	Manual	Research, Testing and Development (RT&D)
---	---------------	---

Title: **RT&D Quality Management System Manual** Document Identifier: **240-98784903**

Alternative Reference Number: **N/A**

Area of Applicability: **Research, Testing and Development**





Functional Area: **Business Enablement**

Revision: **5**

Total Pages: **16**

Next Review Date: **February 2027**

Disclosure Classification: **Controlled Disclosure**

Compiled by	Supported by	Functional Responsibility	Authorized by
			
T. Mngomezulu Senior Advisor: Quality Assurance	T. Nevhulaudzi Middle Manager: SHERQ	C. Ramonotsi Senior Manager: Business Enablement	P. Madiba General Manager: Research, Testing & Development
Date: 29.02.2024	Date: 29.02.2024	Date: 29.02.2024	Date: 2024-04-16

CONTENTS

1. Introduction	3
2. Supporting Clauses	3
2.1 Scope	3
2.2 Normative/Informative References.....	3
2.3 Definitions	4
2.4 Abbreviations	4
2.5 Roles and Responsibilities	5
2.6 Process for Monitoring.....	5
3. Context of the Organisation (Clause 4)	6
3.1 Understanding the Organisation and its Context	6
3.2 Understanding the Needs and Expectations of interested Parties	8
3.3 Scope of the Quality Management System.....	8
4. Leadership (Clause 5)	9
5. Planning (Clause 6)	11
5.1 Actions to Address Risks and Opportunities	11
5.2 Quality Objectives and planning to achieve them	11
5.3 Planning for Changes.....	11
6. Support (Clause 7)	11
6.1 Resources	11
6.2 Competence	12
6.3 Awareness.....	12
6.4 Communication	12
6.5 Documented information	12
7. Operation (Clause 8)	13
7.1 Operational planning and control	13
7.2 Requirements for products and services.....	13
7.3 Design and development of products and services	13
7.4 Control of externally provided processes, products and services.....	14
7.5 Production and service provision	14
7.6 Release of products and services	14
7.7 Control of non-conforming outputs.....	14
8. Performance evaluation (Clause 9)	14
9. Improvement (Clause 10)	15
10. Acceptance	15
11. Revisions	16
12. Development Team	16
13. Acknowledgements	16

CONTROLLED DISCLOSURE

1. Introduction

The aim of the quality management system manual is to give framework of practices applicable to management of Research, Testing & Development (RT&D) processes. The identified practices are aligned to ISO 9001. The manual serves as the principal document which provides direction for management system for RT&D.

RT&D plays an integral role in the pursuit of company objectives and strategic imperatives. The business unit provides a variety of services to the Eskom organisation including scientific and technical advice, research and consulting, analysis, detailed design as well as providing strategic technical planning services and direction, technical skills transfer on new technologies.

The research is focussed on the needs of the line divisions within Eskom: - they are the core business and recipient of the majority outputs. Their needs drive the research agenda and they determine value add. Thus, the focus is predominantly on applied, not pure research and the outputs are focussed on the strategic and operational needs of Eskom.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this manual is to explain/ describe how RT&D applies the principles of ISO 9001 and to guide and assure governance and compliance to requirements which support its operational activities. The manual serves as the principal document for introduction to QMS of RT&D and provides direction to all related QMS documentation and further provides an overview of business processes to ensure compliance with the requirements of the ISO 9001 standard.

2.1.2 Applicability

This document shall apply throughout RT&D and personnel working on behalf of RT&D.

2.1.3 Effective date

The manual shall be effective once authorised by RT&D General Manager.

