

MALAWI ENERGY REGULATORY AUTHORITY



Regulating Energy for Sustainable Development

ENVIRONMENTAL, HEALTH AND SAFETY GUIDELINES FOR LIQUID FUELS AND GAS INDUSTRY IN MALAWI

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FOREWORD

This document has been developed to provide Guidance for compliance with minimum requirements to enable proper handling of liquid fuels and gas and associated facilities throughout the chain of supply.

It should be noted that compliance with these guidelines does not grant immunity from relevant legal requirements and other by-laws. It is believed that adoption of these guidelines will help mitigate Environment Health and Safety risks.

ABBREVIATIONS

AST	Aboveground Storage Tank(s)
EHS	Environmental Health and Safety
EA	Environmental Assessment
EMA	Environment Management Act
LPG	Liquefied Petroleum Gas
MERA	Malawi Energy Regulatory Authority
MS	Malawi Standard
OSHA	Occupational Safety, Health and Welfare Act
PVC	Poly Vinyl Chloride
PPE	Personal Protective Equipment
SVO	Straight Vegetable Oil
UST	Underground Storage Tanks
WC	Water Capacity

ACKNOWLEDGEMENT

The Environmental, Health and Safety (EHS) Guidelines are a result of an intensive and extensive consultative process, with a variety of stakeholders within liquid fuels and gas industry in Malawi. As much as it is not possible to mention all who contributed to the development of the Guidelines, we would not do justice if we do not mention the few that we believe made substantial contributions.

A core team of experts from all sections of the liquid fuels and gas industry who provided the bulk of drafting technical, editorial and secretarial support deserve special accolade. The list is shown in **Appendix 1**.

1.0 INTRODUCTION

The Environmental, Health and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP)¹. These guidelines should be used as reference and used together with the Liquid Fuels and Gas (Production and Supply) Regulations, 2009 which provide guidance to users on common EHS issues potentially applicable to the industry. For complex projects, use of multiple industry-sector guidelines may be necessary.

The EHS Guidelines provide minimum performance levels and measures required. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them.

The applicability of the EHS Guidelines should be tailored to mitigate the hazards and risks associated with each project (site) on the basis of the results of an environmental assessment conducted in accordance with the requirements of the Environment Management Act (EMA) 1996 and the Malawi Environment Impact Assessment guidelines. The guidelines require that specific technical recommendations should be based on the professional opinion of qualified and experienced persons. When company guidelines differ from the levels and measures presented in these EHS Guidelines, all operations are expected to achieve whichever is more stringent.

2.0 SCOPE OF THE GUIDELINES

The EHS Guidelines are applicable to storage, transportation and distribution of liquid fuels and gas or related products as well as liquid fuels and gas outlets. These guidelines are also applicable to production of bio-fuels.

3.0 DEFINITIONS

For the purposes of these EHS Guidelines, the following definitions and those in relevant part of MS 667 and Energy laws, shall apply.

3.1 Transportation

As defined in the Liquid Fuels and Gas (Production and Supply) Act

3.2 Approving authority

the appropriate of the following:

- a) in terms of the Occupational Safety Health and Welfare Act: Ministry of Labour;
- b) in terms of the Weights and Measurement Act: Malawi Bureau of Standards;

- c) in terms of the Environment Management Act: Ministry of Environment and Climate Change Management;
- d) in terms of the Water and Sanitation Act: Ministry of Water ;
- e) Liquid Fuels and Gas (Production and Supply) Act: Malawi Energy Regulatory Authority;
- f) in terms of Land Act: Ministry of Land, Housing and Urban Development;
- f) the local authority concerned: City Councils, Town Councils and District Councils; and
- g) in terms of Road Traffic Act: Ministry of Transport and Public Works

3.3 Personal Protective Equipment

Specialized clothing or equipment worn by employees for protection against health and safety hazards such as overalls, rubber boots, headgear, rubber gloves, and breathing apparatus.

3.4 Combustible liquid

Any liquid having a flash point at or above 100°F (37.8°C). Combustible liquids are divided into two classes as follows:

1. Class II liquids shall include those with flash points at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flash points of 200°F (93.3°C) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.
2. Class III liquids shall include those with flash points at or above 140°F (60°C).

