

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
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Description of Request	Dx / NTCSA Enterprise Historian
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Document Title: 240-IT042 Rev 1.7 – Tender Scope of Work

Department: Group Information Technology

Project Number: IT00662

Project Name: Dx / NTCSA Enterprise Historian

Effective Date: 24 August 2026

Project Title: Dx / NTCSA Enterprise Historian Implementation

Purpose: To define the scope, requirements, and expectations for the procurement and deployment of an Enterprise Historian system across Eskom's Distribution and Transmission environments.
Prepared By: Group IT – Architecture & Integration Team

This document is issued by Eskom for the purposes of the IT00662 Enterprise Historian tender process. The information contained herein is provided to prospective respondents for the preparation of tender submissions and remains subject to Eskom's governance, security, information management, and procurement policies.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Table of Contents

1.	High level background.....	4
2.	Scope of work/Business requirements	4
3.	Detailed Product/Service Description.....	6
4.	Product / Service Description	6
	High level Requirements.....	10
5.	Non-Functional Requirements.....	11
6.	Scope of Work.....	21
6.1.	Contract period	21
6.2.	Integration Risk Identification	21
6.3.	On-Prem (Private IaaS).....	21
6.4.	Hybrid / Azure (Virtual Private Cloud)	22
6.5.	SaaS (Secure VPC)	22
6.6.	Enabling Works	23
7.	Architecture Services (Functional Specifications and Detailed Design).....	23
8.	Maintainability and Supportability	34
9.	Training/Transfer of Skills Requirements.....	35
10.	Service Level Agreement Requirements.....	36
11.	SLA Penalties	36
12.	Change Management Requirements.....	37
13.	Project Management Services	37
13.1.	Minimum Resources Required.....	37
13.2.	Minimum Resource Requirements (Summary for the Project)	38
13.3.	Timelines/Project Plan	38
14.	Eskom Governance and Process	38
15.	Testing Requirements	39
16.	Business Systems Integration Requirements.....	40
17.	Approvals	42

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Abbreviations (Abbr)

Abbr.	Meaning	Abbr.	Meaning
AD	Active Directory	LDAP	Lightweight Directory Access Protocol
AES	Advanced Encryption Standard	LIMS	Laboratory Information Management System
AFAS	Automated Fault Analysis System	LLTS	Line Loading Thermal System
AFIS	Automated Fault Identification System	MDI	Microsoft Defender for Identity
AIM	Advanced Infrastructure Management	MDM	Meter Data Management
ALM	Application Lifecycle Management	MDMS	Meter Data Management System
APM	Asset Performance Management	MDF	Model Data Function
BIA	Business Impact Assessment	MFA	Multi-Factor Authentication
BI	Business Intelligence	MMS	Manufacturing Message Specification
BIN	Business Information Network	MQTT	Message Queuing Telemetry Transport
BMS	Building Management System	NERSA	National Energy Regulator of South Africa
BRS	Business Requirements Specification	NIS	Network Information System
CEF	Common Event Format	NIST	National Institute of Standards and Technology
CI/CD	Continuous Integration and Continuous Delivery/Deployment	NTCSA	National Transmission Company South Africa
CIM	Common Information Model	OAuth	Open Authorisation
CoE	Centre of Excellence	OIDC	OpenID Connect
COTS	Commercial Off-the-Shelf	OHS	Occupational Health and Safety
DAST	Dynamic Application Security Testing	OMS	Outage Management System
DCS	Distributed Control System	OPC	Open Platform Communications
DDoS	Distributed Denial of Service	OPC DA	OPC Data Access
DLMS	Device Language Message Specification	OPC HDA	OPC Historical Data Access
DMS	Distribution Management System	OPC UA	OPC Unified Architecture
DMZ	Demilitarised Zone	OT	Operational Technology
DNP3	Distributed Network Protocol 3	OWASP	Open Worldwide Application Security Project
DR	Disaster Recovery	PaaS	Platform as a Service
DRP	Disaster Recovery Plan	PII	Personally Identifiable Information
DRT	Design Review Team	PMU	Phasor Measurement Unit
Dx	Distribution	POC	Proof of Concept
EAAB	Enterprise Architecture Approval Board	POPIA	Protection of Personal Information Act
EH	Enterprise Historian	QIM	Quality Issue Management
ESB	Enterprise Service Bus	QOS	Quality of Supply
ESI	Electronically Stored Information	RBAC	Role-Based Access Control
ESRI	Environmental Systems Research Institute	RMON2	Remote Network Monitoring Version 2
FIPS	Federal Information Processing Standards	RPO	Recovery Point Objective
GIS	Geographic Information System	RTO	Recovery Time Objective
HA	High Availability	RTU	Remote Terminal Unit
HSM	Hardware Security Module	SaaS	Software as a Service
IaaS	Infrastructure as a Service	SAML	Security Assertion Markup Language
ICCP	Inter-Control Centre Communications Protocol	SAST	Static Application Security Testing
ICT	Information and Communications Technology	SCADA	Supervisory Control and Data Acquisition
IDIS	Interoperable Device Interface Specification	SCCM	System Centre Configuration Manager
IEC	International Electrotechnical Commission	SDK	Software Development Kit
IED	Intelligent Electronic Device	SDLC	Software Development Life Cycle
iPaaS	Integration Platform as a Service	SFTP	Secure File Transfer Protocol
IRA	Integration Reference Architecture	SIEM	Security Information and Event Management
ISB	Integration Service Bus	SIT	System Integration Testing
ISO	International Organization for Standardization	SLA	Service Level Agreement

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

ITSO	Information Technology Security Operations	SLO	Service Level Objective
JET	Just Energy Transition	SOA	Service-Oriented Architecture
JDBC	Java Database Connectivity	SOE	Sequence of Events
KMS	Key Management Service	SSO	Single Sign-On
KSACS	Key Sales and Customer System	TASE.2	Telecontrol Application Service Element 2
ODBC	Open Database Connectivity	TCoE	Testing Centre of Excellence
OEM	Original Equipment Manufacturer	TEMSE	Transmission Energy Management System
PI/PO	Process Integration/Process Orchestration	TLS	Transport Layer Security
PM	Plant Maintenance	Tx	Transmission
PMBOK	Project Management Body of Knowledge	TxSIS	Transmission Substation Information System
SAP	Systems, Applications and Products in Data Processing	UAT	User Acceptance Testing
SSIS	SQL Server Integration Services	UFT	Unified Functional Tester
VPC	Virtual Private Cloud	UTC	Coordinated Universal Time
WAF	Well-Architected Framework	WAMS	Wide Area Monitoring System

1. High level background

Eskom Holding's Distribution (Dx) and National Transmission Company South Africa (NTCSA) covers a vast power network infrastructure which is largely analogue. For both Dx and NTCSA to maximise the efficiency and resilience thereof, it needs to digitise its operations to realise forward-thinking solutions. A significant challenge lies in capturing, storing, managing, and analysing large volumes of data from various data sources to provide valuable insights and support informed decision making. A suitable historian fulfils a foundational role in such digitisation efforts and is the enabler and precursor to many of Eskom's "Smart Grid" initiatives and is in line with the Just Energy transition (JET) approved by senior management. Eskom's current Enterprise Historian (EH) has, due to various functional reasons, not seen adoption in the Distribution and NTCSA businesses. The primary reason for this stems from our organic or everchanging plant (substations, field devices/smart grid sensors, etc.), seeing many changes on a daily basis. This requires a solution that is flexible enough to accommodate such a dynamic environment. The current Enterprise Historian does not provide near adequate support for this, necessitating the need for a replacement to deliver the required functionality.