2.2 Normative/Informative References

2.2.1 Normative

- [1] ISO 9001:2015 Quality Management Systems- Requirements
- [2] ISO 9001:2015 Quality Management System-Fundamentals and Vocabulary
- [3] SANS 9004 Managing for Sustained Success of an Organisation - A Quality Management approach
- [4] SANS 19011 Guidelines for Quality and or Environmental Management System Auditing

CONTROLLED DISCLOSURE

2.2.2 Informative

- [1] 32-727 Safety, Health, Environment and Quality (SHEQ) Policy
- [2] 32-391 Integrated Risk Management Framework and Standards
- [3] 240- RT&D- 139 RT&D Business Plan
- [4] 240-56927206 Eskom Holdings Corporate Plan.

2.3 Definitions

Definitions	Explanation
Context of the organisation	Combination of internal and external issues that have an effect on an organisation, approach to developing and achieving objectives.
Continual Improvement	Recurring activity to enhance performance.
Customer Satisfaction	Customer perception of the degree to which the expectation has been fulfilled.
Documented information	Information required to be controlled and maintained by an organisation and the medium on it is contained.
Improvement	An activity to enhance performance.
Management System	Set of interrelated or interacting elements of an organisation to establish policies, objectives and process to achieve those objectives.
Nonconformity	Non- fulfilment of a requirement.
Objective	Results to be achieved.
Policy	Organisation intention and direction of an organisation as formally expressed by its top management.
Quality	Degree to which a set of inherent characteristics of an object fulfils requirements.
Quality Management	Management with regard to Quality.
Quality Manual	Specification for Quality Management System of an organisation.
Risk	Effect of uncertainty.

2.4 Abbreviations

Abbreviation	Explanation
DOA	Delegation of Authority
EMS	Environmental Management System
HR	Human Resources
KPI	Key Performance Indicators
Mancom	Management Committee
NCR	Non-Conformity Report
PCM	Process Control Manual
PESTEL	Political, Economic, Social, Technological, Environmental, Legal
PLCM	Project Life Cycle Model

CONTROLLED DISCLOSURE

Abbreviation	Explanation
OPS plan	Operations Plan
OPS meeting	Operational Meeting
QMS	Quality Management System
RT&D	Research, Testing & Development
RT&D IC	Research, Testing & Development Investment Committee
SHEQ	Safety, Health, Environment & Quality
SLA	Service Level Agreement
SWOT	Strengths, Weakness, Opportunities, Threats

2.5 Roles and Responsibilities

RT&D management is the responsible for implementing the Quality Management System Manual.

2.6 Process for Monitoring

Audits will be performed to monitor and embed the compliance requirements of the quality elements.

2.7 Related/ Supporting Documents

RT&D Business Plan

Research Management Procedure

Pilot and Demo PLCM

RT&D Operational Research Work Instruction (Consulting)

Research PCM.

CONTROLLED DISCLOSURE

3. Context of the Organisation (Clause 4)

3.1 Understanding the Organisation and its Context

The RT&D business plan considers the context of the organization by ensuring alignment to Eskom's strategy as outlined in the Corporate Plan. This means that RT&D aligns with:

- Eskom Mandate from the government
- Strategic Intent Statement
- Strategy Review; and
- Shareholder Compact

To determine the extent of the ability to achieve intended results, as part of planning, RT&D has done a SWOT analysis, PESTEL analysis and has put together a risk and resilience management plan.

RT&D Mandate

The mandate of the Eskom Research, Testing and Development (RT&D) business unit is to provide energy research, development, and evaluation of technologies and products, specialised testing, analytical, consulting and training services for the benefit of Eskom and South Africa.

RT&D Departments

RT&D consist of the following departments: Technology Strategy & Research Management (TS&RM), Generation (Gx) Delivery, Transmission/ Distribution Delivery (Tx/Gx) Delivery, Specialised Testing and Sustainable Energy Research (STSER) and Business Enablement (BE).