3.5 Flammable liquid

Any liquid having a flash point below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids

4.0 PETROLEUM INDUSTRY

4.1 Fuel storage depots

Premises (sometimes referred to as marketing installations or terminals), on which the capacity for the storage of flammable goods or combustible goods (or both) exceeds 200 m³ in above-ground tanks, on which goods are normally received from a refinery or other bulk depot by road, rail (or a combination of these), and from which such flammable goods or combustible goods (or both) are delivered

4.1.1 ABOVEGROUND STORAGE TANKS

4.1.1.1 Design and Construction of Tanks

Aboveground storage tanks (ASTs), shall be designed and built in accordance with MS 113 and MS 840

Before the installation of above-ground storage tanks, and after the approval of the Environmental Assessment (EA), written permission to proceed with the installation shall be obtained from the appropriate approving authority as defined in section 3.2.

4.1.1.2 Installation

Installation of the storage tanks shall be done in accordance with MS 172, Part 1 and MS 840.

4.1.1.3. Painting And Protection

Ensure that all tanks are painted in accordance with MS 113.

4.1.1.4 Tank Markings

The following markings must be painted clearly on every tank where it can be easily accessed and seen:-

- a) Serial/Code Number of tank;
- b) A brief summary of product name, capacity and the dates of painting of various sections of the tank. The following codes should be used:
 - (i) T E = Tank Erected
 - (ii) T L I C = Tank Last Internally Cleaned
 - (iii) T L P = Tank last painted
 - (iv) T L C = Tank Last Calibrated

- (v) TLT = Tank last tested

The above information painted on the tank shall be kept up-to-date.

NOTE - The words "Last Painted" do not refer to patch painting but to one or more complete coats of paint.

4.1.1.5 Storage tank cleaning

Aboveground storage tanks (ASTs), shall be cleaned in accordance with MS 172 – 1. Additionally, when cleaning the tanks, the following shall be observed.

4.1.1.5.1 Frequency of tank cleaning

- a) As a general guide tanks shall be cleaned at intervals as indicated in Table 1 below:

Table 1: Tank Cleaning Recommended Intervals

Product	Frequency
i. All Aviation fuels	Cleaning intervals should not exceed five years.
ii. Other White products (Petrol, Illuminating Paraffin, Gas Oil, etc.)	As necessary – a maximum of 10 years
iii. Black products (Diesel and Fuel Oils, etc.)	As necessary - a maximum of 10 years
iv. All products	When changing grade, if product quality may be affected and in the circumstances listed in this sub section

- b) When a tank is emptied, the opportunity should be taken to inspect it internally to access the possibility of cleaning. In addition to the provided frequencies in table 1, tanks should also be cleaned under the following circumstances:
 - i. When bottom-sample tests indicate the presence of sludge or deposits liable to cause deterioration of products.
 - ii. When a tank which has contained any other product (including another Aviation product) is to be changed over to an Aviation product.
 - iii. When a tank which has contained any other product is to be changed over to another product.
 - iv. When internal maintenance is required.

4.1.1.5.2 Gas-Freeing and preparation for tank cleaning

The following is a general guide to the preliminary procedures required for Tank Cleaning:

- a) The necessary permits should be issued by an authorised person within the organisation before any further work is done
- b) Drain the remainder of the tank contents through the bottom drain valve.
- c) After draining is complete, close all valves and disconnect all pipelines from the tank. Fit blank flanges to the open ends of the disconnected pipelines.
- d) Make sure that atmospheric conditions are suitable for quick dispersal of vapour, i.e. a slight breeze is blowing. When suitable conditions exist, open all roof manholes and fit a wind sail or an air extractor to improve air movement in the tank.
- e) Open all tanks valves, unbolt side manhole covers and remove them, avoiding striking which could lead to sparks. This could be a hazardous operation if care is not exercised. The valves/manholes should be opened slowly to limit the volume of gas released and therefore the extent of the danger area.
- f) If atmospheric conditions are likely to cause a static electrical discharge to occur during a gas-freeing operation, close all tank openings to prevent any possibility of ignition of gas by lightning etc.
- g) After ventilation of at least 24 hours, an authorised person:
 - i. Must test the surrounding area and interior of the tank for gas with an explosimeter.
 - ii. Must wear full protective clothing and use breathing apparatus.
 - iii. If the explosimeter tests indicate a dangerous atmosphere at any point, the ventilation must be continued until safe readings are obtained at all points.
 - iv. To accelerate the gas-freeing operation, fill the tank with water until the tank bottom is covered, and then drain away. This may need to be repeated several times.
 - v. The water must be introduced through an open hose (without nozzle) resting on the tank bottom, not with a nozzle or allowing free fall.
 - vi. Drainage should be to an interceptor.