2. Scope of work/Business requirements

2.1. 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.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

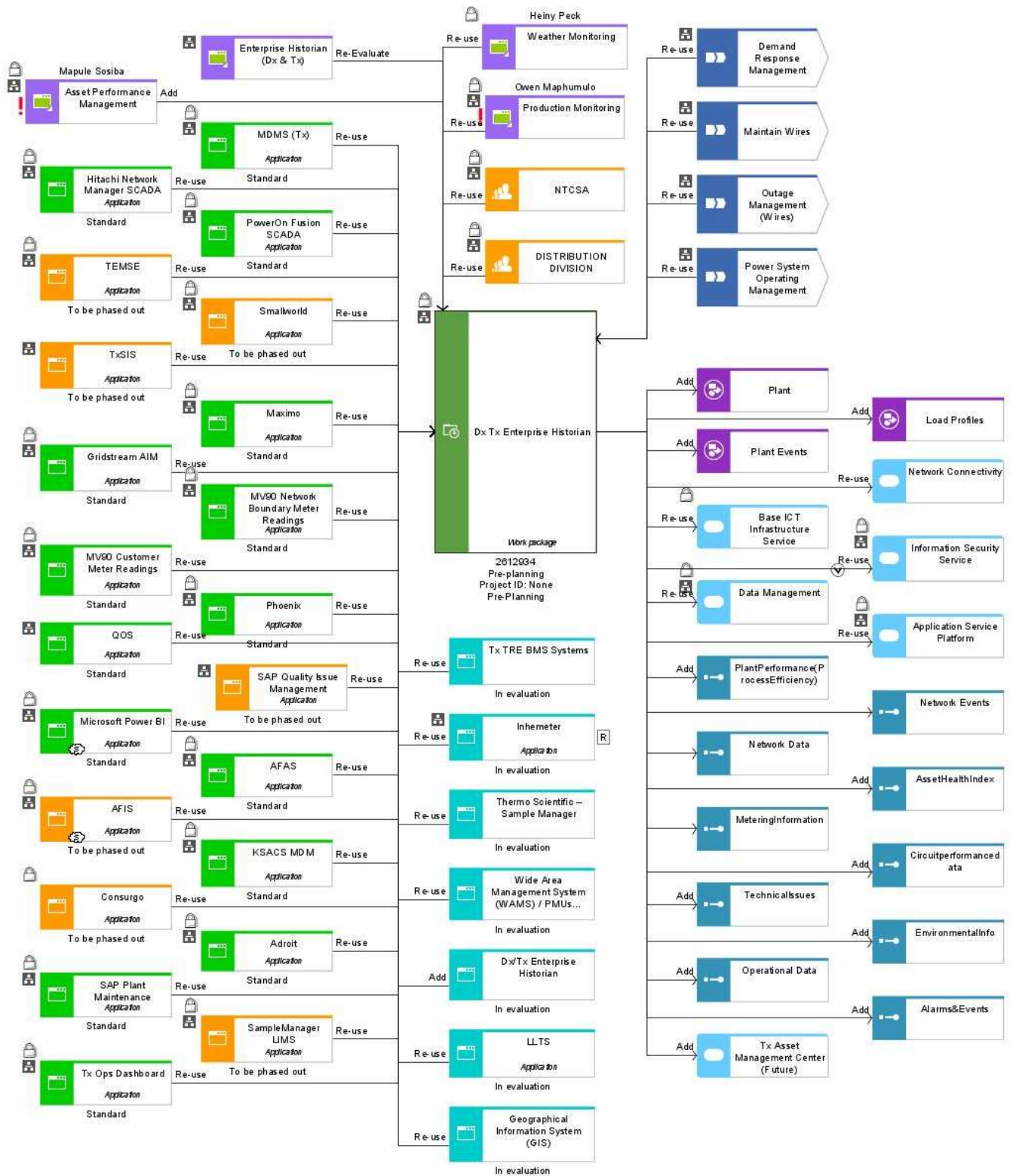


Figure 1 - High-level target architecture

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

3. Detailed Product/Service Description

The required solution shall comprise **two separate and distinct Enterprise Historian instances**, one deployed within the Eskom Distribution environment in Megawatt Park, Sandton, and one within the NTCSA environment. The NTCSA deployment will be located at NTCSA's main offices at Simmerpan, Germiston. The tenderer shall ensure costing is adequate for all physical hardware and logical requirements for the two required instances.

For the purposes of this Tender Scope document, any reference to “the solution”, “Enterprise Historian”, or “the deployment” shall be understood to mean two separate deployments, unless explicitly stated otherwise. A single shared or combined deployment across Dx and NTCSA environments is out of scope.

The solution shall be capable of collecting, storing, processing, modelling, and distributing time-series operational and engineering data within its respective environment.

The solution shall provide scalability, adaptability, and reliability to support Eskom's digitisation and Smart Grid objectives and enable seamless integration across the Wires business units.

4. Product / Service Description

Core Functionality:

- Data Collection:**
 Collect and archive **real-time and historical data** from SCADA, DCS, RTUs, IEDs, metering systems, field sensors, and manual data-entry systems, as well as business systems and databases (e.g., SAP PM, GIS, APM, MDMS, AFAS, TEMSE, TXSIS).
 Supports automatic detection and configuration of new or modified data points with minimal manual intervention (**BRS 2.1, 7.1, 7.2 & 7.3**).
- Data Modelling:**
 Incorporates a **model-driven framework** that is fully object-oriented and version-controlled, enabling seamless contextualisation of data, relationships, and hierarchies for analytics, notifications, and visualisation (**BRS 8.1 – 8.19**).
 Supports inheritance, rule-based creation of model instances, and integration of Model Data Functions (MDFs) for analytics, alerts, and reports.
- Analytics & Reporting:**
 Provides **off-the-shelf MDFs** for analytics and supports both **real-time and event-based** triggers.
 Enables user-defined reports, trend analyses, and dashboards through **Excel Add-ons** and **thin/thick clients** (**BRS 10–12**).
 Supports scheduled and ad-hoc report generation and email distribution.
- User Interfaces:**
 Offers both **thick (desktop)** and **thin (web-based)** clients, with HTML5 technology ensuring accessibility without additional plugins (**BRS 9.13**).
 Supports advanced trending, dashboards, and ad-hoc analysis with role-based access and intuitive data search features.

Deployment:

- Supports **logically and physically separated instances** for Dx and NTCSA. (**BRS 1.1**). The NTCSA instance shall be located at NTCSA's main offices at Simmerpan. The tenderer shall ensure costing is specified for all physical hardware and logical

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

requirements for the two separated instances. Where NTCSA and Dx grants permission a mechanism for centralised reporting and analytics shall be catered for.

- Enables **incremental rollout (“factory mode”)**, allowing staged implementation and migration (*BRS 0.4*).
- Deployed in **virtualised (on-prem) or hybrid private cloud environments** supporting scalability and high availability (*BRS 0.1–0.2*).
- Must provide **SLA-based support** within the South African time zone, covering patching, upgrades, and development services (*BRS 0.5*).
- Due to the distributed nature of Eskom Dx and NTCSA environments and depending on the products requirement, the exact number and geographic placement of collectors, points-of-presence, or other distributed components may not be fully defined at the time of tender.
 - Where the proposed solution requires on-site / on-prem deployment, whether as a fully on-prem or hybrid private cloud architecture, the tenderer shall be responsible for specifying, supplying, and costing all hardware components required to enable the full functionality, performance, scalability, high availability, and resilience of the solution. Ensure costing caters for the separate deployment of the NTCSA instance at Simmerpan and the one for Eskom Dx.
 - The tenderer is therefore required to provide component-based pricing for a generic reference deployment, with costs specified per functional component of their solution. This includes, but is not limited to:
 - Central platform components (core servers, databases, management services)
 - Distributed components (collectors, gateways, edge nodes, points-of-presence)
 - High-availability, redundancy, and disaster recovery components
 - Any additional hardware required to support specific solution functions
 - Costing model for installation and commissioning
 - Pricing must be provided on a per-unit or per-instance basis, enabling Eskom (Dx and NTCSA) to independently evaluate and derive the total solution cost by scaling the required components in line with the envisaged deployment architecture. Eskom reserves the right to aggregate, scale, and evaluate costs based on the functional components proposed, without requiring a fully defined final deployment topology at tender stage.
 - All supplied hardware shall be handed over to Eskom (Dx and NTCSA) upon completion of implementation and acceptance. Post-implementation, the hardware will be owned, managed, and supported internally by Eskom, unless explicitly stated otherwise in the tender response.

