Eskom Rotek Industries	**Procedure**	**Eskom Rotek Industries SOC Ltd**

Title: **Environmental Aspects and Impacts, Occupational Health and Safety Hazard identification Risk Assessment Procedure**

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1. INTRODUCTION

Eskom Rotek Industries SOC Ltd (ERI) subscribes to International Organisation for Standardisation (ISO) for Environmental and Occupational Health and Safety management systems. These standards requires that the organisation must establish, implement and maintain a process(es) for hazard/aspect and impact identification that is ongoing and proactive in order to ensure that business is conducted with respect and care for the people and the environment. This document is developed in order to ensure compliance to the Environmental Management System (ISO 14001:2015) and Occupational Health and Safety Management System (ISO 45001:2018).

2. SUPPORTING CLAUSES

2.1 Scope

2.1.1 Purpose

The purpose of this document is to ensure that Occupational Health and Safety Risk assessments and environmental aspects and impacts assessments are conducted in a consistent manner throughout ERI

2.1.2 Applicability

This document shall apply throughout Eskom Rotek Industries SOC Ltd. Plant Safety Regulation activities are excluded from this procedure.

2.1.3 Effective Date

This document shall be effective once authorised.

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

a) ISO 9001 - Quality Management Systems.
b) ISO 14001 - Environmental Management System.
c) ISO 45001 - Occupational Health & Safety Management System
d) Occupational Health and Safety Act 85 of 1993 Regulations;
e) 240-104638872 - ERI Retention of Records;
f) 32-391 Integrated Risk Management Framework and Standard.

2.2.2 Informative

a) ISO 31000: 2018 Risk Management Guidelines

2.3 Definitions

Definition	Explanation
Aspect (Environmental)	An element of an activity or product, or service can interact with the environment
Assurance	Assurance is a process that provides confidence that objectives will be achieved with a tolerable level of residual risk
Communication	Continual or iterative process that an organisation conducts to provide, share, and/or obtain information
Consultation (from standard)	Seeking views before making a decision. It includes enagaging health and safety committees and workers' representatives where they exist
Consequence	Outcome of an event/exposure affecting objectives
Control	Measure that is modifying risk • controls include any process, policy, device, practice, or other actions which modify risk • controls may not always exert the intended or assumed modifying effect
Control Measures	The action taken to eliminate, reduce, isolate or control a risk
Control Owner	The person nominated as accountable for the assurance of the control to ensure that both the design and the operation of the control are effective. Control owners names are recorded in risk registers.
Environmental Impact Assessment	The process of identifying, analysing and evaluation of environmental aspects and impacts
Event	Occurrence of, or change in, a particular set of circumstances
Exposure	Extent to which an organisation is subjected to an event
Internal & External context	External and external environment in which the organisation seeks to achieve its objectives
Frequency	Measure of the likelihood of an event, expressed as a number of events or outcomes per defined unit of time
Level of risk	Magnitude of a risk expressed in terms of the combination of consequences and their likelihood
Likelihood	Chance of something happening
Hazard	Potential source of harm
Hazard Identification	Process of finding, recognising, describing hazards
Hazardous Chemical Substances	Any toxic, harmful, corrosive, and irritant or asphyxiate substance or a mixture of such substances

Definition	Explanation
Hazard Indenitifcation Risk and Assessment (HIRA)	Overall process of estimating the magnitude of risk and evaluating the adequacy of any existing controls, deciding whether or not the risk is tolerable and determining what further controls, if any, are needed to make the risk tolerable
Human Factors	Human and individual characteristics, which influence behaviour at work in a way which can affect health and safety
Impact (Environmental)	Change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects
Monitoring	Continuous checking, supervising, critically observing, or determining the status in order to identify change from the required or expected level of performance
Probability	Measure of the chance of occurrence expressed as a number between 0% and 100%
Residual risk	Risk remaining after risk treatment
Responsible Manager	The person shall be regarded as the employer with duties listed as per Section 8 General Duties of Employers to their Employees and Section 9 General Duties of Employers and Self-Employed Persons to Persons other than Employees of the OHS Act 85 of 1993.
Review	Activity undertaken to determine the suitability, adequacy, and effectiveness of the subject matter to achieve established objectives
Risk	A chance that injury, ill health, or damage could occur as a result of an uncontrolled hazard • Effect of uncertainty on objectives • A risk with a negative consequence can be the result of human interaction with a hazard ○ ***Note 1:*** *an effect is a deviation from the expected – positive and/or negative* ○ ***Note 2****: objectives can have different aspects such as financial, health and safety, and environmental goals and can apply at different levels such as strategic, organisation-wide, project, and product and process levels* ○ ***Note 3****: risk is often characterised by reference to potential events, a consequence or a combination of these, and how they can affect the achievement of objectives* ○ ***Note 4****: risk is often expressed in terms of a combination of the consequences of an event or a change in circumstances and the associated likelihood of an occurrence of the risk*
Risk acceptance	Informed decision to take a particular risk
Risk analysis	Process to comprehend the nature of risk and to determine the level of risk

