Integration | End interface points, whether consuming or providing, needs to be done in a secure web service fashion. Eskom standard is Oracle Fusion and IBM DataPower Gateway underlying the present Enterprise Integration Platform/ Service Bus. |
| Authentication | Azure AD |
| Database | • MS SQL 2019<br>• IBM DB2 V 11.5<br>• Oracle Database 19c (not preferred)<br>• Oracle Database 21c (not preferred)<br>• PostgreSQL V13.2 and PostGIS |
| Server OS | • Microsoft Windows Server 2022<br>• SuSe Linux SLES 15<br>• AIX 7 |
| Client OS | • Windows 10 or higher |
| Browser | • Edge<br>• Mozilla Firefox v39<br>• Mozilla FireFox V60 |
| Load Balancer (ADM) | • F5 Viprion |
| Backup | • NetBackup |
| Communication Protocol | • TCP/IP |
| Desktop/Laptop specifications (see below) | • High End Laptop<br>• Midrange Laptop<br>• Lower Range Laptop |

### 5.2.15 Desktop/Laptop specifications:

| | | |
|---|---|---|
| **High End Laptop** | Processor | 11th Gen Core i7-11800H |
| | Speed | Base 2.3GHz Turbo Frequency 4.6GHz |
| | Graphics | NVIDIA® T1200 4GB GDDR6 |
| | Storage | 512 NVME |
| | Memory | 16 GB DDR4-3200MHz (SoDIMM) |
| **Midrange Laptop** | Processor | 11th Gen i7-11800H |
| | Speed | Base 2.3 Turbo Frequency 4.6GHz |
| | Graphics | NVIDIA® T1200 4GB GDDR6 |
| | Storage | 512 NVME |
| | Memory | 16GB DDR4-3200 |
| **Lower Range Laptop** | Processor | 11th Gen i5--1135G7 |
| | Speed | Base 2.4GHz Turbo Frequency 4.2GHz |
| | Graphics | Intel Iris Xe Graphics |
| | Storage | 512 NVME |
| | Memory | 8GB DDR4 3200 |

### 5.2.16 Secure and optimised design

The well architected framework (WAF) is a set of best practices and guidelines for designing and operating cloud-based systems. Taking into account all Eskom's architecture requirements specified above, the Service Provider must state which WAF or alternative Cloud Best Practice Reference Architecture will be used, and discuss in detail how it will ensure an optimal, resource and cost effective, secure configured design and deployment in terms of the following (more design aspects and principles could be added if required):

- Reliability
- Security
- Cost optimization
- Operational excellence
- Performance efficiency
- Sustainability

### 5.2.17 Seamless and Efficient Operations & integration between on-premises and cloud

The cloud offering must efficiently and securely integrate with Eskom's datacentre at Megawatt Park, the Eskom corporate/ private network(s) and the Enterprise Integration Platform (IEP or ESB), and in future also with other Eskom approved and deployed multi-cloud/ hyperscaler environments (MS Azure tenant already in progress).

Please note that Integration Business Service API activities is to expose/consume and test Services to/from the Eskom Integration Services Bus. Eskom will be responsible for the development of the Integration Services to/from the bus to the internal systems

A multitude of integration points with on-premise solutions/ data sources are envisaged. A preliminary view is shown in 1.

Various integration requirements, which will have to be verified and confirmed during detailed design workshops in the ERA phase. The Service provider must allow for sufficient time to review the integration requirements with the business, followed by workshops with the Integration CoE.

Integrating with Eskom's CIPC local data copy/ service will be very important. Efforts are underway to change from the data export provided to an API service.

Some high-level descriptions for **Error! Reference source not found.**.