Integration:

- **System Connectivity:** Seamless integration with Dx/Tx operational systems namely
 - ABB Network Manager SCADA (Dx),
 - TEMSE (Tx),
 - TxSIS/NIS (Tx),
 - Gridstream AIM (Dx),
 - MV90 Customer Meter Readings (Dx),
 - MV90 Network Boundary Meter Readings (Dx),
 - MDMS (Tx),
 - KSACS MDM (Dx),
 - SAP Quality Issue Management (QIM),
 - SAP Plant Maintenance (PM),
 - Adroit (Telecoms – Tx),
 - Consurgo (Telecoms – Tx),

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- Phoenix (Tx OMS),
- GE PowerOn Fusion (Dx OMS/DMS),
- Maximo (Asset Management),
- Asset Performance Management (APM),
- AFAS Server (Tx),
- AFIS – CSIR (Tx),
- QOS Database (Dx/Tx),
- Sample Manager (Tx – LIMS),
- Thermo Scientific – Sample Manager (Tx),
- Wide Area Management System (WAMS/PMUs – Tx),
- Tx TRE BMS Systems,
- LLTS (Tx),
- Geographical Information System (GIS),
- ESRI and Tx Asset Management Center (Future)
- MDMS,
- OMS and QOS databases other enterprise systems
(*BRS SI1 – SI33*)
- **Protocols:** Supports standard industry protocols including
 - DNP3,
 - IEC 60870-5-101 and -104,
 - IEC 61850 (MMS V1 & V2),
 - ICCP/TASE.2,
 - Modbus (TCP, RTU, ASCII),
 - OPC DA/HDA/UA,
 - MQTT v3.11+,
 - SNMP v1/2c/3,
 - RMON2,
 - DLMS IDIS Packages 2 & 3,
 - SQL/ODBC/JDBC,
 - Perfmon,
 - XML,
 - CSV,
 - JSON,
 - YAML
(*BRS 2.1*).
- **APIs & SDKs:** Open API/SDK for custom integrations, supporting data model administration and programmatic operations (*BRS 8.13, 10.10*).
- **Eskom Integration Bus:** Integration Business Service API to expose and consume services through the Eskom Integration Services Bus, with Eskom developing the bus interfaces.

Security & Compliance:

- Implements **Role-Based Access Control (RBAC)** with **Active Directory (AD)/LDAP** integration, in line with Eskom IT/OT security standards (*BRS 14.1 – 14.5*).
- Supports **per-point and per-model access control** and **audit trail** logging (*BRS 16.1 – 16.2*).
- Ensures **unidirectional data flow** from OT to IT via DMZ interfaces, compliant with Eskom's IT/OT Cyber Security Standards 240-170001061 and 240-79669677 (*BRS 16.3*).
- Integrates with **SIEM** for real-time event monitoring.
- Complies with **NERSA, OHS Act No. 85 of 1993**, and **South African Grid Code** data retention and reliability requirements (*BRS 13, 14 & LR1*).
- Ensures **data encryption at rest and in transit**.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Volumes and Capacity

- **Scalability:** Supports a minimum of **2 million homogenous data points per instance**, with clustering options for unlimited scalability.
- **Performance:** Capable of handling **200,000 peak and 100,000 sustained analogue events per second** per historian database.
- **Timestamp Precision:** Supports timestamp accuracy of at least **50µs**, enabling high-resolution event capture (sampling up to 20kHz).
- **Data Quality:** Supports configurable **deadbands**, validation, and cleansing to ensure data integrity (*BRS 2.7 & 37 note*).

Retention & Availability:

- Provides 99.9% system availability (*BRS 14*).
- Retains operational records **indefinitely** in accordance with OHS Act No. 85 of 1993 per OHS Act requirements (BRS 13).
- Disaster recovery within 24 hours.

Provision Implementation, Transition, and Migration:

- **Migration of eDNA datasets**, models, and metadata to the new historian, with seamless commissioning of new data points and no service interruptions (*BRS 1.2 & 0.8*).
- If the solution requires onsite/on-prem deployment (hybrid) and hardware of any nature to facilitate functionality the tenderer will be required to specify and cost for said hardware.
- Includes **training and skills transfer** for administration, end-user functionality, and analytics (*BRS 17.1–17.2*).
- Training and skills transfer (administration, functional use, advanced analytics).

Licensing True-Up / True-Down:

- **Variable-based licensing** on monitored variables, with sliding scale and no per-user limits (*BRS 0.3*).
- Supports incremental scaling from single device upward, with dynamic adjustment of licensed volumes.

Technology Evolution:

- Supports **regular upgrades, patching, and feature enhancements** under SLA (*BRS 0.5*).
- Provides for emerging protocols, APIs, and **cloud-ready deployment models**.
- Vendor to support for custom dashboards, analytics extensions, and integration with evolving business systems.

Engineering hours / professional services contract for resources:

Eskom Dx and NTCSA requires provisional services for **resources skilled in the offered product**. Eskom Dx and NTCSA will require professional services for a range of operational tasks and activities for a non-committed estimate of up to **3000-man hours per annum for the duration of the 5-year contract**.

Eskom Dx and NTCSA will also require **resources for projects and initiatives**, as and when required for a non-committed amount of up to **5000-man hours over the same 5-year period**. The vendor will be allowed to also subcontract if certain skills are not available within their company structures.

The required resources will be allocated to perform the tasks outlined in the scope below. However, they may also be utilized for additional tasks as needed. The vendor may be required to travel to Eskom

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

sites to participate in meetings, workshops, or as necessitated by the scope of work, on an 'as and when required' basis. Travel, toll, and accommodation costs may be incurred.

The following activities represent the types of tasks that may be assigned to Professional Services resources. Crucially, these services are exclusively provisioned for activities, scope, or deliverables that are NOT, directly or indirectly, defined, required, or anticipated in any other section of this Tender Scope of Work, related BRS, or any associated appendix or addendum. This provision is solely intended to provide capacity for future, currently undefined work.

Typical Activities (Scope Not Otherwise Defined):

- **Custom Development & Scripting:** Development of new, bespoke software components, scripts, or extensions not included in the COTS product, such as custom data manipulation tools, specialised APIs, or middleware integration logic.
- **Novel Interface Setup:** Configuration and testing of new data acquisition interfaces (protocols, drivers) required for systems not initially specified in the tender documentation.
- **Advanced Analytics and Reporting:** Design, creation, and deployment of complex analytical models, custom reports, or dashboards (including non-standard visualisations) beyond the core reporting requirements.
- **Notification and Alerting Configuration:** Implementation of specialised, multi-tiered notification logic and custom escalation workflows not covered under the base deployment scope.
- **Unforeseen Pilot Projects:** Execution of targeted mini-pilots or proofs-of-concept (POCs) for newly identified use cases or integration scenarios that arise post-contract award.
- **Data Structure Optimisation:** Ad-hoc re-architecting or performance tuning of data models, databases, or specific query mechanisms for unforeseen performance bottlenecks.
- **Specialized Training & Knowledge Transfer:** Delivery of highly customized training or workshops on new product features or complex workflows adopted by Eskom after the initial go-live.

Mandatory Scope Limitation:

The utilisation of hours under the Professional Services contract is **strictly and exclusively limited** to fulfilling requirements or tasks that fall outside the defined or implied scope of all other contract sections. This serves as capacity for **currently undefined, future scope only**.

High level Requirements

Dx and NTCSA each require their own Historian system that can collect, store, process, manage time series data from various data sources, and thereafter make this data readily available on a real time basis to all identified users. The data collection of the system should allow for seamless integration to the various required data sources (both discrete and business systems) with the ability to automatically identify changes within source systems and create new / update existing points within the modelling framework to ensure continuous synchronisation between systems.

The modelling framework of the system needs to be agile, flexible, and adaptive in order to allow for seamless, scalable and version-controlled modelling of all necessary data for the dynamic Wires power system environment. The model framework is the basis for all analytics, alerts and notifications, visualisation as well as integration into other systems and as such the tools provided within the modelling framework should allow for various methods of building relationships, perspectives, and contexts to data tags in an easy and effective manner.

