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| | | Effective Date | April 2023 | | |
| | | Review Date | April 2028 | | |

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| Description of Request | Asset Performance Management Tool for Distribution and National Transmission Company South Africa (NTCSA) Implementation and Support and Maintenance for the period of 7 years. |
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1. High level background


NTCSA is a subsidiary of Eskom Holdings, while Distribution is a division of Eskom, and they are responsible to transmit and distributes electric power from dispersed Substations and IPPs to high load customers and the distribution and NTCSA networks at load centres. The business is mandated to provide a reliable and efficient Distribution and NTCSA network, a system operator, and energy market services in South Africa and designated electricity markets. The operating model for the Distribution and NTCSA business is evolving as part of the Department of Public Enterprises' plan to reform the South Africa's electricity supply industry. Eskom's unbundling will result in three legally separated entities (i.e. Generation, Transmission, and Distribution) wholly owned by Eskom. The Distribution and NTCSA Business Plan (2021/22 to 2023/24) highlights that creating an independent Distribution and NTCSA entity is expected to enable cost-efficient trade to meet demand, to improve market transparency and reputation, to provide universal access with ease and speed, and to allow for value chain growth and linkages in the electricity industry. The organisation is facing challenges amongst which includes the ageing infrastructure and constrained delivery capabilities against the backdrop of an expected rise in expansion of the Distribution and NTCSA system to interconnect new various electric power plants. These challenges lead to reduction in asset performance, increasing maintenance cost and slows the country's growth potential. To manage these asset related challenges, Distribution and NTCSA has been pursuing improvements to its asset management practices and it is seeking an Asset Performance Management (APM) tool (also referred to as APM solution) that will assist to improve the performance of its physical assets while minimising risk and cost.

NTCSA and Distribution is a high physical asset intensive organisation, and thus, the optimal care of these assets is essential to sustain their technical integrity and performance. These large fleet of assets with varied and complex maintenance requirements lack an integrated system to ensure effective and efficient asset care regime over their full life cycle. While there are efforts to standardise the processes and asset management practices, without an effective system the processes and practices are applied manually, consequently the consistency to execute is lacking and cannot be managed within the

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resources available. NTCSA and Distribution currently employ several business applications to manage assets and related aspects. The purpose of an APM solution will be to augment the capabilities of the existing applications to have a fully integrated asset management solution. The tender encompasses two instances, with evaluations conducted by NTCSA and Distribution. This Turnkey Project involves two ringfenced instances (NTCSA and Dx). (Implementation and Support and Maintenance for the period of 7 years)

The current limitations to optimal asset care includes the following:

- Use of stand-alone basic tools (excel, word) to develop maintenance requirements with no integration capabilities to leverage information from other standalone system.
- Asset health reports are reviewed on a three yearly basis, consequently there could be lost opportunities to timely address assets in poor health status.
- Asset performance i.e., asset failures / failure rates is monitored, however the analysis to improve asset performance is sluggish due to manual processes of collecting information, analysis, and reporting.
- The critical spares holdings levels are based on the judgement of engineers without considering the continuously changing asset performance.
- Asset replacements / refurbishments are informed by technical end of life measures which does not consider economic parameters.

The Asset Performance Management tool is required to bring NTCSA and Distribution in line with international asset management best practice in support of the NTCSA business objectives:

- Achieve a financially sustainable business.
- Pursue operational sustainability.
- Adoption and integration of technology platforms.

2. Scope of work/Business requirements

2.1. Current business challenges / issues that need to be addressed


NTCSA and Distribution has a large fleet of assets with varied and complex maintenance requirements, it lacks an integrated system to ensure effective and efficient asset care regimes to derive optimal performance from assets over their useful lives. A business need was identified to optimise the reliability and performance of the Distribution and NTCSA assets by deploying an Asset Performance Management (APM) tool.

The effective and efficient management of physical assets is an indispensable component of any asset intensive enterprise to prosper. Without an APM tool the performance of assets will continue to

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deteriorate and compromise the Distribution and NTCSA Grid. Asset failures have a high probability impact on the continuity and quality of supply, safety, health and environment.

- Asset Performance Management (APM) tool will provide the platform for the:
- Development & review maintenance engineering and execution strategies
- Determination of optimal strategic and critical spares holding levels
- Development, measure, monitor and report on asset health and asset performance.
- Performance analytics (i.e., reliability, availability, maintainability, probability of failure based on asset age / health)
- Remaining technical & economic life analysis (age analysis, condition criticality & risk assessment)
- Recording & tracking of recommendations.

If the historical and current issues identified above are not addressed, the resulting impact in Distribution and NTCSA is as follows:

- Maintenance strategies will become suboptimal overtime due to inability to continuously keep them customized to complement the asset condition and performance.
- The asset health reports will continue to update on a three yearly basis, consequently there could be lost opportunities to timely address assets in poor health status.
- Limited asset performance measures will continue to be reported.
- Spares levels may not be optimal.
- Premature / delayed asset replacements as the asset replacements may not be informed by both technical end of life measures and economic aspects.
- To improve asset reliability and availability while minimising risk and cost through optimum asset management practices.
- Improve decision making through the integration of various diverse data sources.
- Improve the integration between asset management and operations.
- Provides a platform for analysis and visibility of asset risk for timeous decisions making.
- To maximise the useful life of assets.