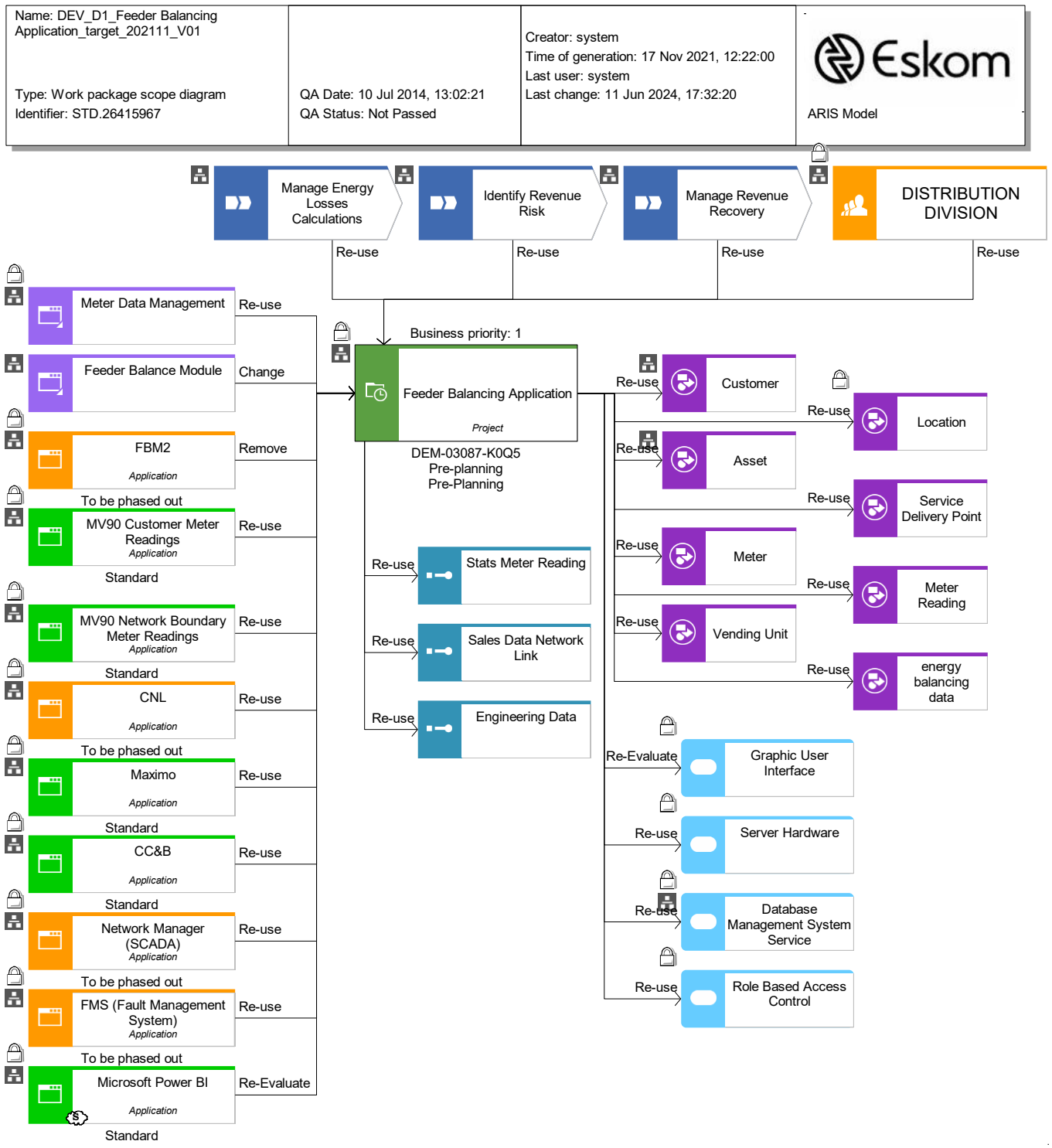

Name: DEV_D1_Feeder Balancing Application_target_202111_V01
Type: Work package scope diagram
Identifier: STD.26415967
QA Date: 10 Jul 2014, 13:02:21
QA Status: Not Passed
Creator: system
Time of generation: 17 Nov 2021, 12:22:00
Last user: system
Last change: 11 Jun 2024, 17:32:20
ARIS Model
Manage Energy Losses Calculations
Identify Revenue Risk
Manage Revenue Recovery
DISTRIBUTION DIVISION
Re-use
Re-use
Re-use
Re-use
Meter Data Management
Re-use
Feeder Balance Module
Change
FBM2
Application
Remove
To be phased out
MV90 Customer Meter Readings
Application
Re-use
Standard
MV90 Network Boundary Meter Readings
Application
Re-use
Standard
CNL
Application
Re-use
To be phased out
Maximo
Application
Re-use
Standard
CC&B
Application
Re-use
Standard
Network Manager (SCADA)
Application
Re-use
To be phased out
FMS (Fault Management System)
Application
Re-use
To be phased out
Microsoft Power BI
Application
Re-Evaluate
Standard
Business priority: 1
Feeder Balancing Application
Project
DEM-03087-K0Q5
Pre-planning
Pre-Planning
Re-use
Stats Meter Reading
Re-use
Sales Data Network Link
Re-use
Engineering Data
Re-use
Customer
Re-use
Location
Re-use
Asset
Re-use
Service Delivery Point
Re-use
Meter
Re-use
Meter Reading
Re-use
Vending Unit
Re-use
energy balancing data
Re-Evaluate
Graphic User Interface
Re-use
Server Hardware
Re-use
Database Management System Service
Re-use
Role Based Access Control