Definition	Explanation
Risk assessment	Overall process of hazard and identification, risk analysis, and risk evaluation
Risk evaluation	Process of comparing the results of the risk analysis to risk criteria to determine whether the level of risk is acceptable or tolerable
Risk priority	Combination of the likelihood and consequence (severity) of a specified hazardous event occurring
Risk management	Coordinated activities to direct and control an organisation with regard to risk
Risk management framework	Set of components that provide the foundations and organisational arrangements for designing, implementing, monitoring, reviewing, and continuously improving the risk management processes throughout the organisation
Risk matrix	Tool for ranking and displaying risks by defining ranges for the consequences and likelihood
Risk owner	Person with the accountability and authority for managing the risk and any associated risk treatment With regard to Occupational Health and Safety, and in line with the OHS Act, designated 16.1 and 16.2 appointees have this accountability This includes the Responsible Manager as defined in 240-62582234 and 240-123319868 - Appointment letter for Responsible Manager- Environmental Management Systems
Risk profile	Description of a set of risks
Risk Register	Record of information about identified risks
Risk reporting	Form of communication intended for particular internal or external stakeholders to provide information about the current state of risk and its management
Risk sharing	Form of risk treatment involving the agreed distribution of risk with other parties
Risk tolerance	Organisation's readiness to bear the risk after risk treatment in order to achieve its objectives.
Risk treatment	Process of developing, selecting, and implementing measures to modify risk
SHEQ Objectives	Overall SHEQ goals, in terms of SHEQ performance, consistent with the SHEQ policy, that an organisation sets itself to achieve
Significant aspect / hazard	An aspect / hazard with a Residual Risk Rating of I or II
Tolerable risk	Risk that has been reduced to a level that can be tolerated by the organisation having regard to its legal obligations and its own SHEQ policy
Workplace	Any location or situation in which a person(s) works for or on behalf of the organisation

2.4 Abbreviations

Abbreviation	Explanation
HIRA	Hazard Identification Risk Assessment
ERI	Eskom Rotek Industries SOC Ltd
LTI	Lost Time Injury
PG	Product Group
SS	Area under Support Services structure
RP	Risk Priority
SHEQ	Safety,Health, Envornmental and Quality
SHE	Safety,Health and Envornmental
ISO	International Organization for Standardization
IRM	Integrated Risk Management
OHS	Occupational Health and Safety
PSR	Plant Safety Regulations
CBRA	Contractor Baseline Risk Assessment
CRA	Client Risk Assessment
OH HIRA	Occupational Health Hazard Identification Risk Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
BBSO	Behaviour Based Safety Observation

2.5 Roles and Responsibilities

2.5.1 Product Group / Support Services General Manager:

a) Top Management shall ensure that the responsibilities and authorities for relevant roles are assigned and communicated within the organisation.

b) Ensure that the Responsible Managers and Supervisors develop a baseline HIRA and Environmental Aspect and Impact Register for operations within their area of control.

c) Ensure that all management plans arising from the baseline HIRA and Environmental Aspect and Impact Register are implemented by the delegated person as per the “action by date(s)”.

d) Ensure that the baseline HIRA and Environmental Aspect and Impact Register is updated by the Responsible Manager and/or Supervisor as and when required.

2.5.2 Responsible Managers

a) To develop baseline HIRA and Environmental Aspect and Impact Register for his / her area of control.

b) To identify the baseline HIRA and Environmental Aspect and Impact Register team consisting of the following members:

i) Supervisors/Team Leaders (anyone whose job involve supervision of employees).

ii) Technical employees.

iii) SHE Officer(s).

iv) Environmental Officers / Advisors

v) Worker Representatives.

c) To Appoint a competent person to perform Risk Assessments in terms of the Construction Regulations.

d) To Consult with Environmental Advisor, regarding activities that may require Environmental Impact assessment in terms of the Environmental Impact Assessment Regulations.

e) Assign a facilitator and scribe for baseline HIRA and Environmental Impact Assessment teams.

f) To review and update the baseline and issue based HIRA and Environmental Aspect and Impact Register when there are changes in operations, legislation, a non-conformance is identified (audit finding and/or incident) and when the document is due for revision.

g) To ensure that the baseline and issue based HIRA and Environmental Aspect and Impact Register is communicated to all relevant employees.

h) To ensure that employees are adequately trained on how to conduct a risk assessment.

i) To ensure that continuous Environmental Impact Assessment and OHS Risk Assesment is conducted.

2.5.3 HIRA and Environmental Impact Assessment teams:

Conduct and compile baseline and issue based HIRA and Environmental Impact Assessment for a specific site.