The Historians would serve as the source information system for many dashboards and decision-making tools within each of the respective environments and as such this would require increased reliability and consistent performance levels of the system. As such the system should have real-time

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

systems monitoring tools that include all necessary metrics to detect any related failures or issues easily and effectively. The system must include tools that leverage its own built-in features and functions to enable a rapid response in the event of any issue arising. Together with being able to collect, store and model the data into the database systems, the system should have off-the shelf Model Data Functionality (MDFs) that engineers can lever off to analyse big data sets and create variety of business reports and dashboards seamlessly and efficiently.

At the time of writing, NTCSA has been legally separated from Eskom and Dx is in the process of unbundling and will also constitute as a separate legal entity. As such, the deployment of the NTCSA and Dx Historians shall support both logically and physically separated instances for each legal entity, the sections below should be fulfilled for both instances if not specified otherwise. Centralised reporting, visualisation and analytical capabilities shall be supported at an Eskom Holdings SOC Ltd / national level.

For the system to meet the high-level requirements above the detailed key requirements needed are documented below.

Note that the requirements should include but not be limited to the requirements listed. Any reference to “Tx” may be interchanged with NTCSA (National Transmission Company of South Africa)

For detailed functional requirements, please see:

- Annexure A-2612934_BRS_Dx_Tx_Enterprise_historian
- Annexure B-Evaluation Criteria Excel document

5. Non-Functional Requirements

5.1. Non-Functional Security

Security objective: Provide both Historian platforms that protects people, plant and grid operations by enforcing Zero-Trust principles across OT and IT, while complying with Eskom security policies, POPIA and relevant NERSA/industry obligations.

Controls (minimum):

- **Identity & access**
 - Centralised authentication via **AD/LDAP** with **SSO (SAML/OIDC)** and **MFA** for all roles.
 - **RBAC with least privilege**; Segregation of Duties for admin, operator, integrator and auditor roles.
 - **Just-In-Time** elevation for break-glass procedures with full audit trail.
- **Network & segmentation**
 - OT/IT **zones & conduits** per IEC-62443 intent; one-way data flow OT→IT via **DMZ** (data diode/proxy) for historian replication/consumption.
 - No inbound sessions from IT to OT historian nodes.
- **Data protection**
 - **TLS 1.2+ in transit**, AES-256 at rest; managed keys (HSM/KMS) and key rotation policy.
 - Data classification and retention aligned to operational, regulatory and OHS obligations; secure disposal.
- **Monitoring & audit**
 - **Comprehensive audit logging** (auth, admin changes, model changes, API calls, data access) streamed to **SIEM**; use cases for alerting (privilege misuse, brute force, anomalous reads).

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- **Configuration integrity** monitoring of collectors, interfaces and models.
- **Vulnerability & patching**
 - Quarterly (min) vulnerability scanning of IT-side components; vendor-aligned patch windows for OT components with roll-back plans.
 - Secure SDLC for custom integrations (code review, secrets management).
- **Resilience & recovery**
 - Online backups for time-series and configuration stores; **immutable snapshots** and off-site copies.
 - **RTO ≤ 24 hours** for regional failover; **RPO ≤ 15 minutes** for historian data (journal/log shipping to DR).

5.2. Non-Functional – Architecture:

Eskom aims to accelerate its digital transformation roadmap by adopting (amongst others) a revised cloud policy and cloud strategy, allowing for a multi-cloud journey and innovative new technologies to improve market agility and drive business growth. However, the preferred option for deployment in **virtualised (on-prem) or hybrid private cloud environments** supporting scalability and high availability is still catered for. The deployed solution shall require a hybrid approach as critical functions (data collectors) of the solution will be required to be on-prem.

(a) Cloud service model: PaaS

- **PaaS-first** for core data services (compute, storage, messaging, identity, observability) to gain managed scalability and reliability.
- **SaaS-where-appropriate** for user-facing analytics/visualisation and APM/BI integrations **provided** data-residency, OT security controls and integration requirements are met.
- **Licensing**: subscription **variable-based (monitored points/events)** with no per-user charges; supports **true-up/true-down** as volumes change.

(b) Hybrid Cloud deployment model with localised deployment

The Platform-as-a-Service (PaaS) is the preferred deployment model.

- **Hybrid**:
 - **Core historian/collectors** in **private cloud/virtualised (on-prem)** OT zones close to plants/substations.
 - OT specific collectors will be placed on-prem either virtualised or physical
 - **Analytics, dashboards and data science** may run in **public cloud** (multi-cloud capable) consuming **replicated/sanitised** datasets from the DMZ.
- **Data residency**: primary storage/processing located in **South Africa**; cross-region DR within SA where available.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- **Licensing:** subscription **variable-based (monitored points/events)** with no per-user charges; supports **true-up/true-down** as volumes change
- Due to the distributed nature of Eskom Dx and NTCSA environments and depending on the products requirement, the exact number and geographic placement of collectors, points-of-presence, or other distributed components may not be fully defined at the time of tender.

Where the proposed solution requires on-site / on-prem deployment, whether as a fully on-prem or hybrid private cloud architecture, the tenderer shall be responsible for specifying, supplying, and costing all hardware components required to enable the full functionality, performance, scalability, high availability, and resilience of the solution. The tenderer is therefore required to provide component-based pricing for a generic reference deployment, with costs specified per functional component of their solution.

This includes, but is not limited to, and is required per instance:

- Central platform components (core servers, databases, management services)
- Distributed components (collectors, gateways, edge nodes, points-of-presence)
- High-availability, redundancy, and disaster recovery components
- Any additional hardware required to support specific solution functions
- Costing model for installation and commissioning

Pricing must be provided on a per-unit or per-instance basis, enabling Eskom (Dx and NTCSA) to independently evaluate and derive the total solution cost by scaling the required components in line with the envisaged deployment architecture. Eskom reserves the right to aggregate, scale, and evaluate costs based on the functional components proposed, without requiring a fully defined final deployment topology at tender stage.

All supplied hardware shall be handed over to Eskom (Dx and NTCSA) upon completion of implementation and acceptance. Post-implementation, the hardware will be owned, managed, and supported internally by Eskom, unless explicitly stated otherwise in the tender response.

(c) **Architectural approach and style (Modern IT)**

- **API-first, event-driven ingestion**, container-ready services, infrastructure-as-code, automated CI/CD to lower time-to-change.
- **Horizontal scale-out** for ingestion, compression and query layers; stateless services behind load balancers; health-checks and auto-healing.
- **Observability**: metrics, logs and traces exported to central monitoring; SLOs defined for ingestion latency and query response.
- **Backwards-compatible model/versioning** for points and asset models to enable live commissioning with zero downtime.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

(d) **Open Architecture and Standards**

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

- **Protocols:** DNP3, IEC60870-5-101 & -104, IEC-61850, IEC61850-2, Modbus (RTU&ASCII/TCP, TCP), OPC UA/DA/HDA, MQTT v3.11 and later, SNMP, RMON2, Generic File Parser, DLMS with IDIS Package 2 &3, Perfmon, SQL/ODBC/JDBC for enterprise apps.
- **Data & APIs:** REST/JSON and (where useful) gRPC; support for CSV/Parquet exports for analytics; **SDKs** for driver and model extensions.
- **Models/semantics:** leverage IEC CIM (61970/61968) where practical for asset/network context; consistent asset & tag naming conventions.
- **Portability:** support Windows/Linux nodes; no hard dependency on proprietary hardware.

(e) **Logical Access Control**

(i) **Authentication**

Authenticate against Eskom central identity (AD/LDAP) with SSO; enforce MFA for admins/integrators; use managed service accounts for collectors/interfaces; rotate credentials automatically.

(f) **Authorisation**

- **Least privilege by role** (viewer, analyst, operator, integrator, admin, auditor).
- **Attribute-based** rules for network zone, data domain (Dx vs Tx), and sensitivity; approvals required for production model changes; periodic access recertification.

(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

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

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.

Outstanding Items

Business Impact Assessment (BIA) Classification

Table 1: Eskom system criticality and business continuity guidelines)

The classification of the Enterprise Historian application within the Business Impact Assessment (BIA) framework remains under review. While the standard support classification table has been included in the scope document, no final selection has been made pending confirmation from the relevant stakeholders. It is critical that this classification be finalized to ensure the appropriate support model is communicated to prospective vendors. The placement - whether under "Mission Critical" or another category - will directly influence vendor obligations and service expectations. Input from the BIA team, particularly *Palesa Pete*, is required to conclude this aspect. This section serves as a placeholder until formal confirmation is received.