*Figure 1*

## 6. Scope of Work:

### 6.1 Contract period

The supplier to provide timelines for the project to be complete:

Total Project Implementation Period:

- Supplier to indicate project timelines for a cloud-based implementation
- Implementation must include Go-Live for the base application
- Enhancement including integration as specified in the Architecture of the system
- Stabilisation Period

The supplier will justify the timelines based on their expertise and the various milestones outlined in the project scope.

6.1.1 Support and Maintenance: **60 months**

- 5 years Maintenance and Support.
- This will only apply after base implementation is completed and in production.
- Fixed or Milestone based Contract.

It is recommended that the Support and Maintenance for the licence and hardware should be paid on completion of the project implementation (Go-Live). To be paid only at the start of the five (5) years Support and Maintenance period.

The supplier should note that the take-on will be on as and when required.
*Sliding scale based on cumulative volumes for licence to be included (indication based on minimum values):*

- 20 – During Implementation
- 40 - Users year 1
- 50 - Users year 2
- 50 - Users year 3
- 50 - Users year 4
- 50 - Users year 5

6.1.2 Preferably deployed on Eskom's Azure Tenant

This should include:

- Licensing Costs per annum
- Maintenance and Support Costs per annum

| Deliverable | Description |
|---|---|
| **Architecture Services** (Functional Specifications and Detailed Design) | **Introduction (Architecture Services):**<br>The objective is to define and design various architectural components necessary for the successful implementation of the application. The Tenderer is required to render solution architect services to this project which includes making sure that Enterprise Architecture committee approval is gained before build (Physical Application Design (PAD) and again before go-live (Pre-Transfer). Sufficient time must be allowed for requirement refinement and functional design workshops, as well as the physical design (s) detailing all configurations.<br><br>**Scope:**<br>Deliver approved functional specifications and detailed design (physical design) based on the user requirement specifications and Enterprise Architecture design guidelines and requirements provided as part of this RFP. The scope of the architecture work includes the following key areas:<br><br>• **Data Architecture:**<br>  • Define the data architecture, including data modelling, storage, retrieval, and data flow diagrams.<br>  • Design data schemas, considering scalability, data integrity, and performance optimization.<br>  • Recommend appropriate database technologies and data storage solutions based on project requirements.<br><br>• **Solution Architecture:**<br>  • Collaborate with stakeholders to understand functional and non-functional requirements.<br>  • Develop a comprehensive solution architecture that outlines the application's components, their interactions, and the overall system behaviour, while ensuring that it would be cloud native and portable across different cloud hyperscaler platforms.<br>  • Identify key software modules, frameworks, and technologies required for the solution.<br>  • Provide guidelines for designing and developing each module while ensuring alignment with project goals.<br><br>• **Technical Architecture:**<br>Technical Architecture Scope:<br>  • Define the technical infrastructure required to support the application's deployment and operation.<br>  • Recommend hardware, network, and cloud infrastructure configurations to ensure scalability, availability, and performance.<br>  • Specify software development tools, frameworks, and best practices to be used by the development team.<br>  • Collaborate with internal technical stakeholders.<br>  • Address technical constraints, such as latency, bandwidth, and system compatibility.<br><br>• **Security Architecture:**<br>  • Collaborate with internal IT Security stakeholders.<br>  • Identify potential security threats and vulnerabilities relevant to the application.<br>  • Design security measures, including authentication, authorization, encryption, and access controls.<br>  • Define security policies, protocols, and procedures to safeguard sensitive data and ensure compliance with relevant regulations.<br>  • Ensure cyber security compliance.<br>  • Conduct security risk assessments and propose mitigation strategies.<br>  • Secure by Design solution modelling and deployment in compliance to Eskom governance to be applied.<br><br>• **Integration Architecture:**<br>  • Collaborate with internal integration stakeholders such as the Integration CoE.<br>  • Identify and outline all the required integration points between the application and external systems, services, or APIs.<br>  • Design data exchange formats, protocols, and communication patterns for seamless integration.<br>  • Specify middleware or integration platforms if needed, considering performance and reliability.<br>  • Ensure proper error handling, data consistency, and fault tolerance across integration points<br>  • Integration Business Service API activities to expose/consume and test Services to/from the Eskom Integration Services Bus. Eskom will be responsible for the development of the Integration Services to/from the bus to the internal systems<br>  • The tenderer's team is expected to contribute and participate in the Different testing preparations and executions<br><br>**Communication:**<br>Regular update meetings will be held to discuss architecture deliverable progress, address concerns, and ensure alignment with project goals. |