Technology Strategy & Research Management (TS&RM)

TS&RM is tasked with setting the technical research strategy and implementing the research programme through RT&D centres of expertise (CoEs). The department is the custodian of the technical research process responsible for assessing cost, quality, added value, return on investment (ROI), goal alignment and implementation of the research programme. The Centre of Excellences (CoEs) within TS&RM include:

- Research Management
- Project Office
- Intellectual Property
- Technology Strategy and Planning
- Gas & Renewables
- Data Science, System Dynamics Simulations and Digitalisation

CONTROLLED DISCLOSURE

Generation (Gx) Delivery

Gx Delivery is responsible for providing engineering solutions and support with the aim of ensuring the integrity of Eskom plants across the value chain. This is achieved through providing technical solutions to operational plant engineering challenges while simultaneously developing next horizon technologies to support, amongst other things, Eskom key strategic objectives to keep the lights on. The department is made up of the following Centre of Excellences.

- Real Time Asset Management
- Fuels Combustion
- Emission Reduction Technologies

Transmission/ Distribution (Tx/ Dx) Delivery

Tx/Dx Delivery is responsible for conducting research, and for providing strategic technical consulting to various Eskom line divisions including:

- Product evaluation & performance testing, end user technology development and plant & process optimisation
- Grid planning and operations
- Insulator performance testing (through distribution solutions)
- Control and Instrumentation (through smart grid solutions)

There are five (5) CoEs within (Tx/Dx) Delivery namely:

- Demand Management
- Distribution Solutions
- Transmission Solutions
- Smart Grids
- Grid Planning & Operations.

Specialised Testing and Sustainable Energy Research (STSER)

Sustainability (SUS) provides research and consulting of sustainable development related solutions, supporting Eskom future business and sustainable operations. In particular, the department aims to provide advanced research and consulting analysis to support technical & compliance performance of Eskom operations with reference to chemical sciences, air quality, climate change, environmental impacts, water and waste, renewable energy and social impacts. The department has four CoEs namely:

- Applied Chemistry & Microbiology
- Renewable Technologies
- Petroleum & Flow Science
- Air Quality, Climate Change & Ecosystem Management.

CONTROLLED DISCLOSURE

Business Enablement (BE)

Business Enablement provides support through monitoring of performance improvement in line with the approved management system requirements. BE in pursuance of its objectives enables the four business units, and the GM office through assurance and reporting, to fulfil their mandate on the adopted key performance areas. The department has three (3) CoEs namely:

- Support Services
- Safety, Health, Environment, Risk and Quality
- Innovation Circuit.

3.2 Understanding the Needs and Expectations of Interested Parties

Interested parties, their needs and expectations are defined and documented in the business plan; this information will be reviewed annually or when required during operational plan review. Customer input into the research process is done through multiple fora, inter alia, executive input, strategic direction review and research steering committees. See section (Key Stakeholders) on the RT&D operational plan, details of key stakeholders with impacts / influence on the business.

3.3 Scope of the Quality Management System

RT&D 9001:2015 certification scope covers the products and services provided by the business unit in line with its mandate as outlined below:

- Applied research, select, and develop next horizon technologies to support Eskom strategic objectives.
- Provide specialised technical testing consulting and inspection services.
- Demonstrating and piloting technologies through capital projects.
- Specialised technical skills transfer on new technologies.

