Eskom	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042		
		Effective Date	April 2023		
		Review Date	April 2028		

Description of Request	Generation Enterprise Historian Replacement User Requirements Specification

1. High level background

Eskom currently operates two Historian platforms that serve as a critical repository for real-time and historical operational data in Generation. The existing solution, uses both AVEVA eDNA, implemented in 2016, and a local RMDC implementation of AVEVA PI (previously OSISOFT PI) , implemented in 2010. These systems have successfully enabled robust data collection, storage, visualization, and integration with various enterprise systems, significantly contributing to improved operational decision-making, plant reliability, and asset management.

AVEVA eDNA, will reach end-of-life status by May 31, 2026. AVEVA, the vendor for eDNA, has advised Eskom of its plan to sunset this product, ceasing all official support, updates, and critical security patches beyond the stated date. Consequently, Eskom must migrate to a single replacement solution to ensure continuous operational reliability, enhance cybersecurity compliance, and maintain alignment with modern technological advancements. As a result the data currently residing in AVEVA eDNA needs to be migrated to the AVEVA PI platform.

The AVEVA PI system requires a maintenance contract to be established. AVEVA has moved from a fixed license model to a subscription license model. An AVEVA subscription license contract needs to be established to enable the support of Pi under the AVEVA subscription plan. Existing AVEVA PI and eDNA licenses to be migrated to the new subscription license model.

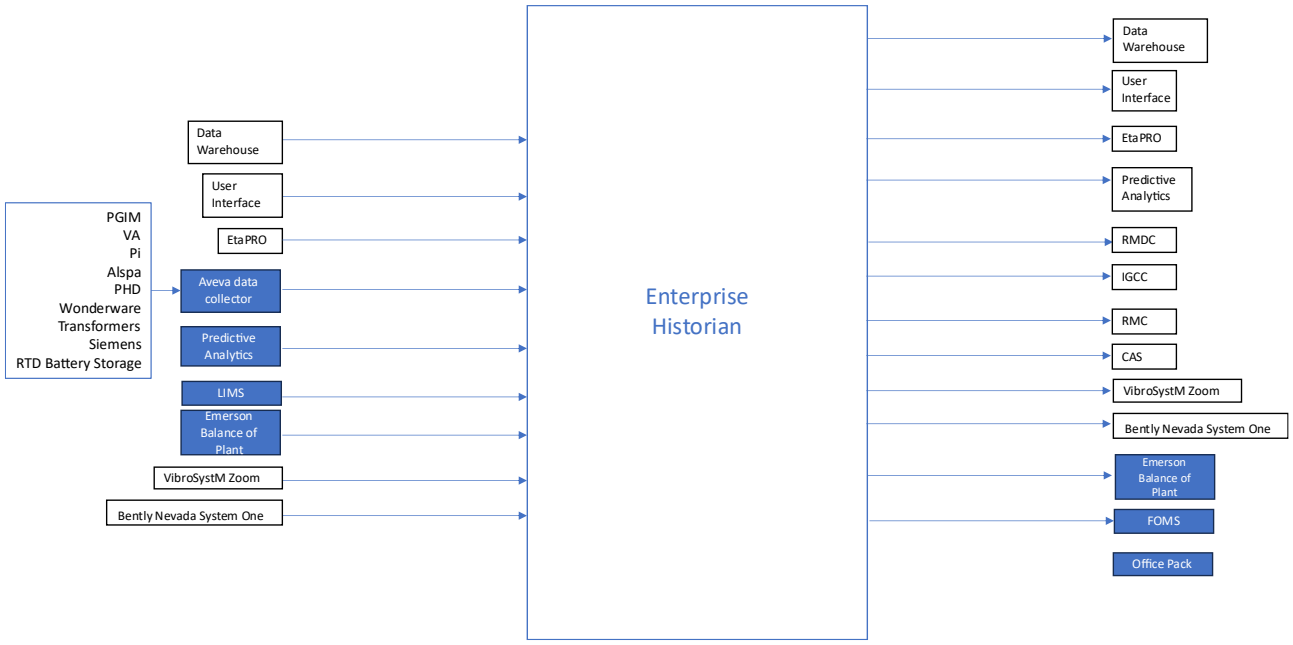
This Tender Scope Of Work articulates Eskom's business and functional requirements for implementing only AVEVA PI, ensuring a seamless migration from the existing data in the eDNA historian with minimal disruption to operations. The document also addresses critical interfaces and integration points defined within the Logical Architecture Design (LAD) and aims to preserve historical data integrity while enhancing data accessibility and analysis capabilities across the enterprise.