| Deliverable | Description |
|---|---|
| | **Deliverable Acceptance Criteria:**<br>The architecture work will be considered successfully completed upon support/approval of the architecture documentation by both Enterprise Architecture and project stakeholders.<br><br>Facilitate review and approval of the design as required by Eskom methodology and governance. A lead time of at least two weeks needs to be provided for in the timelines in order to allow for review and approval processes.<br>• Detailed design approved by EAAB<br>• Approved functional specifications<br>• Development environment ready for Build/ Configuration |
| Integration | The Work Feeder Balancing Module system procured is intended to interface with the systems listed **in** Error! Reference source not found..<br><br>Please be aware that the Eskom Integration team will do the integration activities. The successful bidder is required to do the business services development to communicate to the other systems. |
| | The application must have the capability of secure communication when exposing the services via the business services |
| | Provide the required detail to the Eskom Integration Team to enable the design of the end-to-end solution and work closely with Eskom's Integration team.<br><br>Provide input and contribute to the Analysis, Design, Message Modelling, Unit testing, SIT testing, UAT testing and Non-Functional testing<br><br>Provide Application Business Services that conform to the specific security and Integration standards<br><br>Provide Application Business Services that can receive an Integration reply with a full-service response (pre-defined message structure) in case the Application is invoking an Integration Web Service<br><br>Provide Application Business Services that can communicate via One-Way or Two-Way certificate (SSL/TLS) to secure the channel<br><br>Provide Application Business Services that support Basic Authentication for Web Services, Database or SFTP for Authentication security<br><br>Provide Application Business Service with the capability to distinguish between Technical and Business error and handle each one in a separate manner |
| | The scope excludes the following:<br><br>• All testing except unit testing. The tenderer's team is expected to contribute and participate in the testing preparations and executions.<br>• Integration messages from the Eskom integration bus to Eskom's systems.<br>• Support and Maintenance of the Eskom Integration Services |
| Testing | The solution will undergo comprehensive testing following Eskom's standards to ensure its completeness and authenticity. The testing team is responsible for gathering testing requirements, creating test cases, and executing the tests to thoroughly evaluate the solution for deployment within Eskom's IT environment.<br>Please note that the following:<br><br>1. All testing, except unit testing, will be carried out by the Eskom testing team. The tenderer is responsible for conducting unit testing.<br>All testing (including unit testing) must be performed within Eskom's test management systems, such as Application Lifecycle Management (ALM), LoadRunner (for performance testing), and Unified Functional Tester (UFT).<br>2. The implementation team must coordinate with the testing team to ensure sufficient time is allocated for testing, and that all testing activities are incorporated into the project schedule.<br>3. Before the official test cycle begins, the development team must provide unit test results, adhering to the entry and exit criteria outlined in the master system test plan. A signed-off test closure report is required before making any test milestone as complete.<br><br>The following tests and milestones must be completed: |