Quality Management System and its Processes

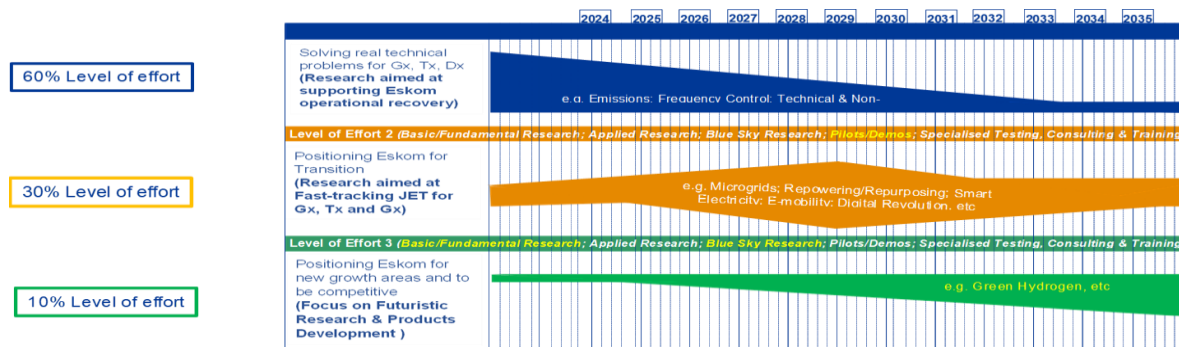
- Various processes are documented in the PLCM, PCM and procedures and work instructions. Inputs required and outputs expected, monitoring and measurement activities, resources needed are incorporated in the PLCM, PCM, procedures and work instructions. PLCM, PCM, procedures and work instructions and supporting documents such as forms and templates are available on the research website (SharePoint).
- Roles are defined in profiles. Risk and opportunities are determined following documented processes (SWOT analysis) in the operational plan.
- Sequence and interaction of processes follows RT&D process model.

Process Model

CONTROLLED DISCLOSURE

RT&D Strategy has adopted a 60:30:10 principle to support the line divisions. In this strategy 60% represents RT&D efforts to support line divisions with the operational recovery initiatives. 30% is representative of RT&D's efforts to assist with preparing for a liberalised market with a particular focus on the Just Energy Transition. 10% is illustrative of RT&D's efforts to assist Eskom to remain competitive in the long term by developing new capabilities to compete in new markets through innovation and agility.

Responding to business operational requirements, Eskom RT&D has therefore, developed a corresponding roadmap to 2035 is detailed in figure 3 below:



4. Leadership (Clause 5)

4.1. Leadership and Commitment/ Management Commitment

4.1.1 (General)

Top management demonstrates its commitment to the implementation and management of quality management by:

i. Taking accountability for effectiveness of the quality management system, through:

- Development of an operational plan to guide and lead the business unit (providing strategic direction),
- Appointment of SHERQ Manager to monitor compliance and conformance to QMS and other requirements.

ii. Establishing quality (business) objectives which are compatible with strategic direction and context of the organisation. These are outlined on the RT&D operational plan (refer to operational objectives). From these, the KPIs have been developed and are tracked through the RT&D balanced scorecard.

iii. Communicating the importance of meeting customer requirements as well as, statutory and regulatory requirements.

iv. Documented processes and procedures.

v. Conducting regular management meetings (Management Review, Mancom, OPS meeting, SHEQ departmental meetings and Departmental meetings).

4.1.2 Customer Focus

CONTROLLED DISCLOSURE

Top Management demonstrate leadership and commitment to customer focus by identifying current and future customer needs to meet requirements. Management ensures that customer requirements are understood and met.

Customer interface takes place by business partnering initiatives such as research management consults to Line Divisional Executives and Departmental Managers of RT&D, Investment Committee and Research Technical Committees.

To ensure consistent delivery and accountability, RT&D also has Service Level Agreements (SLAs) with their customers. Furthermore, customer satisfaction is reviewed using customer feedback forms.