2.5.4 Supervisors/Team Leaders

a) Ensure that the baseline and Issue based HIRA and Environmental Aspect and Impact Register is communicated to employees under his/her supervision.

b) Ensure that a job specific SHE Risk Assesment is conducted for every activity under his/her supervision e.g. no job is performed without a job specific risk assessment.

c) Ensure that all job specific SHE Risk Assessment conducted for activities under his/her supervision are reviewed for adequacy and approved before a task is executed.

d) Ensure that all new SHE Risks identified are communicated to the relevant stakeholders in order for the baseline HIRA to be updated.

e) Ensure that a continuous Environmental Impact- and OHS Risk Assesment is conducted.

2.5.5 Product Group/Support Services SHEQ Department

a) Provide HIRA and Environmental Impact Assessment guidance to the responsible manager and other stakeholders e.g. HIRA teams.

b) Participate in baseline HIRA and Environmental Aspect and Impact Register reviews.

c) Ensure that proper records are kept for audit purposes and management reviews.

d) Assist the Responsible Manager/s and Supervisor/s to develop the OHS Risk Register and the Environmental Aspect and Impact Register.

2.5.6 Employees

a) Identify any hazards and aspect in the workplace that might affect the Health and Safety of him/herself or his/her fellow employee and the environment.

b) Participate in job specific Risk Assesment before starting any activity.

c) Ensure that environmental aspects are considered when conducting the job specific and continuous OHS Risk Assesment.

2.6 Process for Monitoring

Compliance with the requirements of this document shall be audited as per the audit process.

2.7 Related/Supporting Documents

Parties using this document shall apply the most recent edition of the documents listed below:

2.7.1 Form 240-94026665 OHS Baseline Hazard Identification Risk Assessment.

2.7.2 Form 240-161309269: Issue Based Risk Assessment.

2.7.3 Form 240-156168761 Travelling Baseline Risk Assessment.

2.7.4 Form 240-156169447 Trip Risk Assessment.

2.7.5 Form 240-115779893: Job Specific Risk Assessment.

2.7.6 Form 240-128035498: Environmental Aspect and Impact Register.

3. RISK ASSESSMENT PROCESS

3.1 The risk assessment process shall follow the framework set out in the Eskom Integrated Risk Management Framework and Standard (32-391). The process for Risk Management is based on the ISO 31001 Risk Management standard.

3.2 Section 8 of the Occupational Health and Safety Act require an employer to provide a work environment that is free from Health and Safety Risks.

3.3 The National Environmental Management Act promotes the application of appropriate environmental management tools to ensure the integrated environmental management of activities.

3.4 These requirements lead to the development of a process for identification, analysis, evaluation and control of Environmental and Occupational Health and Safety Risks.

3.5 The Occupational Health and Safety risk assessment shall focus on hazards that have impact on human health and safety.

3.6 The Environmental Aspect and Impact Assessment shall focus on environmental aspect and impacts affecting the natural environment.

3.7 Hazards that have impact on property will be managed through the business risk assessment processes.

3.8 Occupational Health and Safety Risk Assessment

Types of occupational Health and Safety Risk Assessment.

3.8.1 Baseline Risk Assessment (240-94026665)

a) Baseline risk assessment refers to the OHS hazards and risks that are identified and assessed before the inception of a new project and commencement of operations.

d) The baseline risk assessment must be performed to obtain a benchmark of the types and size of potential hazards, which could have a significant impact on the whole site and/or organisation.

e) The baseline risk assessment shall include both routine and non-routine tasks

f) The baseline risk assessment shall be reviewed when there are changes in operations, law, a non-conformance is identified (audit finding and/or incident) and when the document is due for revision.

g) The output of baseline risk assessments is a set of OHS risk profiles per operation and/or process and/or activity, which is used to prioritise action programmes.

h) The OHS Baseline Risk Assessments Form 240-94026665 shall be used to perform baseline risk assessments within ERI.

i) Form 240-156168761 shall be used to perform baseline risk assessment for travelling.

j) Types of Baseline Risk Assessment

i) Baseline Risk Assessment for routine tasks

- Baseline risk assessments need to be developed for routine activities (including travel) that the business performs on a daily basis. These will assist the business in developing treatment measures, such as standard operating procedures or work instructions to reduce the hazards and risk attached to these activities.
- Occupational exposures with potential health effects must be identified, assessed, documented, controlled, and communicated.
- The hazards and control measures from this baseline risk assessment shall be communicated to all affected employees, so as to inform them of hazards attached to the work they are to perform.
- The hazards identified from this baseline shall be incorporated in employee person-job specifications, so that they can be conducted along with occupational medical assessments.

ii) Contractor Baseline Risk Assessment (CBRA)

- The contractor shall, based on the client risk assessment, develop a baseline risk assessment for all planned activities, which shall form part of the OHS plan submitted to the client.
- The CBRA will be an essential consideration during the tender evaluation/adjudication/negotiation and/or clarification processes before the contract is awarded.

iii) Client Risk Assessment (CRA)

- The OHS Act, Construction Regulations 5.1(a), (b), (c), (d), (e), (f), (g), and (h) require the following from the client:
  - To prepare a baseline risk assessment and site-specific health and safety specifications based on the baseline risk assessment for consideration by the designer during the project design phase.
  - To provide the principal contractor or his or her agent with any information that might affect their health and safety while performing work on behalf of the client.
  - The baseline risk assessment and health and safety specifications should be submitted as part of the tender documents and during negotiations, so that the potential contractor can make provision for the cost of health and safety measures during construction.

iv) Travel Baseline Risk Assessment

- A travel baseline risk assessment must be conducted for all areas where travel is one of the activities performed.

