

 Eskom	Report	Transmission
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None

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## **1. Introduction**

Subject to final investment approval, Eskom Transmission (hereinafter referred to as Transmission) intends to procure a service for an independent assessment of its asset management practices against the ISO 55001 standard. ISO 55001 is an international standard that specifies the requirements for the establishment, implementation, maintenance and improvement of a management system for asset management. Transmission aims to be ISO55001 certified in future. A gap assessment is essential to establish the extent to which Transmission asset management practices compare with the ISO55001, identifies shortfalls and the necessary actions to address those gaps. Achieving alignment with ISO 55001 requirements is expected to bring Transmission in line with internationally recognised best practice approaches in asset management such that the organisation can sustainably realise its business objectives through effective and efficient management of its assets.

Transmission has already embarked on a journey towards aligning to the ISO55001 standard. So far, an Asset Management Policy, a Strategic Asset Management Plan (SAMP), and several Asset Management Plans (AMPs) have been published. Additionally, several tools and systems that are deemed critical for sustaining certification have been identified.

To procure this service, Transmission will enter into a contract with a service provider that will carry out an ISO55001 compliance gap assessment and support Transmission in better preparing for ISO55001 certification.

## **2. Supporting Clauses**

### **2.1 Scope**

This document covers the scope of work for the ISO 55001 compliance gap assessment.

#### **2.1.1 Purpose**

The purpose of this document is to outline the scope of service for a gap assessment that will establish how well Transmission complies with the requirements of ISO 55001. The document will be used as basis for the contractual scope.

#### **2.1.2 Applicability**

This document is applicable to Transmission.

### **2.2 Normative/Informative References**

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

#### **2.2.1 Normative**

- [1] ISO 9001 Quality Management Systems
- [2] ISO 55000:2014 Asset Management – Overview, Principles and Terminology

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- [3] ISO 55001:2014 Asset Management – Management Systems – Requirements
- [4] ISO 55002:2018 Asset Management – Management Systems – Guidelines for the Application of ISO 55001
- [5] 240-56926886 Transmission Business Plan, rev 3

### **2.2.2 Informative**

- [6] None.

## **2.3 Definitions**

<b>Definition</b>	<b>Description</b>
Asset Management	Co-ordinated activity of an organisation to realise value from assets
Asset Management System	Management system for asset management whose function is to establish the asset management policy and asset management objectives
Requirements	Need or expectation that is stated, generally implied or obligatory

## **2.4 Abbreviations**

<b>Abbreviation</b>	<b>Explanation</b>
BU	Business Unit
GP&D	Grid Planning and Development
IPS	Interconnected Power System
ISO	International Standard Organisation
P&SCM	Procurement and Supply Chain Management
TDP	Transmission Development Plan
SA	South Africa(n)
SO	System Operator

## **2.5 Roles and Responsibilities**

Asset Strategy is responsible for the development and upkeep of the requirements in this document.

## **2.6 Process for Monitoring**

Not applicable.

## **2.7 Related/Supporting Documents**

None.

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### 3. Company Information

Transmission is a division of Eskom that transmits electric power from generating plants to distribution networks. The business is mandated to provide a reliable and efficient transmission network, a system operator, and energy market services in South Africa and designated electricity markets.

Transmission is headquartered at Megawatt Park, Sunninghill, Sandton, with major asset management activities at Simmerpan Germiston, and centres such as Polokwane, Witbank, Bloemfontein, Durban, Port Elizabeth and Cape Town. The division employees just over 3000 employees.

Transmission is comprised of business areas as illustrated in the organisational structure below.