2.2. The scope shall include:

| Deliverable | Description |
|----------------------|---|
| Application Solution | Deliver approved functional specifications and detailed design (physical design) based on the user requirement specification and logical design provided as part of this RFP. |

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| | Facilitate review and approval of the design as required by Eskom methodology and governance. Ensure cyber security compliance and integration end points. The Tenderer is required to render solution architect services to this project which includes making sure that Architecture Design Review (ADR) committee approval is gained before build and again before go-live. |
|--|--|

| Deliverable | Description |
|----------------------|--|
| | Temporary training environment implementation, Build and test, including QA environment implementation, Production environment implementation, Disaster Recovery (DR) environment implementation |
| | Vendor software and licenses, Best practice templates, Third party software and licenses, Provision of training courses |
| Engineering Solution | Industry best practice models for assets in scope (asset maintenance strategies, health and performance measures and indices, technical remaining life and spares holding calculations). |
| | Scope ratification, Engineering Solution development, Pilot. |
| Integration | The Tenderer must provide technical resources to build and implement all required interfaces. Refer to the integration architecture diagram of the logical design provided by the Eskom Architect for systems that must integrate to the solution. |
| | Integration scope and deliverables is listed below: |
| | <ul style="list-style-type: none"> Analyse, design, develop, test, and deploy integration solutions based on the designs. External interfaces to integrate using Oracle Fusion 12c and IBM WebSphere (Data Power), thus the vendor should be well skilled to work with the mentioned technologies. The Integration Centre of Excellence (ICOE) governance process must be followed for all approvals. Kindly reference "SOA Workgroup artefacts". All diagrams and processes are to be captured in the Sparx Enterprise Architect (EA). All CIM message artefacts (including Mapping Document) to be placed in the Eskom defined CIM SVN. All code to be placed in Eskom defined Code SVN repository All artefacts to be placed in the Eskom share point. |
| | <ul style="list-style-type: none"> Sparx Enterprise Architecture and Altova XMLSpy licences are to be provided by the Vendor for the staff that will be executing the formulation or updating of the Diagrams and Process during the Design |

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| | The following are the integration and Testing activities and artefacts to be produced and presented at the committee for approval and sign off: |
| | <ul style="list-style-type: none"> • Business test case document. Integration specification document. Mapping Document. • CIM message artefacts including WSDL's and XSD's. • Code and unit testing review. • Deployment Guide. • SIT testing review of results in ALM. SIT test case sign-off. • Performance testing review of results in ALM. |

| Deliverable | Description |
|-------------|--|
| | <ul style="list-style-type: none"> • Performance testing sign-off. • Pre-transfer documents for go-live approval. • Test requirements in ALM. • Test cases and results in ALM. • Defects managed in ALM. • Test plan Document. • Non-functional Test plan document. • Test closure reports documents. • Performance test scripts and results. |
| | Provide an Integration message modeller to complete the following: |
| | <ul style="list-style-type: none"> • Analysis of message requirements. • Model or update integration message which follow a Common information model. • Create payloads and envelopes. • Generate xsd, message model and model dictionary. |
| | <ul style="list-style-type: none"> • All testing requirements must cover all identified interfaces that have been identified. |

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| Testing | <p>The testing team is responsible to 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.</p> <p>The testing staff may not be the same staff as the configuration, development and implementation staff assigned to the Project. The tenderer must make sure skilled adequate resources with an experienced test manager are deployed to test the system</p> <p>All testing must be completed on Eskom's test management systems namely Application Lifecycle Management (ALM), Load Runner and Unified Functional Tester (UFT).</p> <p>The testing team must provide unit test results before resuming the next cycle/level of testing as per defined entry and exit criteria outlined in the master system test plan</p> <p>A signed off test closure report is required before a test milestone is completed. The following testing and testing milestones must be completed:</p> <ul style="list-style-type: none"> • 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. |
|---------|---|

| Deliverable | Description |
|-------------|---|
| | <ul style="list-style-type: none"> • 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. <p>The testing team must complete Disaster Recovery Testing on the Disaster Recovery (DR) environment and complete and Vulnerability Testing.</p> <p>The testing team must adhere to the Eskom's TCoE testing standard to be provided as part of the RFP document.</p> <p>All the levels will require an internal Eskom resource unless communicated otherwise. 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.</p> |