Table 1: Eskom system criticality and business continuity guidelines

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

(k) **Ease of Consumption**

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

The solution should provide a seamless **intuitive, and user-centric experience** that enables rapid adoption across the Distribution and NTCSA environments. It must offer:

- **Unified access** to historian services and data sources through standard interfaces (APIs, SDKs, web clients, and dashboards).
- **Consistent user experience** across thin and thick clients, with minimal training overhead.
- **Self-service capabilities** allowing users to easily search, query, trend, and visualize time-series data.
- **Integrated authentication** (via Eskom AD/LDAP) to enable single sign-on and role-based access.
- **Ease of deployment and administration**, with configuration tools that support “plug-and-play” device onboarding, automated tag registration, and template-driven model creation.

This ensures consumption of the historian data and services is efficient, secure, and aligned with Eskom’s digitisation and Smart Grid initiatives.

(l) **Application workload placement**

The solution must support **flexible workload placement** across Eskom’s **hybrid IT/OT environments**, enabling deployment across:

- **Private cloud, on-premises, or virtual infrastructure** managed by Eskom.
- **Logically and physically separated Dx and NTCSA instances**, with centralised analytics and reporting at Eskom Holdings level.
- **Edge deployments (collectors/gateways)** within substations or field environments for near real-time data acquisition.
- **Scalable architectures** supporting containerisation and workload mobility between hosting environments.

The design should be **vendor-agnostic**, support **multi-hypervisor compatibility**, and allow workloads to transition between environments with minimal downtime, ensuring business continuity and operational resilience.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

(m) **Resource optimisation and continuous monitoring**

The solution and all components must support **efficient utilisation, monitoring, and proactive management of resources** to ensure performance, reliability, and cost-effectiveness. This includes:

- **Automated system health monitoring** for historian databases, collectors, interfaces, and network links, with metrics exposed as standard data points within the historian (*BRS 13.2–13.6*).
- **Performance dashboards and alerts** for CPU, memory, storage, and network utilisation.
- **Dynamic scaling** of compute and storage resources to accommodate growth in data volume or load.
- **Predictive analytics** for capacity planning and early detection of anomalies or system degradation.
- **Integration with Eskom's SIEM and monitoring systems** for unified operational visibility.
- **Continuous improvement mechanisms** to optimise energy and infrastructure utilisation, supporting Eskom's sustainability goals.

This ensures the Historian platform operates efficiently under varying loads while maintaining Eskom's high availability and reliability standards.

(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

Vendor will be responsible for the 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 Middleware Services to/from the bus to the internal systems

End interface points, whether consuming or providing, needs to be done in a secure fashion (certificate (SSL/TLS, OAuth2, SFTP, Tokens etc.).

All integrations must comply with **Eskom's Integration Reference Architecture (IRA)** and make use of the defined **standard Integration Service Bus (ISB)** patterns where applicable. The solution must support **secure RESTful APIs and SFTP** for all interfaces and enable **logging in CEF/JSON format** for correlation with Eskom's enterprise SIEM tools
All integrations must comply with **Eskom's Integration Reference Architecture (IRA)** and make use of **standard**

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Integration Service Bus (ISB) patterns where applicable. The solution must support **secure RESTful APIs and SFTP** for external interfaces and enable **logging in CEF/JSON format** for correlation with Eskom's enterprise SIEM tools.

Authentication

- Azure AD/Entra ID
- MS Active Directory
- LDAP

The solution must support **federated identity protocols** such as **SAML 2.0, OAuth 2.0, and OpenID Connect** to enable single sign-on (SSO) across hybrid on-premises and cloud environments, consistent with Eskom's security and identity management policies.

Server virtualisation

VMWare vSphere / Microsoft Hyper-V, or another Group Technology approved solution.

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-premises environment:

- VMware vSphere 7 or higher,

PowerVM (RISC) (only exceptional cases shall be supported).

The solution must also be **deployable on containerised environments** such as **Kubernetes or OpenShift**, where approved by Group Technology, to support cloud-native scalability and lifecycle management.

Storage virtualization

NetApp, Dell EMC, or Azure-based storage solutions.

Storage must support **data tiering, encryption at rest (AES-256)**, and **replication** as per Eskom's backup and disaster-recovery policies.

Database

- Microsoft SQL Server 2022 or later
- IBM DB@ V11.5 or higher
- Others, any DB not listed above will be treated as an exception.

Where aligned with Eskom's cloud strategy, equivalent **cloud-native database services** (e.g., Azure SQL Managed Instance, Azure Database for PostgreSQL) may be considered, provided they meet Group IT's security and performance standards.

Server OS

Windows Server 2019 or 2022 (64-bit, Standard or Datacentre Edition).

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

The system should also support **Linux-based operating systems** (e.g., Red Hat Enterprise Linux or Ubuntu LTS) where required for specific collector, broker, or analytics components.

Client OS	Windows 11 Enterprise (64-bit)
Browser	• Microsoft Edge (Chromium-based) • Google Chrome • Mozilla Firefox V60 or higher • Others (will be treated as exceptions)
Load Balancer (ADM)	F5 Big-IP / Azure Load Balancer / Citrix ADC
Backup	Veeam, Commvault, or Azure Backup compliant with Eskom backup policies.

All backups must comply with **Eskom Standard 240-56296995 – Standard for Records Retention Periods** and support **data encryption in transit and at rest**.

Communication Protocol	HTTPS (TLS 1.2+), OPC UA, MQTT, SMB 3.0, SNMP
	The solution must also support SFTP, RESTful API connectivity , and TLS 1.3 where available. All communications should use FIPS 140-2 validated cryptographic modules .

Desktop/Laptop specifications (see below)	Refer to Desktop/Laptop specs section below
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(a) Desktop/Laptop specifications:

Client user-tools shall be compatible with all desktop/laptop configurations listed below:

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
Midrange Laptop	Memory	32 GB DDR4 RAM or higher
	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
Lower Range Laptop	Storage	512 GB SSD
	Memory	16 GB DDR4 RAM
	Processor	Intel Core i5 / AMD Ryzen 5

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Speed	2.4 – 3.0 GHz, quad-core
Graphics	
Storage	256 GB SSD (SATA or NVMe)
Memory	8 GB DDR4 RAM

(o) **Secure and optimised design**

The solution design must align with the **Microsoft Azure Well-Architected Framework (WAF)** principles — covering **Reliability, Security, Performance Efficiency, Cost Optimisation, and Operational Excellence**. These principles must guide all solution components, both on-premises and in the cloud, to ensure secure, resilient, and cost-effective deployment.

(p) **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, and as required at a separate interface for NTCSA at its Simmerpan offices.

Hybrid operations must comply with **Eskom’s Cloud Adoption and Connectivity Framework**, support **ExpressRoute or approved VPN** connectivity, and ensure **consistent monitoring and governance** across cloud and on-premises workloads.

(q) **OT Standards**

- Dx and TX Cyber Security Standard for OT (240-170001061)
- DMZ Designs for OT (240-79669677)
- Remote device communication standard for data retrieval and remote access (240-64038621)
- IT/OT and 3rd Party Remote Access Standard (32-373)
- NTCSA Cyber Security Architecture and Design Principles (240-171000271)

Network segmentation, data flow, and device placement must adhere to these OT standards, ensuring **unidirectional data flow (OT → IT)** and alignment with **Eskom’s OT Network Architecture Principles**.

(r) **Patch and Vulnerability Management**

All solution components must comply with **Eskom ITSO Patch Management Standards**, supporting quarterly and emergency patch cycles with documented rollback procedures.

(s) **Security Information and Event Management (SIEM)**

All systems must generate logs in CEF or JSON format and integrate with

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Eskom's enterprise SIEM platform (e.g., Microsoft Sentinel or Splunk) for centralised monitoring, threat detection, and incident response.

6. Scope of Work

6.1. Contract period

- a) Implementation: **24 months**
- b) 12 – 24 months implementation for the Base Solution and (Integration and Business Processes).
- c) Support and Maintenance: **60 months**
- d) Total Contract Period: **72 months**.