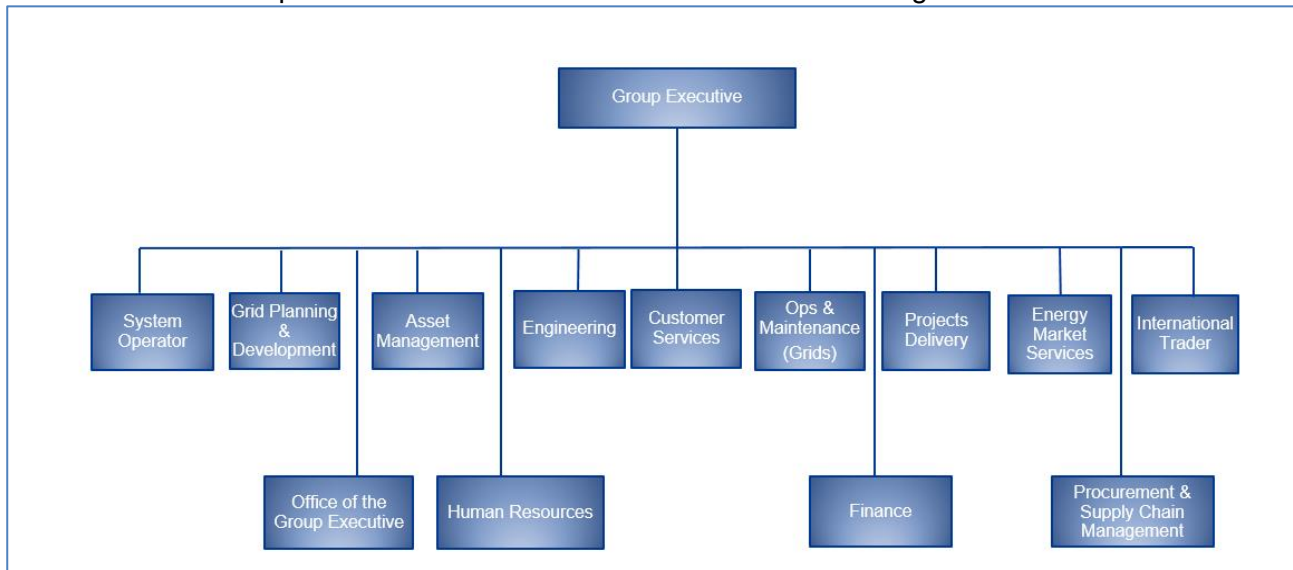


Figure 1: Transmission organisational structure

#### System Operator (SO)

The System Operator BU controls the operations of the Interconnected Power System (IPS) and is responsible for the short-term reliability of the IPS as defined in the South African (SA) Grid Code. This BU incorporates Transmission's Telecommunications business. The number of employees in this business area is 589.

#### Grid Planning and Development (GP&D)

The Grid Planning and Development BU prepares technical plans to augment the Transmission Grid in accordance with the SA Grid Code. In doing so, it secures the rights to land required for the augmentation of the Transmission System, develops the Transmission network infrastructure projects and interfaces with external customers and independent power producers to meet grid connection requirements. GP&D develops strategic plans and the 10-year Transmission Development Plan (TDP) using energy and demand forecast and acquiring servitude rights and provides grid access and connectivity to the reliable network. The number of employees in this business area is 106.

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## Asset Management

The Asset Management BU provides asset life cycle management strategies, while providing assurance that asset condition risk is within tolerable levels. The quantities of the major Transmission network assets are indicated in the table below.


<b>Eskom Tx Asset Base (R111bn)</b>	<b>Number</b>		
<b>HV Plant Assets</b>			
Substations	182		
Power Transformers	595		
High Voltage Reactors	115		
Circuit Breakers	3505		
Isolators & Earth Switches	2 263		
Instrument Transformers	16 987		
Gas Insulated Substation	14		
Capacitor Banks	157		
<b>Secondary Plant Assets</b>			
Protection Systems	2 458		
Metering systems	1 227		
DC Systems	1 630		
<b>Network Lengths</b>			
Overhead Powerlines (ckm)	32698		
<b>Telecomms</b>			
Telecom Towers	874		

Figure 2: Transmission network assets

Functions within this BU are equipment specifications, equipment diagnostics, asset strategy, asset investment optimisation, contracts resources and performance, servitude and land management, programme delivery and grid modernisation. The number of employees in this business area is 121.

## Engineering

The Engineering BU provides technical specifications, design solutions and technology direction in substations, secondary plant and overhead lines assets. This unit delivers project design solutions for the rollout of new and replacement infrastructure and supports the Grid operations with technical specialists. The number of employees in this business area is 203.