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| Business Training | Provision for both online and physical / virtual (MS Teams) classroom training. Develop training material and train Eskom business users, including Eskom suppliers. |
| | The supplier must provide super user training based on the below table. The supplier is also requested to provide Eskom with a sliding scale training cost estimate as per the pricing schedule. This will be used for further training on Eskom users and suppliers. This sliding scale will be used to train users and suppliers during project implementation and will be used again post project implementation should the need arise. No payment will be made if training services were not used. |
| | The supplier must provide Eskom a training approach indicating how training will be implemented during project implementation phase for the super users (will be used for training the trainer approach when needed and available), overall Eskom users and Eskom suppliers. |
| | Supplier must also make provision for a training video or noddy guide which will be used by Commercial practitioners and published on the Eskom tender bulletin for Eskom suppliers. Training material must also be provisioned as part of this transaction. |
| Technical Training/Transfer of skills | Develop training material and support material. Train Eskom technical 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 at all 3 Eskom levels of functional application support, |

| Deliverable | Description |
|------------------|---|
| | 1st line support, 2nd line, and 3rd line of support, including the application technical support and database support. |
| | 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: |

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| | <ul style="list-style-type: none"> Architecture Design Review Committee (ADR) 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 "240-170007584 Rev 2 - Web Services Security Standard.pdf" Document. 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. |

| Deliverable | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|--------------------|-----|--|--|----|----|---|-----|----|----|---|----|----|----|---|----|----|----|----|----|------------------|-------|----------|-------------|-----------------------------|--------------------|--------------|---------------------------------|----------------|-------------|----------------|-------------------|
| | <p>Due to the gravity of the solution, 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.</p> <p>Service performance management:</p> <table><tr><td></td><td></td><td></td><td></td></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> <p>Escalation procedure:</p> <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> | | | | | P1 | 15 | 4 | 100 | P2 | 15 | 6 | 99 | P3 | 30 | 8 | 99 | P4 | 30 | 16 | 99 | Escalation level | Eskom | Supplier | First level | Application Support Manager | Operations Manager | Second level | Middle Manager solution support | Senior Manager | Third level | Senior manager | Managing Director |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P1 | 15 | 4 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P2 | 15 | 6 | 99 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P3 | 30 | 8 | 99 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P4 | 30 | 16 | 99 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Escalation level | Eskom | Supplier | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| First level | Application Support Manager | Operations Manager | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Second level | Middle Manager solution support | Senior Manager | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Third level | Senior manager | Managing Director | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| Project Management | Deliver project documentation required by the Eskom Group IT PMO. This includes but is not limited to: |
| | 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. |
| | During execution deliverables will be evaluated by Eskom and a deliverable acceptance certificate will be issued on approval. Approved deliverables can then be invoiced. |
| | 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). |
| | Please note that, all scope items mentioned on this scope document and all the requirements stated on the Business Requirements Specification document must be accepted. There will not be any scope exclusions on the project RFP scope and business requirements. |
| | Dependencies and pre-requisites on Eskom must be clearly stipulated. |
| Deliverable | Description |
| Other Responsibilities | 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). |
| | Project change control refers to the changes in project scope, time, and Cost. Changes will follow the process below: |
| | <ul style="list-style-type: none"> Changes must be approved by the requester, business owner, project manager, and project sponsor. 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. |

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3. NTCSA Requirements

3.1. High level functional requirements


Detailed functional requirements of the APM tool are outlined in the document 240-180100056 Asset Performance Management Functional requirements. Provided below only highlight high level Scope of Work:

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
|----------------------------------|------------|---|---|--------|
| Maintenance engineering strategy | BRS 1 | Develop / review maintenance engineering strategies. (Accommodate maintenance strategy models that includes <ul style="list-style-type: none"> • Preventative maintenance • Condition based maintenance • Time based maintenance • Predictive maintenance Statutory maintenance) | Develop maintenance strategies using RCM / FMECA studies. Able to capture tasks without RCM / FMECA studies Import FMECA studies from other sources e.g., excel. Specify maintenance data to be captured in the CMMS for condition monitoring. Identify the required critical spares. Generate reports for FMECA / RCM studies / others | 6 |
| Maintenance execution strategy | BRS 2 | Develop / review maintenance execution strategies | Classify assets based on functional importance, duty cycle, operating environment and health in order to determine the optimal frequency of maintenance. Grouping of maintenance tasks with common frequencies to minimise | 6 |

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| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
|------------------------|------------|------------------------------------|--|--------|
| | | | outages. Identify resource required to execute the maintenance tasks. Generate reports for asset classification and optimisation of outages. Link strategies to asset breakdown structure in SAP PM. | |
| Asset health | BRS 3 | Create asset health framework | Capture life expectancy information, asset degradation review, asset condition assessment techniques. Asset condition rating and end of life criteria. Configure the asset health parameters & algorithms to be monitored. Configure display reporting method. Configure data sources & extraction methods | 6 |
| Asset health | BRS 5 | Monitor and report on asset health | Upload the asset health data. Run framework rules & algorithms. Display asset health and trends (tabular, graphs, geographical). Identify deviations and send actions/recommendation | 6 |
| Asset health | BRS 7 | Analyse asset health | Perform asset health trends. Perform statistical analysis. Display data/graphs/visualisation. Generate asset health reports. Perform failure predictions | 6 |