6.2. Integration Risk Identification

- a) The Vendor should be required to:
 - Review all systems listed in the integration landscape and provide a comprehensive risk assessment related to integration with each system.
 - Identify technical, operational, data-related, and security risks associated with integrating the proposed solution into the existing ecosystem.
 - Propose mitigation strategies for each identified risk, including timelines, dependencies, and required support from Eskom or third parties.
 - Highlight any assumptions or constraints that may impact integration success.
 - Include a risk register as part of the tender submission, clearly mapping each risk to the relevant system(s).
- b) Deployment and Licensing Options
Perpetual licenses Deployed on Eskom's On-Premises Datacenter (Private Cloud – IaaS).

6.3. On-Prem (Private IaaS)

Eskom's first preference is to deploy the Wires Historian on-premises, within Eskom-controlled private cloud infrastructure (IaaS). This ensures full alignment with requirements for **OT / IT separation, data residency in South Africa, compliance with the OHS Act, and high-performance local data acquisition**. Where the proposed solution requires on-site / on-premises deployment, whether as a fully on-prem or hybrid private cloud architecture, the tenderer shall be responsible for specifying, supplying, and costing all hardware components required to enable the full functionality, performance, scalability, high availability, and resilience of the solution as well as installation and commissioning.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

The perpetual licensing option must include:

- **Core licensing** for a minimum of **2 million homogenous points per instance** with clustering for scale-out.
- **Maintenance and support costs per annum**, including security patching, upgrades, and tested DR support (RTO ≤24h, RPO ≤15m).
- **Access to software upgrades and version revisions** as covered under the vendor's support program (e.g. Customer FIRST Premium)
- **Training and knowledge transfer** for Eskom engineers (administration, advanced analytics, migration).
- **Factory mode / incremental expansion** (BRS 0.4) to add devices or points without downtime.

6.4. Hybrid / Azure (Virtual Private Cloud)

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

Where Eskom requires a hybrid deployment model, perpetual licenses may be deployed within Eskom's secure Azure tenant. This model aligns with Eskom's multi-cloud and modern IT roadmap while retaining direct control of security, performance, and compliance.

The Azure-based perpetual licensing option must include:

- **Licensing costs per annum** for historian server instances sized to support both Distribution and Transmission separation.
- **Maintenance and support per annum**, covering patching, upgrades, and Azure-optimised deployment templates.
- **Support for cloud bursting of analytics** while ensuring historian data collection remains local and compliant.
- **Integration with Azure identity management** while preserving Eskom's RBAC and least-privilege principles.
- Flexibility to **migrate workloads** between on-premises and Azure based on Eskom's evolving architecture, without relicensing penalties.

6.5. SaaS (Secure VPC)

Software-as-a-Service (SaaS) (must be a secure, (virtual) Private Cloud)

Although on-premises is preferred, Eskom requires SaaS options for certain workloads where **operational agility, reduced infrastructure management, or rapid analytics scaling** is a priority. SaaS solutions must be hosted in a secure, virtual private cloud with strict compliance to Eskom's IT/OT security standards (DMZ separation, unidirectional OT→IT flows).

The SaaS licensing option must include:

- **SaaS subscription costs**
- **Automatic entitlement to upgrades, patches, and evergreen features**, ensuring Eskom benefits from continuous innovation.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- **24/7/365 cloud application support** for access/connectivity, backed by vendor Customer FIRST Premium.
- **Comprehensive usage reporting.**
- Options to allocate credits to subsidiaries or third parties under Eskom's governance.

6.6. Enabling Works

The Contractor shall include all additional product components and activities required to ensure a fully functional and performant solution, even where not explicitly detailed in this scope. This includes, but is not limited to, the provision, configuration, and commissioning of data collectors, interface servers, and associated hardware or virtual machines deployed at appropriate locations within the Dx and NTCSA networks. Such deployments shall be determined during detailed design and shall ensure secure, reliable, and performant data acquisition and integration in accordance with Eskom's architectural, operational, and performance requirements.

7. Architecture Services (Functional Specifications and Detailed Design)

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) applications. This includes the formulation of functional specifications and detailed physical designs in alignment with Eskom's enterprise architecture principles for the deployment options available. The architecture will enable secure, scalable, and reliable data collection, storage, integration, and visualization. Scope: The scope of architecture services encompasses the design of functional specifications and detailed technical designs aligned with Eskom's architectural guidelines and business requirements. The following architectural domains will be addressed. The scope of the architecture work includes the following key areas: Data Architecture: 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.

Deliverable	Description
	- 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. - 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 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, OPCHDA, 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. - Identify potential security threats and vulnerabilities relevant to the application. - Design security measures, including authentication, authorization, secure deployment, secure communications, 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 with Eskom governance to be applied.

Deliverable	Description
	- 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 Smallworld (and/or ESRI SA, depending on implementation readiness), SCADA, DCS, SAP PM, Maximo, LIMS, and other enterprise systems, using the original source systems. - Align with Eskom's Common Information Model and utilize APIs and standard protocols for data exchange. - Vendor is responsible for Application-Level 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/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, including any internal Eskom governance committees Develop the following artifacts: - Architecture Design Documents. - Integration Specifications and Message Models. - Security Architecture Reports. - Physical and Logical Diagrams. - Compliance Matrix against Eskom Standards. - Architecture Sign-Off Documentation. - Documents required for approval/support from governance (e.g. design) committees. Communication: Regular update meetings will be held to discuss architecture deliverable progress, address concerns, and ensure alignment with project goals.

Deliverable	Description
	Deliverable Acceptance Criteria: The architecture work will be considered 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 the 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 Application-Level Business Services for the interfaces. Although Eskom has capacitated resources for Integration and testing, a successful integration of the solution with internal and 3rd party solutions, and the successful testing thereof is the accountability of the successful bidder. Thus, respondents must ensure to cost and plan for sufficient resources. The successful Contractor shall design, implement, test, and commission all required integrations between the solution and identified business systems. The Contractor shall ensure all interfaces are: • Functionally complete as per BRS Section 11. • Stable under operational conditions • Reliable with no data loss • Of production quality with appropriate monitoring, alerting, and recovery mechanisms • See section 16 for further Business Interface Requirements. The Contractor shall: • Implement bidirectional interfaces where applicable • Support near-real-time and batch data exchanges as required • Ensure time synchronisation across systems (UTC aligned) • Provide store-and-forward capability for resilience • Implement validation, reconciliation, and error handling mechanisms • Provide interface monitoring dashboards and alerting Each interface shall be demonstrated as:

Deliverable	Description																													
	- Functionally correct - Performance compliant - Load tested - Stable over a continuous 30-day operational period Minimum Initial Quantified Scope: <table><tr><th>System Group</th><th>Systems (BRS SI#)</th><th>Minimum Scope (Quantified) ***Applicable per system***</th><th>Data Types</th><th>Key Requirements</th></tr><tr><td>SCADA (Dx & NTCSA) SCADA => EH</td><td>SI1 - SI3</td><td>Equivalent of 5 substations including: 750+ analogue points 1,000+ status points 75+ control points (status of) 150+ alarms/events </td><td>Telemetry, status, SOE</td><td> ≤ 2 sec latency - Event-driven alarms </td></tr><tr><td>SCADA (Dx & NTCSA) EH => SCADA</td><td>SI4 – SI6</td><td>Equivalent of 5 substations including: 50+ analogue points 1,00+ status points 10+ alarms/events </td><td>Telemetry, status, SOE</td><td> ≤ 2 sec latency - Event-driven alarms </td></tr><tr><td>GIS/NIS (Network information system) / Network Topology **</td><td>SI7 – SI9</td><td>5 substations + feeders: 1,000+ assets 1,500+ connectivity nodes </td><td>Asset data, full topology, connectivity</td><td> - Daily sync - Incremental updates - Topology consistency validation </td></tr><tr><td>Plant / Asset Systems (Maximo/SAP PM)</td><td>SI10, S26</td><td> 1,000+ assets 250+ work orders 1,000+ maintenance records </td><td>Asset master, work orders, condition data</td><td> <5 min sync latency - Data reconciliation with GIS </td></tr></table>					System Group	Systems (BRS SI#)	Minimum Scope (Quantified) ***Applicable per system***	Data Types	Key Requirements	SCADA (Dx & NTCSA) SCADA => EH	SI1 - SI3	Equivalent of 5 substations including: 750+ analogue points 1,000+ status points 75+ control points (status of) 150+ alarms/events	Telemetry, status, SOE	≤ 2 sec latency - Event-driven alarms	SCADA (Dx & NTCSA) EH => SCADA	SI4 – SI6	Equivalent of 5 substations including: 50+ analogue points 1,00+ status points 10+ alarms/events	Telemetry, status, SOE	≤ 2 sec latency - Event-driven alarms	GIS/NIS (Network information system) / Network Topology **	SI7 – SI9	5 substations + feeders: 1,000+ assets 1,500+ connectivity nodes	Asset data, full topology, connectivity	- Daily sync - Incremental updates - Topology consistency validation	Plant / Asset Systems (Maximo/SAP PM)	SI10, S26	1,000+ assets 250+ work orders 1,000+ maintenance records	Asset master, work orders, condition data	<5 min sync latency - Data reconciliation with GIS
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Deliverable	Description				
	Field Devices / OT	SI11	• 200+ IEDs • 10+ RTUs/gateways (5x Dx and 5x NTCSA gateways, totalling 10)	Telemetry, device status, events	• IEC protocol support • Store-and-forward • Secure comms
	Metering (MV90/MDMS) and QOS	SI12, SI13, SI16	• 150+ meters • Interval data (15/30 min) • 90+ days history • QOS data to be referenced in, not duplicated.	Energy, demand, meter events, PQ data	• ≥99.5% completeness • Batch ingestion • Validation/estimation
	Other BRS Systems		• Minimum 20 complete data exchanges per system	Supporting business data	• Proven interoperability • Interface readiness
The above shall support the future development/commissioning of the interfaces of systems listed in Eskom's BRS req. 11, to enable the listed data transactions. Furthermore the tenderer shall: • Develop an interface between the Power Systems Simulation Tool (DigSilent's PowerFactory at the time of writing) and the Historian, to source data from, and optionally sink to, the Historian. • **SI7-SI9: At the time of writing Eskom is transitioning from SmallWorld's NIS to ESRI SA, the latter which will be utilised as part of this integration. As such any reference to SmallWorld shall be replace with ESRI's equivalent. For NTCSA, the same top-down structure shall be obtained from SAP PM.					
The application must have the capability of secure communication when exposing the services via the business services for both internal and external communication					
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.					

Deliverable	Description
	• 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 OAuth2 for Web Services, Database, or SFTP for Authentication security. • Provide Application Business Service with the capability to distinguish between Technical and Business errors and handle each one separately. • The solution can manage instances where the same record is published multiple times, and not create duplicates
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 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 ticking 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.

Deliverable	Description
	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.
Pilots	In addition to the integration and interface requirements, the Contractor shall execute pilots that demonstrate a fully deployed, functional end-state implementation of the Historian solution using the integrated data volumes and exchanges defined earlier (minimum 5x Dx and 5x NTCSA substations equivalent and associated assets). Each pilot shall, as a minimum, include the following end-state capabilities configured and proven using the integrated data: • Operational modelling and structure ○ Configure the enterprise/asset model representing substations, lines/feeders and associated plant (including hierarchical structures, naming standards, asset IDs, geospatial references where applicable). ○ Link telemetry, events, alarms, metering intervals, asset master data and maintenance/work management records to the model so that users can navigate from asset to data and back. ○ Model instances shall be derived from templatised master classes, with analytics and reusable functions defined at class level and inherited by all instances. • Data quality, alignment and governance ○ Implement validation and reconciliation rules (completeness, plausibility, duplicates, time alignment, unit standardisation). ○ Provide auditability and traceability from source to Historian, including exception handling and reprocessing where required. • Analytics on the model ○ Configure core calculations and KPIs relevant to operations (for example: availability, reliability, utilisation, energy and demand metrics, threshold breaches, abnormal condition detection). ○ Demonstrate template/class-based analytics (ie. repeatable through instances) operating on the model (not standalone tags), including persistence of results and refresh behaviour. • Notifications and escalations ○ Configure alerting rules, routing, and escalation workflows based on model context (asset, site, voltage level, feeder, etc.). ○ Demonstrate acknowledgement, closure, and audit trail of notifications, including failover behaviour and missed-message handling. • Reporting and visualisation ○ Provide a minimum set of ad hoc and scheduled operational reports and dashboards aligned to the pilot assets, including distribution to defined user groups.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

Deliverable	Description
	○ Demonstrate role-based access to reports and data views. • Operational readiness features ○ Implement monitoring of interface health, queue/backlog, data latency and data-loss indicators with alarms for degradation. ○ Provide standard operating procedures for support, restart, and recovery of integrations and Historian services. Pilot definition and acceptance: Pilots shall be defined with Eskom Testing CoE and end users and shall include clear deliverables and acceptance criteria. Acceptance shall require that the end-to-end solution (data ingestion, model, analytics, notifications, and reporting) operates stably and reliably on the integrated dataset for an agreed proving period, with defects and data quality exceptions managed via documented processes.

Cybersecurity

- a. The System shall be able to integrate with 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-based 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 the 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 a non-production environment before being deployed into the production environment. Integrity checks for any software and patches shall be provided and confirmed during download and before testing (i.e. at minimum confirm hash values of patches and software as provided by OEM).
- k. Vendor/OEM to provide a secure portal for software and patches that require access control.
- l. 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.
- m. The Supplier shall comply with applicable privacy and protection of personal information Acts such as GDPR in the 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.
- n. The Supplier shall notify Eskom immediately or within 24 hours when any cybersecurity breach has occurred. Although the GDPR and the South African Cybercrimes Act 19 of 2020 state 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.
- o. The database shall be placed within the 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.
- p. 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.
- q. Distributed Denial of Service (DDoS) protection mechanism shall be employed for all databases.
 - r. The System shall support the prevailing Application-level enterprise services bus (ESB), application-level programmable interfaces (API's) and Application-Level 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, Salesforce 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.
 - s. 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.
 - t. The System shall provide a feed for SIEM Integration using standard technologies such as Syslog, Windows events, etc.
 - u. The System shall support the installation of Eskom's End-Point protection Solution/s.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

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 them. All deliverables shall be provided in a 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 the steering committee minutes, and the scope document must be compiled and signed off.
Eskom Governance	Various Eskom governance and processes are 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.
Cybersecurity insurance	Stipulate a cyber Insurance contract.
Exit strategy	Compile and sign an exit strategy.

8. Maintainability and Supportability

- Vendor to indicate licensing models for requisite software, the validity periods, mechanisms for renewal/extension, and associated costs.
- All diagnostic software necessary to debug/diagnose/troubleshoot the system applications must be provided with the initial application release package or be readily available for the base operating system (i.e., Microsoft).
- Subsequent releases or updates of the initial software package must adhere to CI/CD best practices. Vendor to advise how and when releases, patches, or any upgrades will be implemented on the system.
- Any expected planned maintenance activities for the solution's lifetime are to be provided, including the expected system downtime for these activities
- Vendor to provide details on Operating System Patch Management process, indicating evaluation of patches and process for deployment (i.e., approval of released MS patches for the application environment and the responsibility for implementation).

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- A list of all software and other licenses used by the solution must be provided. Eskom to leverage existing enterprise licensing agreements to aid in the determination of the elected solution.
- The solution offered must be capable of logging system errors and generating error reports exportable to formats native to Microsoft.
- The offered solution must also comprise a fully licensed, Production, Pre-Production, and Development/QA environment that replicates the solution placed into Production.
- Disaster Recovery solution with associated architecture environment to be provided.
- Proposed solution should offer 2N level redundancy on the Production system, such that downtime on primary systems is negated/minimized.
- All applications and services necessary for the operation of the solution must start automatically from cold or warm-restart conditions.
- The vendor shall provide details of all single points of failure in the expected data flow, and the manual interventions necessary to remedy the particular point of failure.
- Vendor to provide comprehensive free-issued support documentation for all components of the solution delivered. Documentation to be available in English.
- Vendor to provide expected performance and expected failure rates, based on historic experience with the offered solution.
- Solution platform must be extensible via in-built tools or low/no-code capabilities.
- Any client's software must have the capability to be packaged for remote deployment via Microsoft SystemCenter Configuration Manager (SCCM)
- Vendor to provide details of any certification or product agreements with the solution OEM.
- Vendor must have proven project implementation and support experience with the offered solution in deployments of similar size and scope.