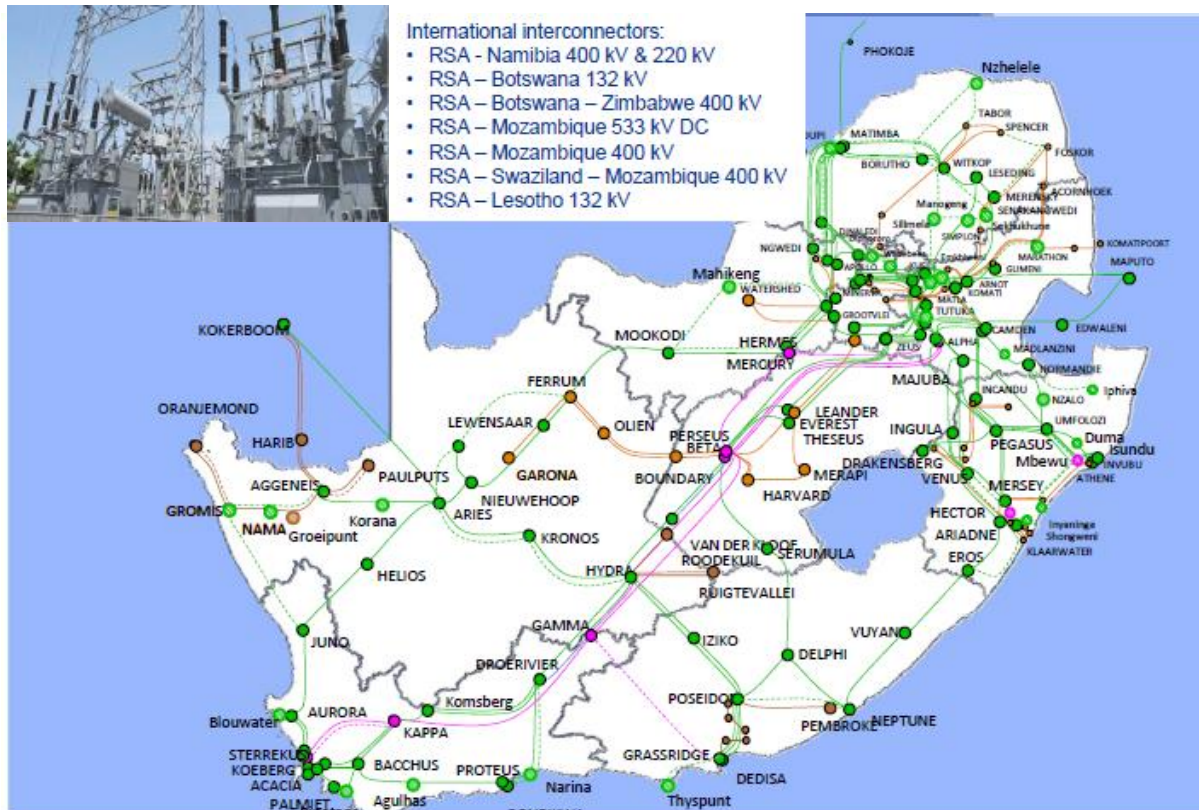
## Customer Services

The Customer Services BU guides the organisation towards overall objective of achieving fully satisfied and serviced customers.

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## Operations and Maintenance (Grids)

The Grids BU ensures a reliable and sustainable transmission network through operating, maintenance, and restoration of the Grid. The Transmission substation interconnections are shown in the figure below.



### Figure 3: Transmission Substation Interconnections

The employees in this BU are stationed in cities, towns and substation offices throughout the country. The number of employees in this business area is 1327.

## Project Delivery

Projects Delivery BU supports the Transmission network availability and reliability through the development and execution of expansion, new build and refurbishment projects. Projects are constructed by external companies on contract to Transmission. The number of employees in this business area is 273.

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### **Energy Market Services**

The Energy Market Services BU plans for adequate electricity supply and demand resources to meet expected future customer energy and capacity requirements, at country level, including the import and export of power from South Africa. Facilitate the procurement of Independent Power Producers and wholesale energy for the purposes of energy trading and provide the administrative services required for a wholesale electricity market, including wholesale pricing and settlements of trade. The number of employees in this business area is 27.

### **International Trader**

The International Trader BU pursue the development and execution of trading opportunities in the SADC region, to access strategic resources, and grow Eskom's market share in the region. The number of employees in this business area is 19.