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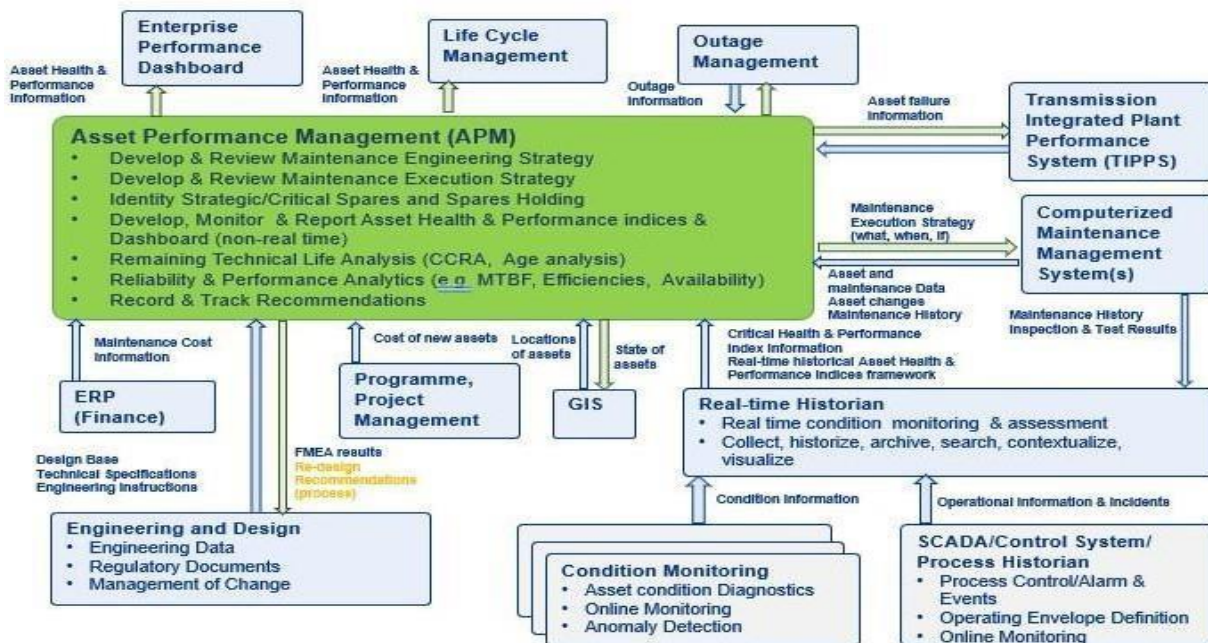
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| Asset performance | BRS 4 | Create asset performance framework Feedback to Engineering to design out failures | Establish asset performance measures e.g. failure rates, MTBF / MTTF, Weibull analysis, Monte Carlo simulation Configure the asset performance algorithms & parameters to be monitored. Configure display / reporting methods Configure data sources & extraction methods | 6 |
| Asset performance | BRS 6 | Monitor and report on asset performance | Upload the data Run framework rules & algorithms | 6 |
| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
| | | | Display performance indices and trends (tabular, graphs, geographical) Identify deviations and send actions/ recommendation Take into account geographical parameters | |
| Asset performance | BRS 8 | Analyse asset performance | Perform asset performance trending Perform statistical analysis Display data/graphs/visualisation Generate performance analysis report Perform failure prediction | 6N |
| Refurbishment planning | BRS9 | Determine technical remaining life | Determine asset technical remaining life based on ageing analysis, statistical analysis or other factors such as obsolescence | 4 |
| Spares | BRS 10 | Determine strategic & critical spares holding levels | Determine / review strategic & critical spares holding levels through methodologies such as e.g. failure rate analysis, lead time, Monte Carlo simulations etc. | 5 |
| General | BRS 11 | General functions | Manage actions and recommendations | 6 |

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3.2. NTCSA Data flow diagram / Context diagram



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3.3. NTCSA High level reporting requirements

| Nr | Report Name | Functionality | Define business objective being supported | Define KPI being measured | Weight (refer to rating table) |
|--------|------------------------|--|---|---|--------------------------------|
| HLREP1 | Asset health | Asset health framework, status, and recommendations | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms. | The asset health KPI measures the number of updated assets health appraisal reports. | 6 |
| HLREP2 | Asset performance | Asset performance framework, trends, and recommendations | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | The asset performance KPI (also referred to as plant performance) measures the number of asset failures / failure rate over a given period. | 6 |
| HLREP3 | Maintenance Strategies | Development of Maintenance strategies | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | The maintenance strategies KPI measures the number of compiled / reviewed maintenance strategies | 6 |

| | | | | | |
|--------|----------------------|---|--|---|---|
| HLREP4 | Asset classification | Asset classification based on functional importance, environment, duty cycle and asset health | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | The asset classification KPI measures the % of assets classified. | 6 |
|--------|----------------------|---|--|---|---|

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| | | | | | |
|--------|---------------------------------------|---|--|---|---|
| HLREP5 | Strategic and critical spares holding | Required stock levels for strategic and critical spares | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | The strategic & critical spares KPI measures the actual stock level against the Required Stock Level (RSL). | 5 |
| HLREP6 | Asset remaining life | Technical remaining life / remaining technical life | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | The asset remaining life KPI measures the technical remaining life of assets. | 4 |