9. Training/Transfer of Skills Requirements

- Vendor to provide User training courses (in English) for system users to effectively use the system as intended, and to meet desired business goals/deliverables. Various levels of user training to be offered (e.g. standard-user, super-user, administrator). A minimum of 50 Eskom users will require said training.
- The capability for online self-led training for, at a minimum, standard-user level must be made available for unlimited users.
 - Vendor to provide technical training courses (in English) to upskill Eskom system support staff in the installation, configuration, operation, and maintenance of the offered solution, thus enabling in-house 1st and 2nd line maintenance.
 - Design and development training to be offered to enable select users to develop user-specific requirements within the solution platform via any extensibility features.
 - Both on-site/classroom-based and virtual/remote methods of delivery for the training shall be made available (with a preference for MS Teams for virtual/remote method).

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- training material used in the facilitated training must also be available for download to Eskom personnel.
- Training is to include a form of knowledge assessment at its commencement to ensure trainees have sufficiently met training outcomes.
- Relevant course information for all training offered must be provided, including location, duration, syllabus, knowledge/skill pre-requisites, trainee capacity, and associated costs.
- Methods for knowledge and skills transfer to Eskom staff must be in place during the implementation stage (i.e., installation, configuration, and deployment).
- Vendor must have experienced, certified/qualified training facilitators available.
- All training materials, manuals, and user guides shall be handed over to the client in editable format upon completion of the training sessions
- Assessment of skills transfer effectiveness shall be conducted through post-training evaluations and competency-based testing.

10. Service Level Agreement Requirements

- SLA to be proposed by vendor with clearly defined support tiers, response times, and escalation processes.
- Vendor to offer 3rd line and higher system support, with details of the type of support (e.g., on-site support, remote support, hardware support, error debugging, upgrade implementation) and extent of technical support received from the OEM for all applications constituting the solution for the duration of the solution/contract lifetime.
- SLA to detail the standard system and maintenance support provided, and the associated annual costs.
- Vendor to have available at least 2 technical resources for 3rd line support during contracted support hours.
- SLA proposal to include factors that constitute a critical incident and expected response times.
- SLA to detail the process for requesting vendor support for troubleshooting/maintenance, and the hours of availability. A formal method for the logging, tracking, and reporting of such instances must be detailed. Process for requesting additional/ad-hoc support outside of the standard software support must be detailed. The process for requesting technical support outside of standard office hours must be detailed.
- The SLA must detail baseline system performance. The vendor should also express a commitment to exceed the outlined system performance.

11. SLA Penalties

- A ten percent (10%) penalty will be imposed if the SLA of 98% availability over 30 consecutive days is not met.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- A detailed root cause analysis will be done on all incidents before penalties are imposed, vendors are expected to provide inputs thereto.
- Planned and agreed downtime and planned maintenance are excluded from the above.

12. 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.

13. Project Management Services

- Provide a full-time project manager for the duration of the project. A proposed implementation plan and timeline should accompany all proposals.
- The service provider should note that there are governance processes to be followed, which could be time-consuming, for example, but not limited to:
 - Enterprise Architecture (EAAB) approvals/ support (weekly Monday meetings, but submissions due by mid-week the week prior)
 - Group IT Delivery approvals (only monthly meetings, submissions due a week prior)
 - OT Design Review Teams (DRT), for approval/support, typically by monthly meetings.
 - NTCSA Architecture Data Committee, monthly meetings.
 - Integration SOA Governance approvals/ support (weekly Tuesday and Thursday meetings, but submissions due by 2 days before)
 - Project Delivery related approvals
 - Provisioning of infrastructure (set-up and patching could take a few days, after approval by the IP CoE/ H CoE)

13.1. Minimum Resources Required

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

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

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

13.2. Minimum Resource Requirements (Summary for the Project)

The supplier needs to specify any extra resources they need to finish it. Eskom has given the minimum requirements, but the supplier can add more resources as they see fit to meet the deliverables.

#	Resource	Level	Number of resources
01	Project Manager	Senior	1
02	Project Administrator	Intermediary	1
03	Business Analysts	Intermediary	2
06	Integration Developer	Intermediary	1
04	Testers	Intermediary	2
05	Integration Architect	Intermediary	2
06	Technical Architect	Intermediary	1
07	Cybersecurity Professional	Intermediary	1

The supplier will be allowed to provide other skills needed to ensure the success of the project.

13.3. 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.

14. Eskom Governance and Process

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

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

15. Testing Requirements

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 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-premises option).** Led and executed by the Disaster Recovery team.

All testing requirements must cover all identified interfaces that have been identified. The testing team must adhere to the Testing Centre of Excellence (TCoE) standard document provided as part of the RFP documentation.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

16. Business Systems Integration Requirements

The Tenderer must provide technical resources to build and implement all required Business Services for the interfaces. The Enterprise Historian shall seamlessly integrate with the following Dx and Tx operational and business systems:

- ABB Network Manager SCADA (Dx),
 - TEMSE (Tx),
 - TxSIS (Tx),
 - Gridstream AIM (Dx),
 - MV90 Customer Meter Readings (Dx),
 - MV90 Network Boundary Meter Readings (Dx),
 - MDMS (Tx),
 - KSACS MDM (Dx),
 - SAP Quality Issue Management (QIM),
 - SAP Plant Maintenance (PM),
 - Adroit (Telecoms – Tx),
 - Consurgo (Telecoms – Tx),
 - Phoenix (Tx OMS),
 - GE PowerOn Fusion (Dx OMS/DMS),
 - Maximo (Asset Management),
 - Asset Performance Management (APM),
 - AFAS Server (Tx), AFIS – CSIR (Tx),
 - QOS Database (Dx/Tx),
 - Sample Manager (Tx – LIMS),
 - Thermo Scientific – Sample Manager (Tx),
 - Wide Area Management System (WAMS/PMUs – Tx),
 - Tx TRE BMS Systems, LLTS (Tx),
 - Geographical Information System (GIS),
 - ESRI,
 - Tx Asset Management Center (Future).
- Please reference the “Group IT End Systems Integration Design Requirements v1.0.1 (4)” document to guide the available communication protocols. Please be aware that the Eskom Integration team (ICOE) will do the building of the defined Business Integration Services on the approved Eskom Middleware.
- 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.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

- 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 errors and handle each one separately.
- The solution can manage instances where the same record is published multiple times, and not create duplicates

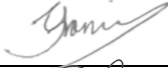
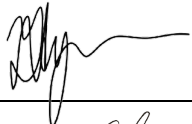
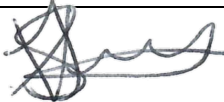
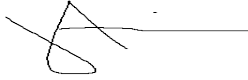
A signed-off test closure report is required before a test milestone is completed. The following testing milestones must be completed:

- 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 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 to ensure 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.

	TENDER SCOPE OF WORK Group Information Technology	Template Identifier	240-IT042	Rev	1.5
		Effective Date	April 2023		
		Review Date	April 2028		

17. Approvals

Name	Role	Signature	Date
Richard McCurrach Sponsor - NTCSA	Snr Manager Info Mngmt	 p.p	28/08/2026
Kwena Seema Sponsor - Distribution	Snr Manager Operational T		02/09/2026
Alvin Francis Project owner (NTCSA)	Senior Advisor		28/08/2026
Vijay Khoosal Project Owner - Distribution	Distribution - Project owner		28/08/2026
Johann Swart (Project Manager)	Snr Program Manager		28/08/2026
Tertius Hyman	Chief Engineer		28/08/2026
Meenal Vala	Chief Advisor Security Cyber		28/08/2026
Leigh Ann Vermaak	Chief Advisor Application		28/08/2026
Jason Sewpaul	Snr Advisor Applications		28/08/26
Juan Atkinson	Snr Engineer Prof Electri		28/08/2026

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