



ESKOM

STANDARD

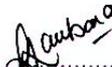
TITLE: OIL SPILL CLEAN-UP AND
REHABILITATION

REFERENCE REV
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COMPILED BY

FUNCTIONAL RESP.

AUTHORIZED BY



A E Lombard and
M E Hunter


V Govender
CEAM


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Foreword

This standard has been compiled to set a uniform standard addressing oil spill emergencies and long term action following the need identification by Eskom's Corporate Environmental Affairs Department. The standard addresses the containment and the remediation issues surrounding an oil spill. It also gives a risk rating and response reaction guideline. The standard was compiled following various discussions with staff involved in oil spills as well as response teams from various organizations

NOTE All comments for revising and updating this document must be directed to the Environmental Liaison Committee (ELC), who will in turn liaise with the Technology Standardization Manager.

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Introduction

Insulating oil and other related hydrocarbon and synthetic compounds pose a serious pollution problem when released into the environment. Not only do these compounds pose a fire hazard, but with one litre of oil having the potential to contaminate in excess of a million litres of water, it needs to be handled with care. Oil can rapidly penetrate certain soil types, which may lead to extensive soil contamination as well as ground water and surface water contamination. The Water Act 36 of 1998, states that "hydrocarbons should not touch the soil or water and if they do, they shall be removed immediately".

1 Scope

1.1 Purpose

The purpose of this standard is to communicate a standard policy and response action following an oil spill on a site. It includes a rating system to enable a risk assessment that will assist with the reporting and especially the level of reporting of an oil spill.

This standard is applicable to any oil handling site and oil containing equipment, which includes distribution, transmission, generation sites as well as all contractors working on Eskom sites. It is of particular importance for employees in oil storage areas, maintenance teams and contractors to be familiar with the contents of this standard.

1.2 Applicability

This standard is applicable to all Eskom employees and contractors who in the event of their daily activities come across an oil spill.

2 Normative references

The following documents contain provisions that, through reference in the text, constitute requirements of this standard. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below. Information on currently valid national and international standards and specifications can be obtained from the Information Centre and Corporate Technology Standardization Division at Megawatt Park.

Erickson, MD:1993, *Remediation of PCB Spills*. Lewis publishers, Tokyo.

Waste-tech:1999, *National spill response service*.

MRO Product Management:1999, *Inland oil spill contingency plans*.

Eskom:1999, *NIOSC Insulating Oil Manual*.

ESKADABG8:Rev.0, Directive on oil spill clean-up and rehabilitation.

3 Definitions and abbreviations

3.1 Definitions

3.1.1 clean-up: The action of remediation, this may include soil excavation, bio-remediation, solvent soil wash, landfarming or electrochemical treatment.

3.1.2 containment: The prevention of the spreading of the oil spill.

3.1.3 drip: Where continuous dripping is taking place and can result in pooling of the oil.

3.1.4 explosion: A situation, which occurred due to the rupture of electrical equipment as a result of an electrical fault.

3.1.5 leak: A continuous dripping that will result in pooling of oil that will require corrective action as the electrical equipment will have to be topped-up.

3.1.6 off-site: A site, road or property not belonging to Eskom.

3.1.7 on-site: Any Eskom site (including any Eskom leased site).

3.1.8 remediation: A method of clean-up that will ensure a minimum hydrocarbon or synthetic oil presence of 1000 ppm or (0,1 %) above the background level.

3.1.9 Responsible Person: The person appointed by the relevant line manager, who will take responsibility during remedial action following a spill. This might be the environmental co-ordinator or the relevant site manager.

3.1.10 spill: Any amount of oil present out off its "normal" container – where normal refers to a transformer or a drum etc.

3.1.11 weep: 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.

3.2 Abbreviations

3.2.1 NIOSC: National Insulating Oil Steering Committee

3.2.2 PCB: polychlorinated biphenyls

3.2.3 ppm: parts per million

3.2.4 TSI: Technology Services International

3.2.5 UTO: used transformer oil

4 Requirements

4.1 General

An oil spill may be defined as being any amount of oil no longer present in its normal container or equipment. The Water Act, 1998 (Act 36 of 1998) states that "hydrocarbons should not touch the soil or water and if they do, shall be removed immediately". Oil spills can be categorized as being small or large, historic, weep, seep, drip, leaks on Eskom or neighbouring sites or major catastrophic events. However, the immediate prevention and clean-up is considered to be essential in all of the above.

4.2 Assessment of the spillage

Assessment of the oil spill will need considerable judgement to perform. Evaluating the cause, extent and ultimate corrective action can be done using the table given in annex A. The assessment shall include the following factors:

- a) identifying the source of the spill;
- b) the age of the spill;
- c) life-threatening conditions;
- d) weather conditions;
- e) properties affected (Eskom, neighbours, National roads);
- f) traffic implications;

- g) threat to any water bodies;
- h) PCB presence;
- j) soil types; and
- k) public relations threat.