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3.4. NTCSA SYSTEM INTEGRATION REQUIREMENTS


| | | | | | |
|-----|--|--|--|--|---|
| SI1 | Display Asset health and performance information | Sending system: APM tool Receiving system: Enterprise Performance Dashboard | | | Asset health and performance information |
| SI2 | Optimise outages | Sending system: APM tool Receiving System: Outage Management | | | Outage information |
| SI3 | Asset performance analysis and monitoring | Sending system: TIPPS Receiving system: APM tool | | | Asset performance information |
| SI4 | Maintenance strategies | Sending system: APM tool Receiving system: CMMS | | | Functional locations, Asset and maintenance data, maintenance strategy, maintenance plans, maintenance history |
| SI5 | Asset health and performance determination | Sending system: Real time historian Receiving system: APM tool | | | Asset health and performance information Asset condition information Asset operations information and incidents |
| SI6 | Asset risk mapping | Sending system: GIS Receiving system: APM tool | | | Asset locations |
| SI7 | Development / review of maintenance strategies, asset health and performance | Sending system: Engineering and design tools Receiving system; APM tool | | | Design base information Engineering instructions |

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4. Distribution Requirements


4.1. Distribution (Dx) High level functional requirements

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
|----------------------------------|------------|--|--|--------|
| Maintenance engineering strategy | BRS 1 | Develop / review maintenance engineering strategies. (Accommodate maintenance strategy models that includes <ul style="list-style-type: none"> • Preventative maintenance <ul style="list-style-type: none"> ○ Condition based maintenance ○ Time based maintenance • Predictive maintenance • Statutory maintenance) • Technology types <ul style="list-style-type: none"> ○ Oils ○ Vacuum ○ SF6 • Determine operational spares / special tools requirements | Develop maintenance strategies using RCM / FMECA studies. Able to capture tasks without RCM / FMECA studies Import FMECA studies from other sources e.g., excel. Specify maintenance data to be captured in the CMMS for condition monitoring. Identify the required critical spares. Generate reports for FMECA / RCM studies / others | 6 |

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| Maintenance execution strategy | BRS 2 | <p>Develop / review maintenance execution strategies</p> <p>Execution strategy should be driven by various triggers eg. age performance/ operating regime</p> <p>OEM recommendations / modifications</p> | <p>Classify assets based on functional importance, duty cycle, operating environment and health in order to determine the optimal frequency of maintenance.</p> <p>Grouping of maintenance tasks with common frequencies to minimise outages.</p> <p>Identify resource required to execute the maintenance tasks.</p> | 6 |
|--------------------------------|-------|--|---|---|

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
|------------------------|------------|---------------|--|--------|
| | | | <p>Generate reports for asset classification and optimisation of outages.</p> <p>Link strategies to asset breakdown structure in the CCMS</p> <p>Number and extent of excursions</p> | |

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|--------------|-------|------------------------------------|--|---|
| Asset health | BRS 3 | Create asset health framework | Capture life expectancy information, asset degradation review, asset condition assessment techniques. Asset condition rating and end of life criteria. Configure the asset health parameters & algorithms to be monitored. Configure display reporting method. Configure data sources & extraction methods | 6 |
| Asset health | BRS 5 | Monitor and report on asset health | Upload the asset health data Run framework rules & algorithms Display asset health and trends (tabular, graphs, geographical) Identify deviations and send actions/recommendation For individual and fleet of assets. Number and extent of excursions | 6 |

| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
|------------------------|------------|---------------|----------------------------------|--------|
|------------------------|------------|---------------|----------------------------------|--------|