4.1.1.5.3 Cleaning – General Instructions

The following general instructions should be applied to any tank cleaning work:

a. Sludge

Water and sludge should be pumped directly into a sludge tank.

b. Entry to Tank

When as much sludge as possible has been washed out and when authority in the form of work permits, etc has been granted,

- (i) Personnel wearing protective clothing/breathing apparatus may enter and continue washing the entire tank bottom and shell plates under responsible and continuous supervision.
- (ii) Under all circumstances the use of full personal protective equipment (PPE) shall be fully observed. These clothes must be washed daily.

Manuals/procedures shall be provided.

c. Washing

- (i) The bottoms of tanks which have contained Class I or II petroleum products shall be washed down usually by a stream of water from an open hose (without nozzle) introduced through a shell manhole. This also applies to Class III products if practical.
- (ii) Water flow must be slow and well dispersed to avoid building up a static electricity charge. Otherwise squeegees, brooms, rags and mops have to be used.

d. Scale

If heavy scale has to be removed, it may be necessary to use wire brushes and scrapers, keeping the surfaces wet. As this operation may release vapour with the scale, a regular check must be kept on the vapour concentration.

e. Cleaning Liquids

With Class III Petroleum Products there is little risk of vapour being released by scale, but products which produce flammable vapours must not be used in cleaning such tanks, as the tank would no longer be gas free.

f. Sludge Disposal

The disposal of sludge shall be as approved by the approving authority as stipulated in MS 719 and EMA.

g. Lighting

- (i) The interior of a tank may be illuminated during cleaning by suspending a flame proof electric lamp on a rope through the roof manhole. Extension lights on a cable passed through a shell manhole should never be used nor should lamps be suspended from their own cables.

(ii) Artificial lighting should not be encouraged. The limited natural light should be employed to best advantage by using bright tinplate sheets as reflectors. Painting the underside of the tank roof with titan white maintained in good condition will also assist.

h. Fire Precautions

During tank cleaning operations, water hoses, fire extinguishers and sand shall be available on site and close by.

i. Date of Cleaning

Apart from any entry in the tank logbook or tank cleaning report, the date of cleaning shall be stencilled on the tank shell near a shell manhole in **letters 50 mm high**.

j. Personal Hygiene

Personnel engaged in tank cleaning must wash and bathe thoroughly before putting on their ordinary clothes, eating, drinking or smoking.

k. Inspection

After completion of tank cleaning, the tank interior must be thoroughly inspected.

4.1.1.5.4 Existing Sludge Pits

The burying of sludge in sludge pits is no longer permitted. Where there are existing sludge pits, the position of these pits must be identified with a sign. The site shall be treated as a storage site for hazardous waste in accordance with MS 719

4.1.1.5.5 Returning of Tanks to Service

Tanks should be returned to service under supervision to ensure that all valves, etc have been refitted correctly and that there are not any leaking joints

4.1.2 UNDERGROUND STORAGE TANKS

4.1.2.1 Design and Construction

Underground storage tanks (USTs) shall be designed and built in accordance with MS 114.

Before the installation of underground storage tanks, and after the approval of the Environmental Impact Assessment, where appropriate written permission to proceed with the installation shall be obtained from the appropriate approving authority as defined in section 3.2.

4.1.2.2 Installation

Installation of the storage tanks shall be done in accordance with MS 172, Part 3. Such installation, where conditions demand that concrete walls and base be constructed shall be approved by the Malawi Energy Regulatory Authority.

4.1.2.3 Painting and Protection

Ensure that all tanks are painted in accordance with recommended standards.

