Eskom	Work Instruction	Duvha Power Station Generation

Title: **HYDROCARBONS MANAGEMENT WORK INSTRUCTION**

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Content

1. INTRODUCTION

Hydrocarbons pose a serious pollution problem when released into the environment. Due to the nature of mineral insulating oil or hydrocarbons used in Duvha's equipment's, effective oil management is required to ensure the prevention of pollution and ecological degradation. Aspects such as usage, handling, storage, transport, disposal and general control of this commodity needs careful management.

2. SUPPORTING CLAUSES

2.1 Scope

This document involves management of all hydrocarbons and is applicable to everyone working on or within the Duvha Power Station premises

2.1.1 Purpose

The purpose of this document is to provide guidance regarding the management hydrocarbons at Duvha Power Station in order to minimise impact on the surroundings and the natural environment

2.1.2 Applicability

This document shall apply throughout Duvha Power Station employees and contractors.

2.1.3 Effective date

This document will be effective from the date of authorisation date.

2.2 Normative/Informative References

2.2.1 Normative

[1] ISO 9001 Quality Management Systems
[2] DUV0048 Duvha Environmental Policy.

2.2.2 Informative

[3] ENVP0005 Procedure for Waste Management
[4] ENVP0020 Procedure for Legal and other Requirements
[5] EPM001 Procedure for Emergency Preparedness

2.3 Definitions

2.3.1 Bioremediation – a biological process by which oil is reduced to less complex molecules

Clean Up – Refers to the action of remediation, this may include soil excavation, bioremediation, solvent soil wash, or electrochemical treatment

2.3.2 Containment – the prevention of the spreading of the hydrocarbon spillage

2.3.3 Disposal – the process of disposing off unwanted material in a correct and responsible manner. The disposal of hydrocarbons or material contaminated with hydrocarbons must be done at an authorised hazardous waste disposal site

2.3.4 Drip – this is where continuous dripping is taking place and result in pooling of the oil

2.3.5 Explosion – this is a situation which occurred due to the rupture of electrical equipment as a result of an electrical fault.

2.3.6 Leak – a continuous dripping taking place and this will result in pooling of oil and will need corrective action (e.g. a leak would warrant electrical equipment to be topped up).

2.3.7 Major spillage - An oil spillage where a large quantity of oil is involved and environmental contamination is anticipated. This spillage must be cleaned up as quickly as possible, in collaboration with specialists

2.3.8 Minor spillage - An oil spillage that can be cleaned up by local personnel by using oil absorbent products and where no contamination of the station drains is likely to occur

2.3.9 On-site – any area within the jurisdiction and management of Duvha Power Station.

Off-site – a site, road, or property not within Duvha Power Station or its management

2.3.10 Remediation – entails a method of clean-up that will ensure a minimum hydrocarbon presence of 1000 ppm or (0.1 %) above ground level, whichever is higher.

2.3.11 Responsible person – the person appointed by the responsible line manager, who will take responsibility to prevent spillages, and take responsibility during remedial action following a spill. This might be an environmental practitioner or the responsible site manager

2.3.12 Spill – is defined as overflow of hydrocarbon out of its “normal’ container or containment.

2.3.13 Weep – this is where no free running oil is visible, but the area is damp with oil. It will be an area where dust is accumulating but no effective loss of oil is evident.

2.4 Abbreviations

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Abbreviation	Explanation
CSM	Chemical Services Manager
DWS	Department of water and Sanitation
EMD	Electrical Maintenance Department
HMD	Heavy Maintenance Department
OPS	Operating Support Department
MOT	Main Oil Tank
SM	Shift Manager
OM	Operating Manager
PCB	Polychlorinated Biphenyl
PPM	parts per million
UTO	Used Transformer Oil
WTP	Water Treatment Plant

2.5 Roles and Responsibilities

2.5.3 Line Managers/ Supervisors

Responsible for areas where oil is used must ensure that their personnel adhere to this procedure. They must also ensure that each area where oil is present and spillages can happen, appropriate spill kits are made available and such kits are maintained in a state adequate to deal with the worst spill (a spill kit is any product that can be used to contain the oil spill), and such kit shall be easily accessible. Contaminated kits shall be disposed of in accordance with the current Waste Management Procedure (ENVP0005) for the Power station.

2.5.4 Electrical Maintenance Manager:

- Conduct inspections and maintenance of transformers and transformer oils according to the PM Schedules

2.5.5 Operating Support Manager:

- Offloading of all fuel oils received by road tankers
- Clean-up of any fuel oil spillages during offloading and transfer of fuel oil to the bulk storage tanks
- Clean up and rehabilitation for all oil and oil related spillages on site.