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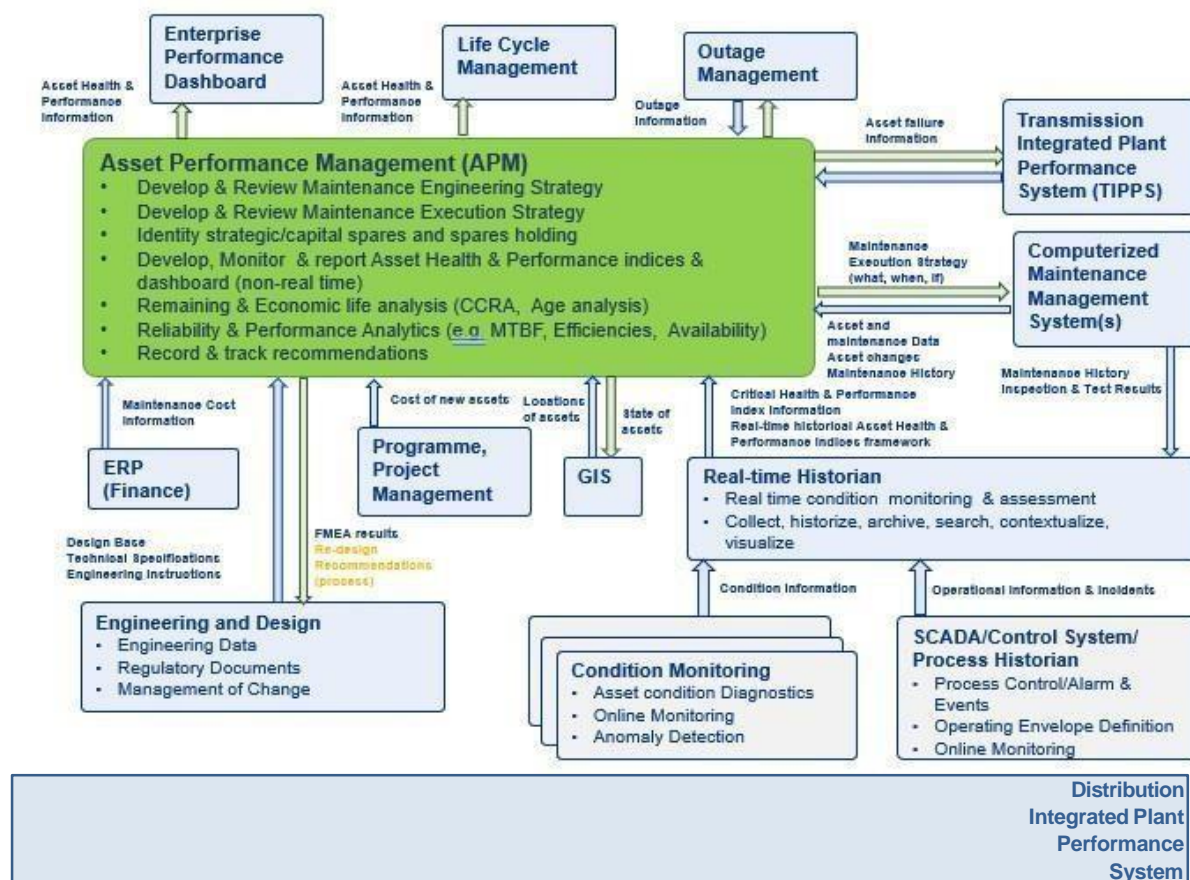
| | | | | |
|-------------------|-------|--|--|---|
| Asset health | BRS 7 | Analyse asset health (Input to maintenance strategy and refurbishment strategy BRS1 / 10) | Perform asset health trends Perform statistical analysis Display data/graphs/visualisation Generate asset health reports Perform failure predictions / remaining life | 6 |
| Asset performance | BRS 4 | Create asset performance framework Feed back to Engineering to design out failures | Establish asset performance measures e.g. failure rates, MTBF / MTTF, Weibull analysis, Monte Carlo simulation Configure the asset performance algorithms & parameters to be monitored. Configure display / reporting methods Configure data sources & extraction methods | 6 |
| Asset performance | BRS 6 | Monitor and report on asset performance | Upload the data Run framework rules & algorithms Display performance indices and trends (tabular, graphs, geographical) Identify deviations and send actions/ recommendation Take into account geographical parameters | 6 |
| Asset performance | BRS 8 | Analyse asset performance | Perform asset performance trending | 6 |


| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
|------------------------|------------|---|--|--------|
| | | | Perform statistical analysis Perform geographical analysis Display data/graphs/visualisation Generate performance analysis report Perform failure prediction | |
| Refurbishment planning | BRS 9 | Determine technical remaining life | Determine asset technical remaining life based on ageing analysis, statistical analysis or other factors such as obsolescence | 4 |
| Refurbishment planning | BRS 10 | Determine asset economic remaining life | Determine asset probability of failure based on asset class performance information and asset health Determine asset risk using probability of failure and consequence. Quantify risk (Rand terms) Calculate fit curves (probability of failure. risk cost. life cycle cost) Capitalise asset costs Determine optimal economic replacement time (Extending life of plant e.g cost of delaying refurbishment and continuing maintenance) | 3 |

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|-------------------------------|-------------------|--|---|---------------|
| Spares | BRS 11 | Determine strategic & critical spares holding levels | Determine / review strategic & critical spares holding levels through methodologies such as | 5 |
| Functionality grouping | BRS Number | Functionality | Business Rule No and Description | Weight |
| | | | e.g. failure rate analysis, lead time, Monte Carlo simulations etc. | |
| General | BRS 12 | General functions / Workflow | Manage actions and recommendations | 6 |
| General | BRS 13 | Workflow | Add details – APM Approval etc | |


4.2. Data flow diagram / Context diagram



| | | | | | |
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4.3. Distribution High level reporting requirements

| Nr | Report Name | Functionality | Define business objective being supported | Define KPI being measured | Weight (refer to rating table) |
|--------|---------------------------------------|---|---|-----------------------------------|--------------------------------|
| HLREP1 | Asset health | Asset health framework, status, and recommendations | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms. | Asset health index | 6 |
| HLREP2 | Asset performance | Asset performance framework, trends, and recommendations | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | Asset Performance index | 6 |
| HLREP3 | Maintenance determination | Development of Maintenance strategies | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | listing of maintenance strategies | 6 |
| HLREP4 | Asset classification | Asset classification based on functional importance, environment, duty cycle and asset health | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | Asset classification report | 6 |
| HLREP5 | Strategic and critical spares holding | Required stock levels for strategic and critical spares | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | Speres listing | 5 |
| HLREP6 | Asset remaining life | Technical remaining life / remaining technical life | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | Asset remaining life report | 4 |
| HLREP7 | Economic asset replacement | Economic asset end of life determination | <ul style="list-style-type: none"> Pursue operational sustainability. Achieve a financially sustainable business Adoption and integration of Technology platforms | Asset end of economic life report | 3 |