4.2 Policy

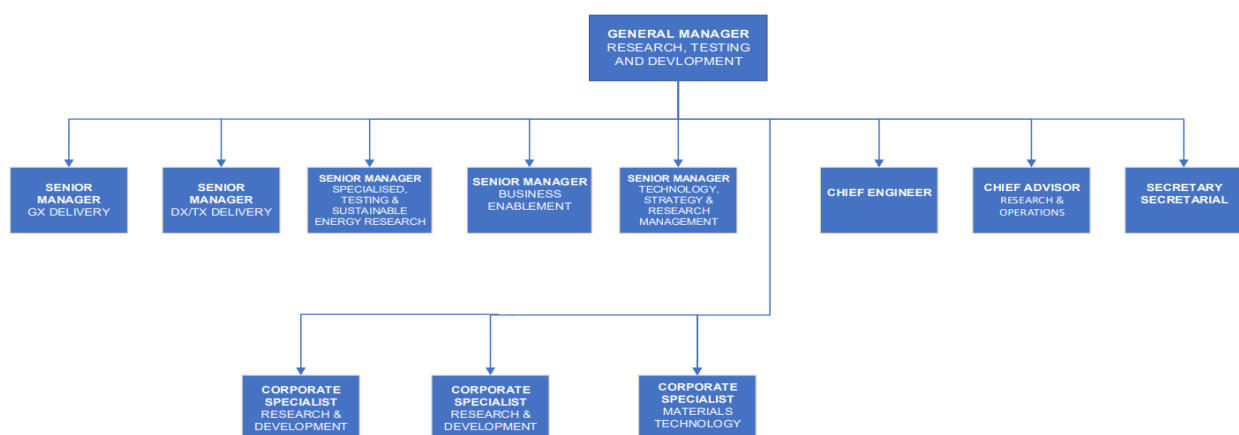
Top Management has adopted ESKOM SHEQ Policy; furthermore RT&D has developed the Statement of commitment to Quality. It will ensure communication of the Policy and Statement of commitment. The policy provides the framework for safety, health, environment and quality management in Eskom to ensure consistency across the business. SHEQ Policy and RT&D Statement of Commitment to Quality shall be made available to relevant interested parties, as appropriate.

4.3 Organisational Roles, Responsibilities and Authorities

Top Management ensures that the responsibilities and authorities for relevant roles are assigned, communicated and understood within the organisation by establishing the following:

- i. Organograms per department
- ii. Delegation of Authority (DOA)
- iii. Legal appointments
- iv. Performance and development review.

Organisation/ Business Unit Structure



CONTROLLED DISCLOSURE

5. Planning (Clause 6)

5.1 Actions to Address Risks and Opportunities

- i. Business risks are identified by following the Integrated Risk Management (IRM) process following Integrated Risk Management framework and standards (32-391). The outcomes of the assessment are stored on CURA System.
- ii. Operational risks are identified following our core processes RT&D Research Management Procedure (240- RT&D-127)), Research PCM (240-83890250) and Pilots & Demo PLCM (240-76479198) and RT&D Operational Research Work Instruction (Consulting) (240-123132697).

5.2 Quality Objectives and Planning to Achieve Them

RT&D objectives are developed from Eskom corporate plan. The alignment of this information is reflected on the RT&D business plan. Departmental objectives are developed specific to each department. Furthermore, individual objectives are defined in performance contracts to support departmental objectives. Objectives are measured and reviewed against performance goals at RT&D Mancom and OPS meeting. The extent to which objectives have been met will be discussed in management review meetings. A balance scorecard is used to monitor and track objectives. The balance scorecard specifies what will be done, who will be responsible, and when it will be completed.

5.3 Planning for Changes

Any changes to the organisation structure or operations of RT&D, a planned method e.g. appropriate project plans shall be deployed to update the management system accordingly and provide assurance that the integrity of the management system is maintained.

6. Support (Clause 7)

6.1 Resources

RT&D will provide the necessary specialist and support resources in line with HR and Finance allocations. Where resources aren't available internally, procurement processes are followed to supplement through collaborations, partnerships and service provisions.

6.1.2 People

As indicated in the RT&D operational plan, the required positions are reflected in the organogram.

6.1.3 Infrastructure

Infrastructure includes but is not limited to buildings, offices, workstation and process equipment (telephones and computers). Eskom Real Estate and Information Technology management is responsible for ensuring suitability and maintenance.

6.1.4 Environment for the Operation of Processes

A suitable environment, necessary for the operation of our processes, will be provided following human resource processes (social and psychological), Eskom regulations e.g. Eskom lifesaving rules (social) and occupation hygiene surveys and ergonomics (physical).