2.5.6 Chemical services personnel:

- Sampling and analysis of the effluents from the station drains;
- Analysis at designated boreholes for oil associated components;
- Carry out sampling on the transformer oils

2.5.7 Environmental Officer & Environmental Manager:

- Loading those hydrocarbon related incidents that have a potential to impact the environment through use of the SAP EH&S and SAP QIM system.
- Should reporting to stakeholders outside the business unit or the organisation be necessary, it is the responsibility of the Environmental Manager to ensure that reporting takes place.
- Facilitating training and awareness related to the detrimental effects of Hydro carbons on the environment.
- Responsible for completing and capturing the Oil spill assessment form (240-47176039) on SAP

2.5.8 WTP personnel

- Must inform the CSM immediately if any irregular condition is observed, during inspections, on the oil trap emergency dam at the station drain outlet.

2.5.9 OPS with their cleaning contractors

- With the help of MMD personnel must supply the necessary pumping equipment and to assist with pumping, recovery and cleaning up of spills

2.5.10 Every employee & contractor working in or on behalf of the station

- Is responsible for handling oil correctly and be aware of the detrimental effects it could have on the environment
- When working with oil, employees and contractors must ensure that every spill is reported, recorded and cleaned

2.5.11 Waste Officer

- Must ensure that all hydrocarbon contaminated materials are disposed of at a permitted hazardous waste disposal site.

2.6 Related/Supporting Documents

2.6.1 Records Generated

(1) Hyperwave form 240-47176039 – spillage assessment table form

(2) Hyperwave form 240-47176095 – spillage feedback form

3. ACTIONS

3.1 Transformers and transformer oil

The overall responsibility of transformers and transformer oil management lies with the Electrical Maintenance Manager.

The potential impact of the transformer oil lies in the possible rapturing of the transformer and a subsequent transformer oil spillage, which could lead to soil and water contamination. In order to reduce the impact, the responsible manager shall ensure that:

- Bund drains valves are permanently closed and locked;
- Regular inspections are conducted;
- Extra oil be disposed of according to waste procedure;
- Regularly drain any accumulated rainwater from bunds;
- Prevent the bund from overflowing in case of major leaks;
- Ensure that necessary pre-cautions are applied in order to prevent ignition of the transformer oil;
- Recover all spills as soon as possible.

3.2 Waste Oil and Grease

The storage of all waste fuel oils, waste lubricating oil, and grease as well as general housekeeping in and around the storage area is the duty of OSM.

In order to minimise the impact, the OSM must ensure that:

- Storage area is properly maintained and restricted to bunded areas;
- Allocation of dedicated person to effectively manage the storage area;
- All the oil spills are contained and reclaimed before they spread;
- Contaminated soil is bio-remediated or disposed of in hazardous skips;
- Spill kits available and accessible on site for clean-up;
- Conduct regular inspections on the area to ensure proper management practices.

3.3 Fuel Oil

The management of fuel oil area (including off-loading) is the responsibility of OSM. The OSM must ensure that the following are practiced in order to minimise the impact on the surrounding environment:

- Ensure that offloading is continuously supervised and roper management practices are applied during offloading;
- Containment equipment are always kept at the offloading area and structures are at good working conditions;
- Regular maintenance and inspections are done at the off-loading & storage area.

3.4 Handling of oil spills from different types of hydrocarbons

In case of hydrocarbon spill, the following must be followed in order to ensure cleaning, disposal, and rehabilitated of the affected area is done correctly. This will, in turn minimise the impact of the spill on the surrounding environment:

3.4.1 Spillage of Fuel Oil

- Fuel oil is the crudest product that is used on site and it needs to be treated as a potentially very dangerous environmental polluter.
- Spilled fuel oil can be removed by using oil absorbent booms or mats, which can be ordered from the store. After hours, the SM should be contacted.
- Use White Spirits or Acetone (found in the Oil and Chemical laboratories) to clean up the area properly. Avoid the usage of aromatic organic compounds such as Benzene and Toluene as they are carcinogenic (can cause cancer).
- The disposal of the booms will be according to the station's Waste Management Procedure (ENVP0005).

- The spillage of fuel oil into station drains should be avoided at all costs.
- Oil spill kits or any other material used to clean up oil are to be kept in a lockable area at the Fuel Oil Off-loading plant or where fuel oil is used, to be proactive in case of a spillage.
- Suitable drip trays must, at all times, be put underneath the couplings of bulk fuel oil tankers to minimise oil spillage. When they are full, the oil is emptied into the fuel oil sumps.
- Major spillage should be treated by specialists. The Environmental Officer should be contacted in case of major spillages.

3.4.2 Spillage of Fire Resistance Fluid (FRF)

- FRF has a high density than water and it will always settle at the bottom of the water if spilled into the station drains. As a result, the oil skimmer plant will not be able to remove it from the station drains outlet to the dirty dam and thus a spill must be prevented at all times.
- A spill into the bed-plate underneath the FRF hydraulic system needs to be drained into metal drums, through the drain pipe to zero meter level
- For any small FRF spills use oil absorbing cushions to absorb the chemical. These cushions can be ordered from the stores during normal working hours or contact the SM after hour.
- In case of a large FRF oil spill in the MOT room, booms must be used to contain the spill. The hydraulic fluid must be allowed to settle in the trenches underneath the main oil tank from where it can be drained into metal drums or a bulk tanker
- Any oil contained in the MOT lube oil bund can be drained off in the same above mentioned manner
- Contact the oil store personnel for the removal of full oil drums
- In case of a major spill, notify the SM, OM, CSM, Fire Department and the Environmental Officer
- Suitable drip trays must be used with topping up, the replacement of filters or any maintenance related activities, involving oil, on the plant
- Major spillage should be treated by specialists.