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4.4 Distribution System Integration Requirements

| BRS Number | Functionality | Impacted Systems (if known) | Sending System Owner (if known) | Receiving System Owner (if known) | What information needs to be integrated |
|------------|--|----------------------------------|---------------------------------|-----------------------------------|---|
| SI1 | Display Asset health and performance information | Enterprise Performance Dashboard | APM tool | Enterprise Performance Dashboard | Asset health and performance information |
| SI2 | Optimise outages | Outage Management | APM tool | Outage Management | Outage information |
| BRS Number | Functionality | Impacted Systems (if known) | Sending System Owner (if known) | Receiving System Owner (if known) | What information needs to be integrated |
| | | | | | |
| SI3 | Asset performance analysis and monitoring | TIPPS / OMS / NEPS | TIPPS | APM tool | Asset performance information |
| SI4 | Maintenance strategies | CMMS | APM tool | CMMS | Functional locations, Asset and maintenance data, maintenance strategy, maintenance plans, maintenance history |
| SI5 | Asset health and performance determination | Real time historian | Real time historian | APM tool | Asset health and performance information Asset condition information Asset operations information and incidents |
| SI6 | Asset risk mapping | GIS | GIS | APM tool | Asset locations |
| SI7 | Economics analysis | Programme project management | Programme project management | APM tool | Asset capital costs |
| SI8 | Development / review of maintenance strategies, asset health and performance | Engineering and design tools | Engineering and design tools | APM tool | Design base information Engineering instructions |
| SI9 | Economics analysis | Financial system | Financial system | APM tool | Maintenance cost information |
| SI10 | Analytics (APM data) | BI Tools | APM tool | BI System | Data should be made available to Datawarehouse |

5. Licence Management for Maintenance and Support:

In terms of SaaS, Eskom request is for term-licences for the use of the software and should be charged accordingly. Maintenance and support are for the vendor to ensure that the

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software is provided within a stable infrastructure environment to ensure continuous use of the software as a service.

6. Training/Transfer of skills:

- The contractor shall provide a list of training courses as per Appendix E catering for Endusers, administration and support.
- The training courses shall be costed per head and the maximum number of candidates per course intervention shall be provided.
- It is preferred that training courses be presented in South Africa.
- All travel and subsistence cost for candidates will be for the account of Eskom. The contractor shall provide training to the Employer's personnel in relation to the APM tool.
- The contractor is accountable for the overall training of the Employer employees to a highlevel standard.
- The contractor shall also offer suitable end-user, administration and support training material to enable Eskom to perform in-house end-user training.
- All successfully completed training courses offered by the contractor shall be acknowledged with a certificate.
- Training interventions shall be scheduled based on mutual agreement with the employer All training interventions shall be conducted in English.
- Training shall cover both theory and practical training developed specifically for the APM tool.
- Where the training is facilitated outside the Employer's facilities, the training cost shall be all inclusive (e.g. venue, catering, training material, facilitator cost), but excluding accommodation, subsistence and travel.


7. Safety

Vendor is expected to adhere to Eskom's Health and Safety regulations as and when they visit Eskom offices at Mega Watt Park. Most of the support will be online and not on site.

8. Risk Analysis

Indicate only applicable risks:

| Risk Description | Risk Mitigation | Rating (H/M/L) |
|------------------|-----------------|----------------|
|------------------|-----------------|----------------|