3.8.2 Issue Based Risk Assessment

a) The issue based risk assessment must be conducted before every activity or task and it shall be informed by the baseline risk assessment.

b) The issue based risk assessment is essential for the development/review of safe work procedures, method statement, emergency plans, etc. as it addresses work specific hazards and risks.

c) On construction projects, an issue based risk assessment shall be conducted and submitted to the client.

d) The Issue Baseline Risk Assessments Form 240-161309269 shall be used to perform issue based risk assessments within ERI.

3.8.3 Job specific Risk Assessment

a) Job specific risk assessment must be conducted before any task in order to address the circumstances surrounding the activities that may vary from day to day.

b) The Job specific risk assessment shall be completed as part of the job specific planning processes by the responsible and authorised person(s), together with all the people who will perform the task.

c) The Job Specific Risk Assessment Form 240-115779893 shall be used to perform Job specific risk assessments within ERI.

d) The Job Specific Risk Assessment Form 240-115779893 shall not be required if a task to be performed falls under the Plant Safety Regulations (PSR), unless, the supervisor of the task specifically request that the job specific risk assessment be conducted, for example, for outage related activities, were the PSR pre-task covered plant isolation related activities.

e) The Job specific risk assessment shall be conducted at the location where the activity takes place to ensure that all work conditions are evaluated adequately.

f) All employees who participate in the activity must be made aware of the contents of the risk assessment to ensure that they understand the hazards associated with the task.

3.8.4 Trip Specific Risk Assessments

a) A Trip Specific risk assessment must be conducted by all employees using company-owned and privately owned vehicles travelling on ERI business.

b) The Trip Specific Risk Assessment Form 240-156169447 shall be used to conduct an assessment of the route before embarking on a trip.

c) The trip specific risk assessment will not be required for travel within the boundaries of a site/power station.

3.8.5 Continuous Risk Assessment

a) Continuous risk assessment includes tool box talks, behavioural observation, task observations, supervisor inspections, etc, which are an integral part of the OHS risk management process

d) Occupational health and safety risk assessments should take place continuously, as an integral part of day-to-day health and safety management

e) This form of risk assessment is an important tool for ensuring the reduction of OHS hazards and risks in the workplace, as it addresses day-today changes in the activity

f) It is the duty of employees and supervisors to ensure that effective continuous risk assessment actually takes place in the workplace

g) The employer must ensure that all employees are competent to perform continuous risk assessments.

3.8.6 The Occupational Hygiene Hazard Identification and Risk Assessment (OH HIRA)

Occupational Hygiene risk assessments shall be conducted according to the relevant legislation and occupational hygiene policies and procedures.The outcome of the OH HIRA shall inform the implementation requirements for OH monitoring programme and medical surveillance programme, and to also recommend exposure control measures such as elimination/substitution, engineering, administrative, and PPE control measures.

3.9 Environmental Impact Assessment

Environmental Impact Assessment for listed activities (as per Environmental Impact Assessment Regulations)

3.9.1 Where Environmental Impact assessment is the responsibility of ERI, the Environmental Impact Assessments (EIA) process shall be conducted in accordance with the requirements of the Department of Environmental Affairs for listed activities

3.9.2 EIA's will identify environmental aspects (i.e. elements of our products, services and activities that can interact with the environment) that have the potential to cause harm and/or are beneficial to the environment.

3.9.3 The ultimate purpose of the environmental impact assessment process is to develop an integrated environmental management plan (EMP) that, amongst others, addresses:

a) Controls relating to planning/design, pre-construction/construction activities, Operation/execution of the activity and rehabilitation.

b) Responsibilities w.r.t. implementation of controls.

c) Monitoring of compliance.

d) Time periods for implementation.

e) Awareness programmes

3.9.4 On conclusion of the EIA process, an integrated environmental management plan is developed for the defined activities and submitted to the appropriate Minister for consideration. If satisfied with the application, the Minister may grant the necessary Environmental Authorisation although additional control measures may be identified by the Minister for inclusion in the EMP.

3.9.5 The EMP is not a static document and must be periodically reviewed based on, for example, incident trend-analysis or changes to scope of work.

3.9.6 The EMP is an essential component of any planning exercise as this will impact on the method statements and the financial provisions made for environmental management.

3.9.7 It is a requirement that the EIA be conducted by an independent body.

3.10 Baseline Environmental Impact Assessment

3.10.1 The Baseline Environmental Impact Assessment shall be documented on Form number 240-128035498.

3.10.2 A Baseline Environmental Impact Assessment needs to be developed for routine activities that the business performs on a daily basis. These will assist the business in developing treatment measures, such as standard operating procedures or work instructions to reduce the environmental aspects and impacts attached to these activities.

