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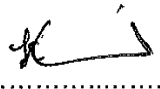

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1 Introduction

Fire Risk Management within the Eskom environment is considered to be a component part of Corporate Services (SHE) and is directly aligned and supportive of the content of the Safety, Health and Environment Policy.

The discipline of Fire Risk Management has many facets and interfaces with many other disciplines and activities. This document confirms the linkage and association with other (fire fighting, safety, environment and Integrated Risk Management) documents already in place within the Eskom environment. It also serves to re-enforce adherence and support of statutory requirements, best practise considerations and insurer recommendations relating to the Management of Fire Risks.

2 Document Content

2.1 Requirements

2.1.1 Fire safety

1. Fire Safety is an integral part of the general safety and protection of Eskom employees, contractors and members of the public (at Eskom facilities) from the effects of fire, heat and smoke. As a minimum, this is ensured by compliance too and the application of legislative and policy requirements.

2. Any building shall be so designed, constructed and equipped that in case of fire –

- (a) the protection of occupants or users therein is ensured and that provision is made for the safe evacuation of such occupants or users;
- (b) the spread and intensity of such fire within such building and the spread of fire to any other building will be minimized;
- (c) sufficient stability will be retained to ensure that such building will not endanger any other building: Provided that in the case of any multi-storey building no major failure of the structural system shall occur;
- (d) the generation and spread of smoke will be minimized or controlled to the greatest extent reasonably practicable; and
- (e) adequate means of access for fire fighters and equipment for detecting, fighting, controlling and extinguishing such fire is provided.

3. The safety of personnel engaged in fire fighting duties, whether in buildings, structures or in any other area, site, location or environment shall be considered and managed.

2.1.2 Fire Prevention

1. During design and development of specifications for processes, equipment, and buildings, the potential for fire must be considered.

2. Specific attention to the control of fuel (i.e. spills, leaks and storage) and/or ignition sources (including hot work – see annexure B.1) under normal and emergency conditions included in the evaluation and development of adequate site specific controls or interventions (see annex A.3).

3. Also, the development of fire safety information applicable to employees (including contractors) for their immediate working environments, for which they are to be informed and trained, shall be addressed.

4. Regular inspections of work areas are established and undertaken to address life safety considerations, including both fire prevention and fire protection aspects.

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5. Develop a process for continuous risk assessment, to ensure no new fire hazards are introduced into the work environment, without considering measures to prevent or mitigate risks or exposures relating to Fire Risk Management.

6. Fire Risk Management is included in the development of Safe Work Procedures, for any work process, operation, activity in the working environment.

2.1.3 Fire Protection

1. As considered and applied during the design, alterations and modifications to processes, equipment, and buildings. This could include the specification and use of non-combustible materials, construction features (including compartmentation, or spatial separation of risks or hazards) active and/or passive fire protection measures.

2. The measures and infrastructure that may be required in addressing this aspect will vary and be dependent on a risk assessment/profile of the site or Business Unit. From the provision of portable fire fighting equipment (generally, a statutory requirement) to the installation of a fixed fire protection system (water sprays – sprinkler or deluge systems, gas suppression systems and or fire detection systems) shall be considered in terms of statutory requirements and/or good engineering and Management practise.

3. In collaboration with Eskom internal and user/stakeholders requirements, related engineering disciplines, any additional recommendations from stakeholders, relating to fixed fire protection systems or measures in minimizing the impact of fire (e.g. from appointed consultants and/or Insurance recommendations) shall be considered.

4. Requirements relating to the continued functionality and operability of such fixed fire protection systems and equipment (inspection, functional testing and maintenance) shall be ensured and adequately addressed. This shall be determined from statutory, legislative and good engineering practise, manufacture's recommendations (O & M manuals) information and resources.