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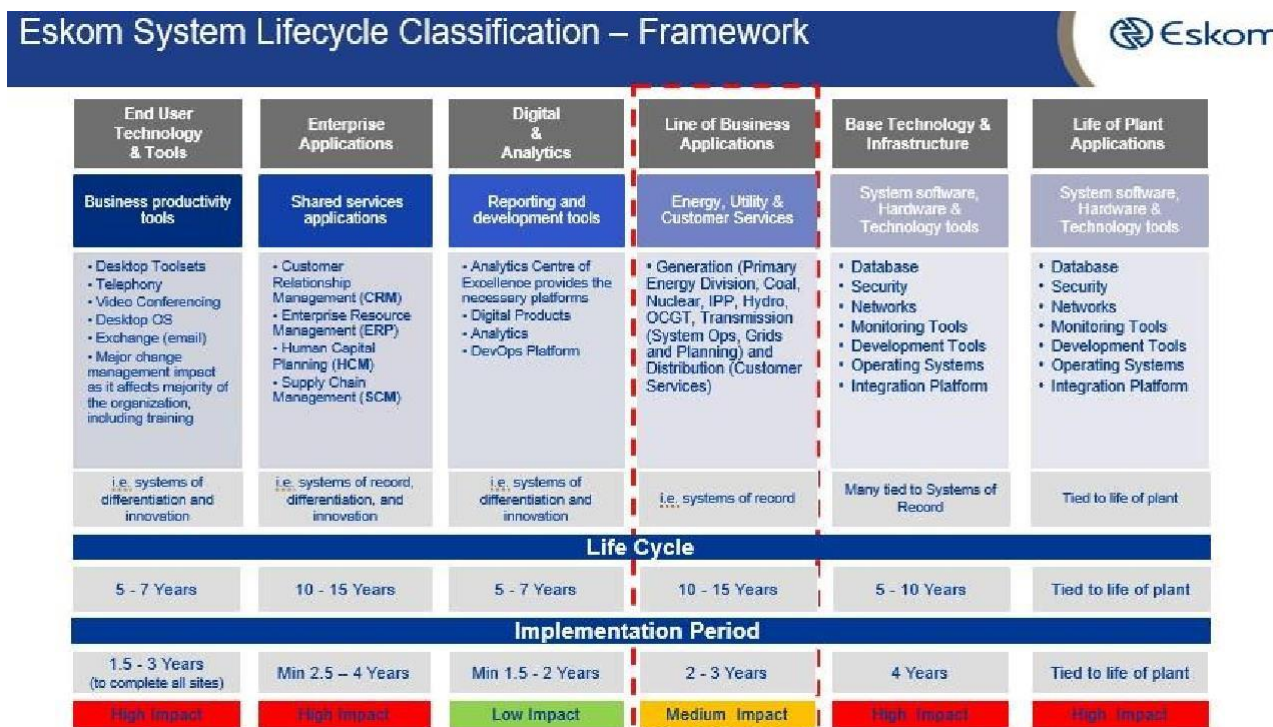
| | | |
|--|---|-------------|
| Slow and tedious commercial process. There is slow and sometimes lack of communication from procurement which creates delays and difficulties in doing proper planning for the project. This matter creates delays to the project. | Project manager to escalate to Commercial or Senior IT Management and highlight the impact thereof. | High |
| Delays in approving deliverables: If the stakeholders take time to sign off documents, it might lead to project delays | Submit documents on time and work closely with approvers | High |
| Resource capacity constraints: There are many initiatives in progress with limited resource availability | Negotiate timeous release of resources with respective managers | High |

9. System Lifecycle Consideration (To be CONFIRMED by NTCSA and DX Architecture)

9.1 Provide details regarding the system lifecycle

The system is classified as line of business application as depicted in the Eskom system lifecycle classification diagram below (with selected in red dotted line).

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9.2 Development Period for new system/solution


Typical software implementation of midrange to enterprise systems takes about 2-3 years.

10. Support & Maintenance Period

- Support and Maintenance will be for a period of 5 years.
- Maintenance and support, including stabilisation, for a period of 2 months.
- Provide 1st and 2nd Line support and maintenance on a per request basis over the period of the contract.
- Telephonic and on-site (when needed) on Software and Hardware.
- Align advisory services with Eskom governance practices.
- Support and maintenance contract for a period 5 years.

11. Service Level Agreement requirements

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.

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Due to the gravity of the solution, 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.

Service performance management:

| Priority | Mean time to respond (mins) | Mean time to resolve (Hrs) | Target (%) |
|----------|-----------------------------|----------------------------|------------|
| P1 | 15 | 4 | 100 |
| P2 | 15 | 6 | 99 |
| P3 | 30 | 8 | 99 |
| P4 | 30 | 16 | 99 |

Escalation procedure:


| Escalation level | Eskom | Supplier |
|------------------|---------------------------------|--------------------|
| First level | Application Support Manager | Operations Manager |
| Second level | Middle Manager solution support | Senior Manager |
| Third level | Senior manager | Managing Director |

12. Change Management

Prepare all internal stakeholders and employees for the adoption of the new solution.

- Develop the change/communications management strategy & plan and share with key project stakeholders.
- Empower and capacitate the change champions & the divisional technical workgroups (change network) with adequate information to successfully drive alignment on the expectations of the project.
- Develop communication material (e.g. roadmap; stakeholder engagement presentations; training communications; quick reference guides; go-live communications). Should include security awareness training on NIS stated under the Security Scope of work.
- Assess the effectiveness of the change/communications management strategy and respond to the issues being raised.

12. Approvals:

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|---|---------------------|--|
| End user / requestor NTCSA: | Name: | |
| | Designation: | Acting Snr Manager Asset Strategy |
| | Date: | 17/10/2024 |
| | Signature: |  |
| End user / requestor Distribution: | Name: | |
| | Designation: | Senior Manager: National Maintenance & Operations |
| | Date: | 2024_09_28 |
| | Signature: |  |
| Project Manager | Name: | |
| | Designation: | Project Manager |
| | Date: | 17/10/2024 |
| | Signature: |  |
| Senior Manager: | Name: | |
| | Designation: | Senior Manager: IT Business Solutions |
| | Date: | 17/10/2024 |
| | Signature: |  |