CONTROLLED DISCLOSURE

RT&D provides an accessible medical centre on site to cater for fitness for duty measuring and monitoring.

6.1.5 Monitoring and Measuring Resources

Measuring and testing equipment are maintained in accordance with the manufacturing specification and following equipment management procedure (240-108370524)

Monitoring of research as well as pilot and demonstration projects is done through the governance of research steering committees and pilot and demonstration committee respectively held triennially.

6.1.6 Organisation Knowledge

Organisational knowledge specific to RT&D both from internal or external sources must be documented and uploaded on Open Text and SharePoint.

6.2 Competence

Necessary competency for each job function will be specified in the job profile. Training needs will be identified on individual development plans. Records of education, training, skills and experience are kept by Human Resource department.

6.3 Awareness

Quality objectives are discussed during management committee meetings, operational meetings, department meetings and management reviews.

Benefits of improved performance and implications of not conforming to the management system are discussed during operational meetings.

Persons doing work for RT&D are to be made aware of the SHEQ policy during induction, awareness sessions and copies are displayed within the strategic areas within the building.

6.4 Communication

Eskom communication protocol is to be applied and observed for both internal and external communication.

6.4.1 External Communication

The RT&D GM will be responsible for external communication.

6.4.2 Internal Communication

Communication is done as per RT&D communication work instruction (240-125809639)

RT&D uses different modes of communication covering both electronic and manual communication methods as approved and standardised by Eskom.

6.5 Documented Information

RT&D documents are controlled according to Eskom documents and records management procedure (32-6)

CONTROLLED DISCLOSURE

6.5.1 Creating and Updating

Creating and updating is done as per Eskom documents and records management procedure (32-6)

RT&D create and maintain information in a manner suitable and for management systems i.e. Documents and records management procedure (32-6). RT&D / Eskom document master register (240-72644416), Eskom records retention matrix (240-104638872) and Eskom records of external origin (240-43898846).

7. Operation (Clause 8)

7.1 Operational Planning and Control

RT&D plans, implements and controls the processes needed to meet the requirements for the provision of products/services. Operational objectives will be fulfilled as per RT&D business plan and operational plan. RT&D will develop Quality objectives. These will be monitored, communicated and updated as appropriate. PLCMs, PCMs, Procedures and Work instructions have been developed and documented to support our operations.

7.2 Requirements for products and services

7.2.1 Customer Communication

Customer communication takes place at different platforms e.g. research steering committees, SLA review meetings, RT&D–Investment Committee (Initiation, progress feedback and conclusion) and working group meetings.

7.2.2 Determining the Requirements for Products and Services

Refer to 4.2 (Understanding the needs and expectations of interested parties) and clause 5.1.2 (Customer focus).

7.2.3 Review of the Requirements for Products and Services

Products and service requirements are reviewed during operational planning and during engagements with customers.

7.2.4 Changes to Requirements for Products and Services

Changes to requirements will be documented and relevant persons will be made aware of all the changes. Any modifications to submissions approved by the IC shall be re-submitted to the IC for approval.

7.3 Design and Development of Products and Services

All RT&D processes are currently established and implemented. Business Enablement is responsible for facilitating the review of documents that govern the development of products and services.

CONTROLLED DISCLOSURE

7.4 Control of Externally Provided Processes, Products and Services.

Provision of products and services from external providers are done as per Eskom procurement and supply management procedure (32-1034). All contracts are managed through supply chain & procurement. The commercial process established by Eskom is to be followed.

7.5 Production and Service Provision

Production and service provision is controlled and managed by RT&D processes (PLCM's, PCM, procedures and work instructions), SHEQ policy and other QMS systems including ISO 17025 established for governance of RT&D operations.

7.6 Release of Products and Services

The release of the final product will not commence without approval by the relevant authority in line with the respective RT&D process.

