

The draft rules are established under section 29 (1) and Section 29 (2) of the Electricity Regulation Amendment Act, 2024 (Act No. 38 of 2024) ('the ERA' or 'the Act'). Energy Regulator is required to consult with the Minister in prescribing general Key Performance Indicators (KPIs) in respect of the technical operational issues pertaining to reticulation systems for municipalities.

An electronic copy of these Draft Rules is available on the NERSA website at www.nersa.org.za.

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ABBREVIATIONS

CAIDI	Customer Average Interruption Duration Index
CAIFI	Customer Average Interruption Frequency Index
ERAA	Electricity Regulations Amendment Act, 2024 (Act no.38 of 2024), as amended or re-enacted from time to time
IPP	Independent Power Producers
NERSA	National Energy Regulator of South Africa
NRS	National Rationalized Specification
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index

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1. INTRODUCTION

- 1.1 The National Energy Regulator of South Africa (NERSA) is a regulatory authority established as a juristic person in terms of section 3 of the National Energy Regulator Act, 2004 (Act No. 40 of 2004). NERSA's mandate is to regulate the electricity, piped-gas and petroleum pipeline industries in terms of the Electricity Regulation Act, 2006 (Act No. 4 of 2006), Gas Act, 2001 (Act No. 48 of 2001) and Petroleum Pipelines Act, 2003 (Act No. 60 of 2003).
- 1.2 Section 29(1) of the Electricity Regulations Act (ERA) as amended, mandates the Regulator, in consultation with the Minister, to prescribe general Key Performance Indicators (KPIs) addressing the technical operational issues pertaining to reticulation systems for municipalities. These KPIs are intended to ensure the efficient, safe, and equitable delivery of electricity services.
- 1.3 The provision of reliable and sustainable electricity supply is a fundamental enabler of economic development and public well-being. In South Africa, municipalities play a critical role in the distribution and reticulation of electricity to end-users. However, varying service quality and operational practices across municipalities have necessitated a regulatory framework to standardise performance expectations.
- 1.4 This document outlines the rules for KPI implementation, defines the roles of key stakeholders, and details technical performance measures—including System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), Customer Average Interruption Duration Index (CAIDI), Customer Average Interruption Frequency Index (CAIFI), Distribution losses and bulk payment account to upstream licensee (e.g., Eskom Distribution).
- 1.5 These indicators serve as national benchmarks for reliability and service quality.
- 1.6 The framework enables differentiation by municipality type and promotes transparency, accountability, and continuous improvement in municipal electricity perform.

2. LEGAL MANDATE

- 2.1 NERSA is a juristic person established in terms of section 3 of the National Energy Regulator Act, 2004 (Act No. 40 of 2004) ('the NERA'). The Energy Regulator (ER), in accordance with section 4 of the NERA, is mandated to regulate the electricity industry and perform the powers and functions set out in section 4 of the Electricity Regulation Act, 2006.
- 2.2 In executing its mandated functions, the ER is required to ensure that the objects set out in section 2 of the ERA are achieved. The decisions of the ER must comply with section 10 of the NERA, read with the provisions of section 4 and 5 of the Promotion of Administrative Justice Act, 2000 (Act No.3 of 2000) ('PAJA').
- 2.3 The Energy Regulator is empowered in terms of section 35 (1), (2) and (3) of the Act, to make guidelines and publish codes of conduct and practice, or make rules, pursuant to the proper implementation of the Act and its objectives.
- 2.4 The Regulator may after consultation with municipalities that reticulate electricity, make guidelines and publish codes of conduct and practice or make rules by notice in the Gazette.
- 2.5 Clause 35 (2)(c) of the Act, such guidelines and codes of conduct and practice without derogating from the general nature may relate to performance objectives and the setting, approving and meeting of performance improvement targets.
- 2.6 Clause 35 (3) of the Act, such rules without derogating from the general nature, may, relate to:
- (b) standards of quality of supply and service;
 - (c) the security, operation, use and maintenance of transmission and distribution power systems;
 - (e) technical and safety standards;
- 2.7 In terms of clause 29(1) of the Electricity Regulations Amendment Act, 2024 (Act No. 38 of 2023), the National Energy Regulator of South Africa (NERSA), after consultation with the Minister, hereby publishes the rules setting out general Key Performance Indicators (KPIs) pertaining to the technical operation of municipal electricity reticulation systems.
- 2.8 These rules are binding on all municipal licensees engaged in electricity reticulation within the Republic of South Africa

3. OBJECTIVES OF THE RULES

3.1 These rules establish the general Key Performance Indicators (KPIs) to be prescribed by the Regulator, in consultation with the Minister, pursuant to Section 29(1) of the Electricity Regulation Act (ERA) as amended.

3.2 The rules are intended to provide a binding framework that municipalities are obligated to adhere to in order to ensure technical and operational performance in electricity reticulation systems. The objectives of these rules are as follows:

- i. Establish an incentive mechanism for municipalities aimed at enhancing the operational efficiency and reliability of electricity network services, thereby improving service quality for customers.
- ii. Promote improved reliability, efficiency, safety, and quality of electricity supply across all municipalities.
- iii. Enable regulatory oversight through defined and enforceable performance metrics.
- iv. Encourage municipalities to adopt best practices in electricity distribution and asset management.
- v. Facilitate public accountability and build consumer trust through published performance outcomes.

4. PRESCRIBED TECHNICAL KPIS

4.1 The technical KPIs to be established under these rules are System Average Interruption Duration Index (SAIDI), Customer Average Interruption Duration Index (CAIDI), System Average Interruption Frequency Index (SAIFI), Customer Average Interruption Frequency Index (CAIFI) and the payment of bulk accounts to upstream licensee (e.g., Eskom Distribution). The proposed five (5) KPI's will each carry the same weight.

4.1.1 System Average Interruption Duration Index (SAIDI)

- a. SAIDI is a standard reliability metric used to quantify the average total duration of electricity interruptions experienced by each customer over a defined period, typically one year. It reflects the reliability of the electricity supply from the perspective of the customer and is widely adopted in global utility performance benchmarks.
- b. A lower SAIDI value indicates better system reliability, as it means that customers experience fewer and/or shorter interruptions. SAIDI is expressed in minutes per customer per year.
- c. Mathematically SAIDI can be expressed as:

$$SAIDI = \frac{\sum U_i \cdot N_i}{N_T}$$

Where:

- U_i = outage duration at location i (in minutes)
- N_i = number of customers affected at location i
- N_T = total number of customers served by the municipalities

d. Annual Target Thresholds for SAIDI per Municipality differentiation:

SAIDI (minutes/customer/year)	Rewards	Deadband zone	Penalties
Metropolitan Municipalities	120	$120 \geq \beta < 150$	150
District Municipalities	130	$130 \geq \beta < 160$	160
Local Municipalities	140	$140 \geq \beta < 170$	170

4.1.2 Customer Average Interruption Duration Index (CAIDI)

- The CAIDI of a network indicates the duration of a sustained interruption that only the customers connected on electricity distribution system affected would experience per annum. This excludes re-interruptions. It is commonly measured in customer minutes or customer hours of interruption.
- This index differs from SAIDI in that only the number of affected customer interruptions is used in the denominator and not the total number of customers served.
- Mathematically CAIDI can be expressed as:

$$CAIDI = \frac{\sum \text{customer interruption durations p.a}}{\text{Total number of customer interruption}}$$

d. Annual Target Thresholds for CAIDI per Municipality differentiation:

CAIDI (minutes/customer/year)	Rewards	Deadband zone	Penalties
Metropolitan Municipalities	120	$120 \geq \mu < 150$	150
District Municipalities	130	$130 \geq \mu < 160$	160
Local Municipalities	140	$140 \geq \mu < 170$	170

4.1.3 System Average Interruption Frequency Index (SAIFI)

- a. SAIFI quantifies the average number of power interruptions that a customer connected on electricity distribution system experiences over a specific period, typically one year. It provides a measure of the reliability of the electricity distribution system by indicating how often service is disrupted.
- b. SAIFI helps regulators and municipalities assess the consistency of supply and take corrective actions where interruptions are frequent. A lower SAIFI value indicates better system performance and fewer disruptions for consumers. SAIFI is expressed in interruptions per customer per year.
- c. Mathematically SAIFI can be expressed as:

$$SAIFI = \frac{\sum \lambda_i \cdot N_i}{N_T}$$

Where:

- λ_i = number of interruptions at location i
- N_i = number of customers affected at location i
- N_T = total number of customers served by the municipalities

- d. **SAIFI Target thresholds (annual):**

SAIFI (interruptions/customer/year)	Rewards	Deadband zone	Penalties
Metropolitan Municipalities	9	$9 \geq \alpha < 15$	15
District Municipalities	12	$12 \geq \alpha < 20$	20
Local Municipalities	14	$14 \geq \alpha < 24$	24

4.1.4 Customer Average Interruption Frequency Index (CAIFI)

- a. The CAIFI of a network indicates how often only the customers connected on electricity distribution system affected by an interruption experience a sustained interruption per annum. The customer is counted only once in this calculation, regardless of the number of times the experienced an interruption in the reporting period.
- b. This index differs from SAIFI in that only the number of customer interruptions is used in the denominator and not the total number of served customers.
- c. Mathematically CAIFI can be expressed as:

$$CAIFI = \frac{\sum \text{Number of customer interruptions p.a}}{\text{Total number of customers interrupted}}$$

d. Annual Target Thresholds for CAIFI per Municipality differentiation:

CAIFI(interruptions/customer/year)	Rewards	Deadband zone	Penalties
Metropolitan Municipalities	9	$9 \geq \lambda < 15$	15
District Municipalities	12	$12 \geq \lambda < 20$	20
Local Municipalities	14	$14 \geq \lambda < 24$	24

4.1.5 Payment of bulk accounts

- Section 5.2.6 of the license condition states that “The licensee shall pay the bulk supplier from whom it purchases its electricity”.
- Responsibility:** The municipality must ensure that all electricity purchased from its bulk supplier is paid for.
- Supplier Relationship:** The “bulk supplier” refers to the upstream entity (e.g., Eskom or another wholesale provider) that sells electricity in large quantities to the municipality.
- Accountability:** Failure to comply could result in penalties, and regulatory non-compliance actions.
- Operational Importance:** Timely payments ensure continuity of supply, maintain good standing with the supplier, and contribute to the financial stability of the electricity market.

Formula: $KPI = \frac{\text{Number of invoices paid on time}}{\text{Total number of invoices received}}$

Target: 100% on time payment (10% tolerance level to be included)

Frequency of Measurement: Yearly

4.1.6 Network losses

- The percentage of electricity lost is calculated as:

Formula: $\text{Distribution losses (\%)} = \frac{\text{Electricity Purchased} - \text{Electricity sold}}{\text{Electricity Purchased}}$

Where:

- **Energy Purchased** = Energy acquired from Eskom or other licensed suppliers.
- **Energy Sold** = Total metered and billed customer consumption.

b) The aim of this KPI is to:

- Minimise technical and non-technical losses.
- Improve municipal revenue collection.
- Enhance network efficiency.
- Reduce electricity theft and illegal connections.
- Improve the financial viability of municipal distributors

c) The recommended performance bands for the network losses are as follows:

Distribution losses (%)	Rewards	Deadband zone	Penalties
Metropolitan/District/Local Municipalities	<8	$8 \leq p < 15$	>15

4.2 Prescribed Rewards/Penalties

4.2.1 Before finalization of the municipal tariffs, the rewards will be capped at 1% of the approved percentage increase for the set municipality, and this percentage will be added to the approved tariff.

4.2.2 Before finalization of the municipal tariffs, the penalties will be capped at 1% of the approved percentage increase for the set municipality, and this percentage will be deducted from the approved tariff.

5. REPORTING FORMATS

5.1 All municipalities must submit quarterly and annual performance reports to the Regulator.

5.2 Data must be validated and signed by the municipal electricity head.

5.3 The Regulator may conduct independent audits and impose compliance enforcement mechanisms for continued non-compliance.

5.4 The reporting format should be aligned with Annexure A – ***NERSA reporting templates in the latest approved NRS 048-6.***

6. EXCLUSIONS

6.1 Interruptions that are directly caused by either upstream distributors, or Independent Power Producers (IPPs) connected directly to the network that have a direct or indirect effect on a Municipalities' ability to supply electricity

to the grid will not be counted against the licensee's overall performance towards the scheme.

6.2 The following exclusions will be allowed when reporting on SAIDI, SAIFI, CAIDI and CAIFI:

- i. Transmission-caused interruptions
- ii. Generation-caused interruptions
- iii. IPP-caused events
- iv. Major events (as defined in NRS 048-6)
- v. Customer-caused events.

7. APPLICABILITY

7.1 These rules are applicable to all distributors of electricity and shall:

7.1.1 come into full effect from the start of the new financial year (1 July 2027) of the municipality and from date of approval by the Energy Regulator till 1 July 2027 municipalities will be provided time to capacitated for the implementation; and

7.1.2 be revised from time to time and will be updated accordingly to accommodate lessons learnt.

8. NERSA PUBLICATION

8.1 NERSA shall publish an annual Electricity Distribution Performance Report presenting distributor performance in a transparent and accessible format.

8.2 The report shall:

- Present KPI results for each distributor.
- Identify year-on-year performance trends.
- Highlight top-performing distributors.
- Identify distributors requiring improvement.
- Provide sector-wide performance statistics.

8.3 The report shall be made publicly available to customers, municipalities, government institutions, and other stakeholders.