3.10.3 The significant environmental aspects and its associated mitigation shall be communicated to all affected employees.

3.10.4 This baseline environmental impact assessment shall be reviewed periodically based on, for example, changes in the scope of work, new technology, changes in legislation, etc.

3.11 Job Specific Environmental Impact Assessment

The job specific Environmental Impact Assessment is integrated with the Occupational Health and Safety Job Specific Risk Assessment form 240-115779893 shall be used to perform this risk assessment.

3.12 Continuous Environmental Impact Assessment

Continuous environmental impact assessments is integrated with the Occupational Health and Safety Continuous Risk Assessment, and is discussed under section 3.8.5.

3.13 Occupational Health and Safety, and Environmental Impact Assessment Process

Note: *where reference is made to Risk, it includes Safety, Health and Environment, unless otherwise specified.*

3.14 Identify the Health and Safety Hazards and Environmental Aspects

3.14.1 Establish the external context, giving consideration to the following:

a) the social and cultural, political, legal, regulatory, financial, technological, economic, natural and competitive environment, whether international, national, regional or local

b) key assumptions, drivers and trends that have an impact on the objectives of the organisation

c) relationships with stakeholders

d) Shareholder requirements.

3.14.2 Establish the internal context, giving consideration to the following:

a) governance, organisational structure, roles and accountabilities;

b) policies, objectives, and the strategies that are in place to achieve them
c) capabilities, understood in terms of resources and knowledge (e.g. capital, time, people, processes, systems and technologies)
d) the relationships with and perceptions and values of internal stakeholders;
e) the organisation's culture
f) information systems, information flows and decision making processes (both formal and informal)
g) standards, guidelines and models adopted by the organisation
h) form and extent of contractual relationships.

3.14.3 Determine the aspects and hazards, giving consideration to the following:

a) Life Cycle Stages for all activities products and services.
b) The life cycle stages include acquisition of raw materials, design, production, transportation/delivery, use, end-of-life treatment and final disposal Scope of work.
c) Past Occupational Health, Safety and Environmental incidents.
d) Social factors (including workload, work hours, victimisation, harassment and bullying).
e) Routine and non-routine activities.
f) People including those having access to the workplace and their activities e.g. workers, contractors, visitors and other persons, those in the vicinity of the workplace who can be affected by activities of the organisation (Interested and relevant parties).
g) Workers at a location not under the direct control of the organisation.
h) Human factors e.g. physical capability, psychological capability, cognitive capability, etc.
i) Situations (hazards) not controlled by the organisation and occurring in the vicinity of the workplace that can cause injury and ill-health to persons in the workplace.
j) Situations occurring in the vicinity of the workplace by work related activities under the control of the organisation.
k) Infrastructure, equipment, materials, substances and the physical conditions of the workplace
l) Actual /proposed changes in organisation, knowledge of and information about hazards, operations, processes, activities and the OH&S management system.
m) Other risks such as modifications to the SHE management system, including temporary changes, and their impacts on operations, processes, and activities.
n) Internal and external issues analysis output.
o) Any applicable legal obligations relating to Risk Assessment and implementation of necessary controls.
p) Compliance Obligations (Legal requirements and other requirements).
q) Product and service design, research, development, testing, production, assembly, construction, service delivery, maintenance.

r) The design of work areas, processes, installations, machinery/equipment, operating procedures and work organisation, including their adaptation to the needs and capabilities of the workers involved.
s) Design reports.
t) Planned or new developments.
u) New or modified activities, products and services.
v) Abnormal conditions.
w) Unforeseen situations within the organisation.
x) Past relevant incidents and emergencies.
y) Potential emergency situations.
z) Work Process flows.
aa) Specifications.
bb) Observations.
cc) Site inspections.
dd) System Deficiency Reports.
ee) Monitoring Records.
ff) Management Review.
gg) Audit reports.

3.15 Risk Identification

3.15.1 Identify risks attached to listed hazards, and list the implications and causes of such risks.

3.15.2 For environmental aspect assessment, identify impacts attached to listed aspects

3.15.3 Describe the risks in terms of an event, changes in a situation, circumstances, and how these lead to consequences, for example, when you identify a risk of fire, it should also describe the source of the fire instead of only identifying the fire (fire caused by flammable liquid).

3.15.4 Environmental impacts should describe the impact, e.g. incorrect storage of hazardous waste.

3.15.5 Impacts of environmental aspects shall be identified with regards to, but not limited to:

a) Use of resources.
b) Waste Management.
c) Air emissions.
d) Water Pollution.
e) Noise and vibration (nuisance).
f) Land contamination.
g) Indirect impacts caused by suppliers and contractors.
h) Impact on Fauna / Flora.
i) Visual impact.
j) Community impact.

k) Transportation impact.
l) Legal impact.

3.15.6 Record the identified risks in the relevant risk registers, with the following information:

a) A description of the risk, its possible cause, and consequence.
b) The risk owner (typically a responsible manager).
c) The risk category (safety or health, not applicable to Environmental).