7.7 Control of Non-Conforming Outputs

Action management process is in place for control of non-conforming outputs and services as per Action management work instruction (240-108275652).

8. Performance evaluation (Clause 9)

8.1 Monitoring, Measurement, Analysis and Evaluation

8.1.1 General

In line with the objectives in the operational plan, RT&D monitors and measures its performance through the balanced scorecard, and performance of individuals is done through the HR performance management process.

8.1.2 Customer Satisfaction

RT&D customer satisfaction is conducted following customer feedback work instruction (240-108319144). The information is analysed and used to improve management system.

8.1.3 Analysis and Evaluation

RT&D collects and analyses data to demonstrate the suitability and effectiveness of the management system and to evaluate continual improvement. This includes data generated as a result of monitoring and measurement and from other relevant sources.

The following data is analysed (but not limited to) objectives and targets, customer satisfaction, non-conformities, safety dashboard and project performance.

8.2 Internal Audit

Internal audits are conducted by Business Enablement (SHEQ personnel) in accordance to Eskom Business management system audits standard (240-53413860).

CONTROLLED DISCLOSURE

8.3 Management Review

8.3.1 General

Management review meetings are to be conducted in accordance with the Management review procedure (240-94027491). Management review assesses the continuing QMS suitability, adequacy and effectiveness. The management review inputs and outputs follow the requirements stipulated by ISO 9001:2015 QMS requirements.

9. Improvement (Clause 10)

9.1 General

- Opportunities for improvement will be determined during: Risk management review
- Analysis of data as required (clause 9.1.3 – Analysis & Evaluation)
- Management review
- Management committee and operational meetings
- Customer feedback reviews.

9.2 Nonconformity and corrective action

Nonconforming product or service is dealt with in accordance with control of non-conforming product /services. Action management work instruction (240-108275652) which is based on NCR management procedure.

9.3 Continual Improvement

Business Enablement facilitates the monitoring of customer satisfaction and non-conformances within the QMS. Communication to the business will be done as and when the need arises. RT&D also aligns to Eskom's approach to continual improvement by monitoring and measuring quality objectives.

Furthermore, continual improvement is facilitated through sharing of lessons learnt, audit findings and employee engagements.

10. Acceptance

This document has been seen and accepted by:

Name	Designation
Prudence Madiba	General Manager: Research, Testing & Development
Cecil Ramonotsi	Senior Manager: Business Enablement
Mfundo Verby	Senior Manager: Generation Delivery
Ouma Bosaletsi	Senior Manager: Transmission/ Distribution Delivery
Bathandwa Cobo	Senior Manager: Specialised Testing and Sustainable Energy Research
Naushaad Haripersad	Middle Manager: Technology, Strategy and Planning

CONTROLLED DISCLOSURE

Name	Designation
Jabulani Bembe	Middle Manager System Dynamics and Digitalisation (Acting)
Motlalepula Dlamini	Middle Manager: Gas and Renewables

11. Revisions

Date	Rev.	Compiler	Remarks
February 2024	5	Thokozani. Mngomezulu	Manual due for revision and to update the process model
April 2018	4	Thokozani Mngomezulu	RT&D Quality Management System Manual revised to be compactible to the new ISO 9001:2015 standard
July 2015	3	Thalukanyo Nevhulaudzi	RT&D Manual revised to include safety, health, risk and environment ISO standard requirements
April 2013	2	Malebitsi Diale	RT&D Manual revised to include changes to the scope of certification by SABS
August 2012	1	Malebitsi Diale	RT&D Manual revised to clarify the scope of the certification, include process of design and development, purchasing, customer focus, equipment, measurement and analysis
August 2011	0	Malebitsi Diale	First review introduced to RT&D

12. Development Team

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

Thokozani Mngomezulu

Bongiwe Gwala

13. Acknowledgements

Naushaad Haripersad

Jack Mathebula

Elvis Mathebula

CONTROLLED DISCLOSURE