Project Scope

- Move from a fixed license model to a subscription license model (mandated)
- Upgrade Existing AVEVA PI and eDNA to subscription licenses as necessary
- Migrate existing AVEVA eDNA History to new AVEVA PI historian. (eDNA end of life)
- Ensure that all current data interfaces are replicated in the AVEVA PI environment.
- Ensure data continuity with minimal disruptions.
- Effective Change management
- Project management

2. Scope diagram

The work package scope provides the high-level target architecture components that are expected to be impacted by the architecture engagement. It links the work package to the relevant business, information, application, and technology components that may be impacted.



3. "As-Is" and "To-Be" Business Requirements

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

As Is Statement	To Be Statement	Therefore, the high-level gap is:
Generation has two historians, AVEVA PI and AVEVA eDNA. The current AVEVA eDNA historian will reach end-of-life in May 2026, with no further vendor support, updates, or security patches. Generation requires a single repository which will be AVEVA PI.	Migrate to the AVEVA PI historian, which is fully supported, secure, and aligned with modern technology standards.	Eskom requires migrating from eDNA to AVEVA PI to ensure continued vendor support, security compliance, and operational reliability.
Eskom holds AVEVA perpetual licences for eDNA and Pi	Subscription licence for just AVEVA PI	Establishment of a subscription licence for AVEVA PI

4. Current eDNa Scope

Below is the current eDNA scope coverage

Site Deployment:
Arnot
Camden
Duvha
Grootvlei
Hendrina
Kendal
Koeberg
Kriel
Kusile
Lethabo
Majuba
Matimba
Matla
Medupi
Peaking
Tutuka

Environments:
Production
Pre-Prod
QA/DEV
Disaster Recovery

Total eDNA Tag Count: **1.5million**

5. AS IS AND TO BE BUSINESS PROCESS ACTIVITY MAPPING

5.1. As-is business process

AVEVA eDNA and PI historians are currently in use with all the current interfacing.
Eskom has perpetual licences for both eDNA and PI

The Enterprise Historian is a key IT infrastructure component that stores information used by systems spanning the Engineering, Operating and Maintenance functions in Generation. The EH therefore does not support a single business process or functional area.

5.2. To-be Business Processes

The AVEVA PI system used to support Generation by storing, analysing, and visualizing time-series data. Subscription license agreement is active and in place.

In the future-state architecture, Eskom will transition to a standardized, enterprise-wide data historian based on the AVEVA PI System. Real-time and historical data will be acquired through a

broad suite of PI Interfaces, OPC connectors, and edge data collectors (e.g., Edge Data Store) feeding into a centralized PI Data Archive with built-in redundancy. Asset Framework (AF) will enable structured, contextual data modelling across plants, while PI Vision and DataLink will support intuitive visualization, reporting, and self-service analytics. The architecture enables seamless integration to SAP PM, SharePoint, RMDC Alarm Systems, and predictive tools like EtaPRO and Bentley System 1. The platform supports hybrid edge-to-cloud deployment and aligns with Eskom's enterprise data governance and digital transformation roadmap. Future workflows will emphasize operational intelligence, condition-based maintenance, and role-based access to curated data views from any location.

6. High level Requirements

Generation requires a unified transition from the existing PI and Wonderware eDNA historian platforms to a consolidated AVEVA PI environment. This transition must ensure continuity and enhance the accessibility, reliability, and scalability of operational data to support informed, real-time decision-making and enterprise-wide visibility.

Functional Replacement of Legacy Historian
Provide a like-for-like functional migration from Wonderware eDNA to AVEVA PI, including support for all existing interfaces, protocols (e.g., OPC DA/UA, Modbus, DNP3, IEC 61850), and alarm/event handling as currently implemented at the RMDC.

Centralized, Scalable Architecture
Deploy a centralized historian platform with high availability, disaster recovery, and distributed edge collection capabilities, scalable up to xx million tags and terabyte-scale data volumes.