3.16 Analyse the Risk

SHE Risk Analysis process shall be conducted as follows:

3.16.1 This is a step where risks are analysed in order to determine the effectiveness of existing control measures and implement further control measures to minimise the consequences of those risks for the health and safety of employees and the environment.

3.16.2 Both qualitative and quantitative techniques can be used to assess and analyse risks, for example, qualitative incident investigation reports or quantitative data/measurements.

3.16.3 The following steps are taken to analyse risks:

a) Determine existing controls to assess opportunities to enhance SHE performance
b) Consider the following (not limited to):
    i) Planned changes to the organisation, its policies, its processes, or its activities.
    ii) Opportunities to adapt work.
    iii) Work organisation.
    iv) Work environment to workers, opportunities to eliminate hazards (best practices and technological options).
    v) Financial capabilities of the organisation.
    vi) Operational and business requirements.
c) OH&S risks and OH&S opportunities can result in business risks and opportunities for the organisation.
d) Existing controls are recorded through walk-throughs, inspections, records, interviews and observations.
e) Controls will include systematic controls and elimination, engineering, administrative, or PPE controls.
f) Risk Control Effectiveness (RCE) will be estimated during risk analysis, taking into account both the adequacy and effectiveness of controls.
g) RCE will be a measure of the completeness, relevance, and efficacy of the existing controls when compared with that which is reasonably achievable.
h) RCE will be rated using the guide in the table below.

i) RCE will be estimated for each control taking into account both the adequacy and effectiveness of each control in light of the objectives of that particular control.

j) Elaborating on existing controls and measuring the effectiveness of these controls, will enable treatment tasks to be created in an endeavour to enhance controls for controls that were not fully effective.

RCE	Guide
Fully effective	Nothing more to be done except review and monitor the existing controls. Controls are well designed for the risk, are largely preventive and address the root causes. Management believes that they are effective and reliable at all times. Reactive controls only support preventive controls.
Mostly effective	Most controls are designed correctly and are in place and effective. Some more work to be done to improve operating effectiveness or management has doubts about operational effectiveness and reliability of the controls.
Mostly ineffective	While the design of controls may be largely correct in that they treat most of the root causes of the risk, they are not currently operationally very effective. There may be an over-reliance on reactive controls, or some of the controls do not seem correctly designed in that they do not treat root causes.
None	Virtually no credible control. Management has no confidence that any degree of control is being achieved.

k) Determine consequence rating:

When determining the consequences of the risk, take into account existing controls and their adequacy and effectiveness.

Consequence rating	**Description**	
	Health and Safety	**Environment**
6	Multiple fatalities	• Irreversible long term environmental harm. • Community outrage due to environmental harm in the area. • Potential large-scale class action (legal). • Public inquiry by Government agency • Environmental licence revoked Potential for significant legal sanctions against Eskom
5	Fatality or life-threatening health effects	• Prolonged environmental impact. • High-profile community concerns raised – requiring significant

Consequence rating	Description	
	Health and Safety	**Environment**
		rectification measures. • Government agency inquiry. • Environmental licences revoked and directives issued
4	Lost-time injury; Irreversible health effects/occupational disease with permanent consequence	• Measurable environmental harm – medium term recovery. • High potential for complaints from stakeholders and community. • Environmental directives issued by authorities
3	Medical treatment case; occupational disease with reversible/non-permanent effect	• Medium term recovery, immaterial effect on environment/community • Required to inform Government agency, (e.g.: noise, dust)
2	First-aid treatment case and temporary discomfort case	• Short term transient environmental or community impact- some clean-up costs
1	No injuries or health effects (near misses)	• Negligible impact on the environment, little to no ecological effect and no measurable impact on human health

l) Determine likelihood rating of risk

The likelihood considers the probability that the event/consequences expected will occur as well as the frequency of exposure to the hazard. This is determined by using the likelihood table below:

Score	Descriptor	Safety/Environment	Occupational Hygiene	
			Exposure	**Probability of exceeding OEL**
A	Highly unlikely	• More than a "100 year event" • Exceptionally unlikely even in the long-term future • < 5% probability	Rare (once a year)	No exposure (or exposure < 10% of OEL)
B	Unlikely	• occur in "years to decades" • ≥ 5% and < 20% probability. • may occur, but not anticipated,	Short periods of time, a few times per day/Intermittent (once in six months, three months, or a month)	Low exposure (< 50% of OEL)
C	Possible	• could occur within "months to year(s) • may occur shortly, but a distinct probability it will not • ≥ 20% and <70% probability	Continuous for between one and two hours (often/weekly)	Moderate exposure (chronic exposure > 50% of OEL or acute exposure ≥ OEL)
D	Likely	• could occur within "weeks to months" • balance of probability it will occur • ≥ 70% and < 90% probability	Continuous for between two and four hours (frequent/daily)	High exposure (chronic exposure > OEL, or exposure exceeding OELSTEL)
E	Unavoidable	• could occur within "days to weeks" • impact is imminent • ≥ 90% probability	Continuous for eight-hour shift	Very high exposure (chronic exposure > 2 x OEL or exposure exceeding OEL-C)

m) Determine risk rating:

Plot the consequence and the likelihood on the risk matrix below to determine the risk priority level.