5. Should active fire protection systems or measures in place addressing the risks associated with identified hazards, exposures become impaired during normal operations, measures and interventions must be considered to ensure acceptance of risk levels are not excessive. A process relating to fire system impairments shall be defined and implemented to ensure reporting and Management of these circumstances and this information. See annexure B.2

6. Where considered applicable and appropriate from the results of a BU/site-specific risk assessment/profile, the establishment of a manual fire fighting capability shall be addressed. This could, as a minimum requirement, be limited to the provision of training in the use and operation of portable fire extinguishers and hose reels.

7. The development of an in-house advanced fire fighting team infrastructure for some BU's / sites shall be considered (including the provision of specialized equipment, training requirements and management of such infrastructure functions) subject to a risk assessment/profile for the BU/site.

8. The development of pre-fire plans in support of the fire protection considerations and the interface with any off site local authority or external fire fighting response available to a BU or site, shall be addressed.

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3 Supporting Clauses

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3.1 Scope

3.1.1 Purpose

This document tables defines the responsibilities relating to Fire Risk Management. It also identifies the applicable and appropriate requirements and recommended resources in developing a consistent approach to fire prevention and protection.

Fire Risk Management must address the issue of Fire Safety by the use of fire prevention and fire protection measures from uncontrolled fire. Secondly, that the protection of assets, plant and equipment from an uncontrolled fire and its possible affects (including their continued function and operation) must be adequately addressed.

3.1.2 Applicability

This standard shall apply throughout Eskom Holdings, its divisions, subsidiaries and entities wherein Eskom has a controlling interest.

3.2 Normative/Informative References

Parties using this standard shall apply the most recent edition of the documents listed below.

3.2.1 Normative

Occupational Health and Safety Act 85 of 1993

National Veld and Forest Fire Act 101 of 1998

SANS 10400: Application of National Building Regulations

32-108: Eskom Standard - Fire Fighting Organization

3.2.1 Informative

The following listing of documents is not exhaustive or complete, and the reader is encouraged to contact the compiler for further additional advice or information.

SANS 1910: Portable rechargeable fire extinguishers

SANS 1567: Portable rechargeable extinguishers - Co2

SANS 10087: LPG

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SANS 10089: The petroleum industry

SANS 10090: Community protection against fire

SANS 10105: The use and control of fire fighting equipment

SANS 10287: Automatic sprinkler installations for fire fighting purposes

SANS 10139: Fire detection and alarm systems for buildings

ISO 14520-1: Gaseous fire-extinguishing systems

3.3 Definitions

Not Applicable

3.4 Abbreviations

3.4.1 CE: Chief Executive

3.4.2 EIMS: Eskom Insurance Management Services

3.4.3 MD: Managing Director

3.4.4 O & M: Operating and Maintenance

3.4.5 EDC: Eskom Documentation Centre

3.4.6 OH & S: Occupational Health & Safety

3.4.7 SHE: Safety, Health and Environment

3.4.8 BU: Business Unit

3.4.9 DCP: Dry chemical powder

3.4.10 Co2: Carbon Dioxide

3.4.11 LPG: Liquefied petroleum gas

3.4.12 CSD: Corporate Services Division

3.4.13 CS (SHE): Corporate Sustainability (Safety Health & Environment)

3.4.14 NFPA: National Fire Protection Association

3.4.15 FM Global: Factory Mutual Global

3.4.16 SANS: South African National Standards

3.4.17 ESCAP: Eskom captive insurance company

3.4.18 GS&A: Generation Safety and Assurance

3.4.19 OHSLC: Occupational Health & Safety Liaison Committee

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3.5 Roles and Responsibilities

3.5.1 Adherence to statutory requirements relating to fire prevention and protection must be ensured. This is to be reflected in all aspects of the Eskom Holdings Limited management, control, operations and function. As a primary management function, risk assessment(s) must be available and have been conducted to identify and document the risk from fire to which the business is exposed. Included in this assessment, measures identified to eliminate or reduce the impact on people, plant, equipment and the environment must be defined in a written document.

3.5.2 Corporate

The CS (SHE) Manager (Corporate Sustainability) shall ensure that a suitable response to Fire Risk Management issues and problems is catered for, included and addressed as part of the Occupational Health and Safety portfolio.