4.1.2.4 Tank Markings

The following markings must be painted clearly for every tank :-

- a. Serial/Code Number of tank: plate to be erected near tank
- b. A brief summary of product name, capacity and the dates of painting of various sections of the tank. The following codes should be used:
 - (i) T E = Tank Erected
 - (ii) T L C = Tank Last Cleaned
 - (iii) The above information shall be kept up-to-date.

4.1.2.5 Tank Replacement

The underground tank shall be replaced when the following conditions and tests indicate that the tanks are due for replacement:

- a. Change of quality of stored product;
- b. Known leakages through commercial losses and pressure testing determination methods or standing tests;
- c. Presence of sludge.

Underground tanks that have been taken out of the ground may be reused on condition that they undergo the following tests:

- a. Pressure testing;
- b. Ultrasonic test;
- c. Physical determination by qualified engineers on the integrity of the tanks.

However it is recommended that underground tanks should be reused as aboveground tanks for easy monitoring.

4.1.3 Piping, Valves and other fittings

Installation of the pipes shall be done in accordance with MS 840 and MS 172, Part 1 and 3.

4.1.4 Forecourt and Driveway; Drainage and Interceptors

Forecourts, driveways and drainage systems shall be designed and constructed in accordance with MS 172 Part 1 and 3 and OSHWA.

4.1.5 Fire Protection Equipment

The provisions of Fire Protection Equipment shall be in accordance with s MS 840 and MS172 Parts 1 and 3.

4.1.6 Safety and Environment

The environmental issues associated with petroleum depots that occur during the operation phases of a facility include: air emissions, wastewater, hazardous materials and oil.

The most significant occupational health and safety issues that occur during operation (mainly related to maintenance activities) primarily include the following: chemical hazards, fire and explosions, confined spaces.

Adherence to safety measures and environmental protection requirements shall be observed as enshrined in the MS 172, Part 1, and 3, MS 840, MS 737 and MS 539, OSHW Act and EMA.

Safety Briefings shall be conducted at all fuel storage depots. Safety briefings shall be done at point of entry. Such briefings shall include the following;

- Smoking is prohibited anywhere in the Terminal



- NO cell phones in the Terminal. Please leave your phones at the gate.



- NO entry to people under the influence of DRUGS or ALCOHOL



- No matches or any Ignition source in the Terminal



- Report any incident to the Depot Manager

- Do not touch any equipment in the Terminal unless you are told to do so by competent personnel
- Please OBEY and FOLLOW all the Safety Rules and regulations posted around this Terminal
- Reverse parking only for all vehicles.
- Taking of meals anywhere in the depot other than administration block is prohibited
- Littering is strictly prohibited in all places in the depot. Please use trash bins provided. If not sure ask.
- Remember to wash your hands before taking any food in the depot
- At the sound of the Fire Alarm, vacate the premises immediately assemble outside the main gate at the Assembly Point
- Putting on of safety shoe(s), and hard hat(s) in the depot where necessary

4.1.7 Electrical Installations

All electrical installations shall be carried out in compliance with Malawi Standard MS 172, Part 2.

4.1.8 Depot Operations

Depot operations such as receiving, loading, etc shall be conducted in compliance with MS 840, MS 172, Part 1. Any depot operation shall have written procedures in place and displayed where they can be easily accessed and seen.

4.2 TRANSPORTATION

4.2.1 Design and Construction

Tanks used for transportation of petroleum products shall be designed and constructed in accordance with MS 121 and MS 849

The road and rail tankers and any other means of conveyance shall fully comply with provisions of Road Traffic Act, Railways Act and Inland Waters Shipping Act.

4.2.2 Markings and Safety Signage

Markings and signage on all road and rail tankers shall be done in accordance with Malawi Standard MS 121 and relevant sections of MS 720. Such markings and signage shall be clearly displayed.

4.2.3 Cleaning

Internal tank cleaning of road and rail tankers used for transportation of petroleum products shall be conducted in compliance with relevant sections of the MS 172 Part 1. The tank cleaning shall be conducted annually.

4.2.4 Emergency Information System

An effective emergency system shall be put in place in accordance with MS **845** Parts 1 to 4.

4.3 SERVICE STATIONS

4.3.1 Construction

Construction of fuel storage tanks shall be in conformance with MS 113 for Aboveground Tanks and MS114 for Underground Tanks.

Before the installation of fuel storage tanks, and after the approval of the EA where appropriate, written permission to proceed with the installation shall be obtained from the appropriate approving authority as defined in section 3.2.

Construction of the service stations shall be in conformance with relevant sections of Malawi Standard MS 172, Part 3 and shall include the following:

- a) Forecourt: Shall be constructed of concrete as per specification by Malawi Energy Regulatory Authority;
- b) Underground Tanks: Installed underground tank shall be of double skinned;
- c) Drainage: There shall be drainage for spillage from the forecourt that will lead to an interceptor (oil/water separator) and a separate drainage for storm water;
- d) Oil/Water Separator: The service stations shall have oil/water separator to collect and separate oil from water
- e) Where Canopy has been constructed, it shall be of minimum height of 4,550mm
- f) Electrical Installations: The electrical installation shall comply with Malawi Standards MS 172, part 2
- g) Signage: The service station shall be provided with the following signs and posters;
 - Product price on the billboard to be visible from a minimum distance of 25m.
 - No smoking, no naked fire and no cell phone signs near the dispensers
 - Clearly marked product name on the dispensers.
 - Entry and exit signs for vehicles on the driveways and markings for car parking area.
 - Height limitation sign for vehicles to go under canopy
 - Fire assembly point

4.3.2 Installation

Installation of Tanks, pipes, pumps and dispensers shall be in accordance with MS 172, part 1 and 3 and MS 840

4.3.3 Operation

The service stations shall be operated in accordance with MS 172, Part 1 and part 3

- a) Emergency Assembly Point: There shall be designated area for assembly point in case of emergency.
- b) Offloading: Offloading operations shall be conducted in compliance with MS 172, Part 1 and part 3.
- c) Attendants: These shall undergo proper induction to deal with emergencies and general safety.
- d) Calibration: All calibrations and inspections of the dispensing equipment shall be as provided for under the Weights and Measurement Act.

5.0 GAS INDUSTRY

5.1 Design, Construction and Installation of Tanks and Cylinders

Tanks or Cylinders used for the handling, storage and transport of LPG must be designed, manufactured and tested in accordance with MS 236.

Any individual involved in gas piping design, fabrication and installation, and piping components specification, must be in accordance with MS 236, Part 1:

The tanks, soon after installation, must also be cladded with approved cladding material to ensure the tank is protected from heat in times of fire incident.

The tanks must have effective excess flow valves fitted to them to limit excessive flow of LPG in times of pipe or valve rupture

Before the installation of containers, and after the approval of the EIA, written permission to proceed with the installation shall be obtained from the appropriate approving authority.

Imported containers and those manufactured to other Codes may only be used and refilled if approved by Malawi Bureau of Standards.

5.2 Painting and Protection

Ensure that all tanks are painted in accordance with recommended MS 236 part 1

5.2.1 Cylinder Markings

- a) Cylinders shall be permanently marked in accordance with MS 236 Part 1
- b) In accordance with the Weights and Measurements Act each cylinder filled in trade shall be marked with:-
 - (i) The empty Tare Mass of the cylinder including the shell of the cylinder, footing, valve and valve guard e.g. TM 16,8 kg.
NB: This should be permanently stamped onto the cylinder. This must be checked and, if necessary, re-stamped on the shroud whenever a valve guard is changed or the cylinder is examined or tested. Old tare mass should be obliterated if not on the body of the cylinder.
 - (ii) The name of the product filled e.g. LPG.
 - (iii) The prescribed filling mass of the product filled into the container. Except as stated in (i) above, these markings are usually displayed on a label attached to the cylinder or on the shoulder.
- c) Cylinders transported by road, rail or sea must bear a cautionary "FLAMMABLE GAS" label (MS 720) and should comply with dangerous goods requirements.

Transportation of gas cylinders in non-dedicated vehicles such as private cars and vans should comply with the following safety requirements

- a. Valves are fully closed and protected
 - b. Vehicle is ventilated and windows are kept open
 - c. Vehicle is not overloaded
 - d. No cylinders are left in the boot of the car or in unventilated place
 - e. Vehicle goes directly to its destination
 - f. No smoking activity takes place while transporting the gas cylinders
 - g. Transportation of gases is done safely with due regard to other road users and members of the public
 - h. Cylinders should be transported in upright position (unless it is designed to sit horizontally)
- d) Cylinders must have a label or stencil marking of an appropriate size to indicate that the cylinder must be used in the upright position, unless it is designed to operate horizontally such as forklift cylinders.

5.2.2 Maintenance of Permanent Markings

All markings applied must be maintained in a legible condition and must not be obscured.

5.2.3 Position of Markings

- a. Cylinders with WC (water capacity) greater than 11,5 litres shall have the markings stamped on the neck or shoulder of the cylinder, or on a metal plate or on a shroud that is permanently secured to the cylinder.
- b. Cylinders with WC (water capacity) less than 11,5 litres shall have the marking stamped on one or more of the following positions:-
 - (i) neck or shoulder of the cylinder.
 - (ii) the footing.
 - (iii) the valve protecting shroud that is securely attached to the cylinder.
 - (iv) a metal plate that is secured to the cylinder.

NB: All mandatory markings must be maintained in a legible condition and must not be obscured.

5.3 Cylinder filling

5.3.1 General

In accordance with the provisions of the Codes of Practice it is mandatory that no-one shall fill gas into a portable container unless:

- a. He/she is fully conversant with the relevant sections of MS 236.

- b. He/she is satisfied that the cylinder complies with the requirements of an approved manufacturing specification/code.
- c. He/she employs staff trained and experienced in the filling of containers with those gases that he handles.
- d. The container is in good condition and that the operator uses a standard check list to ascertain soundness of the cylinder (Refer to relevant Malawi Standard).
- e. Cylinder filling is through use of calibrated automatic cut off cylinder filling scales
- f. Tolerance for LPG cylinder filling is -3% and +2% of the nominal cylinder weight. Where overfill of any cylinder is found to exceed 2% of maximum filling weight the system must be fully investigated and appropriate remedial action taken. Overweight cylinders must be blown-down to maximum filling weight.

When a cylinder is filled for sale, the requirements of the Weights and Measurements Act and Regulations must be observed. When required, permission to fill LPG containers must be obtained from the appropriate local authority.

5.3.2 Filling

The filling shall be done in accordance with MS 236 Part 1 and 3

Safety Briefings shall be conducted at all gas filling depots. Safety briefings shall be done at point of entry. Such briefings shall include the following;

- Smoking is prohibited anywhere in the Terminal



- NO cell phones in the Terminal. Please leave your phones at the gate.



- No matches or any Ignition source in the Terminal



- Report any incident to the Depot Manager

The minimum PPE requirement for fillers shall include: Safety Boots, Safety goggles and safety gloves.

5.4 Handling, Storage and Distribution of LPG Cylinders

Cylinders shall always be handled, stored and distributed in accordance with MS 236.

In case of transportation of LPG in tankers, these shall be done as stipulated under petroleum Industry in section 4 of these guidelines.

5.5 Emergency Information System

An effective emergency system shall be put in place in accordance with MS 845 Parts 1 to 4.

5.6 Handling by End User

Companies shall provide educative materials for public awareness on the safe handling of the products by end users.

6.0 BIO-FUELS

6.1 Production

6.1.1 Production processes shall adhere to requirements as stipulated in the Occupational Safety Health and Welfare Act 1997 and Environment Management Act, 1996.

6.1.2 Production of bio-fuels shall comply with MS 805, MS 573 and MS 888 for bio-diesel, ethanol and Jatropha straight vegetable oil respectively

6.2 Storage (Fuel Depot)

6.2.1 The bio-fuel storage depots shall be set up as stipulated under Petroleum Industry in Section 4 of these guidelines

6.2.1 The tank design and construction shall be done as stipulated under Petroleum Industry of these guidelines.

6.3 Transportation

Transportation of bio-fuels shall be in accordance with Malawi Standards as stipulated under Petroleum Industry of these guidelines.

6.4 Safe Handling by End user

Companies shall provide educative materials for public awareness on the safe handling of the products by end users.

In case of Straight Vegetable Oil (SVO), the companies shall set up procedures on the use and handling for the local end users to mitigate safety, health and environmental hazards.

REFERENCES

MS 113, Above ground non-pressurised horizontal cylindrical steel storage tanks for petroleum products – Specification

MS 114, Underground non-pressurised storage tanks for the petroleum industry – Specification

MS 121, Road tank vehicles for petroleum based flammable liquids – specification

MS 845, Transport of dangerous goods – Design, construction, testing, approval and maintenance of road vehicles and portable tanks

MS 172-1, Part 1: Storage and distribution of petroleum products in above-ground bulk installations

MS 172-2, Part 2: Electrical and other installations in the distribution and marketing sector

MS 172-3, Part 3: The installation of underground storage tanks, pumps/dispensers and pipe work at service stations and consumer installations – Code of practice

MS 236, The handling, storage, and distribution of liquefied petroleum gas in domestic, commercial, and industrial installations

MS 719, Hazardous waste – Management, classification and disposal –Code of practice

MS 720, Packaging of dangerous goods for road and rail transport in Malawi

MS 736, Transport of dangerous goods – Intermediate bulk containers for road and rail transport

MS 840, Above-ground storage tanks for petroleum products

MS 845 Part 1, Transport of dangerous goods- Emergency information systems
Emergency Information system for road transport

MS 845 Part 2, Transport of dangerous goods- Emergency information systems
Emergency Information system for rail transport

MS 845 Part 3, Transport of dangerous goods- Emergency information systems
Emergency response guides

MS 845 Part 4, Transport of dangerous goods- Emergency information systems
Transport emergency card

Environment Management Act 1996

Energy Laws 2004

Occupational Safety Health and Welfare Act 1997

APPENDIX 1
MEMBERS OF THE DRAFTING COMMITTEE

No.	NAME	ORGANISATION	POSITION
1	Gloria Chaonamwene	Malawi Bureau of Standards	Standards Manager (Committee Chair)
2	Richard Magombo	PUMA Energy Malawi Limited	HSSE & A Manager (Vice Committee Chair)
3	Juventius Flao	Total Malawi Limited	HSEQ & SD Manager
4	E. Pingani	Petroleum Importers Limited (PIL)	HSSE Manager
5	M. Banda	International Haulage Brokers (IHB)	Operations Officer
6	F. Panjwani	Bio-Energy Resources Limited (BERL)	Quality Control Manager
7	Juwo Sibale	Ministry of Environmental and Climate Change Management	Principal Environmental Officer
8	A. Mhango	Ministry of Labour	Chief Industrial Hygienist
9	T. Sukasuka	Department of Energy Affairs	Assistant Director
10	R.L. Banda	Road Transport Operators Association (RTOA)	Accountant
11	S. Changalusa	Afrox Malawi Limited	SHEQ Coordinator
12	Welton D. Saiwa	Malawi Energy Regulatory Authority	Director, Technical Regulation
13	Michael P.S. Mwase	Malawi Energy Regulatory Authority	Senior Safety, Health & Environmental Officer
14	Mphatso Kachule	Malawi Energy Regulatory Authority	Senior Legal Officer
15	George M. Ndilowe	Malawi Energy Regulatory Authority	Senior Engineer (Fuels)
16	Mike M.E. Missih	Zagaf Transport	Operations Manager
17	George Nyondo	Total Malawi Limited	Logistics Manager
18	S.H.D. Chitsime	Road Transport Operators Association (RTOA)	Executive Director
19	Leyneck Manjandimo	International Haulage Brokers (IHB)	Finance & Administration Manager
20	Goodluck A. Kayange	Ministry of Labour	Principal Safety and Health Officer
21	MacDonald Nzima	Department of Energy Affairs	Principal Energy Officer
22	Francis N.C. Gondwe	Malawi Energy Regulatory Authority	Licensing Officer
23	Chris Mazuwa Chiumia	Ministry of Environmental and Climate Change Management	Principal Environmental Officer
24	Lusibilo Chakaniza	Ethanol Company	Process Engineer
25	Michael Malanga	Afrox Malawi Limited	SHEQ Coordinator
26	Tufwane Mwangomba	Malawi Energy Regulatory Authority	Licensing Officer

27	Inge Knapen	Bio-Energy Resources Limited (BERL)	Public Affairs Officer
28	Annie Lisuwali	Malawi Energy Regulatory Authority	Administrative Assistant