Integrated Visualization & Reporting
Enable intuitive, web-based dashboards and reports using PI Vision and Excel-based analysis via PI DataLink. Support contextual visualizations based on asset hierarchies and historical performance data.

Interoperability & Integration
Seamless integration with Eskom's business systems (SAP PM, Hyperwave, SharePoint), SCADA/DCS systems, and third-party condition monitoring tools (e.g., ZOOM, EtaPRO, System 1).

Security & Governance
Enforce secure authentication and authorization via Active Directory/LDAP, provide audit trails for data access and manual changes, and comply with Eskom's cybersecurity policies including NESUS scanning and antivirus compatibility.

Future-Readiness
Incorporate support for hybrid deployments across edge, on-prem, and cloud environments.

Enable advanced capabilities such as predictive analytics, digital twins, and remote diagnostics aligned with Eskom's evolving business and operational needs.

7. Business/Functional Requirements

The functional requirements are that the current AVEVA eDNA functionally is replicated in AVEVA PI. If, as part of vanilla AVEVA PI, there is enhanced capability, this shall be acceptable. Given below is the original specification that eDNA met. The requirement for a test environment has been added.

7.1. Data Acquisition & Storage Requirements

- Real-time collection of plant data
- Manage and create real-time and virtual (custom) tags
- Data quality checks to highlight potential suspect data collected due to potentially faulty instruments.
- Ability to create composite tags
- Custom alarm configuration tool
- Advanced tag search engine

7.2. Interfaces Requirements

Application Interfaces Required				
Source System	Destination System	Format	Description	Frequency
PowerStation PIS	PI/System Platform	OPCUA/OPCDA/ Suitelink	To read real-time plant data into the Gx System Platform and archive data in EH.	Real time (dependent on update rate of source)
EtaPRO	PI/System Platform	OPCDA	EtaPRO requires real-time data from EH. It is currently read from power stations AOS OI	Real time (dependant on update rate of source)

			Gateway server	
Predictive Analytics	Enterprise Historian	Predictive Analytics Native eDNA Interface	Reads real time data from the central eDNA historian and write outputs from the models to the site services	Default IO Scan Frequency of 30 seconds.
Transformer Monitoring (Analysers)	PI/System Platform	DNP3	Monitors condition of unit transformers in Generation; processed data used for analysis and planning.	Real time (dependant on update rate of source)
SAP PM	PI/WEI and then System Platform	SQL	Source for maintenance activities; provides work orders and technical history.	Batch updated upon data change
LIMS	PI/WEI and then System Platform	Integration Bus	The LIMS results are published to the Oracle integration bus and then captured by System Platform/EH via WEI.	Batch updated upon data change
POWI	PI/System Platform	SQL		Cyclic
GPSS	PI/System Platform	SQL		Cyclic

Fuel Oil Interface (FOMS)	PI/System Platform		Captures and calculates Fuel Oil usage and tank levels; written to FOMS SQL table	
TEMSE	eDNA	HAB	Realtime data from National Control System.	Real Time
Plant Protocols	PI	OPCDA, OPCUA, DNP3, Modbus (TCP/IP, Serial, Master/Slave), IEC61850, IEC 60870, SNMP, ICCP		
VibroSystM Zoom	PI/System Platform	OPC	Bi-directional link to all the passing of data associated with the monitoring of generators	Real Time
Bently Nevada System One	PI/System Platform	OPC	Bi-directional link to all the passing of data associated with the monitoring of the turbine centreline.	Real Time
RT&D Battery Storage System	eDNA	DNP3	Realtime data that monitors. Energy performance	Real Time

			data is collected from energy storage batteries via a D400RTU.	

7.3. Communication Protocols

- All the currently supported interfaces that have already been implemented in eDNA/System Platform shall be replicated. Also, any additional interfaces that are provided with vanilla AVEVA PI. SDK and API supportive of developing custom protocol drivers and interfaces. Ability to support both data points (including their time-series values) and data model administration, for the creation, reading updating and deleting of these.

7.4. Data Visualisation

- **Suite of Intuitive Visualization Tools:**
  Provide a set of intuitive, object-oriented visualization tools designed to simplify interaction and user experience, eliminating the need for extensive training or specialized knowledge.