3.5.3 Group Level

Groups are responsible for addressing an adequate balance in fire prevention and protection within their working environments. This must be disseminated further down to Business Unit levels and will require a different approach within each of the Group(s) / Business Units relative to their operations, man-power levels, buildings, equipment, assets, statutory requirements and elements of good practise.

It is strongly recommended that specialized functions within the organization i.e. Capital expansion department / Eskom Enterprises (Chemical & Auxiliary Engineering) appoint suitably qualified, permanent, full time engineering personnel to address the areas of Fire Safety by appropriate and applicable intervention of fire prevention and fire protection measures.

3.5.4 Business Unit

In practical terms the development of a fire protection plan for the individual specific Business Units, sites, or locations shall be available (see Annex C). Information relating to the fire protection plan shall be available to ensure the overall Fire Safety, Fire Prevention and Fire Protection measures deemed suitable and necessary for the particular Business Unit (site or location) have been addressed.

3.6 Process for monitoring

3.6.1 The requirements contained in this standard, applicable to any Business Unit shall be monitored by the Business Unit on an annual basis.

3.6.2 Compliance to the requirements, as defined in this standard shall be arranged by the Business Unit and Corporate Technical Audit Department (in conjunction with CS (SHE) at least every 3 (three) years.

3.7 Related / Supporting Documents

3.7.1 The Fire Protection Plan (defined in Annex C) shall be available as a record for each Business Unit, building or structure. Random auditing of the sites will be undertaken as of 3.7.2.

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4 Authorisation

This document has been seen and accepted by:

Name	Designation
PJ Maroga	Chief Executive
B Nqwababa	Finance Director
ME Letlape	Managing Director (Human Resources Division)
E Johnson	Chief Officer (Network & Customer Service)
MM Ntsokolo	Managing Director (Transmission Division)
JA Dladla	Managing Director (Special Project 2010)
Dr SJ Lennon	Managing Director (Corporate Services Division)
BA Dames	Chief Officer (Generation)
A Noah	Managing Director (Distribution Division)
Dr B Mothebedi	Acting managing Director (Enterprises Division)

5 Revisions

Date	Rev.	Remarks
December 2006	0	Revision date and alignment with Eskom documentation system changes. Designation names (employees) referenced within this document were correct as per revision date.
October 2007	0	EDC ISO formatted
May 2008		Changes regarding Risk Finance and re-insurance.

6 Development team

The following list of personnel involved in the development of the document.

- Occupational Health & Safety Liaison Committee members (OHSLC)
- Fire practitioners (Generation)

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Annex A

(informative)

Informative / normative references

A.1 National Fire Protection Association (NFPA) - An internationally acknowledged American based organisation that specifically addresses the development of fire prevention and protection codes and standards. As a point of reference, a comprehensive series of standards and codes relating to specific issues, industries, and interventions applicable to the prevention and protection against fire. The use of these reference documents is strongly supported and encouraged.

Typical examples include -

NFPA 850 - Recommended practise for fire protection for electric generating plants and high voltage direct converter stations

NFPA 851 - Recommended practice for fire protection for hydroelectric generating plants.

A.2 Risk Control and Risk Finance – Risk Management in action

Risk control measures to ensure general safety and asset protection are to be incorporated into design, operation, maintenance and overall function within the Eskom spheres of operation. Measures to ensure fire prevention and protection shall be included, with mitigation actions and methods tabled which could include fire prevention, fire protection both passive measures and active systems.

Risk Finance in the form of Insurance is provided for - Eskom is self-insured and the financial aspect of this is administered through an internal department Eskom Insurance Management Services (EIMS) within the Corporate Services Division. By the collection of a related premium from BU's, insurance cover (financial re-imburement) is ensured and provided for losses that do occur.

As a component part of this arrangement, re-insurance is purchased to cover major and large losses, due cognisance of recommendations by insurance underwriters and providers or their agents shall be considered. A typical example of this can be seen in the **Property Loss Data Sheets**, provided by FM Global (a public domain web site is available) - which can provide a wealth of additional (Risk Control) information, insight and background relating to many risks and perils a Business Unit/site can be exposed to – a significant risk or peril being a fire.