### **Office of the Group Executive**

The office of the Group Executive provides strategic leadership, assurance and support in key areas, including Performance Management, Information Management, Regulatory Management, Legal & Compliance, Risk & Resilience, Strategy and Planning, Safety and Environmental Risk Management, Business Management Systems as well as Communication & Stakeholder Relations. This unit manages Transmission's compliance to management systems such as ISO9001, ISO14001 and ISO 45001. The number of employees in this business area is 69.

### **Finance**

The finance BU improves the medium to long term financial sustainability and financial health of the organisation and supports a stable going concern status. The number of employees in this business area is 124.

### **Human Resources**

The Human Resources BU provides human resource solutions through provision of strategic and operational delivery support, direction to the division and implementation of the best practice based human capital strategies and solutions, thereby actively contributing to the overall achievement of the divisional mandate. The number of employees in this business area is 53.

### **Procurement and Supply Chain Management**

The Procurement and Supply Chain Management BU execute the Procurement and Supply Chain Management (P&SCM) function with a clear line of sight over all external spend to enable the Transmission business to achieve its strategic mandate of providing reliable and efficient transmission network, system operator and energy market services to the South African and designated electricity supply industries. The number of employees in this business area is 102.

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Transmission uses electricity network assets to transmit electricity from dispersed power stations and IPPs to high load customers and the distribution networks at load centres. Annual energy transmitted by the Transmission network assets is over 198TWh (FY22). The asset base of Transmission is R111 billion (as per NERSA's reason for its decision on Eskom's revenue application for the fifth Multi-Year Price Determination (MYPD5) in the 2022/23 financial year.

The operating model for the Transmission business is evolving as part of the Department of Public Enterprises' plan to reform the South Africa's electricity supply industry. Eskom's unbundling will result in three legally separated entities (i.e. Generation, Transmission, and Distribution) wholly owned by Eskom. The Transmission Business Plan (2021/22 to 2023/24) highlights that creating an independent Transmission entity is expected to enable cost-efficient trade to meet demand, to improve market transparency and reputation, to provide universal access with ease and speed, and to allow for value chain growth and linkages in the electricity industry.

The organisation is facing challenges amongst which includes the ageing infrastructure and constrained delivery capabilities against the backdrop of an expected rise in expansion of the Transmission system to interconnect new various electric power plants. These challenges lead to reduction in asset performance, increasing maintenance cost and slows the country's growth potential. To manage these asset related challenges, Transmission has been pursuing improvements to its asset management practices and it is seeking an independent perspective on its asset management maturity and assistance to establish a plan for further improvement and eventually attaining the ISO55001 certification.

## **4. ISO 55001 Compliance Assessment Scope of Work**

### **4.1 General requirements**

- a) The ISO55001 compliance gap assessment pertains to the Transmission division of Eskom.
- b) The evaluation of the Transmission asset management system and asset management practices shall be conducted in accordance with the requirements of ISO 55001.
- c) The assets within the scope of the assessment are the physical transmission network assets that are essential to the transmission of electricity. This entails:
  - (i) Primary and secondary substation assets
  - (ii) Overheads Power lines
  - (iii) Telecommunications
  - (iv) Facilities
- d) Respondents shall provide a detailed plan outlining how they will carry out the assessment, including resources, methods, approaches, cost breakdown and duration.
- e) The respondent's proposal shall include a complete list of Transmission's responsibilities encompassing all items, venues, services, office space, approvals, and activities to be provided or performed by Transmission. This includes any engagements that may be required with Transmission employees.
- f) The duration of the contract shall be limited to a period of three years. The service to be provided under this contract is not required to be continuous throughout the entire three-year term. The work schedule and duration of work periods shall be as per the plan and in mutual agreement with the employer.

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- g) The assessment shall be carried out by a service provider who is experienced in carrying out ISO55001 gap assessments. The service provider shall make use of experienced assessors with a minimum of 5 years ISO55001 assessment experience.
- h) The service provider shall have previously conducted ISO55001 assessment for a utility preferably an electric utility.
- i) The service provider shall use one or more personnel who possess recognised asset management certification such as Certified Practitioner in Asset Management (CPAM).
- j) The service provider shall be required to sign a nondisclosure agreement and commit to restricted use of Transmission information for other uses other than the service being provided.
- k) Transmission will have proprietary rights over the information and records generated from the assessment.