3.4.3 Spillage of Mineral Oil (Gear, Lube, Hydraulic, Transmission)

- Minor spillage can be treated with absorbent pads. Sand/ash can also be used but it needs to be bio-remediated afterwards
- The absorbent pads will be disposed in accordance with the Waste Management Procedure (ENVP 0005).
- In case of a large spill, use booms to contain as much oil as possible within the smallest area possible. Use a barrel pump from MMD to recover as much oil as possible for recycling and store this in drums. The drums must be clearly marked as Waste oil
- Contact the oil store personnel for the removal of these oil drums.
- Suitable drip trays should always be used when draining, filling, replacing filters or performing any relevant maintenance work on the plant
- The SM should contact the OM, CSM, Fire Department and the Environmental Officer regarding major spills as specialists are needed
- All removed oil filters must be stored in red waste bins, separate from the domestic waste, for disposal to a Hazardous Waste Site in accordance to the station's Procedure for Waste Management (ENVP0005).
- Small quantities of waste oil from the plant must be kept in a waste oil drum at the oil store for disposal by the oil removing company.

3.4.4 Spillage of Transformer Oil

- When there is a spillage of transformer oil, the PCB status of the oil must be checked before attempting to clean the spill. There are stickers on all the transformers to show the PCB status of oil contained in the transformer.
- If the oil is PCB contaminated, treat the spill as specified in the Corporate Standard on Management of PCB's (Document no: 32-245).
- If the status of the PCB is not known, treat the oil as PCB contaminated until tested otherwise
- If the oil is PCB free, ensure that it is clearly marked as such, and act as follows:
- If the oil is contained in the bund area, recover as much of it as possible for recycling purposes
- Transfer the oil in metal drums and place them at the oil store for collection by the oil removal company

- Clean the bund area with the absorbent pads and the pads must be disposed of according to the Waste Management Procedure (ENVP0005)
- Always contact the CSM, the OM, SM, Environmental Practitioner and the Fire Department in case of a spill
- Major spills must be cleaned up by specialists.

3.4.5 Rehabilitation of affected soil.

In the event of an oil spillage on exposed or grassed soil the following tasks should be performed:

The uppermost ten centimetres (10 cm) of soil should be removed;

(i) Using an excavator for larger spills.

(ii) Using shovels and spades for smaller spills.

Should the affected soil be underlain by compacted layer, it is advised that as much polluted soil be removed as physically possible.

After the removal of the uppermost ten centimetres, the Environmental Practitioner should be contacted to evaluate the extent of contamination into the sub-surface area where the spill occurred. Should the EP's evaluation conclude that the spill has seeped deeper than the prescribed 10cm, it will be required that more soil be stripped until seepage is not prevalent.

When stripping of topsoil has been completed in a satisfactory manner, tilling may commence.

3.5 Work Instruction

- In case of an oil spill, secure the site and contain the spill to avoid further pollution, determine the spill boundaries, prevent unauthorized access to the spill site and notify all parties involved.
- The securing can include barricades, ropes, plastic taping or covers, or any other appropriate measures in order to prevent access or spread of the contamination.
- Prevent the spill from flowing into water courses or station drains, by containing it using soil barriers, sand bags, ash, bund walls or absorbent materials
- Notify the SM on duty, Fire Department, CSM, Environmental Practitioner and the OPS department for proper cleaning
- Take note of the type of oil spilled and the quantity, if possible
- Recover as much oil as possible for recycling purposes

- The affected area must be dealt with according to the recommendations of all concerned parties, in the most economically viable way without any undue compromise to environmental and safety measures

Note: All waste absorbent materials (rags, booms, cushions saw-dust) recovered from the oil spill site should be disposed of according to the station's Waste Management Procedure (ENVP0005).

3.6 Emergency Telephone Numbers

In case of an oil spillage, the following people should be contacted:

- Operating Support Manager
- Chemical services Manager
- Environmental department
- Fire Department
- Safety Risk Management
- Materials Management
- Station Cleaning Contractor

3.7 RECORDS

(i) Records of all incidents and/or oil spillages must be reported to the environmental practitioner who will capture it on SAP EHS System and Oil Spill assessment form (240-47176039).

(ii) All records of incidents reported and investigated via the SAP QIM system will be kept by the Quality Assurance Department.

4. ACCEPTANCE

This document has been seen and accepted by:

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5. REVISIONS

Date	Rev.	Compiler	Remarks
June 2020	1	T Lechaba.	Minor addition on 2.5.7 & 3.4.4
June 2016	0	B Ratlhogo.	Original. This procedure is a consolidation of procedures ENVP0006,ENVP0007, ENVP0008 and ENVP0009 .

6. DEVELOPMENT TEAM

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

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- T Lechaba