In conjunction with local (principally SANS) identified statutory, legislative, and good practice requirements the reader is strongly advised to review the information from NFPA and FM Global property loss data sheets where this information is appropriate and take cognisance of this material.

Note: Where third party organisations conduct baseline and on-going evaluations at regular, frequent intervals, recommendations shall be documented and considered by BU Management and or project managers. The results of such recommendations could have a major affect on the financial aspects relating to the determination of premiums and settlement of claims, should an incident occur where sufficient attention to (fire) risks can not be demonstrated.

A.3 Administrative controls

The development of administrative controls (permits, inspections, conditions or other specialized tasks or actions) to address and regulate specific risks within a Fire Risk Management programme at Business Unit level shall be addressed and implemented. This is to be reflected in all aspects of the Eskom Holdings Limited management, control, operations and functions.

Typical examples include (but are not limited to) –

Safe Work Procedures

Hot work permit

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Confined space entry

Change Management process

Fire system impairment process

Plant Safety Regulations

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Annex B

(Normative)

Explanatory Information

B.1 Hot Work

Adherence to statutory requirements relating to hot work must be ensured (see OH & S act – General Safety Regulation, section 9). This regulation requires that there shall be a Management Process to control hot work.

Groups are responsible for addressing the Management and process to be employed within their area of operations and jurisdiction. Examples of typical administrative controls (permits) to manage hot work can be found referenced below and can be utilised as tabled or modified to address specific issues applicable within their work environments.

This must be disseminated further down to Business Unit levels and will require a different approach within each of the Group(s)/Business Units relative to their operations, manpower levels, buildings, equipment and assets.

Examples of content and layout of Hot Work permits are contained in these following documents and can be referred to, in support for development of in-house administrative control(s). Training in the operation and application must be addressed at BU level.

SANS 10287 – Automatic Sprinkler Installations for Fire-Fighting Purposes,
Annex B – Precautions When Carrying Out Hot Work

SANS 10089 – The Petroleum Industry – Part 1
Annex C, Examples of Typical Work Permits

Further additional information is available should the reader require further background in the development / implementation of a system / process to manage Hot Work in their work environment - NFPA 51B Standard for Fire Prevention during Welding, Cutting and other Hot Work.

B.2 Impairments – to fire systems

Groups are responsible for addressing the Management and process to be employed within their area of operations and jurisdiction in addressing this issue.

A shutdown of a fire system or portion thereof potentially relates to the following two conditions:

Emergency: A condition where a water-based fire protection system or portion thereof is out of order due to an unexpected occurrence, such as a ruptured pipe, an operated sprinkler head, or an interruption of the water supply to the system.

Pre-planned: A condition where a water-based fire protection system or a portion thereof is out of service due to work that has been planned in advance, such as revisions to the water supply or sprinkler system piping or building work requiring the fire systems to be shut down.

Impairments to fire protection systems shall be as short in duration as practical. If the impairment is planned, all necessary parts, manpower etc should be assembled prior to removing the fire protection system from service. Additional protective measures as necessary and available (e.g. temporary water supplies, additional manual fire fighting equipment, blanking off parts of a system to keep other parts operational) must be considered and documented.

When an impairment is not planned or when a system has discharged the repair work or system restoration should be expedited.

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Annex B

(Continued)

Process: A written process must be established to address impairments to fire systems to ensure that the Business Unit does not accept excessive risk or exposures that impact the fire hazard or exposure.

Included in the process there must be reference to a time frame of which the impairments can be tolerated e.g. no longer than a full working day or shift (i.e. longer than eight (8) hours)

As a minimum the site administrative control should address the following –

1. The BU / site concerned, date, time and identity of person reporting
2. Identify the equipment and area(s) affected by the fire system impairment.
3. Describe the type of system and extent of the system impairment.
4. Identify personnel to be notified e.g. site risk practitioners, safety, fire officers, maintenance personnel, control staff, security staff – any applicable off site notifications (local authority fire brigade).
5. Consider additional measures that could be implemented on a temporary basis (inspections or surveillance of protected areas, partial closures by use of blanking flanges, local authority fire brigade advised) as necessary.
6. Provide additional protective measures as necessary and available, depending on circumstances of the impairment (e.g. temporary water supplies, additional manual fire fighting equipment).