## **4.2 Gap assessment report**

- a) The service provider shall produce a gap assessment report that clearly indicates the extent to which Transmission complies with all the requirements outlined in the clauses of ISO55001, and explanation of what aspects of the asset management system and asset management activities should be improved.
- b) The assessment report shall indicate Transmission's readiness comply with and certify to ISO55001. As well as clearly indicating the necessary steps to be taken for compliance and associated timelines. Findings and recommendations shall be listed for each ISO55001 clause.
- c) The assessment report shall be well structured, as a minimum cover heading provided in item d) below.
- d) The respondent shall provide a sample of the contents of the report and briefly explain what will be covered under each section as part of the returnables for the proposal.
- e) The improvement actions in the assessment report shall be documented as a plan, prioritising the necessary tasks to be carried out. The plan shall specify the resource requirements and estimated timelines for costing purposes.
- f) The gap assessment report shall be written in English.
- g) The draft assessment report shall be sent to the employer representative to review its accuracy, relevance, completeness, and clarity.
- h) Gaps identified in the review will be sent to the service provider for perusal. The plan in 4.1 d) should make a provision for this review and address the shortfall indicated by the employer.
- i) The draft assessment report shall be presented to the Transmission senior management by the service provider for feedback / comments before finalisation.
- j) The final signed report and associated documents shall be provided in electronic format.

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### **4.3 Training**

- a) The service provider shall conduct courses relevant to the establishment, implementation, maintenance, and improvement of the asset management system as per Annexure A. This should include courses for the development of competency of Eskom employees that will perform continuous improvement internal assessments/audits.
- b) The service provider shall supply the training material for the list of courses listed in Annexure A within one year of the commencement of the contract.
- c) The training material shall include facilitator's material, learner manual, assessments, and other necessary supporting material such as PowerPoint presentations. (All training material should in the Eskom template format that shall be provided by Eskom)
- d) The training material shall be provided in electronic format with no restrictions on creating copies or the training being delivered by Transmission, during or at any time after the contract.
- e) Transmission will have ownership of the training material supplied to it.
- f) The service provider shall provide training listed in Annex A to Transmission employees. The number of employees to be trained are provided in Annex A.
- g) Where the service provider makes use of third parties to supply the training material and / or deliver the training, Transmission will not be involved in the arrangements between the service provider and the third parties.
- h) The training shall be conducted by qualified and experienced professionals with a minimum of 5 years of relevant asset management experience.
- i) All-inclusive cost per attendee and minimum number of attendees per training session shall be provided on annexure A.
- j) Transmission will make available a training facility (training room / boardroom) for classroom-based courses in Eskom offices within Gauteng province.
- k) Training sessions shall be scheduled as and when required by the employer.
- l) All training interventions shall be conducted in English.
- m) All successfully completed training courses offered shall be acknowledged with a certificate stipulating the particulars of the attendee, date of training, name of course and signature of the facilitator.

### **4.4 Support**

- a) The service provider shall review and update the below Transmission asset management artifacts to ensure they align with the requirements of ISO55001:
  - i. Asset Management Policy
  - ii. Strategic Asset Management Plan
  - iii. Asset Management Plan for Transformers
  - iv. Asset Management Plan for Protection Systems
  - v. Asset Management Plan for Power Lines

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- vi. Asset Management Plan for Circuit Breakers
- vii. Asset Management Plan for Refurbishment
- b) The service provider shall supply their asset management artifacts templates (AM Policy, SAMP, AMP'S and other relevant templates) that are aligned with the requirements of ISO55001.
- c) Two years after issuing the gap assessment report, the service provider shall assess Transmission's readiness for ISO55001 certification, considering the recommendations outlined in the gap assessment report mentioned in section 4.2
- d) The service provider shall provide technical support to Transmission during the certification audit in order to achieve successful certification.
- e) The service provider shall develop a change management plan for transmission to assist with the adoption of ISO55001 requirements.
- f) Where Transmission deems it necessary, it will utilise the service provider to assist in addressing any identified gaps mentioned in the gap assessment report referred to in section 4.2 or the change management plan mentioned in 4.4 (e) above.