4.3 Securing of sites

Where necessary, secure the site and contain the spill to avoid further pollution, determine the spill boundaries, prevent unauthorized access to the spill site and, where required, 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.

4.4 Spill on an Eskom site

4.4.1 Limit the spillage

The need for immediate corrective action to limit the spillage cannot be overemphasised as this will minimize the environmental damage and reduce remediation costs. This can involve actions such as:

- a) closing a valve;
- b) repairing the leak with rags, plugs or other appropriate material;
- c) repositioning the container so that the leaking area is at the highest level or lifting a fallen drum/container;
- d) placing a leaking container or equipment into a collecting tray or bund area; and
- e) collecting the spilt oil in a container located underneath the leak or channelling the leak into a container.

4.4.2 Containing the spillage

The containment of a spillage will involve an action that will either prevent or stop a spill from spreading. It is vital to prevent any oil spill from entering waterbodies such as drains, stormwater systems, dams or rivers. Containment of the oil near the source will minimize pollution and will enable easy clean-up and/or remediation. This shall be done using one or more of the following:

- a) soil barriers;
- b) sand bags;
- c) bund walls; and
- d) absorbent materials.

4.4.3 Removal of oil

The free oil (puddles) shall be captured and put into a suitable container such as a drum or tanker for proper disposal as soon as possible.

This oil shall not re-enter the Eskom insulating oil pool for regeneration and re-use in electrical equipment.

4.4.4 Final clean-up/remediation

After removal of excess oil, saw dust, suitable absorbents or solvents shall be used to complete the clean-up of the spill. This might include the removal of leaking equipment, cleaning of pavements, removing contaminated soil and vegetation, as well as disposing of clean-up equipment. The absorbing material shall be bagged and disposed of at a class HH registered site.

PCB material shall be incinerated, encapsulated or de-chlorinated following consultation with NIOSC who will advise on the most viable option.

4.4.5 Bio-remediation/Landfarming

Bio-remediation/landfarming are based on the principle of stimulating the relevant microbes in order to break down the hydrocarbon molecules present in an oil spill. Landfarming will entail treatment of the soil away from the affected area, whereas bio-remediation will be done in-situ. Generally these processes may need stimulation or human intervention and are normally performed after the initial remediation phase to ensure total remediation of the site. These processes will need to be completed by bio-remediation /landfarming specialists in accordance with Eskom's approved supplier/contractor list.

4.5 Spill on a non-Eskom site

This shall be considered as a major spill greater than 25 points on the assessment scale in annex A and shall be treated as such.

4.6 Recommended spill kit

To allow for a rapid response and clean-up to an oil spill, it is mandatory for all Eskom sites and vehicles handling oil to have access to a recommended basic spill kit. The vehicle kit shall be a smaller version of the site spill clean-up kit, that meets the basic requirements for the volume of oil transported. This shall be used in the event of a spill that is less than 12 points as assessed using the table in annex A.

Adequate and relevant training shall be given to all staff, maintenance teams and contractors working with oil on an Eskom site. This shall involve the actions to be taken following an oil spill as well as the use of the recommended oil spill kit.

The recommended oil spill kit shall contain the following:

- a) 2 pairs of latex or neoprene gloves;
- b) 20 heavy duty disposable bags (rubbish bags);
- c) 1 shovel;
- d) 1 hard bristle broom;
- e) 5 absorbent pads;
- f) 3 bags of absorbent material (cellulosic or other efficient material); and
- g) 1 pair of plastic goggles.

If a station or site is close to surface water, oil absorbing material for removal and containment of oil on water shall form part of the standard kit.

4.7 Remediation contractors

Because of the emergency situation surrounding an oil spill clean-up, and to avoid bureaucratic delays in obtaining necessary approvals for appointing contractors, it is recommended that annual contracts are established on an “as and when required” basis with approved and relevant hazardous or emergency response teams. This will involve the availability of such a team, and agreement on relevant costs if an unforeseen event occurs.

4.8 Testing

Samples for both hydrocarbon and PCB content or other synthetic oil level evaluation shall be taken and submitted to TSI or approved laboratories for analysis. This shall form part of the evaluation of the oil spill assessment as well as the remediation procedure and prior to final payment, to ensure compliance with the relevant legislation.

4.9 Oil storage

To limit any potential oil spill, it is recommended that all sites where insulating oil is stored are accredited in terms of Eskom’s NIOSC manual. For all other oils, the relevant Eskom standards shall be adhered to.