| Deliverable | Description |
|---|---|
| | • **Unit Testing (Development Environment):** Results provided by the tenderer's development team.<br>• **System Integration Testing & Functionality Testing (QA Environment):** This includes end-to-end functional testing and integration testing, ensuring the solution works with other systems and meets all requirements. The Eskom testing team will lead and execute this testing, while the tenderer's team must provide necessary inputs.<br>• **User Acceptance Testing (Pre-Prod Environment):** Facilitated by the testing team but executed by Eskom's customer/business team to verify that the system meets the requirements defined in the BRS for completeness and authenticity.<br>• **Non-Functional/Performance Testing (Pre-Prod Environment):** Led and executed by the performance tester.<br>• **Disaster Recovery Testing (for the on-premises option).** Led and executed by the Disaster recovery team. |
| | All testing requirements must cover all identified interfaces that have been identified. The testing team must adhere to the Testing Centre of Excellence (TCoE) standard document provided as part of the RFP documentation. |
| Business Training | Recommend and provide suitable method whether online and physical / virtual (MS Teams) or classroom training.<br>Develop training material and train Eskom business users. |
| | The supplier must provide super user training |
| | Train business super users / administrators for each capability included in the scope of work. |
| | The supplier must provide Eskom with a training approach indicating how training will be implemented during project implementation phase for super users (training the trainer approach), Overall Eskom end users will be trained by their super users for their respective capabilities. |
| | Supplier must also make provision for a training video or noddy guide.<br>Training material must also be provisioned as part of this transaction.<br>Supplier to work together with the LSO business unit and training platform to formalise training for Eskom users. |
| Technical Training/ Transfer of skills | Develop training material and support material. Train Eskom Group IT support teams and ensure sufficient knowledge transfer. The vendor will be required to sign-off knowledge transfer acceptance certificate as part of every deliverable to ensure knowledge is transferred throughout the process and does not need to wait until the end of the project. The requirement for training will be of functional application support, 1st line support, 2nd line of support, including the application technical support and database support to assist users with self-service and configuration. |
| | The service provider is required to provide all levels of support services, even though they will be training Eskom support resources. |
| Build and deploy | Provide test cases, provide unit testing evidence, once all the necessary testing is complete, testing reports are produced, all governance approvals are obtained, the solution will need to be deployed to production. The Tenderer must articulate clearly as part of the response the implementation and deploy approach. |
| | Update requirements traceability matrix. Ensure all environments are updated following successful test conclusions. Compile a go-live plan and ensure the solution obtains the necessary governance approvals as follows: |
| | Enterprise Architecture Advisory Board (EAAB)<br>for pre-transfer, Change Review Management Committee (CRMC), Go/No-Go pack and decision by Group IT General Manager. |
| Data Migration | Solution must have the option for data to be exported to other solutions at the end of the contract term. Eskom to retain the ownership of all the data that business stores, transmits, and creates with the cloud service during the period of the contract. |
| Security | Refer to the Technical Evaluation Document for detailed requirements |
| Reporting | Reporting requirements are to be provided as stipulated on the Business Requirements Specification document and Technical Evaluation functional requirements. |
| Service Level Agreement | Eskom will provide 1st line support however, 2nd line, 3rd line, and 4th line support will be required from the service provider to Eskom, which will entail an escalation process. |