## **5. Acceptance**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
Prince Moyo	General Manager – Asset Management
Victor Shikoana	Senior Manager – Asset Strategy

## **6. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Compiler</b>	<b>Remarks</b>
October 2023	3	TJ Mokwana	Reviewed several requirements to make them more specific. Specified training requirements in Appendix A.
June 2023	2	TJ Mokwana	Added training and support requirements in section 4.3 and 4.4. Updated duration of contract and grammar throughout the document.
January 2023	1	TJ Mokwana	New document.

## **7. Development Team**

The following people were involved in the development of this document:

- Tebogo Mokwana
- Teboho Ramorapeli
- Lungile Matang

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## **8. Acknowledgements**

The compiler acknowledges inputs from the Asset Management Leadership and Asset Strategy team.

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## Appendix A – List of Asset Management System Related Courses

No.	Course Title	Course Objective	Course Content	Target Groups (e.g. Maintenance planners)	Duration	Medium (Classroom / Online class)	Course attendance cost per head	Minimum nr of attendees per training intervention	Cost of the training materials (Including supporting material)	Nr of employees to be trained
1	Establishment of the Asset management system	To equip the Transmission employees with the knowledge and skills necessary to design and set up an effective asset management system that conform to ISO55001.	<ol style="list-style-type: none"> <li>1. Principles, methodologies, and best practices required to create an effective asset management system</li> <li>2. Development of the Asset Management Policy, SAMP and AMPs</li> <li>3. Defining Asset Management Objectives aligned to organisational objectives</li> <li>4. Planning to achieve Asset management objectives</li> <li>5. Criteria for asset management decision making</li> <li>6. Requirements for recording financial &amp; non-financial information</li> <li>7. Linking ISO55001 with other management systems i.e., ISO9001, ISO14001 and ISO45001</li> <li>8. Integration of the AMS into other non-technical organisational functions (i.e. Finance, HR, Procurement)</li> <li>9. Determining actions to address risks &amp; opportunities for the asset management system</li> <li>10. Information requirements for the asset management system</li> <li>11. Documented information necessary for ISO55001 certification</li> </ol>	Technical employees and managers identified for the establishment of the asset management system	3 days	Classroom		15		15

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ASSESSMENT AND SUPPORT**

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2	Implementation of the Asset management system	To equip the Transmission employees with the knowledge and practical aspects of putting the established asset management system into action.	<ol style="list-style-type: none"> <li>1. Defining roles, responsibilities and authorities for asset management</li> <li>2. Leadership and culture as determinants of realization of value</li> <li>3. Building employee awareness, competency, and empowerment for asset management</li> <li>4. Communicating asset management system requirements</li> <li>5. Execution of the Asset Management System requirements</li> <li>6. Reporting on the performance of the Asset Management System</li> <li>7. Operational planning &amp; control for the Asset management system</li> <li>8. Implementing action to address risk &amp; opportunity for the Asset management system</li> <li>9. Management of change</li> <li>10. Management of the outsourcing of the relevant asset management activities</li> </ol>	Technical employees and managers identified for the implementation of the asset management system	3 days	Classroom		20		40
3	Review of Asset management system	To equip the Transmission employees with knowledge and skills to evaluate the performance of the asset management system, conduct regular assessments, audits and management reviews to ensure compliance to the Asset management system requirements as per ISO55001 as well as identifying opportunities for continuous improvement	<ol style="list-style-type: none"> <li>1. What needs to be monitored, measured, evaluated how, when</li> <li>2. Reporting on the effectiveness of the asset management system</li> <li>3. Effectiveness of process for managing risks &amp; opportunities</li> <li>4. Conducting assessments and audits</li> <li>5. Management reviews</li> <li>6. Addressing non-conformance and eliminating re-occurrence</li> <li>7. Establishing processes to proactively identify potential failures and evaluate need for preventative action</li> <li>8. Continuous improvement of suitability, adequacy &amp; effectiveness of asset management and asset management system</li> </ol>	Technical employees and managers identified for the review of the asset management system	2 days	Classroom		20		40

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