CONSEQUENCE						
	6	I	I	I	I	I
	5	II	II	II	I	I
	4	III	III	II	I	I
	3	IV	III	II	II	I
	2	IV	IV	III	II	II
	1	IV	IV	III	III	III
		A	B	C	D	E
		LIKELIHOOD				

3.17 Evaluate risk

3.17.1 Rank the risks in different categories based on the level of risk that has been determined as well as the effectiveness of the current risk controls, that is, Very High, High, Medium, or Low, using the qualitative method below:

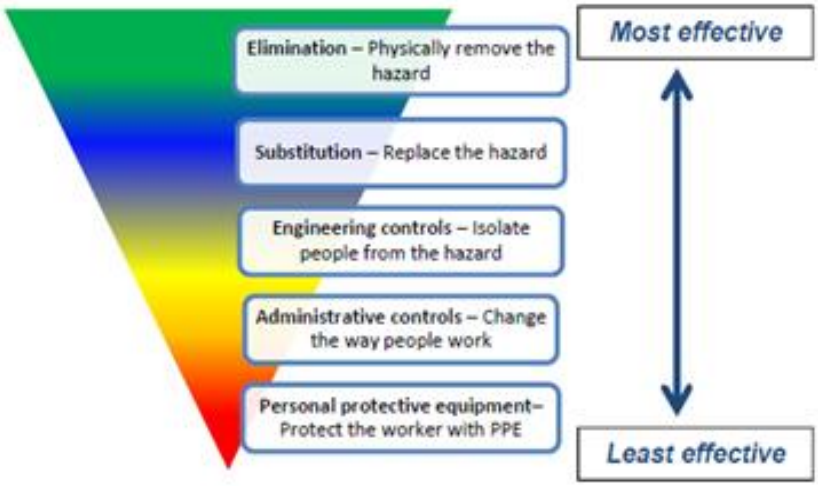
Risk Priority for Attention:	
Risk priority	**Action Required**
I (Very High)	At work execution stage the following action are required: • Cease work immediately • Conduct a SHE review (e.g. work instruction, method statement, safe work procedures, risk assessments, etc.) • Site/Department Manager to authorise the continuity of work. • Work to continue under the direct supervision of a Site/Department Manager or supervisor delegate. At Planning stage (baseline compilation): • The risk must be captured on the IRM system.
II (High)	Execution stage the following action are required: • Cease work immediately • Conduct a SHE review (e.g. work instruction, method statement, safe work procedures, risk assessments, etc.) • Site/Department Manager to authorise the continuity of work. • Work to continue under the direct supervision of a Site/Department Manager or supervisor delegate. At Planning stage (baseline compilation): • The risk must be captured on the IRM system.
III (Medium)	• Line Manager to authorise the continuity of work. • Supervisor shall conduct job observations monthly and where applicable revise work instruction/method statement.
IV (Low)	• Continue work under authority of the Line Manager/Supervisor.

3.17.2 Environmental Impact Analysis process shall be conducted as follows:

a) Environmental Aspects shall be evaluated for their significance according to the ERI Risk Matrix.
b) An aspect that rates I or II (residual risk) will be considered a significant aspect
c) Aspects shall be managed by means of operational control measures.
d) Operational control measures shall be monitored by means of SHE Monitoring Programmes or Action Plans.
e) Significant aspects may, in addition to operational controls, be managed by objectives and targets.
f) Business risks and opportunities that may result from the significant aspects must be identified.
g) Business risks for significant aspects shall be included in and managed through the IRM Risk Register.
h) Opportunities identified for significant aspects shall be discussed through the management review process.
i) An attendance register of the team that conducted the baseline HIRA and Environmental Impact Assessment shall be signed in acknowledgement of the content of the documents.
j) The Environmental Aspect and Impact Registers shall be verified by Risk & Resilience: Environmental Advisor and upon acceptance shall be loaded on SharePoint.
k) Once verified, the significant Aspects and Impacts shall be communicated to relevant functions and levels within the organisation.

3.18 Eliminate and Reduce Risk/Impact

3.18.1 When determining controls, consideration shall be given to reducing the risks/impacts according to the following Hierarchy of Risk Control:



3.18.2 Start here when planning the controls:

a) **Elimination** – modify a design to eliminate the hazard; e.g., introduce mechanical lifting devices to eliminate the manual handling hazard.

b) **Substitution** – substitute a less hazardous material or reduce the system energy (e.g., lower the force, amperage, pressure, temperature, etc.).

c) **Engineering controls** – install ventilation systems, machine guarding, interlocks, sound enclosures, etc.

d) **Signage, warnings, and/or administrative controls** – safety signs, hazardous area marking, photo-luminescent signs, markings for pedestrian walkways, warning sirens/lights, alarms, safety procedures, equipment inspections, access controls, safe systems of working, tagging, and work permits, etc.

e) **Personal protective equipment (PPE)** – safety glasses, hearing protection, face shields, safety harnesses and lanyards, respirators, and gloves.