UTO removed from equipment shall be promptly salvaged and returned to the closest, authorized regeneration facility after its removal from the equipment.

4.10 Reporting

All oil spills shall be assessed using the standard formats in annexes A and B. The completed forms shall be copied to the environmental co-ordinator who shall ensure that all appropriate reporting is carried out in accordance with the latest legislation.

4.11 Training

The Environmental co-ordinators responsible for the site shall ensure that appropriate training is given in the use of the spill equipment, reporting and emergency response procedures.

4.12 Preventive measures

Prevention remains better than cure and for this reason each spill shall be evaluated and analysed and appropriate preventive measures adopted. Any oil site design or facility shall be evaluated using relevant tools such as the Electrical Power Research Institute (EPRI) Mineral Oil Spill Evaluation System (MOSES) MP software that is available to the Eskom line groups.

Annex A
(normative)

Model oil spill assessment table

Using your judgement and the facts available, allocate the relevant points (1, 3 or 5) to each of the following and add them together. The cumulative score will dictate the appropriate corrective action.

Condition	1	2	5
Source of the spill	Weep	Drip/Leak	Explosion/Incident
Age of spill	Historic	Happened recently - spill still moist	Happened within last 24 h
Threat to any waterbody	No threat	Threat with rain	Access to waterway
Containment	Leak is minor – can be controlled, contained and plugged with oil spill kit	Leak is moderate – cannot be successfully managed with spill kit.	Leak is serious, containment is impossible
Life threatening Conditions	Not at all	Moderate (Environmental or health risk only)	Serious (Explosion, fire, health and major environmental)
Weather conditions	Good weather and will last until spill is cleared	Moderate, but may change suddenly to weather conditions which will hamper containment	Raining
Properties affected	None	On-site (Only Eskom's property is affected)	Off-site (Eskom's neighbouring properties and public roads) ≥25 points
Public relations threat	Small	Medium	Large
Soil types	Clay or compacted ground	Loose or loam soil	Sandy soil and Gravel
Traffic implications	Not on any road	Public road	Road closed
PCB presence*	None	Less than 50 ppm in the oil	Over 50 ppm in the oil will automatically get ≥25 points
Total score <input style="width: 40px; height: 20px;" type="text"/>	Sub total	Sub total	Sub total

Signature _____ Name _____ Date _____ Site _____

Annex A
(concluded)

Minor spill ≤ 12 points	Moderate spill 13 – 24 points	Major spill ≥ 25 points
Clean-up must be performed and a report issued to the relevant Environmental co-ordinator	Contain and call in the assistance of the Environmental co-ordinator	Contain, call on Environmental co-ordinator who will assess the situation and if needed call upon an emergency response team

*If the PCB levels of the oil are not known through prior testing, the spill shall be treated as a PCB spill, until such time that analysis proves otherwise.

Annex B
(normative)

Model oil spill feedback form

Please attach additional notes if necessary or if the space supplied is not sufficient

1	Give a short description of the oil spill incident.	
2	Give a short description on the following: -What was done immediately after the spill was discovered? -Could it be contained and how? -Was an emergency team involved and was it a contracted team? -Was free oil evident, how was this removed and what happened to this oil? -Has final remediation begun and what is being done? -Were PCB test results available and during which phase was this established?	
3	Which role did you fulfill within the process?	
4	How many litres of oil were involved?	
5	How big was the area that was polluted?	
6	Did any water pollution occur in the following areas? -trap dam -river -dam (water supply) -streams -underground	
7	How would you describe the incident – major or minor?	
8	Were there any other hazards or issues that needed attention?	
9	What were the weather conditions? -wind -temperature -precipitation, for example, rain or fog	
10	What were the causes - please explain? -human -technical -physical -organizational	
11	What was affected? -installation - describe -establishment -off-site local -off site regional	
12	How many people were affected? -staff -locals Describe the possible risks.	

Annex B
(concluded)

13	What were the ecological effects? -pollution/contamination/damage -residential area -common wild fauna/flora -water catchment areas -land -marine or other fresh water	
14	What were the material losses (in Rands)? -material (costs to Eskom) -response -clean-up -restoration	
15	Was any community life disrupted?	
16	Was any utility such as electricity, sewage or water interrupted?	
17	Was there significant public concern?	
18	Who was notified within Eskom?	
19	Who was notified outside of Eskom?	
20	What lessons were learnt from this? -measures to prevent recurrence -measures to mitigate consequences -useful references	
21	Did you experience a lack of: -guidance -expertise -standards -directives -reference material -Eskom assistance -Outside assistance	
22	Any recommendations	
23	Any other comments	

Name _____ **Signature** _____

Date _____ **Site** _____