<table>
<tr><th>Deliverable</th><th>Description</th></tr>
<tr><td></td><td>Supplier should provide 24/7 on site or remote support. The tender must have a service desk and a call logging system which Eskom can log ticket and track them.<br><br>Service performance management:
<table>
<tr><th>Priority</th><th>Mean time to respond (mins)</th><th>Mean time to resolve (Hrs)</th><th>Target (%)</th></tr>
<tr><td>P1</td><td>15</td><td>4</td><td>100</td></tr>
<tr><td>P2</td><td>15</td><td>6</td><td>99</td></tr>
<tr><td>P3</td><td>30</td><td>8</td><td>99</td></tr>
<tr><td>P4</td><td>30</td><td>16</td><td>99</td></tr>
</table>
Escalation procedure:
<table>
<tr><th>Escalation level</th><th>Eskom</th><th>Supplier</th></tr>
<tr><td>First level</td><td>Application Support Manager</td><td>Operations Manager</td></tr>
<tr><td>Second level</td><td>Middle Manager solution support</td><td>Senior Manager</td></tr>
<tr><td>Third level</td><td>Senior manager</td><td>Managing Director</td></tr>
</table></td></tr>
<tr><td rowspan="5">Project Management</td><td>Deliver project documentation required by the Eskom Group IT PMO. This includes but is not limited to:</td></tr>
<tr><td>Detailed integrated schedule. Weekly progress reports. Payment schedule forecast and actuals tracking against the forecast. Delivery Acceptance Certificates with supporting documents. Provide information required by Eskom team members to facilitate governance of the project and its deliverables. Integrate the current application support teams into the project delivery team. Deliverable Breakdown Structure indicating all fixed cost deliverables with the cost of each deliverable and the total cost of all deliverables.</td></tr>
<tr><td>During execution deliverables will be evaluated by Eskom and a deliverable acceptance certificate will be issued on approval. Approved deliverables can then be invoiced.</td></tr>
<tr><td>A Project schedule in MS Project format. The top-level work breakdown in the schedule must reflect the Software Delivery Life Cycle stages (e.g Feasibility, Design; Build, Test, Train, Deploy and Stabilise).</td></tr>
<tr><td>Please note that, all scope items mentioned on this scope document and all the requirements stated on the Business Requirements Specification and Technical Evaluation Criteria documents must be accepted.</td></tr>
<tr><td rowspan="3">Other Responsibilities</td><td>Dependencies and pre-requisites on Eskom must be clearly stipulated.</td></tr>
<tr><td>All deliverables produced on this contract shall become the property of Eskom with Eskom holding sole rights to it. All deliverables shall be provided in maintainable format for each evaluation (i.e., editable documents).</td></tr>
<tr><td>Project change control refers to the changes in project scope, time, and Cost. Changes will follow the process below:</td></tr>
<tr><td></td><td>Changes must be approved by the requester, business owner, project manager, and project sponsor.<br><br>Depending on the scale of the change, other approvals external to the project may be required. Guidance in this regard will be provided by Eskom. Approved changes must be noted in steering committee minutes and scope document must be compiled and signed off.</td></tr>
<tr><td>Eskom Governance</td><td>Various Eskom governance and processes to be followed during the project.<br><br>Annexure O_Eskom ITO - Schedule Q (Supplementary Terms for Cloud Computing) MUST be completed and submitted as part of the tender proposal.<br><br>Annexure P_Eskom POPI Operator Agreement is attached for information purposes (applicable to the contracting phase).<br><br>Tender proposals MUST in addition to the required hard copies, include an electronic version on a USB device.</td></tr>
<tr><td>Cyber security insurance</td><td>Stipulate a cyber insurance contract</td></tr>
<tr><td>Exit strategy</td><td>Compile and sign an exit strategy</td></tr>
</table>

**6.2 Training/Transfer of Skills Requirements:**

- Train the Trainer approach will be considered.
- Two types of training will be required:
  - **User training** will be required i.e. for systems users to be able to use the system effectively and objectively to achieve desired systems results/goals
  - **Technical training** will be for system support resources, this is technical training or knowledge handover so that the support resources will be able to provide at least 1st and 2nd line support of the system.
- Transfer of skills and Knowledge Transfer is required to be done for the Group IT Support Resources that will be providing support
- Recommend the preferred method of training:
  - Training strategies will be compiled for all stakeholders.
  - Classroom based training for ten (10) x IT Administrators/Super Users (Train the trainer concept)
  - Provide onsite classroom-based training
  - Web-based training for end-users and system support staff. Develop web-based training based on Eskom Academy of Learning (EAL) guidelines. (Users must be able to access web training on and as and when required based). The training can be accessed via the EAL website.
  - Mentor Eskom resources through the installation, configuration and deployment stages using a defined skills transfer programme.
- Post Implementation online training for any potential future changes to the solution during the Maintenance and Support period of the contract.
  - Skills and Knowledge Transfer will be done for GIT Support Resources that will provide first level support as and when major changes are done.
  - The type of training required will be based on the impact on business processes and impact on human resources.
- Specific training identified but not limited to:
  - Advance analytics
  - Ability to upload source system data from BI-FBM universe to FBM application.
  - Manage meter and feeder status
  - Configure the network
  - Map CDU unallocated sales
  - KWh adjustments
  - Adjust technical losses %
  - Calculate balancing results
  - Display losses per OU hierarchy
  - Publish reports
  - Display results provincially and nationally
  - Store data mapping
  - Meter management