- **Real-Time Data Visualization:**
  Enable the visualization of plant operational data at the rate of data capture, ensuring near real-time insights and monitoring capability.

- **Historical Data Visualization:**
  Provide comprehensive visualization capabilities for historical plant data, enabling detailed retrospective analyses.

- **Trend and Graph Visualization:**
  Facilitate the easy creation and viewing of dynamic trends and graphical representations of plant data to support proactive operational management and decision-making.

- **Statistical Analysis & Graphing:**
  Provide built-in functionality for statistical analysis and graphical representation of key process variables, supporting operational performance assessments and optimization activities.
- **Web-Based Thin Client Visualization:**
  Enable web-based thin client visualization, which seamlessly integrates data from the enterprise historian alongside other data sources, accessible through standard web browsers without additional client software installation.

- **Mobile Visualization Capability:**
  Support visualization and interaction on mobile platforms, including but not limited to iOS and Android devices, ensuring accessibility to operational insights regardless of user location.

- **Standard Reporting Functionality:**
  Provide the capability to generate standardized reports (e.g., daily operations, performance analysis, regulatory compliance), built on configurable templates for routine reporting requirements.

- **Custom Reporting Capability:**
  Offer the flexibility to design and generate customized reports tailored specifically to Eskom's unique operational, regulatory, and analytical needs, complementing the standard reporting functions.

- **Interactive and Intuitive Graphical Displays:**
  Enable the creation of interactive, object-oriented graphical displays that intuitively visualize both live and historical data. Display capabilities must include graphics, tables, charts, and embedded objects sourced from third-party systems. The tool must be easy-to-use with built-in configuration editors, minimizing the need for custom programming or additional scripting.

- **Automated Visualization and Trending:**
  Include tools to easily configure and automate recurring graphical displays and trends, ensuring minimal manual effort and enhancing productivity.

- **Excel-Based Data Visualization and Analysis:**
  Provide an Excel interface or plugin enabling direct retrieval, visualization, and analysis of historian data within Excel spreadsheets. Functions and calculations should seamlessly integrate into spreadsheet cells and must update automatically from the historian data source, ensuring real-time accuracy.

- **Alarm Visualization and Management:**
  Provide functionality to view, acknowledge, and historically analyse alarms across multiple historian servers based on predefined alarm groups, with integrated tracking and auditing capabilities.

- **Excel Plugin with Enhanced Data Management:**
  Integrate a powerful Excel plugin allowing users to:
  - Easily search for and select data points directly or through structured model frameworks.
  - Actively refresh Excel workbook data through user-defined mechanisms (e.g., a dedicated update button), ensuring real-time accuracy and operational context.

7.5. Performance & Reliability

High Availability: Clustering and redundancy for fault tolerance.
Failover & Disaster Recovery: Regular backups and disaster recovery testing.
Scalability: Future expansion for increased data points and users.

8. 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

(a) Cloud service model: PaaS
Software as a service is the preferred licencing model

(b) Cloud deployment model and location of deployment
The Platform-as-a-Service (SaaS)

(c) Architectural approach and style
Modern IT

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

(e) Logical Access Control
(i) Authentication
Authenticate against Eskom's central identity management

(f) Authorisation
Utilise the principle of Least Privilege

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

(h) 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.

(i) Portability

The SaaS 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 hyperscale, which services used in the product are vendor agnostic etc.

(j) 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.

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 the 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

(k) Ease of Consumption

The solution should provide a seamless.

(l) Application workload placement

The diverse.

(m) Resource optimisation and continuous monitoring

The solution and all components.

(n) 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 • MS Active Directory
Server virtualisation	VMware vSphere / Microsoft Hyper-V It is expected that the solution should be able to run in a virtualised environment. Clear motivation and reasons will have to be provided where it is not possible. Current Standards of on-premise environment: – VMware vSphere 7 or higher, PowerVM (RISC) (only exceptional cases shall be supported)
Storage virtualization	NetApp, Dell EMC, or Azure-based storage solutions
Database	Microsoft SQL Server 2022 or later (for PI AF and custom app • IBM DB@ V11.5 or higher • Others, any DB not listed above will be treated as n exception
Server OS	Windows Server 2019 or 2022 (64-bit, Standard or Datacentre Edition)
Client OS	Windows 10/11 Enterprise (64-bit)
Browser	Microsoft Edge (Chromium-based), Google Chrome, Mozilla Firefox • MS Edge • Mozilla FireFox V60 or higher • Others (will be treated as exeptions)
Load Balancer (ADM)	F5 Big-IP / Azure Load Balancer / Citrix ADC
Backup	Veeam, Commvault, or Azure Backup compliant with Eskom backup policies
Communication Protocol	HTTPS (TLS 1.2+), OPC UA, MQTT, SMB 3.0, SNMP
Desktop/Laptop specifications (see below)	Refer to Desktop/Laptop specs section below