Proper reinstallation after maintenance or repair should be performed to ensure proper and correct system operation. Once repairs are complete, tests that will ensure proper operation and restoration of the fire protection capabilities should be made.

The latest revision of the design documents reflecting as-built conditions should be available to ensure that the system is properly reinstalled (e.g. drawings showing direction / angles of nozzles)

A process of communication and information shall be defined (e-mail is preferred), of the above information included and implemented to ensure reporting of this information to Group Senior Management (Integrated Risk Management/Fire Safety, Corporate Risk Control and EIMS personnel) as soon as such an event or incident occurs.

On establishing there is a fire system impairment, BU's or departments having control over fire systems (or persons made responsible for such actions or activities) shall raise an e-mail (preferred) to the following Corporate sections,

In all cases –

- Mike Cresswell – Consultant Fire Risk Management – Integrated Risk Management
- Robin Pillay – Consultant, CS (SHE)
- Consider notifying any external organization that may provide assistance during any fire incident (e.g. local authority fire brigade or security personnel)

In addition for impairments within the following Divisions, the following personnel must be included in the original notification.

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Annex B
(Concluded)

For Generation

- GS & A (attention Nosipho Noveve and Andries Oosthuizen)

For Transmission

- Transmission Risk Manager (attention Tony Paterson)

For Distribution

- Distribution Risk Manager (attention Alex Stramrood)

Eskom Enterprises

- Eskom Enterprises Risk Manager (attention Jace Naidoo)

Eskom Finance

- Eskom properties Manager (attention Rueben Mamorare)

Following restoration of the impaired fixed fire protection system(s) to service, the parties previously notified of the impairment should be advised the system being back in service, again by e-mail (preferred).

Note: Impairments to fixed fire protection systems are considered to include active systems, or parts thereof, these include -

Water based systems

Fire pumps (including fire fighting water supplies, tanks, mains or valves)

Sprinkler systems (including water mist)

Deluge / drencher systems

Foam systems

Gas fire protection systems

Systems employing any gas extinguishing mediums for protection (local application or total flooding)

Fire detection systems

Not generally included in the impairment process, however, some evaluation should be considered in that if the power supplies, or a number of component zones or numerous detectors are affected in a significant area of the protected premises is affected – an impairment of that detection system should be declared.

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Annex C

(Normative)

Fire Protection Plan

C.1 Typical example of content for fire protection plan -

A description or narrative of the main features for the specific site indicating the following,

1. General information
 - Building(s), layout, overall size, number of floors (relative to a site plan)
 - Construction materials of main building(s)
 - Means of escape, exit(s) routes, assembly point(s)
 - Population and / or occupancy levels
 - Specific risk areas, hazards, exposures or operations identified
2. Fire protection
 - Specific fire protection measures, hydrant & hose reel layouts
 - Fire protection water supplies, capacity, location of important valves
 - Fire protection systems (active systems) i.e. water based systems, gas systems, special systems and ventilation arrangements (smoke extraction)
 - Fire detection systems, coverage, control points, interface with other building or fire protection systems (ventilation systems, alarms, off site indications)
3. Emergency information
 - Site emergency arrangements, raising an alarm, organisation & infrastructure under emergency conditions, responsibilities defined.
 - Contact information for emergency services, essential staff, and maintenance personnel for site / BU.

Schematic or line drawings can support the basic descriptive document.

Note: A fire protection plan can be requested by a local authority as a specific requirement from the National Building Regulations (SABS 0400 – Application of the National Building Regulations). The development of the Fire Protection Plan as tabled above can be used to address this issue and any additional supporting requirements from an Emergency Planning perspective.

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