## 7. Service Level Agreement Requirements

- Provide 1st, 2nd and 3rd Line support and maintenance per request over the contract period.
- Telephonic and on-site (when needed) on Software and Hardware (only if service provider provisions hardware)
- Align advisory services with Eskom governance practices.
- Contract for a period of 5 years after implementation and system being on production.
- 8X5 System Availability, Monday to Friday
- Included in the proposal we are requesting options to be presented to manage the above-mentioned better.
- Third party system admin.
- Maintenance and support of core back-end infrastructure
- The FBM Service Level Requirement, to be as follows:
  - The system availability to be at optimum level of 98%
  - To provide a higher frequency of system maintenance to be implemented with more maintenance cycles per database instance.
  - Ensure 8x5 monitoring and 4-hour response is in place to mitigate system downtime.
  - Ensure the required 3rd and 4th level OEM support is in place.

## 8. SLA Penalties:

- Ten percent (10%) penalty will be imposed if the SLA of 98% availability over a 30-day period is not met.
- A detailed route cause analysis will be done on all incidents before penalties are imposed.
- Planned and agreed downtime and planned maintenance are excluded from the above.

## 9. Change Management Requirements:

Develop a change management Programme to prepare users and administrators to adopt the new processes introduced by the solution.

Minimum requirements for Change Management Resources

- Minimum of 8 years of experience in a relevant role.
- B Degree in Business Management with Change Management course or module completed.
- Skills in: Change Management - Transformation Management - Organizational design/development.
- Communication - Leadership development - Training management.

## 10. Project Management Services

- Provide a full-time project administrator and project manager for the duration of the project. A proposed implementation plan and timeline should accompany all proposals.
- The service provider should note that there are governance processes to be followed which could be time-consuming, for example but not limited to:
  - Enterprise Architecture (EAAB) approvals/ support (weekly Monday meetings, but submissions due by mid-week the week prior)
  - Group IT Delivery approvals (only monthly meetings, submissions due a week prior)
  - Integration CoE approvals for new messages or amendments to existing messages
  - Project Delivery related approvals

### 10.1 Minimum Resources Required:

- **1 X Project Manager**
  - 10 years working experience.
  - IT Degree
  - Certification in required PMBOK/Prince 2

- **1 X Project Administrator/Co-ordinator**
  - 5 years working experience.
  - IT Degree
  - Certification in required PMBOK/Prince 2
  - Agile Certification

### 10.2 Minimum Resource Requirements (Summary for the Project):

This is a milestone-based project, and the supplier needs to specify any extra resources they need to finish it. Eskom has given the minimum requirements, but the supplier can add more resources as they see fit to meet the deliverables.

| # | Resource | Level | Number of resources |
|---|---|---|---|
| 01 | Project Manager | Intermediary / Senior | 1 |
| 02 | Project Administrator | Intermediary | 1 |
| 03 | Business Analysts | Intermediary | 1 |
| 04 | Technical Architect | Intermediary | 1 |

### 10.3 Minimum Resource Requirements (Maintenance and Support/Subscription based contract):

Provision to be made for ad-hoc professional services (as and when required) for 160 hours per year over the 5-year period. The supplier to provide hourly rate card for the different resources per estimated hours.

### 10.4 Timelines/Project Plan:

The supplier needs to provide the following information:

- The expected duration of each task listed above.
- The recommended approach for executing the project successfully.
- The possibility of overlapping some of the tasks to save time.

## 11. Eskom Governance and Process:

Various Eskom governance and processes need to be followed. Please allow for sufficient time in your estimated timelines/ project plan.