(o) Desktop/Laptop specifications:

High End Laptop	Processor	Intel Core i9 / AMD Ryzen 9 or better
	Speed	3.5 GHz or higher, 8 cores
	Graphics	Dedicated GPU (NVIDIA RTX 3060 or better / AMD equivalent, 6GB+ VRAM)

	Storage	1 TB NVMe SSD
	Memory	32 GB DDR4 RAM or higher
Midrange Laptop	Processor	Intel Core i7 / AMD Ryzen 7
	Speed	2.8 – 3.5 GHz, 6 core
	Graphics	Integrated graphics (Intel Iris Xe / AMD Radeon Vega) or entry-level discrete GPU
	Storage	512 GB SSD
	Memory	16 GB DDR4 RAM
Lower Range Laptop	Processor	Intel Core i5 / AMD Ryzen 5
	Speed	2.4 – 3.0 GHz, quad-core
	Graphics	
	Storage	256 GB SSD (SATA or NVMe)
	Memory	8 GB DDR4 RAM

(p) Secure and optimised design

The well architected framework (WAF).

(q) 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.

9. Contract Period

A 6-year milestone-based contract.

- 6 months implementation for the Base Solution and (Integration and Business Processes)
- 6 months (Integration and business process)
- 60 months (support and Maintenance)

- Maintenance and Support only starts after Implementation is complete and in production **(Go-Live).**
- The Support and Maintenance for the licence will be paid annually

10. Licenses

Perpetual licenses deployed on Eskom's on-premises datacenter (private cloud - IaaS.

This should include:

- Licensing Costs per annum (based on perpetual license acquisition and renewal terms)
- Maintenance and Support Costs per annum (usually 18–20% of license cost annually)

Perpetual licenses deployed on Eskom's Azure tenant (virtual private cloud)

This should include:

- Licensing Costs per annum (reflecting deployment on cloud-hosted infrastructure)
- Maintenance and Support Costs per annum (inclusive of patching and remote vendor support aligned to SLA)

Software-as-a-Service (SaaS) (must be a secure, (virtual) private cloud)

This should include:

- SaaS subscriptions
  - Based on AVEVA Flex Credits subscription model
  - Covers usage of PI System (Core, Edge, Cloud), PI Vision, Integrators, and Edge Data Store
  - Includes software access, maintenance, upgrades, and support services within one unified fee
  - Pricing scales with usage and can be adjusted annually

11. Deliverables

Deliverable	Description
Architecture Services (Functional Specifications and Detailed Design)	Introduction (Architecture Services): The objective of the architecture services is to define, design, and document the architectural components required to support the implementation of the Enterprise-Historian (EH) application. This includes the formulation of functional specifications and detailed physical designs in alignment with Eskom's enterprise architecture principles. The architecture will enable secure, scalable, and reliable data collection, storage, integration, and visualization to ensure operational continuity as the organization transitions from the current eDNA Historian to the AVEVA PI platform. Scope: The scope of architecture services encompasses the design of functional specifications and detailed technical designs based on the User Requirements Specification (URS) and aligned with Eskom's architectural guidelines. The following architectural domains will be addressed. The scope of the architecture work includes the following key areas: Data Architecture:

Deliverable	Description
	Data Architecture Scope: • Define the conceptual, logical, and physical data architecture to support the Enterprise-Wide Historian. • Ensure historical data integrity, continuity, and accessibility. • Define data models, schemas, and metadata structures to support structured, time-series, and unstructured data. • Enable integration of plant-level data (real-time and historical) into enterprise-wide analytics. • Align with Eskom's information governance and security requirements. Resource Requirement: Experienced Data/Information Architects & System Analysts Deliverable: Data architecture documentation and diagrams. Solution Architecture: Solution Architecture Scope: • Collaborate with business and technical stakeholders to gather, analyse and document functional and non-functional requirements. • Define the to-be architecture including deployment topologies, component interactions, and system integration points. • Ensure replication of current functionalities supported by eDNA while leveraging enhanced capabilities in AVEVA PI. • Design for high availability, performance, and scalability. • Resource Requirement: Experienced Solution Architect(s) Deliverable: Solution architecture documentation and diagrams. Technical Architecture: Technical Architecture Scope: • Specify the required infrastructure (on-premises and cloud) to support the deployment and operation of the AVEVA PI Historian. • Define technical specifications for networking, storage, compute, backup, and disaster recovery aligned with Eskom's IT standards. • Ensure compatibility with existing enterprise systems and technologies including support for OPCDA, OPCUA, DNP3, SQL, and other industrial protocols. • Support deployment models for SaaS, IaaS, and on-prem licensing as outlined in the tender. Resource Requirement: Experienced Technical Architect(s) Deliverable: Technical architecture documentation and infrastructure specifications. Security Architecture: Security Scope: • Collaborate with internal IT Security stakeholders.

Deliverable	Description
	• Identify potential security threats and vulnerabilities relevant to the application. • Design security measures, including authentication, authorization, encryption, and access controls. • Define security policies, protocols, and procedures to safeguard sensitive data and ensure compliance with relevant regulations. • Ensure cyber security compliance. • Conduct security risk assessments and propose mitigation strategies. • Secure by Design solution modelling and deployment in compliance to Eskom governance to be applied. • Design security measures for all data exchange interfaces including authentication and authorisation mechanisms. Resource Requirement: Architect(s) with knowledge of Security and Cybersecurity Architects/ Specialists Deliverable: Security architecture documentation and threat model analysis. Integration Architecture: Integration Scope: • Collaborate with internal integration stakeholders such as the Integration CoE. • Identify and outline all the required integration points between the application and external systems, services, or APIs. • Design data exchange formats, protocols, and communication patterns for seamless integration. • Specify middleware or integration platforms if needed, considering performance and reliability. • Ensure proper error handling, data consistency, and fault tolerance across integration points. • Support real-time and batch integrations with SCADA, DCS, SAP PM, LIMS, EtaPRO, and other enterprise systems. • Align with Eskom's Common Information Model and utilize APIs and standard protocols for data exchange. 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. • Architecture Deliverables: Facilitate and conduct design workshops with stakeholders to refine and validate business, functional, and technical requirements. Develop the following artifacts: • Architecture Design Documents (SoAW, LAD, PAD). • Integration Specifications and Message Models. • Security Architecture Reports. • Physical and Logical Diagrams.

Deliverable	Description
	• Compliance Matrix against Eskom Standards. • Architecture Sign-Off Documentation. Communication: Regular update meetings will be held to discuss architecture deliverable progress, address concerns, and ensure alignment with project goals. Deliverable Acceptance Criteria: The architecture work will be considered successfully completed once: • All architectural artifacts have been reviewed and approved by the Enterprise Architecture team. • Functional and technical requirements have been met and validated through stakeholder engagement. • Architecture deliverables have been signed off by project and business owners as per Eskom governance processes. 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. · • Detailed design approved by EAAB. · • Approved functional specifications. · • Development environment ready for Build/ Configuration
Integration	The Tenderer must provide technical resources to build and implement all required Business Services for the interfaces. Please reference “Group IT End Systems Integration Design Requirements v1.0.1 (4)” document to provide guidance on the available communication protocols. Please be aware that the Eskom Integration team will do the integration activities.
	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.

Deliverable	Description
	• Provide Application Business Service with the capability to distinguish between Technical and Business error and handle each one in a separate manner.
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. Please note that the following: • All testing, except unit testing, will be carried out by the Eskom testing team. The tenderer is responsible for conducting unit testing. • 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). 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. • 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 marking any test milestone as complete. The following tests and milestones must be completed: • **Unit Testing (Development Environment):** Results provided by the tenderer's development team. • **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. • **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. • Non-Functional/Performance Testing (Pre-Prod Environment): Led and executed by the performance tester. • Disaster Recovery Testing (for the on-premise 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.