Note: *Where control(s) identified for a risk are administrative and/or PPE controls* likelihood must be "unavoidable" or "Likely".*

Example of the Application of the Hierarchy of Control: *The hazard that we want to control is exposure to a toxic chemical used in cleaning a workshop area that is likely to cause ill health at a certain level of exposure.*

Step 1 – ***Elimination:*** *Can you stop using this chemical?*

Step 2- ***Substitution:*** *If the use of this chemical cannot be eliminated, then you would explore whether there is a substitute chemical that can be used that does not have the same potential to cause ill health*

Step 3 – ***Engineering control:*** *If the use of the chemical cannot be eliminated and there is no suitable less toxic substitute then one explores whether there is an appropriate engineering control – such installation of a ventilation system that reduces the exposure.*

Step 4 – ***Administrative Control:*** *If the engineering control cannot be used (or until it can be installed) then other "administrative controls" such as warning signs, PPE etc. would need to be put in place to reduce the impact of the hazard.*

f) More than one control measure maybe used to address the risk.

For example, controlling the risk of exposure to a toxic chemical may required the following controls:

i) Installation of a ventilation system.

ii) Establishing maintenance program for the ventilation system.

iii) Use of warning signs.

3.19 Risk and Opportunities Monitoring

3.19.1 On a continuous basis, review/re-analyse the identified risks, opportunities and control measures at intervals determined by the applicable legislative requirements or if there is a change in the risk.

3.19.2 During the review, incident statistics, Behaviour Based Safety Observations(BBSO), and inspection reports shall be reviewed to measure the effectiveness of controls.

3.19.3 Risks shall be managed by the IRM process, and that opportunities shall be managed through various platforms such as action plans, objectives and targets or other relevant processes.

3.20 Reporting of Risk

3.20.1 All risks identified during the analysis of the context of the organisation process shall be recorded in the Context of the Organisation.

3.20.2 Risks identified from significant aspects/hazard identified during the baseline risk assessment process shall be recorded in the Baseline and Environmental aspect and impact Register.

3.20.3 Further analysis will be conducted to determine the significant risks which will be managed through the IRM process.

3.21 Communication, Participation and Consultation

3.21.1 Communication, participation and consultation will be as per the Communication, participation and consultation Work Instruction (240-111519336).

3.21.2 Risk assessments results shall be discussed with all affected employees.

3.21.3 SHE Committees must be consulted on Occupational Hygiene Risk Assessment e.g. schedule, measurement methods, etc.

3.21.4 Results of Occupational Hygiene Risk Assessment must be communicated to the SHE Committee.

3.22 Training

Product Groups/Support Services shall have a training matrix that covers the following:

3.22.1 SHE Awareness conducted for all employees.

3.22.2 Training for SHE personnel, line management and supervisors in the principles of SHE risk management, line management responsibilities and the use of risk assessment tools.

3.22.3 Employees responsible to conduct and authorise HIRA on a construction site/s shall be appointed in terms of Construction Regulations as a Risk Assessor. Appointment shall be accompanied with a competency certificate.

3.22.4 An appointment letter is not required for those employees performing and authorising Hazard Identification Risk Assessment/s for non-construction site/s however such employee shall possess proof of training on HIRA.

3.23 Control Of Documented Information

All documented information relating to risk assessment shall be retained and maintained.

4. ACCEPTANCE

This document has been seen and accepted by:

Name	Designation
Zwelithini Tshabalala	Plant Compliance Manager
Rassie Small	SHEQ BP: Construction Services (Acting)
Sandhya Narainsingh	SHEQ BP: Logistics Services
Henry Rust	SHEQ BP: Bulk Material Services
Nalini Ramnarian	SHEQ BP: Transformer and Switchgear Services
Tumelo Taunyane	SHEQ BP: Turbo Gen Services
Thulani Cekwane	Occupational Hygiene Manager
Bhutana Mhlanga	Environmental Manager
Jacobus Dirksen	Health Services Manager
Tendani Ndwamise	Integrated Risk Management

5. REVISIONS

Date	Rev.	Compiler	Remarks
January 2013	0	S Narainsingh	Initial document
June 2017	1	J Leshiba	Align procedure with OHSAS 18001 with regards to hierarchy or risk control
March 2019	2	J Leshiba	Align Aspect and Impact identification process with ISO14001:2015. Clarification of process to follow.
22/01/2021	3	J Leshiba	Align procedure with ISO 45001:2018.

6. DEVELOPMENT TEAM

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

- Joyce Leshiba
- Anelia Bothma

7. ACKNOWLEDGEMENTS

Members of the ISO 45001 Migration projects.
ERI Training Department.