	OHSSHE SPECIFICATION: Definition of synchronous Zones and Optimal Placement of Phasor Measurement Units (PMUs) for Inertia Monitoring and Tracking	Document Identifier	559-715332013	Rev	1	
		Effective Date	July 2024			
		Review Date	July 2027			

Annotation: *The information contained in this document is the minimum requirement; it can be updated, amended or removed to cover the SHE requirements related to the scope or the risks of the project. (This annotation shall be removed when drafting and finalising a specification)*

Project Name: Definition synchronous Zones and Optimal Placement of Phasor Measurement Units (PMUs) for Inertia Monitoring and Tracking

Project Address: NTCSA: AM: Grid Modernisation

Eskom Megawatt Park

2 Maxwell Drive

Sunninghill

Sandton


1091

Scope of the project: Definition of synchronous Zones and Optimal Placement of Phasor Measurement Units (PMUs) for Inertia Monitoring and Tracking

NTCSA: Asset Management: Grid Modernisation: NTCSA: Asset Management: Business

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1. Introduction

NTCSA is part of Eskom Group that is mandated for the planning, operating and maintaining transmission assets throughout their economic life, provides access to an interconnected transmission system and influences customer demand and behaviour.

NTCSA develop optimal plans and engineering solutions for the expansion, maintenance and refurbishment of the power transmission network as well as providing a technology and asset management service to ensure that the integrated power system is reliable, adequate and secure.

The NTCSA execute projects related to the capital expansion, strengthening and refurbishment of transmission assets as well as construction management of transmission networks required for the integration of new generators and loads. Ensure a reliable and sustainable transmission network through operating, maintaining and commissioning of new assets.

NTCSA's responsibility and commitment is to ensure a safe working environment is in line with its Safety, Health, Environmental and Quality Policy, along with legislative obligations.

This OHS specification is NTCSA minimum requirements which are required to be met for the specific contract and for the duration of the contract period by contractors and where required, the delivery organisation.

The contractor is expected to develop an OHS plan which meets these requirements as well as all the relevant applicable legislation they conform to.

NTCSA / Eskom in no way assuming the contractor's legal responsibilities. The contractor is and remains accountable for the quality and the execution of his/her health and safety programme for his/her employees and appointed contractor employees.

This OHS specification reflects minimum requirements and should not be construed as all encompassing.

Note 1: All the requirements listed hereunder are in relation to the contract and do not supersede or replace any organizational OHS requirements.

Where requirements listed are already in place, then the organisational requirements must be taken in cognisance of and listed in the respective OHS plans. If there are any additional NTCSA/Eskom and or legislative requirements listed in the OHS specification, then these must be addressed.


2. Supporting Clauses

2.1 Scope

This OHS specification lists the legislative and NTCSA/Eskom's requirements and where applicable, any requirements pertaining to Local Authorities / Municipal by-laws / Environmental legislation that must be met by the contractor.

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2.1.1 Purpose

This document will provide a standardised approach to the compilation of OHS specifications throughout NTCSA/Eskom for contracts, standards and NEC 3 contracts.

2.1.2 Applicability

This OHS specification is applicable to any contracting organisation who intends tendering for the contract.

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] Basic Conditions of Employment Act No 75 of 1997.
- [2] Occupational Health and Safety Act and Regulations No 85 of 1993.
- [3] National Environmental Management Act 107 of 1998.
- [4] National Road Traffic Act 93 of 1996.
- [5] 32-37 Eskom Substance Abuse Procedure.
- [6] 32-136 Contractor Health and Safety Requirements
- [7] 240-62196227 Life- saving Rules
- [8] 32-95 Environmental, Occupational Health and Safety Incident Management Procedure
- [9] 32-727 SHEQ Policy
- [10] 32-418 Working at Heights Procedure
- [11] Plant Safety Regulations

2.2.2 Informative

- [12] Tobacco Products Control Act 83 of 1993 (Updated 2011.05.19)
- [13] SANS 1186 Symbolic Safety Signs
- [14] Constitution of the Republic of South Africa No 108 of 1996

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Definitions	Definition	Explanation
Appointed contractor		Means a contractor appointed by the principal contractor
Baseline risk assessment		(32-520) baseline operational risks refer to the health and safety risks associated with all standard processes and routine activities in the business
Controlled disclosure		controlled disclosure to external parties (either enforced by law, or discretionary).
Client		Eskom representative (Internal – Asset Owner), also referred to as the contract administrator/custodian or agent or project manager (as defined in the contract). He/she is the person responsible for ensuring that the works or services are executed in terms of the contract, as well as adherence to legislation pertaining to the contract.
Competent person		(OHS Act) means any person having the knowledge, training, experience, and qualifications, specific to the work or task being performed, provided that, where appropriate, qualifications and training are registered in terms of the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995)
Contractor – includes appointed contractor		means an employer as defined in section 1 of the Act who performs contract work and includes principal contractors
Consultant		means a person providing professional advice
Duty of care to the environment		(32-136) anybody who causes or has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing, or recurring. If such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, such person must minimise and rectify such pollution or degradation of the environment
Employee		(OHS Act) means, subject to the provisions of subsection (2), any person who is employed by or works for an employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person
Employer		(OHS Act) means, subject to the provisions of subsection (2), any person who employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerate him/her, but excludes a TES (ex labour broker) as defined in section 1(1) of the Labour Relations Act 1956 (Act No. 28 of 1956)
Eskom requirements		Eskom requirements flowing from directives, policies, standards, procedures, specifications, work instructions, guidelines, or manuals
Hazard		(OHS Act) means a source of, or exposure to, danger
Hazard identification		(OHS Act) means the identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed
Health and safety file		(OHS Act) means a file or other record, containing the information in writing required by the construction regulations.
Health and safety plan		(OHS Act) means a site, activity or project specific document plan in accordance with the client's health and safety specifications.
Health and safety specification		(OHS Act) means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work.

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Definitions	Definition	Explanation
Health and safety requirements		means comprehensive health and safety requirements for a contract, project, site, and scope of work. This specification is intended to ensure the health and safety of persons, both workers and the public, and the duty of care to the environment. The health and safety requirements must be specific to each contract, project, site, and scope of work
Organisation		may be defined as a group of individuals (large or small) that is cooperating under the direction of executive leadership in accomplishment of certain common objects
Principal contractor		(In the text of this document) Means an employer, as defined in section 1 of the OHS Act, who intends to tender for or has signed a contract with Eskom for services rendered.
Responsible Manager		Is a Manager of a department, section or operating/business unit who has been appointed as part of the Eskom delegation of authority process with the aim to assist the applicable 16(2) assigned person in executing his/her duties in terms of the Occupational Health and Safety Act
Risk assessment		(OHS Act) means a programme to determine any risk associated with any hazard at a construction site in order to identify the steps needed to be taken to remove, reduce, or control such hazard.
Service provider		any private person or legal entity that provides any service(s) to Eskom for compensation
The Act		(OHS Act) means the Occupational Health and Safety Act No. 85 of 1993, as amended, and the Regulations thereto
Visitor		Any person visiting a workplace with the knowledge of, or under the supervision of, an employer.

2.3 Abbreviations

Abbreviation	Description
BU	Business Unit
CE	Chief Executive
COID Act	Compensation for Occupational Injuries and Diseases Act
DMR	Driven Machinery Regulations
DoL	Department of Labour (Inspection and Enforcement services – Provincial office)
EP	Emergency Preparedness
EAP	Employee Assistance Program
ERfW	Environmental Regulations for Workplaces
GAR	General Administrative Regulations
GSR	General Safety Regulations
HCS	Hazardous Chemical Substances
LDV	Light Delivery Vehicle
MSDS	Material Safety Data Sheets

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Abbreviation	Description
NEMA	National Environmental Management Act
OHS Act	Occupational Health and Safety Act and Regulations, 85 of 1993
SABS	South African Bureau Standard
SANS	South African National Standard
NTCSA	National Transmission Company South Africa

2.4 Related/Supporting Documents

Eskom Transmission’s OHS Act section 37(2) agreement to be signed at procurement during the signing of the NEC contract, it is the responsibility of the project manager to ensure that the 37(2) agreement is signed, and a copy be kept in the contractor file at procurement.

3 Specification

3.1 Scope of work

The Contractor shall as per the issued scope of work, will undertake the following key tasks:

- Inception and data gathering.
- Grid synchronous zones definition.
- PMU placement study.
- Simulation and validation.
- Reporting and recommendations.
- Recommendations for future inertia mitigation.

Note: The contractor who will be awarded this contract will be known as the “appointed contractor” and any contractor who be working for the appointed contractor will be known as the “sub-contractor”.

3.2 Legal Compliance

3.2.1 Section 37(2) (Legal) Agreement


A section 37(2) agreement must be signed between NTCSA and the principal contractor at the time of awarding the contract. The principal contractor must ensure that a section 37(2) agreement is compiled between the principal contractor and all their appointed contractors for the contract.

The original copy of the section 37(2) agreement must be retained by the contractor and a copy retained by the responsible project manager.

A copy of all the agreements must form part of the respective contractor’s OHS file

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3.2.2 Hazardous work by children (Child Labour)

The constitution of the Republic of South Africa, in the “Bill of Rights” is clear on the rights of children, especially when it comes to:

- 17. *being protected from exploitative labour practices;*
- 18. *not to be required or permitted to perform work or provide services that*
 - i. are inappropriate for a person of that child’s age; or*
 - ii. place at risk the child’s well-being, education, physical or mental health or spiritual, moral or social development and the Basic Conditions of Employment Act, Chapter six Section 43 “Prohibition of employment of children”.*

Before resorting to the use of child labour, due consideration must be given to the rights of the child in terms of the constitution. Where work is being performed which is not prohibited in terms of the constitution, then such work must be conducted in terms of the OHS Act “Regulations on Hazardous Work by Children in South Africa” with emphasis on paragraph 2 Purpose and Interpretation. Eskom does not condone the use of child labour and therefore all effort must be exercised, and child labour should not be used.

3.2.3 OHS Act

The principal contractor and appointed contractors shall have an up-to-date copy of the OHS Act and regulations which will be available to all employees.

3.2.4 Legislative compliance

All contractors will comply with all the legislation pertaining to this contract being:


- The Constitution of the Republic of South Africa (particularly Section 24 of the Bill of Rights).
- Occupational Health and Safety Act 1993 (Act 85 of 1993) and its Regulations.
- Compensation for Occupational Injuries and Diseases Act.
- National Environmental Management Act 107 of 1998.
- National Road Traffic Act 93 of 1996.

3.3 Eskom Requirements

All contractors shall, before commencement of the project ensure that all their employees are familiar with the relevant Eskom Transmission’s OHS documentation that is applicable to contract services.

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3.3.1 Appointment of a contractor

The principal contractor will be appointed by Eskom Transmission on the awarding of the contract and will be responsible and accountable for all legislative and Eskom Transmission’s requirements for the duration of the contract.

3.3.2 Appointment of sub-contractors

The principal contractor may appoint contractors to assist in the contract. All appointments shall be done in writing and will form part of the OHS plan that is required to be submitted to Eskom Transmission. Adequate training and instruction must be given to the appointees, and the principal contractor must ensure that all the appointed contractors understand their roles and responsibilities.

Note: Copies of contractor appointments must be kept in the respective OHS file.

3.3.3 SHEQ policy

A OHS policy is a statement of intent and a commitment by the organisation’s CE and senior management in relation to the relevant OHS roles and responsibilities, the achievement of their strategic objectives, values of integrity, customer satisfaction, excellence, and innovation.

The principal contractor and all appointed contractors, if already not in place, will be required to compile an organisational OHS policy in line with their OHS responsibilities. The policy must be signed by the organisation’s **GCE /MD** or the appointed assistant to the **GCE/MD** OHS Act Section 16(2). The policy must be displayed in a prominent place within the workplace. A copy of the policy must be filed in the contractor OHS files and attached as an annexure in the SHE Plan.

3.3.4 COID


The principal contractor and all his/her appointed contractors shall be registered with an appropriate employment compensation commissioner and have available a valid letter of good standing (LoG) from such commissioner. The obligation lies with the contractors to ensure that the LoG remain valid throughout the contract period. A copy of the LoG must be filed in the contractor SHE files.

3.4 Substance Abuse

1. Alcohol and substance abuse poses a significant threat to any business, more so in industrial incidents and the driving of vehicles. Eskom is therefore, entitled to take reasonable steps to ensure that intoxicated persons are identified and prevented from entering Eskom Transmission sites.
2. General Safety Regulation 2A is clear on the legal stance regarding intoxication.
3. **The alcohol and drug permissible level is 0%.**
4. All contractors shall comply with Eskom’s procedure 32-37 (“Substance Abuse Procedure”), taking in to account that this is an Eskom Life-saving Rule number 4: BE SOBER”, this means anyone entering the Eskom Transmission sites will be subjected to ad hoc alcohol testing.
5. Contractors are encouraged to compile their own manual and to carry out regular alcohol testing of their own employees. The legislative alcohol level is deemed to be zero.

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6. Test records must be treated as “Confidential” and filed in the employees’ personal file.

3.5 Occupational Health, Hygiene and Rehabilitation

All contractors are required to develop an Occupational Health, Hygiene and Rehabilitation program. The program is intended to ensure that the risks to health are identified and controlled.

3.5.1 Medicals

Note: Eskom Transmission sites will only accept medical surveillances conducted by an Occupational Health Practitioner who holds a qualification in occupational health.


1. Principle contractors must ensure that their employees and their appointed contractor employees have a medical surveillance program whereby their employees undergo entry, periodic and exit medical fitness examinations.
2. For the appropriate medical examinations to be conducted, each employee must have a man job specification, which must indicate the description of work, list of hazards and potential occupational exposure limits, physical hazards and required physical attributes.
3. Medical fitness certificates shall be renewed annually for employees who are working on site. This shall be maintained until completion of the contract.
4. The Principal Contractor must ensure that his / her employees and appointed contractor employees have undergone pre-entry medical examination before starting work on the contract.
5. The principal contractor shall provide a documented process for managing those employees who are issued with a conditional certificate of fitness.

3.6 Appointments

For the duration of the contract, the principal contractor and all appointed contractors shall appoint competent employees who will meet the requirements of the OHS Act. Where appointments are made, contractors shall ensure that the appointees have been suitably trained and or informed of their responsibilities before getting them to accept such appointment. The relevant statutory appointments shall be made in accordance with the requirements of the OHS Act which includes the requirement of a competent person being appointed in the relevant roles. The statutory appointments should include but not limited to: Fire Fighter and Evacuation warden, First Aider, incident investigator, risk assessor, SHE representative, project supervisor or project manager and 16(2) appointments.

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3.7 Working at Height Procedure

3.7.1 General Requirements

Wherever reasonably practicable, preference is given to the performance of work at ground level as opposed to the elevated position.

Where work in an elevated position is necessary, preference is given to fall prevention measures such as, but not limited to, effective barricading and the use of work platforms. Persons may only work from a fall risk position if a site-specific fall protection plan is in place and correctly implemented and consists of the following:

1. All appointments for the fall protection plan developer and implementer are in place.
2. Baseline risk assessment, which is specific and incorporates the working at height risk assessment, as well as the site-specific risk assessment, has been completed for the work to be conducted.
3. Safe working procedure/task analysis and work instructions, approved by a competent person, are in place.
4. A fall rescue plan, along with necessary equipment and trained rescuers, is in place.
5. Appropriate training, as determined by the risk assessment, has been provided.
6. Appropriate height safety equipment and personal protective equipment have been issued to the individual.
7. There are equipment inspection procedures and up-to-date inspection records.
8. Individuals are medically fit to work at height, and records of this are kept.
9. A site-specific risk assessment is performed.

While work is in progress, adequate warning signs and/or barricades shall be used in all areas where there is a risk of persons being injured by materials or equipment falling from the work area. Barricades should be continuous and easily visible.


A drop zone shall be established with appropriate warning signs and barricading, warning personnel below of workers above and potential falling objects.

Every employer shall ensure that work at height is:

1. properly planned;
2. appropriately supervised; and
3. carried out in a manner that is, as far as is reasonably practicable, safe and that its planning includes the selection of work equipment.

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3.8 Risk Assessments

It is a legal requirement in terms of Section 8 (2)(d) of the OHS Act for an employer to carry out risk assessments to establish what hazards to the health and safety of persons are attached to any work which is performed, any article or substance which is, handled, stored, transported. A risk assessment is defined as an identification of the hazards present in an organisation and an estimate of the extent of the risks involved, considering whatever precautions are already being taken. It is essentially a three-stage process:

- identification of all hazards;
- evaluation of the risks;
- measures to control the risks.

Risk assessments are required to be maintained. This means that significant changes to a process or activity, or any new process or activity should be subjected to a risk assessment and that if new hazards come to light during the work process, then these should also be subjected to risk assessments. Risk assessments for long term processes should be periodically reviewed and updated. Method statements or written safe work procedures are an effective method as information and record of the way jobs / tasks must be performed. Prior to start of work, risk assessments on every job / task are ideal to allow managers and employees to assess any inherent risks that could have been overlooked during the initial risk assessment or any changes that might have occurred in a period of absence. In particular, if a job / task is extended over a day or halted due to inclement weather.

3.9 Safe Work Procedures and Practices /Safe Operating


There must be written safe work procedures for all activities, the safe work procedures must be aligned with the risk assessments.

3.10 Personal Protective Equipment Requirements

1. The Principal contractor must provide a detailed programme that includes the issuing, maintenance and replacement of PPE for all his employees and appointed contractors on site.
2. All contractors shall comply with the requirements of GSR 2 of the OHS Act.
3. The risk-based PPE matrix must be compiled detailing the types of PPE that is required to be issued to employees performing the respective tasks.
4. Where there are unusual instances where particular activities require additional type of PPE, then a risk assessment must be conducted where such PPE requirements will be identified, and the issuing be carried out.

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5. All contractors shall ensure that their visitors wear and use the correct PPE whilst on worksites.
6. Where PPE is required and visitors are not in possession of, then it is the individual contractor's responsibility to provide the PPE.
7. All PPE purchased and used by all contractor employees including visitors must comply with the relevant SANS standards.
8. Where deemed as a requirement, then high visibility vests shall be worn.

3.11 Incident Investigation

All incidents shall be investigated in terms of OHS Act General Administrative Regulations 8 and 9, using Eskom Procedure 32-95 as a reference, and where injuries as contemplated in sections 24 and 25 have been sustained, be reported to the Department of Labour.

Contractors shall use the standard General Administrative Regulation Annexure 1 "Recording of an Incident" form for all incident investigation reports. The objective of incident investigation should not only be a legal requirement, but should establish why and how the incident occurred and find out the real root cause of the incident and to decide on precautionary measures that are required to address the root cause to prevent any further recurrences of the same or similar incidents.

3.12 Emergency Management


The art of emergency preparedness and response is to minimise the effects of any emergency and to restore normal activities as soon as practical. Periodic emergency drills must be undertaken to test the effectiveness of the plan. This must be recorded and provided on request.

3.12.1 Non-Conformance and Compliance

1. Any non-compliance to any health and safety requirement in this SHE specification is subject to discipline in terms of the Eskom Procurement and Supply Management Procedure.
2. Principal contractors are required to implement a non-conformance procedure (if not already in place) for issuing to contractors for transgressions. The procedure can include "quality" related non-conformance issues. Similarly, appointed contractors must implement a non-conformance procedure.
3. The procedure for the issuing and closing off non-conformance reports shall be strictly adhered to.
4. Contractor project management must monitor the close out non-conformances issued, in not doing so, any recommendations made may not be implemented.
5. Where non-conformances are issued by NTCSA, then one of the close-out steps of the procedure will be for the offender to be called by the responsible project manager to explain the non-conformance issued and what plan is in place to prevent a recurrence of the non-conformance.

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6. Should the contractor fail to provide adequate PPE to their employees for the tasks being performed and/or to visitors; failure to enforce the wearing of such PPE will be viewed as a transgression of the legislative and Eskom requirements

4 Acceptance

Null.

5 Revisions

Date	Rev.	Compiler	Remarks
November 2025	01	RT Kekana	This provides the initial SHE specification requirements that must be met by the relevant contractors who have been awarded a contract for the work to be performed for Eskom

6 Development Team

Null

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