Deliverable	Description
Business Training	Recommend and provide suitable method whether online and physical / virtual (MS Teams) or classroom training. Develop training material and train Eskom business users. Gx 50 users

CyberSecurity	a. The System shall be able to integrate with existing Eskom's MS (Microsoft) on-prem active directory (AD), Identity (MDI), MS Entra ID, and Multi Factor Authentication (MFA) to enable Single sign-on (SSO). b. Role base access control (RBAC) shall be employed. c. Data at rest (using AES-256), in use and in transit or in motion (using TLS 1.2, or later version) shall be encrypted. d. Audit trails, logs, user administration and user activity logs shall be enabled, encrypted, and securely kept with limited access to administrators. e. Sensitive information such as personal identifiable information (PII) data in development environment shall be marked. f. Incremental daily back-ups shall be done, encrypted, and securely kept offsite. g. Real-time data synchronization or data replication to a secondary or disaster recovery (DR) site, located in different regions shall be employed. h. Disaster Recovery Plan (DRP) shall be defined, annually tested and such DRP test results shall be submitted to the Eskom Cyber Security team. i. Back up Restore Plan and Procedure shall be defined, annually tested and such test results shall be shared with the Eskom Cyber Security team. j. Patch Management Process shall be defined. The software updates and patches shall be tested on non-production environment prior being deployed into production environment. k. The static application security test (SAST), dynamic application security test (DAST), vulnerability assessment and penetration test shall be conducted prior deploying the cloud system and on-prem system to production environment, all critical, high, and medium vulnerabilities shall be addressed prior deploying production environment, and the summary of the test results shall be submitted to the Eskom Cybersecurity team for review and acceptance. l. The Supplier 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. m. The Supplier shall notify Eskom immediately or within 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. n. The database shall be placed within Eskom corporate local area network (LAN)/business information network (BIN) network (if hosted on premise) and partner private network (If hosted in the cloud) behind the perimeter firewall. o. Database Security tools shall be employed to provide regulatory compliance, encryption, key management, granular access controls,

	flexible data masking, comprehensive activity monitoring, and sophisticated auditing capabilities. p. Distributed Denial of Service (DDoS) protection mechanism shall be employed for all databases. q. The System 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, Dream Factory 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. r. The System 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. s. The System shall provide a feed for Siem Integration using standard technologies such as Syslog, Windows events etc. t. The System shall support installation of Eskom's End-Point Solution.

Deliverable	Description
Other Responsibility	Dependencies and pre-requisites on Eskom must be clearly stipulated.
	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:
	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.
Eskom Governance	Various Eskom governance and processes to be followed during the project. **Annexure O_Eskom ITO - Schedule Q** (Supplementary Terms for Cloud Computing) **MUST be completed and submitted** as part of the tender proposal. Annexure P_Eskom POPI Operator Agreement is attached for information purposes (applicable to the contracting phase). **Tender proposals MUST in addition to the required hard copies, include an electronic version on a USB device.**
Cyber security insurance	Stipulate a cyber insurance contract
Exit strategy	Compile and sign an exit strategy

12. Training/Transfer of Skills Requirements:

To ensure sustainable operation and support of the Aveva PI Historian platform, training and knowledge transfer must be included as a contractual deliverable.
Training Requirements

- Type of Training:
  - PI System Administration (PI Data Archive, PI Asset Framework)
  - Tag Configuration and Data Integration
  - PI Vision and PI System Explorer usage
  - Historian Data Analytics and Reporting
  - License Monitoring and Management
  - Basic Troubleshooting and Support
- Delivery Format:

- Instructor-led (on-site or virtual)
- Hands-on workshops
- Access to Aveva University or equivalent e-learning platform

- Duration:
  - **5 to 7 training days** depending on role specialisation
- Number of Trainees:
  - Around 15 personnel from Eskom Generation, including:
    - OT Engineers
    - System Administrators
    - Data Analysts
    - Support Technicians
- Training Materials:
  - User manuals and quick reference guides
  - Recorded sessions for future reference
  - Certification (if available)

Contractual Inclusion

The vendor must:

- Include training as a **mandatory deliverable** in the implementation contract.
- Provide a detailed **training plan** and schedule.
- Ensure **post-training assessments** to validate knowledge transfer.
- Offer **follow-up support** for a defined period post-training.