## 12. Testing Requirements:

- Acquire the testing requirements, develop the test cases, and conduct testing to ensure that the solution is comprehensively evaluated for implementation in the Eskom IT environment.
- The testing staff may not be the same staff as the configuration, development and implementation staff assigned to the Project.
- All testing must be completed on Eskom's test management systems (Application Lifecycle Management, Load Runner, and Unified Functional Tester) and Vendor must ensure that test staff is skilled in using the test management systems, Defects reporting and management throughout the project.
- The following testing and testing milestones must be completed. A signed off test closure report is required before a test milestone is completed.
    - Unit Testing – test results from the Vendor team.
    - System Integrated Testing, Functionality testing (in QA – end to end functional testing and integration testing. That means testing with other systems and ensuring that all requirements have been successfully configured). This testing must be driven & executed by the Vendor but must include Eskom staff for completeness & authenticity.
    - Non-Functional Testing (performance testing and disaster recovery testing). This testing must be driven & executed by the Vendor but must include Eskom staff for completeness & authenticity.
    - User Acceptance Testing (Testing by the Eskom customer team that the system is working and meets requirements). This testing must be driven by the Vendor but must be executed by Eskom staff for completeness & authenticity.
    - All testing requirements must cover all identified interfaces that have been identified. The testing team must adhere to the TCoE Turnkey Project Requirements Guideline provided as part of the RFP document.

### 12.1 Deliverables:

- Document the Test Strategy, Test Plan, Test Scenarios, Defect Report/Bug Report, Test Execution Reports, Test summary reports, test incident reports and Test Closure report.

- Prepare test data required by the testers to execute test cases.
- Automation of test cases
- User Guides
- Release Notes
- Installation and Configuration Guide
- Resources allocated to the project must be certified in ISTQB (International Software Testing Qualifications Board). Certificate must be provided.
- Experience with ALM and/or Loadrunner must be provided.

**13. System Integration Requirements:**

Integration scope and deliverables is listed below:

The application must have the capability of secure communication when exposing the services via the business services.

Additionally, the tenderer must:

- Provide the required detail to the Eskom Integration Team to enable the design of the end-to-end solution and work closely with Eskom's Integration team.
- Provide input and contribute to the Analysis, Design, Message Modelling, Unit testing, SIT testing, UAT testing and Non-Functional testing.
- Provide Application Business Services that conform to the specific security and Integration standards.
- Provide Application Business Services that can receive an Integration reply with a full-service response (pre-defined message structure) in case the Application is invoking an Integration Web Service.
- Provide Application Business Services that can communicate via One-Way or Two-Way certificate (SSL/TLS) to secure the channel.
- Provide Application Business Services that support Basic Authentication for Web Services, Database or SFTP for Authentication security.
- Provide Application Business Service with the capability to distinguish between Technical and Business error and handle each one in a separate manner.
    - Test closure reports documents.
    - Performance test scripts and results

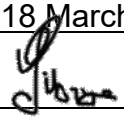
A signed off test closure report is required before a test milestone is completed. The following testing and testing milestones must be completed:

- Unit Testing – test results from the Tenderer's team. System Integrated Testing, Functionality testing (in QA – end to end functional testing and integration testing. That means testing with other systems and ensuring that all requirements have been successfully configured). This testing must be driven & executed by the Vendor but must include Eskom staff for completeness & authenticity.
- Non-Functional Testing (performance testing and disaster recovery testing). This testing must be driven & executed by the Vendor but must include Eskom staff for completeness & authenticity. User Acceptance Testing (Testing by the Eskom customer team that the system is working and

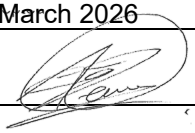
meets requirements). This testing must be driven by the Tenderer but must be executed by Eskom staff for completeness & authenticity.

All testing requirements must cover all identified interfaces that have been identified. The testing team must adhere to the TCoE Turnkey Project Requirements Guideline provided as part of the RFP document.

**14. Approvals:**

| | | |
|---|---|---|
| **End user / requestor:** | **Name:** | Thuleleni Sibiya |
| | **Designation:** | Programme Manager |
| | **Date:** | 18 March 2026 |
| | **Signature:** |  |

| | | |
|---|---|---|
| **Senior Manager (Distribution):** | **Name:** | Maboe Maphaka |
| | **Designation:** | Senior Manager – Retail and Energy Distribution |
| | **Date:** | 18 March 2026 |
| | **Signature:** |  |

| | | |
|---|---|---|
| **Senior Manager:** | **Name:** | Alex Daneels |
| | **Designation:** | Senior Manager - |
| | **Date:** | 19 March 2026 |
| | **Signature:** |  |