ICS 29.180

DMS ZZZ:2022

First edition

DRAFT PROPOSAL

Minimum Energy Performance Standards for Distribution Transformers

(In the 5 - 3150 kVA rated power range)

ICS 29.180 DMS ZZZ:2022

Minimum Energy Performance Standards for Distribution Transformer

Obtainable from the
Malawi Bureau of Standards
P O Box 946
BLANTYRE

Tel: +265 1 870 488
Fax: +265 1 870 756
E-mail: mbs@mbsmw.org
Website: www.mbsmw.org

Price based on 10 pages

Introduction

This Draft Proposal addresses the following for distribution power transformers in the 5 - 3150 kVA rated power range; primary voltage up to 36 kV at 50 Hz; and continuous duty operation:

- energy performance requirements;
- product information reporting and labelling requirements;
- demonstrating compliance with the requirements; and
- market surveillance and enforcement of the requirements.

This Draft Proposal does not cover requirements on mechanical construction, functional performance, safety, hazardous substances or warranty, since these requirements are not primarily related to energy efficiency and are already covered by relevant International Electrotechnical Commission (IEC) standards and their corresponding mirror national standards, or parallel regulations on these same products.

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FOREWORD

These Minimum Energy Performance Standards (MEPS) for distribution transformers are targeted to serve as a recommendation for policy implementation to the eight countries with Green Climate Fund (GCF) Readiness projects in the Southern African region.

This document proposes three levels of minimum efficiency standards which are suggested to be phased over several years. Transformers have long planning horizons and improving efficiency can require investment in new manufacturing equipment investment, so having a longer phase-in period will require local/regional suppliers time to make the necessary changes, while giving a schedule of expected performance improvement over time to utilities and suppliers alike.

Background information on each of the three tiers:

- **Tier 1**- aligned with SANS 780:2021: The existence of the **South African National Standard (SANS) 780** with maximum loss levels in the region is important to consider, as ESKOM uses this standard and thus the volume product in Southern Africa is going to be built to the SANS 780 specification. The efficiency tables in SANS 780 were updated in 2019, and the standard was slightly updated (without changing the efficiency tables) in 2021, thus the **latest version is SANS 780:2021**, however the levels existed since a few years already. This is therefore recommended to be adopted as Tier 1. The ambition of this level at 50% loading is **nearly identical to IEC TS 60076-20 Tier 1**, thus in adopting the local standard, countries would essentially be moving to IEC Tier 1 at the same time. In addition, as the SANS specification is the volume product in the region, the GCF countries will essentially be leveraging the South African market and benefiting from the lower prices created by harmonising with the most recent SANS 780.

- **Tier 2** – interim step: It was considered that a step from SANS 780/IEC Tier 1 to IEC Tier 2 might be too great and therefore an interim step called Tier 2 was created which is simply the average of the SANS 780 standard (Tier 1) and the IEC Tier 2 standard (Tier 3). This interim step helps **to save more energy**, and keeps the focus in the sector on investing in **reducing losses**.

- **Tier 3** – aligned with IEC: SANS 780:2021 only provides one set of efficiency levels, so there is no higher tier, however IEC TS 60076-20 does have a Tier 2, and it is recommended that this more ambitious level be set as Tier 3. This ensures that the countries eventually transition to the international high efficiency standard and companies are given adequate time to procure new equipment and train staff. Setting this level out in the future gives the planning horizon suppliers and customers need so they are prepared.

The proposed MEPS are based on the U4E Model Regulation Guidelines for distribution transformers: https://united4efficiency.org/resources/model-regulation-guidelines/. Reference was also made to IEC 60076-1 ed3.0 (2011-04) *Power transformers - Part 1: General*

Acknowledgement is hereby made for use of the information.

TECHNICAL COMMITTEE

The following organisations were represented on the Technical Committee, MBS/TC 4, *Electrical Installation and Distribution systems,* when this Draft Malawi Standard was being formulated:

NOTICE

This Malawi Standard shall be reviewed every 5 years or earlier, whenever necessary, in order to keep abreast of progress. Comments are welcome and shall be considered when the standard is being reviewed.

DRAFT PROPOSAL

Recommendations for Distribution Transformer Minimum Energy Performance Standards

1 SCOPE OF COVERED PRODUCTS

1.1 Scope

This Draft Proposal applies to all distribution power transformers that are manufactured in, or imported into the country, and are either sold, installed or put into service as standalone equipment or as a component of a system, and which meet the following criteria:

Distribution power transformers within scope have:

- 2 windings per phase;
- a rated capacity equal to or between 5 kVA and 3150 kVA;
- a primary voltage greater than 1.1 kV, but not exceeding 36 kV; and
- are designed for use in electricity networks or industrial applications.

Distribution power transformers regardless of when they were first placed on the market or put into service, shall be reassessed for conformity and comply with this Regulation if they are subject to replacement operations both of the core (or part thereof) and one (or more) of the complete windings.

1.2 Exclusions

This regulation does not apply to:

- instrument transformers, specifically designed to transmit an information signal to measuring instruments, meters, relays and other similar apparatus;
- transformers with low-voltage windings specifically designed for use with rectifiers to provide a DC supply;
- transformers specifically designed to be directly connected to a furnace;
- transformers specifically designed for offshore applications and floating offshore applications;
- transformers specially designed for emergency installations;
- transformers and auto-transformers specifically designed for railway feeding systems;
- earthing or grounding transformers, this is, three-phase transformers intended to provide a neutral point for system grounding purposes;
- traction transformers mounted on rolling stock, this is, transformers connected to an AC or DC contact line, directly or through a converter, used in fixed installations of railway applications;
- starting transformers, specifically designed for starting three-phase induction motors so as to eliminate supply voltage dips;
- testing transformers, specifically designed to be used in a circuit to produce a specific voltage or current for the purpose of testing electrical equipment;
- welding transformers, specifically designed for use in arc welding equipment or resistance welding equipment;
- transformers specifically designed for explosion-proof and underground mining applications;
- transformers specifically designed for deep water (submerged) applications; and
- Medium Voltage (MV) to Medium Voltage (MV) interface transformers up to 5 MVA.

2. NORMATIVE REFERENCES

The following documents contain provisions which through reference in this text constitute provisions of this standard. All standards are subject to revision and since any reference to a standard is deemed to be a reference to the latest edition of that standard, parties to agreements based on this standard are encouraged to take steps to ensure the use of the most recent edition of the documents indicated below. Information on current valid national and international standards can be obtained from the Malawi Bureau of Standards.

IEC 60076-1, *Power Transfomers – Part 1: General*

IEC 60076-2, *Power transformers - Part 2: Temperature rise for liquid-immersed transformers.*

IEC 60076-3, *Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air.*

IEC 60076-4, *Power transformers - Part 4: Guide to the lightning impulse and switching impulse testing- Power transformers and reactors.*

IEC 60076-5, *Power transformers - Part 5: Ability to withstand short circuit.*

IEC 60076-6, *Power transformers - Part 6: Reactors.*

IEC 60076-7, *Power transformers - Part 7: Loading guide for oil-immersed power transformers.*

IEC 60076-8, *Power transformers - Part 8: Application guide.*

IEC 60076-10, *Power transformers - Part 10: Determination of sound levels.*

IEC 60076-10-1, *Power transformers - Part 10-1: Determination of sound levels - Application guide.*

IEC 60076-11, *Power transformers - Part 11: Dry-type transformers.*

IEC 60076-13, *Power transformers - Part 13: Self-protected liquid-filled transformers.*

IEC 60076-14, *Power transformers - Part 14: Design and application of liquid-immersed power transformers using high-temperature insulation materials.*

IEC/TS 60076-19, *Power transformers – Part 19: Rules for the determination of uncertainties in the measurement of losses in power transformers and reactors.*

IEC/TS 60076-20, *Power transformers - Energy efficiency.*

IEC 60137, *Insulated bushings for alternating voltages above 1000 V.*

IEC 60296, *Fluids for electro technical applications – Unused mineral insulating oils for transformers and switchgear.*

EN 50329, *Railway applications – Fixed installations – Traction transformers.*

IEC 61378-1, *Converter transformers - Part 1: Transformers for industrial applications.*

IEC 61869-1, *Instrument transformers - Part 1: General requirements.*

SANS-780, *Distribution Transformers.*

3 DEFINITIONS AND ACRONYMS

3.1 Definitions

For the purpose of this Draft Proposal the following terms and definitions apply:

3.1.1
electric energy converter
a device for changing one or more characteristics associated with electric energy

3.1.2
transformer
an electric energy converter without moving parts that changes voltages and currents associated with electric energy without change of frequency

3.1.3
power transformer
a transformer with the purpose of transmitting electrical power which converts a system of alternating voltage and current into another system of alternating voltage and current at the same frequency

3.1.4
liquid-immersed transformer
a power transformer in which the active parts are immersed in liquid

3.1.5
dry-type transformer
a power transformer in which the active parts are not immersed in an insulating liquid

3.1.6
winding
the assembly forming an electrical circuit associated with one of the voltages assigned to the transformer

3.1.7
rated voltage of a winding
Ur
is the voltage assigned to be applied, or developed at no-load, between the terminals of an untapped winding, or of a tapped winding connected on the principal tapping

3.1.8
high-voltage winding
the winding having the highest rated voltage

3.1.9
highest voltage for equipment
Um
a transformer winding is the highest r.m.s phase-to-phase voltage in a three-phase system for which a transformer winding is designed in respect of its insulation

3.1.10
load loss
Pk
the absorbed active power at rated frequency and reference temperature associated with a pair of windings when the rated current (tapping current) is flowing through the line terminal(s) of one of the windings and the terminals of the other windings are in short-circuit with any winding fitted with tappings connected to its principal tapping, while further windings, if existing, are open-circuited

3.1.11
no load loss
Po

the active power absorbed at rated frequency when the transformer is energised and the secondary circuit is open. The applied voltage is the rated voltage, and if the energized winding is fitted with a tapping, it is connected to its principal tapping

3.1.12
IEC Standard
an international standard that is published by the International Electrotechnical Commission denoted by the letters “IEC” and identifying number and/or letters

3.1.13
SI unit
any of the units adopted for international use under the Système International d’Unités

3.1.14
instrument transformer
any transformer as defined in subclause **3.1.1 of IEC 61869-1**, even if it supplies energy for the operation of connected equipment

3.1.15
transformer with low-voltage windings specifically designed for use with rectifiers to provide a DC supply
any transformer specifically designed and intended to supply power electronic or rectifier loads specified according to **IEC 61378-1**

Note 1 – term “low-voltage winding” refers to the winding having the lowest rated voltage as per IEC 60076-1, whatever its voltage level.

Note 2 – This definition does not include:
- transformers which are intended to provide AC from DC sources such as transformers for wind turbine and photo voltaic applications;
- transformers designed for DC transmission and distribution applications.

3.1.16
transformers specifically designed for offshore applications and floating offshore applications
any transformer to be installed on fixed or floating offshore platforms, offshore wind turbines or on board of ships and all kind of vessels

3.1.17
transformers specially designed for emergency installations
any transformer designed only to provide cover for a specific time limited situation when the normal power supply is interrupted either due to an unplanned occurrence such as failure or a station refurbishment, but not to permanently upgrade an existing substation

Note – Such transformer could have some specific features that make it suitable for emergency or temporary use as opposed to normal use. Examples of some specific features include:
- multiple windings making it suitable for use at several locations;
- special low weight or dimensions for easy transport, or special capability to be disassembled into smaller units for transport;
- increased overload capability achieved by the use of special materials;
- permanent mounting on a transporter arrangement.

3.1.18
transformers and auto-transformers specifically designed for railway feeding systems
any transformer as defined in **EN 50329**

3.1.19
earthing or grounding transformers, this is, three-phase transformers intended to provide a neutral point for system grounding purposes
any transformer as defined in subclause 3.1.10 of **IEC 60076-6**

3.1.20
traction transformer
any transformer installed on board of rolling stock inserted in the traction and auxiliary circuits of rolling stock and in the scope of **IEC 60310**

3.1.21

starting transformers, specifically designed for starting three-phase induction motors so as to eliminate supply voltage dips
any transformer that is de energized during normal operation, used for the purpose of starting a rotating machine

3.1.22
medium voltage (MV) to medium voltage (MV) interface transformers
any transformer used in network voltage conversion program and placed at the junction between two voltage levels of two MV networks and which needs to be able to cope with emergency overloads

3.1.23
rated power
Sr
is a conventional value of apparent power assigned to a winding which, together with the rated voltage of the winding, determines its rated current in accordance with **IEC 60076-1** on which P_k is based

3.2 Acronyms

CAR	Conformity Assessment Report
ICA	International Copper Association
IEC	International Electrotechnical Commission
GHG	greenhouse gas emissions
Hz	hertz
kVA	kilovolt-ampere
MV	Medium Voltage
MW	megawatt
PCB	Polychlorinated biphenyls
UN	United Nations
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
U4E	United for Efficiency
OLTC	On Load Tap Changer

4 REQUIREMENTS

4.1 General

All distribution power transformers in the scope of this regulation as defined in **Clause 1**, that are manufactured in, undergo repair (as defined in the scope) in or are imported into the country, shall meet the minimum energy performance requirements of **Clause 4.2**, the PCB requirements of **Clause 4.3**, the product and technical information requirements of **Clauses 4.4** and **4.5**, and the certification and registration requirements of **Clause 4.6**. The related reference test standards, compliance certification and surveillance testing requirements are as listed in **Clause 4.7**.

4.2 Energy performance requirements

Transformers in the scope of this Draft Proposal shall comply with the maximum allowed load and no-load losses values set out in the following tables. If not otherwise specified, three phase or single phase power transformers shall be evaluated against the rated power of the individual unit. Maximum allowable losses rated powers that fall in between the given values shall be obtained by linear interpolation.

Table 1 – Three-phase Liquid-imersed distribution power transformers – Maximum load losses (LL) and no-load losses (NL)

1	2	3	4	5	6	7	8	9	10
Three phase, 50 Hz; Primary voltage ≤36kV, OLTC range ≤ 5%									
Rated Power IEC 60076-1	**Level 1**			**Level 2**			**Level 3**		
	LL	**NL**	**EIA50**	**LL**	**NL**	**EIA50**	**LL**	**NL**	**EIA50**
kVA	**W**	**W**	**%**	**W**	**W**	**%**	**%**	**%**	**%**
≤25	520	70	98.40%	460	56	98.63%	400	42	98.86%
50	880	110	98.68%	782.5	92	98.85%	685	74	99.02%
100	1500	190	98.87%	1340	156	99.02%	1180	122	99.17%
160	2200	270	98.98%	1930	225	99.12%	1660	180	99.26%
250	3100	380	99.08%	2715	320	99.20%	2330	260	99.33%
315	3600	450	99.14%	3200	387	99.25%	2800	324	99.35%
400	4400	540	99.18%	3825	463.5	99.29%	3250	387	99.40%
500	5200	630	99.23%	4550	544.5	99.33%	3900	459	99.43%
630	6200	750	99.27%	5400	645	99.37%	4600	540	99.46%
800	7500	900	99.31%	6750	742.5	99.39%	6000	585	99.48%
1000	8900	1070	99.34%	8200	855	99.42%	7500	640	99.50%
1250	10500	1260	99.38%	9650	1025	99.45%	8800	790	99.52%
1600	12800	1520	99.41%	11800	1247.5	99.48%	10800	975	99.54%
2000	15100	1790	99.44%	14050	1460	99.50%	13000	1130	99.56%
2500	18000	2120	99.47%	16750	1720	99.53%	15500	1320	99.58%
3150	21500	2520	99.50%	20250	2075	99.55%	19000	1630	99.59%

Table 2 – Single-phase Liquid-immersed distribution power transformers – Maximum load losses (LL) and no-load losses (NL)

1	2	3	4	5	6	7	8	9	10
Single-phase, 50 Hz; Primary voltage ≤36kV, OLTC range ≤ 5%									
Rated Power IEC 60076-1	**Level 1**			**Level 2**			**Level 3**		
	LL	**NL**	**EIA50**	**LL**	**NL**	**EIA50**	**LL**	**NL**	**EIA50**
kVA	**W**	**W**	**%**	**W**	**W**	**%**	**%**	**%**	**%**
5	133	37	97.17%	123	28	97.68%	112	18	98.18%
10	243	44	97.90%	224	33	98.23%	205	21	98.56%
15	331	58	98.13%	305	43	98.42%	278	27	98.71%
25	486	83	98.36%	448	61	98.61%	410	39	98.87%
50	889	119	98.63%	819	88	98.83%	749	56	99.03%
100	1535	211	98.81%	1414	155	98.98%	1293	99	99.16%

The losses given in **Tables 1** and **2** above can be weighted by the correction factors given in **Table 3** below, in order to take account of variations related to the highest voltage for equipment values.

The level of losses given in **Tables 1** and **2** above shall be weighted by the correction factors given in **Table 4** below, in order to take account of variations related to dual voltage windings.

For power transformers having dual voltage on both windings for which both voltages on one winding are fully rated in combination with one of the voltages on the other winding, the levels of losses shall be based on the highest power and the values indicated in **Tables 1** and **2** above can be increased by 15 % for no load losses and by 10 % for load losses. The level of losses shall refer to the highest voltages of both windings. This remains valid even if further voltage combinations are available.

For a power transformer having an insulation level according to **Table 3** below and having dual voltage according to **Table 4** below the loss level shall take into account both corrections.

Table 3 – Correction of load loss and no load loss applicable to other insulation levels

Ref	Highest voltage for equipment values	Correction of load loss and no load loss
1	One winding with 1.1 kV **<** U_m **≤** 24 kV and the other with 1.1 kV **<** U_m **≤** 24 kV	The maximum losses indicated in **Tables 1** and **2** can be increased by 10 % for no load loss and by 10 % for load loss.
2	One winding with 24 kV **<** U_m **≤** 36 kV and the other with U_m **≤** 1,1 kV	The maximum losses indicated in **Tables 1** and **2** can be increased by 15 % for no load loss and by 10 % for load loss and short circuit impedance unless otherwise specified should be increased by adding a value of 0.5 %.
3	One winding with 24 kV **<** U_m **≤** 36 kV and the other with U_m **>** 1.1 kV	The maximum levels of losses indicated in Table 1 and 2 can be increased by 20 % for no load loss and by 15 % for load loss and short circuit impedance unless otherwise specified should be increased by adding a value of 0.5 %.

Table 4 – Correction of load loss and no load loss applicable to dual voltage

Ref	Dual voltage	Correction of load loss and no load loss
A	One winding	In the case of power transformers with one high-voltage winding and two voltages available from tapped low-voltage winding, losses shall be calculated based on the higher low-voltage and shall comply with the levels indicated in **Tables 1** and **2**. The maximum available power on the lower low-voltage on such power transformers shall be no more than 0.85 times its rated power. In the case of power transformers with one high-voltage winding with two voltages available from a tap, the maximum available power on the lower high-voltage on such power transformer shall be limited to 0.85 of its nominal rated power. In the case where the full rated power is available regardless of the combination of voltages, the levels of losses indicated in **Tables 1** and **2** can be increased by 15 % for no load loss and by 10 % for load loss. Such levels of losses shall refer to the highest voltage.
B	Both windings	The maximum allowable losses indicated in **Tables 1** and **2** can be increased by 20 % for no load losses and by 20 % for load losses for power transformers with dual voltage on both windings if the rated power is the same regardless of the combination of voltages. The level of losses shall refer to the highest voltages of both windings. This remains valid even if further voltage combinations are available.

4.3 PCB Contamination Requirements

Transformers within the scope of this regulation shall comply with the Stockholm Convention on Persistant Organic Pollutants and shall not contain PCB (Polychlorinated biphenyls) fluids or other hazardous materials as defined in the relevant international, regional and national regulations.

4.4 Product Information Requirements

The following product information requirements for power transformers included within the scope of this regulation shall be included in any related product documentation, including free access websites of manufacturers:

(a) information on rated power
(b) load loss and no-load loss
(c) the electrical power of any cooling system required
(d) information on the weight of all the main components of a power transformer (including at least the conductor, the nature of the conductor and the core material)

(e) manufacturer/repairer name
(f) year of manufacturing/reparing
(g) serial number

The above mentioned information shall also be durably marked on or near the rating plate of the power transformer.

4.5 Technical Documentation Requirements

The following information shall be included in the technical documentation of power distribution transformers:

(a) manufacturer's/repairer's name and address
(b) model identifier, the alphanumeric code to distinguish one model from other models of the same manufacturer

(c) the information required under **Clause 4.4** above.

4.6 Compliance Certification and Registration Requirements

4.6.1 General

The transformer's energy performance must be tested in accordance with the requirements set by **IEC 60076-1**.

The transformer's fire performance must be tested in accordance with the requirements set by a suitable recognized test standard. For dry-type trasformers for example **IEC 60076-11**.

4.6.2 Test certificates

Test certificates from the following laboratories are accepted:

1) Manufacturers' in-house test laboratories;
2) Third party test laboratories

that have been accredited by their respective national accreditation bodies or by an international accreditation body for a measurement expanded uncertainty, as defined in **EN 60076-19** and referring to a coverage factor k = 2 (i.e. to a confidence level of about 95 % assuming a normal distribution), not exceeding 5 %.

4.6.3 Registration

Importers and manufacturers/repairers of transformers covered by this regulation must register themselves with the designated authority, following the prescribed procedure, accompanied by the required documents and information and the applicable fees.

Transformer designs covered by this Draft Proposal must be registered with the designated authority through the submission of the full product and technical information as required under **Clause 4.4** and **4.5**, together with the test certificates as required by **4.6.2** above.

Transformer designs that are already registered with other countries that are members of a recognised official "Regional Energy Efficiency Certificate Mutual Recognition Agreement"[1] or equivalent may be registered by providing the registration certificate of the respective country.]

5 DECLARATION OF CONFORMITY

Compliance with the requirements of this Draft Proposal shall be demonstrated in accordance with the provisions of **Clause 4**. Suppliers (i.e. importers and manufacturers/repairers) shall provide the information and technical documentation necessary for the market surveillance authority to assess conformity and verify compliance and any additional optional claims. This information and technical documentation can be provided by the supplier as a Conformity Assessment Report (CAR) and/or entered into the relevant product registration database or supplied in any other format as reasonably determined by the market surveillance authority. The conformity assessment information and documentation should:

(1) demonstrate that the product model fulfils the requirements of this Draft Proposal;
(2) provide any other information required to be present in the technical documentation file;
(3) specify the reference settings and conditions in which the product complies with this Draft Proposal.

[1] It is suggested that countries should enter into such an agreement with neighbouring countries within the region for multiple equipment and appliances, including motors. Please refer to the U4E Guidance Notes on Registration.

Annex A
(normative)

Market surveillance and enforcement

In order to verify the claimed energy performance of a power transformer covered by this Draft Proposal, the designated market surveillance authority can test any one single unit to be picked at any time directly from the market or where appropriate the premises of manufacturer, at its sole discretion, according to the test method prescribed above.
For the purpose of compliance with the requirements of this Draft Proposal, measurements shall be made using a reliable, accurate and reproducible measurement procedure, which takes into account the generally recognised state of the art measurement methods.
When performing market surveillance the designated market surveillance authority shall apply the following verification procedures for the set out requirements:

(a) The designated market surveillance authority shall test one single unit per model;
(b) The model shall be considered to comply with the applicable requirements set out by this Draft Proposal if the values in the technical documentation comply with the requirements set out in 4.3 and 4.5, and if the measured parameters meet the requirements set out in 4.2 within the indicated verification tolerances set by **IEC 60076-1**;
(c) If the results referred to in point (b) are not achieved, the model shall be considered not to comply with this Draft Proposal. If a decision of non-compliance is taken, the market surveillance authority may inform other government authorities to take consequential enforcement actions against the manufacturer and / or importer, as well as inform other authorities in the region of the decision being taken to help protect against the widespread sale of the same model.

Given the weight and size limitations in the transportation of power transformers, the designated authorities may decide to undertake the verification procedure at the premises of manufacturer(s), before they are put into service in their final destination. The verification tolerances set out in this Annex relate only to the verification of the measured parameters by designated authorities and shall not be used by the manufacturer or importer as an allowed tolerance to establish the values in the technical documentation.
Any person, persons or firm manufacturing, importing, storing for sale, supplying, selling, or distributing distribution power transformers in the scope of this regulation, which do not meet the specified minimum energy performance requirements after the date of entry into force of this regulation shall be liable for penal actions including, but not limited to warnings, sanctions, fines, penalties, public naming, delisting etc. as may be determined by the designated authority.
Further, the entity in possession of a distribution power transformer within the scope of this regulation, other than an end-user, that does not meet the specified requirements shall ensure that it is rendered unusable and dispose of it as scrap within three months from the date that the non-conformance is first detected.
An exception shall be allowed for new distribution power transformers which have been placed on the market (i.e. supplied by a manufacturer or importer for distribution and sale) prior to the entry into force of this regulation. Existing stocks of such transformers in the distribution chain may continue to be sold even after the entry into force of this regulation, up to a maximum period of two years or until the stocks of such transformers are exhausted, whichever is earlier.

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THE MALAWI BUREAU OF STANDARDS

The Malawi Bureau of Standards (MBS) is the standardizing body in Malawi under the aegis of the Ministry of Industry. The MBS is a parastatal body whose activities aim at formulating and promoting the use of standards relating to structures, commodities, materials, practices, operations and from time to time revise, alter and amend the same to incorporate advanced technology.

CERTIFICATION MARK SCHEME

To bring the advantages of standardization within the reach of the common consumer, the Bureau operates a Certification Mark Scheme. Under this scheme, manufacturers who produce goods that conform to national standards are granted permits to use the Bureau's "Mark of Quality" depicted below on their products. This Mark gives confidence to the consumer of the commodity's reliability.