The Supplier shall clearly specify any additional training requirements necessary. The Supplier must outline the scope, duration, delivery method (e.g., in-person, online), and any associated costs of such training in their proposal

13. Service Level Agreement Requirements

- Provide 3rd Line support and maintenance per request over the contract period.
- Align advisory services with Eskom governance practices.

<table>
<tr><th>Service</th><th>Service Description</th><th>Service Metric</th><th>Service Target</th></tr>
<tr><td>Application Support</td><td>Maintenance and enhancement of applications</td><td>Delivery of the enhancement according to the implementation plan</td><td>95%</td></tr>
<tr><td></td><td colspan="3">Investigation and Resolution of application incidents
<table>
<tr><th>System Classification</th><th>Priority</th><th>Metric</th><th></th><th>Target</th></tr>
<tr><td></td><td></td><td>Mean Time to Respond (Acknowledge) Hrs</td><td>Mean time To Resolve Hrs</td><td></td></tr>
<tr><td>Mission Critical</td><td>P1</td><td>2</td><td>8</td><td>100%</td></tr>
<tr><td></td><td>P2</td><td>3</td><td>10</td><td>99</td></tr>
</table></td></tr>
<tr><td></td><td>Any other services pertaining to the applications excluding enhancements and incidents</td><td>Service within 80 hours</td><td>95% of all calls</td></tr>
</table>

13.1 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.

14. 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.

15. Implementation Partner experience

The Supplier must demonstrate proven experience in the successful implementation, configuration, and support of the **AVEVA PI System** (formerly OSIsoft PI System) within industrial or enterprise environments. Specifically, the Supplier must provide:

- Evidence of at least **2 completed AVEVA PI System implementation projects** within the past **5 years**, preferably in sectors such as manufacturing, utilities, mining, or energy.
- Detailed descriptions of each project, including:
    - Scope of implementation (e.g., data historian setup, integration with SCADA/DCS systems, analytics, visualization tools)
    - Project duration and value
    - Technologies and modules used (e.g., PI Vision, PI Asset Framework, PI Interfaces)
    - Outcomes and performance improvements achieved
- Contactable references for each project, including client name, role, and contact details.

Eskom Entity reserves the right to verify all submitted information and may disqualify any bidder who fails to demonstrate sufficient and relevant AVEVA PI System experience.

16. Project Management Services

16.1. Minimum Resources Required:

- 1 X Project Manager
    - 10 years working experience.
    - Degree
    - Certification

16.2. 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 complete it. Eskom has given the minimum requirements, but the supplier can add more resources as they see fit to meet the deliverables.

Please note that the Vendor will confirm that all resources will be available for the duration of the project.

16.3. Minimum Resource Requirements (Maintenance and Support/Subscription-based contract):

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

16.4. 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.
- Resource allocation of each task

17. Eskom Governance and Process:

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

18. System Integration Requirements:

The Tenderer must provide technical resources to build and implement all required Business Services for the interfaces. Please reference “Group IT End Systems Integration Design Requirements v1.0.1 (4)” document to provide guidance on the available communication protocols. Please be aware that the Eskom Integration team will do the integration activities

- 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.

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

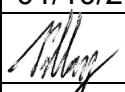
- Unit Testing – test results from the Tenderer’s team. System Integrated Testing, Functionality testing (in QA – end to end functional testing and integration testing. That means testing with other systems and ensuring that all requirements have been successfully configured). This

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 Project Requirements
Project plan timeline guideline per interface

19. Approvals:

End user / requestor:	Name:	Ashwin Pillay
	Designation:	Senior Manager
	Date:	01/10/2025
Senior manager:	Signature:	
	Name:	Owen Maphumulo
	Designation:	Chief Advisor Solution Architecture
	Date:	
	Signature:	
	Name:	Yuvika Ramkissoon
	Designation:	Chief Advisor Application
	Date:	01/10/2025
	Signature:	
	Name:	Lebogang Rametsi
	Designation:	Middle Manager Info Solution
	Date:	01/10/2025

	Signature:	
	Name:	Tshifhiwa Nevuwari
	Designation:	Middle Manager Program
	Date:	2025/10/01
	Signature: