

 Eskom	Standard	
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Title: Requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos-containing material, equipment and articles

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1. Introduction

Eskom and its subsidiaries are committed to Zero Harm and will conduct business with respect and due care for the environment and people.

This standard specifies the requirements for the identification, evaluation and control of any work that exposes, or is likely to expose any person to asbestos fibres, and also the requirements for compliance with the provisions of the Asbestos Regulations 2001, framed under the OHS Act (Act 85 of 1993). Further environmental and Eskom requirements for asbestos phase-out programmes are also outlined in the standard.

2. Supporting clauses

2.1 Scope

The scope of this document covers the minimum requirements that must be adhered to for the management of asbestos.

2.1.1 Purpose

The purpose of this standard is to give practical expression to Eskom's commitment to protecting people and the environment against the harmful effects of regulated asbestos fibres by the following:

- Preventing the exposure of persons to uncontrolled airborne regulated asbestos fibres;
- Complying with all requirements and best practices pertaining to asbestos; and
- Ensuring the effectiveness and efficiency of all asbestos management interventions.

2.1.2 Applicability

This document applies throughout Eskom Holdings SOC Limited, its groups, divisions, subsidiaries and contractors, including any joint ventures in which Eskom have a controlling interest; where exposure to asbestos fibres may occur and where ACM, equipment and articles are used.

2.1.3 Effective date

This document is effective as from the authorisation date.

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2.2 Normative/Informative references

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems
- [2] Occupational Health and Safety Act, 1993 (Act 85 of 1993)
- [3] Asbestos Regulations 2001, as promulgated under the Occupational Health and Safety Act (Act 85 of 1993)
- [4] Construction Regulations 2014; as promulgated under the Occupational Health and Safety Act (Act 85 of 1993)
- [5] National Environmental Management Waste Act (NEMWA), 2008 (Act 59 of 2008)
- [6] Norms and Standards for Waste Storage (GN 926 of 2013) Government Notice Regulations 341. March 2008: Environment Conservation Act (73/1989): Regulations for the prohibition of the use, manufacturing, import and export of asbestos and asbestos-containing materials. Environmental Conservation Act, Regulations for the requirements of an Asbestos Phase-out Plan.
- [7] MDHS 39/4: The methods for the Determination of Hazardous Substances 39/4 of the Health and Safety Executive of the United Kingdom – Asbestos fibres in air, sampling and evaluation by phase contrast microscopy (PCM) under the control of Asbestos at Work Regulations, 1995 HSE 0 7176 0913 8, as revised from time to time
- [8] SANS 17020: 2012: General criteria for the operation of various types of bodies performing inspection
- [9] SANS 10228: 2012 Edition 6: The identification and classification of dangerous goods for transport by road and rail modes
- [10] SANS 10229-1:2010 Edition 2 Transport of dangerous goods — Packaging and large packaging for road and rail transport Part 1: Packaging
- [11] SANS 10229-2:2010 Edition 1.1 Transport of dangerous goods — Packaging and large packaging for road and rail transport Part 2: Large packaging
- [12] 32-95: Eskom Environmental, Occupational Health and Safety Management Procedure
- [13] 32-249: Eskom Environmental Indicator Reporting Standard
- [14] 32-245: Eskom Waste Management Standard
- [15] 240-84733329: Eskom Medical Surveillance Procedure

2.2.2 Informative

- [16] HSG 173: Monitoring Strategies for Toxic Substances, second edition, 2006, of the Health and Safety Executive of the United Kingdom, as revised from time to time

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- [17] HSG 248: Asbestos: The analysts' guide for sampling, analysis and clearance procedures, first edition, 2006, of the Health and Safety Executive of the United Kingdom, as revised from time to time
- [18] HSG 264: Asbestos: The survey guide, second edition, 2012, of the Health and Safety Executive of the United Kingdom, as revised from time to time
- [19] SANS 17025: 2005 (Rev 2): General requirements for the competence of testing and calibration laboratories
- [20] 240-75567900: Manual for Internal Quality Assurance Management of the Eskom Occupational Hygiene Approved Inspection Authority
- [21] OHSAS 18001: 2007: Requirements
- [22] 240-44175132: Eskom PPE Specification

2.3 Definitions

Term	Definition/Explanation
Approved Inspection Authority (AIA)	An inspection authority, approved by the Chief Inspector for Occupational Health and Safety, of the Department of Labour, for the monitoring of asbestos concentrations in the air.
Asbestos	Any of the following minerals: Amosite, Chrysotile, Crocidolite, Fibrous Actinolite, Fibrous Anthophyllite and Fibrous Tremolite or any mixture containing any of these minerals.
Asbestos cement products	Homogeneous materials where asbestos fibres are used to reinforce thin rigid cement sheets, commonly encountered as corrugated and flat sheets or as various moulded products.
Asbestos-containing material	Means material which contains or is likely to contain regulated asbestos fibres.
Asbestos-related work	Any work involving asbestos, irrespective of the extent of the work. This includes for example, inspections or work conducted at sites where substandard conditions in relation to asbestos, or the cleaning of asbestos roofs, removal of seals and packing, where the potential exists for exposure to asbestos dust.
Asbestos Phase-out Plan	The authorised plan for the phase-out and removal of asbestos.
Asbestos work	Work that exposes or is likely to expose any person to asbestos dust.
Demolition work	This includes the demolition, alteration, stripping, removing, repair, gleaning of any spilt asbestos, or high-pressure water jetting of any structure containing asbestos lagging or insulation; but exclude routine maintenance work (e.g. painting / sealing of these materials) performed on asbestos cement products, e.g. asbestos cement sheeting and related products, that form part of the structure of a workplace, building, plant or premises where no asbestos is, or will be removed.
Formalised manner	According to an approved documented procedure, in line with an existing quality management system.
Gleaning	The safe clearing/cleaning/collecting of any asbestos waste material or fibres from an area.

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Term	Definition/Explanation
Routine asbestos maintenance	Where routine maintenance work is performed on asbestos material, asbestos cement sheeting and related products, where the work does not result in structural changes, the removal or demolition of ACM, e.g. painting and sealing of material's surfaces.
Measurement programme	A programme according to the monitoring strategy as contemplated in HSG 173.
Monitoring	The planning and carrying out of a measurement programme as well as recording the results thereof.
Occupational Exposure Limit	A limit value of 0,2 asbestos fibres per millilitre of air, measured over a period of 4 hours, as set by the Minister and published in the Asbestos Regulations.
Occupational Hygiene Practitioner	The person formally allocated the duties to manage asbestos work at an OU/BU. Note that the responsible person in terms of the Occupational Health and Safety Act (Act No. 85 of 1993) shall nevertheless still be responsible.
Phase-out	The total removal of asbestos and ACM from business use.
Phase-out Plan	An authorised management plan which directs the timely removal of asbestos products and ACM from Eskom-owned areas in a formalised manner, to ensure total phase-out by the set due date.
Registered Asbestos Contractor	A mandatory person or employer conducting demolition work, who is registered with the Chief Inspector.
Regulated Asbestos Fibre	A particle of asbestos with the length-to-diameter ratio greater than 3 to 1, a length greater than five micrometres and a diameter of less than 3 micrometres.
SHE-S Inspectorate	An Eskom-established body, with the main responsibility of assuring that all Eskom sites adhere to South African occupational health and safety statutory requirements, SANS standards, environmental, security statutory and other requirements, as applicable to Eskom, where non-compliances might result in serious injury or harm to people, property, equipment, systems and the environment.
Short-Term Exposure Limit	The concentration to which workers can be exposed continuously for a short period of time, which is a 10-minute Time Weighted Average (TWA) exposure of 0,6 regulated asbestos fibres per millilitre of air. The Short-Term Exposure Limit (STEL) TWA exposure for asbestos should not be exceeded at any time during the working day, even if the 4-hour TWA is within the OEL TWA.
Sustainability Systems	The delegated employees of the Sustainability Systems, Occupational Hygiene and Safety and Environmental Management departments.

2.4 Abbreviations

Abbreviation	Explanation
AAIA	Approved Asbestos Inspection Authority
ACM	Asbestos-containing material
ACP	Asbestos Cement Products
AIA	Approved Inspection Authority
A&F	Assurance and Forensics
BU	Business Unit

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Abbreviation	Explanation
Eskom AIA	Eskom Holdings SOC Limited Approved Inspection Authority
f/ml	Fibres per millilitre
GE	Group Executive, also refers to the relevant appointed persons in terms of section 16.2 of the OHS Act
GS	Group Sustainability
HEPA	High-efficiency particulate air
OEL	Occupational Exposure Limit
OESSM	The Occupational Exposure Sampling Strategy Manual, published by the National Institute for Occupational Safety and Health (NIOSH), United States of America: Department of Health, Education and Welfare.
OHP	Occupational Hygiene Practitioner
OHS	Occupational Hygiene and Safety
OHS Act	Occupational Health and Safety Act
OU	Operating Unit
PCM	Phase Contrast Microscopy
SAIOH	Southern African Institute for Occupational Hygiene
SS	Sustainability Systems
STEL	Short-Term Exposure Limit
TWA	Time-weighted average

2.5 Roles and responsibilities

2.5.1 Asbestos AIA

The responsible Asbestos AIA will perform the verification function and must approve all asbestos work plans. The Asbestos AIA will declare the competence of the persons appointed responsible for training in asbestos management.

2.5.2 Assurance and Forensic Department

See paragraph 2.6.2 for more information.

2.5.3 Environmental Practitioners

The Eskom and/or contracted Environmental Practitioners are responsible for the following:

- Overseeing the disposal of asbestos and asbestos-containing products;
- Keeping records of all documentation regarding disposal according to the requirements stipulated in the applicable Asbestos Work Plan;
- Reporting on the disposal figures and the practices followed.

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2.5.4 Group Executive (GE)

The GE is responsible for the sign-off of divisional asbestos inventories and phase-out plans before submitting them to SS OHS.

2.5.5 OU/BU Responsible Manager

The onus is on the OU/BU Responsible Manager to ensure that no persons, including those who are not employees, are exposed to asbestos from any asbestos work performed.

The OU/BU Responsible Manager has to ensure the following:

- That this standard is implemented effectively;
- That training is conducted by a person declared competent by an Asbestos AIA to ensure awareness and understanding of this standard among employees and contractors;
- That the implementation of this standard is monitored; and
- That a person/s is/are appointed in writing who will co-ordinate/manage asbestos activities on site, including the following:
 - Ensuring that asbestos work is performed according to approved asbestos plans;
 - Compiling and maintaining the asbestos inventories applicable to each OU/BU, including the operational management and disposal functions of asbestos management;
- That the inventory is signed before submission; and
- Ensuring that the OU/BU fulfils all the requirements of this standard.

2.5.6 SHE-S Inspectorate

See paragraph 2.6.4. for more information.

2.5.7 Sustainability Systems OHS Department

The Sustainability Systems (SS) OHS Department is responsible for providing assurance to the Eskom Management that the requirements of this standard have been fulfilled.

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2.6 Process for monitoring

2.6.1 Asbestos AIA

The Asbestos AIA (AAIA) is responsible for the following:

- Objectively monitoring and giving feedback during the implementation of approved asbestos plans regarding the health and safety of persons, the safety and risks to health of any work, article, substance, plant or machinery or of any conditions prevalent, and whether there were any violations of the relevant standards or whether there has been compliance with the particular standards.
- Reporting on the findings thereof to the OU/BU Responsible Manager.

2.6.2 Assurance and Forensics Department

The Assurance and Forensic Department or any person appointed to do so, on its behalf, will audit and monitor the business compliance and implementation of this standard at random intervals as determined by their agreed-upon audit schedule.

2.6.3 OU/BU Responsible Manager

The OU/BU Responsible Manager is responsible for monitoring the implementation of this standard, specifically the following:

- Evaluating the status and outcomes of asbestos risk assessments every two years;
- Reviewing the Asbestos Phase-out Programmes every 6 months;
- Reviewing the Asbestos Inventory every 6 months; and
- Reviewing the effectiveness of the implementation of the approved asbestos plans (monthly).

2.6.4 SHE-S Inspectorate

The SHE-S Inspectorate will do checks and inspections to test compliance with the legal and Eskom requirements at random intervals as determined by their agreed-upon inspection schedule

2.7 Related/Supporting documents

[23] 240-47175987: Eskom Asbestos Inventory Template

[24] 240-64724984: Appointment of Responsible Persons for OHS and Environmental Responsibilities

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3. Asbestos information

Asbestos has a fibrous form that is often clearly visible as straight colourless to grey/brown fibres or curly white to grey fibres that are difficult to separate; straight dark blue fibres; or a finely powdered fibre dust.

Asbestos and asbestos-containing materials (ACM) were historically used for lagging and insulation purposes, especially at power stations. Asbestos work may vary among tasks and could include the handling of asbestos-containing lagging or insulation material that might be disturbed by the demolition of, or structural alterations to buildings or structures, to the cleaning of large asbestos spills. It includes work performed on asbestos cement products (ACP), for example sheeting and other related products as well as asbestos that form part of the structure of a workplace, building plant or premises.

Possible sources of asbestos dust that becomes airborne could be the result of air movement, or the vibration of plant/equipment or incorrect work practices such as dry sweeping and de-dusting. Examples include asbestos-containing dust that collects on top of surface areas such as ceilings, beams, work surfaces or structures, which dust could become airborne owing to disturbances caused by wind, vibration, cleaning or work processes.

The inhalation of regulated asbestos fibres may cause serious lung diseases, including asbestosis, cancer of the lungs and mesothelioma. These diseases usually become apparent only some years after exposure to asbestos, and sometimes until forty (40) or more years after the first exposure. Cigarette smokers, who are exposed to asbestos, have a marked increase in the incidence of lung cancer in comparison to non-smokers. Research has shown that smoking increases the risk of contracting asbestosis by approximately 25%.

Asbestos in water systems might be carried by water to other areas where it could accumulate and become dry and airborne in an uncontrolled manner.

4. Risk assessments

The OU/BU Responsible Manager shall ensure that the exposure of their employees to hazardous environmental conditions relating to the condition of asbestos, ACM and/or asbestos work in the workplace is assessed by a suitably qualified and experienced risk assessor.

The assessment shall be conducted at regular intervals, at least once every two years, provided that re-assessment is not required.

Where this assessment indicates a risk or a possibility of exposure, the air should be sampled or monitored for airborne regulated asbestos fibres, then compared with the prescribed standards, and relevant control measures should be taken.

In applying these control measures, it should be "reasonable practicable" according to the definition contained in the OHS Act. It is therefore the responsibility of the OU/BU Responsible Manager to provide reasons for what he or she regards as reasonably practical in a particular given situation.

The purpose of the assessment is to recognise any hazards or potential hazards and to evaluate the extent of the risk that performing asbestos work holds for the health of the exposed persons. Assessment results must be recorded in a report format. The findings of the assessment should assist the OU/BU Responsible Manager to make decisions about taking any further actions.

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During the assessment, the assessor in consultation with the OU/BU Responsible Manager should consider various options. If it is obvious that a health hazard does, or is likely to exist, control measures should be taken as soon as reasonably possible. Where there is uncertainty about whether a particular situation may or may not be hazardous, it should be dealt with as hazardous to health until such time as it has been confirmed as not hazardous by means of air-sampling results.

The AIA could verify the assessment results by means of occupational hygiene monitoring, and has the right to change the outcome of an assessment, provided that the AIA gives a written motivation for the change in the assessment result, and that such change is recorded.

The assessor should complete the relevant risk assessment forms and use the information gathered to complete the Eskom Asbestos Inventory (240-44047082) during an assessment.

The focus is on the prevention/control of exposure to asbestos. The steps to be taken to reduce exposure shall be based on the principle of preventing/controlling exposure at the source and of controlling such exposure to the lowest level that is reasonably practicable.

Where the risk assessment conducted by the assessor in consultation with the OU/BU Responsible Manager indicates a need to establish and maintain either a system of the occupational hygiene monitoring of regulated asbestos fibres and/or a system of medical surveillance, or where such system is required by regulation, the OU/BU Responsible Manager or his/her delegated representative shall prepare an asbestos work plan which includes an asbestos phase-out plan for managing the risk. More information about the requirements of this phase-out plan is given in paragraph 5 of this standard.

5. Asbestos Inventory

The OU/BU Responsible Manager shall ensure that all asbestos and ACM are identified and recorded in an inventory by a suitably experienced and qualified person, i.e. competent in the identification of asbestos and ACM as well as in the formulation of the relevant inventories and phase-out plans. If such material does not belong to the OU/BU Responsible Manager, the owner of the asbestos or ACM should provide the inventory, but in such a case the onus is on the OU/BU Responsible Manager to verify the correctness and applicability of the information on the inventory.

An inventory has the following purpose:

- To establish the exact locations for asbestos or ACM on site;
- To assess the condition of the material and to provide supporting information for an asbestos phase-out plan;
- To provide an estimate of the quantity of asbestos or ACM on site;
- To provide a historical record of the movement of asbestos in the business (especially regarding the management of the phase-out of asbestos).

If one is not sure if a particular material is asbestos, or does contain asbestos, it shall be handled as if it were asbestos material until such time as it is confirmed as not containing asbestos material.

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Visual inspection of the sample shall only be regarded as a guide and shall not be used for identification purposes, as cases are known where the insulation or lagging has been painted over, or bound with cotton or some other textile. In other cases, the insulation or lagging may already have been treated with specialised encapsulation materials.

Nationally or internationally recognised sampling methodology/techniques shall be used to sample and analyse material so as to confirm the presence of asbestos or ACM (e.g. HSG 264 Asbestos: The survey guide by the Health and Safety Executive – add to references.) by a person suitably experienced and qualified to do such sampling and the analysis shall be done by a competent laboratory as required.

The inventory shall be specific with regard to the location, description and estimated amount of asbestos or ACM. The type of asbestos should be recorded where this information is available so as to assist with the prioritisation of the phase-out of ACM.

It is advisable to check all the calculations made in the inventory to ensure that all the asbestos and ACM in the applicable areas are included.

The Asbestos Inventory Template (240-47175987) should be completed or updated as required. Where significant changes to the initially identified risks are noted, the risk assessment should be updated to reflect the new risk status.

The inventory shall be kept on record for a period of 40 years.

6. Management and control of asbestos

The onus is on the OU/BU Responsible Manager to ensure the exposure of employees and the environment to asbestos is prevented or controlled. The OU/BU Responsible Manager should have an asbestos management strategy dealing with asbestos and ACM in his/her areas of control, with the aim of managing asbestos exposure. Appendix C provides an outline on the elements/components of this strategy. This strategy must be based on the findings made in the Risk Assessment and the available information in the Asbestos Inventories.

This requires taking proactive steps to eliminate or phase out asbestos or ACM (and to replace them with non-asbestos-containing materials); to manage existing asbestos structures/materials/equipment and perform asbestos-related work in a safe manner in order to control the potential for exposure to asbestos; to follow the correct procedures to prevent asbestos fibres from becoming airborne; and to prohibit the use of ACM in new buildings.

6.1 Phase-out programmes and plans of work

6.1.1 Aim of the Asbestos Phase-out Plan

The aim of asbestos phase-out programmes is to remove all asbestos and ACM (management by elimination of the asbestos risk) in order to prevent future exposure.

These programmes require the development and implementation of asbestos phase-out plans of work for the different projects/phases of the phase-out programme.

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The phase-out programme must address the following:

- All of the high-risk activities which may potentially cause asbestos exposure to regulated asbestos fibres;
- All of the high-risk areas involving raw asbestos material (lagging); and
- If reasonably practicable, the use of low-risk material and activities where there may potentially be a risk of inhaling regulated asbestos fibres.

6.1.2 Development of asbestos phase-out programmes and plans

Each OU/BU Responsible Manager is required to develop an asbestos-phase out programme to be implemented over a time period as specified by the OU/BU in order to remove asbestos and ACM and/or replace it with non-asbestos-containing material.

The development of an asbestos phase-out programme is required when –

- the material creates an immediate risk and should be removed (where risk of exposure is identified),
- the phase-out of asbestos is planned as part of the normal maintenance schedule;
- all raw asbestos material which forms part of plant must be removed and replaced by safer non-asbestos material, where reasonably practicable;
- raw asbestos is present in the natural environment or where it has been introduced in the natural environment, and there is a potential risk of regulated asbestos fibres becoming airborne due to work activities, the movement of vehicles or persons, or any disturbance due to natural environmental conditions such as the movement of water and wind;
- all asbestos cement material in an unsafe condition has to be made safe or removed in a controlled manner.

The asbestos phase-out programme should be conducted in a formalised and proactive manner. The phase-out programme should be broken down into projects/phases and the time periods for these should be reasonably practicable.

6.1.3 Asbestos phase-out programme and plan contents

The asbestos phase-out programme shall include the following as minimum information:

- The OU/BU's proposed alternatives to the use of asbestos and ACM;
- The time periods within which the BU intends removing/replacing the currently used asbestos or ACM;
- The current total asbestos, asbestos areas, types of asbestos and the condition of the asbestos;
- The maintenance plan for the asbestos in use;
- The amount of asbestos in storage and the amount of asbestos already removed;

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- Target time frame(s) for total asbestos removal, and the dates for commencing and completing the phase-out;
- The plan shall spell out the procedure(s) for –
 - the phase-out of ACM;
 - the disposal of ACM; and
 - the reasons why and where phase-out is not possible.

A detailed template for the development of the asbestos phase-out plan is available and should be used.

6.1.4 Approval and authorisation

The sites where the ACM have been used shall have an asbestos phase-out plan approved by the OU/BU Responsible Manager and this plan must be available for auditing purposes at any time.

6.1.5 Implementation

The asbestos phase-out programme (as described in paragraph 5.1. of this standard) should be completed by the end of **2033** and will achieve the following milestones:

- All raw asbestos material has been removed and replaced by safer material;
- All unsafe asbestos cement structures/articles have been removed or made safe;
- All asbestos-containing material used for backfill or other uses where there is a potential risk of regulated asbestos fibres becoming airborne, have been rehabilitated and made safe.

In cases where there are no alternatives available or where asbestos cannot be removed or where some OUs/BUs find that the asbestos phase-out programme is not reasonably practicable, within the initially indicated time frames (as per the phase-out programmes), a formal detailed letter signed by the divisional GE and OU/BU Manager has to be submitted to SS OHS.

The asbestos phase-out or any removal of ACM shall be performed after normal working hours, or under controlled conditions, in order to limit the number of persons who might be exposed. The OU/BU Responsible Manager shall obtain the relevant permit for asbestos phase-out or removal. The communiqué regarding asbestos phase-out or removal shall be circulated to all employees, or contractors, on site in order to make them aware of the hazard or to restrict unnecessary movement in such areas.

6.1.6 Progress reports

Annual progress reports on asbestos phase-out should be compiled for reporting purposes on or before **31 January** each year. These reports must be accessible and made available to SS OHS from time to time for auditing purposes.

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The Asbestos Inventory (as per template (240-47175987)) must also be referred to and updated in correspondence about the completion of the projects/phases in the implementation of the asbestos phase-out programme.

6.2 Asbestos Maintenance Plans

6.2.1 Aim of routine asbestos maintenance

Routine asbestos maintenance is aimed at ensuring that the current asbestos and ACM are kept intact with limited risk of exposure to asbestos fibres.

6.2.2 Basic principles

The onus is on the OU/BU Responsible Manager to ensure that all asbestos and asbestos-containing structures and articles are kept in a safe condition.

Where routine maintenance work is performed on asbestos material and asbestos cement sheeting and related products, which work does not result in structural changes to or the removal or demolition of ACM, e.g. painting and sealing of the surfaces of materials, shall only be regarded as purely routine maintenance work and not as asbestos work as such. A safe work procedure must be available for the work to be performed. A standardised asbestos plan of work is required for such work and should be readily available on site.

6.3 Asbestos Plan of Work for asbestos-related work (e.g. maintenance and demolition work)

6.3.1 General requirements

Asbestos-related work refers to any work involving asbestos, irrespective of the extent of the work. This includes, for example, the inspections conducted at sites where there are substandard conditions in relation to asbestos; or the cleaning of asbestos roofs, removal of seals and packing, where there is a potential exposure to asbestos dust.

At least **30 days** prior to the commencement of the asbestos-related work, the written plan of work for the asbestos-related work should be developed and submitted to the Eskom AIA for approval.

At least **14 days** prior to the commencement of any asbestos-related work, every OU/BU Responsible Manager shall notify the relevant provincial director of the Department of Labour (either by registered mail or delivered by hand), of such work by means of an AIA-approved asbestos work plan.

The notification must give a specific description of the asbestos-related work, the name of the approved asbestos contractor, the dates of the commencement and completion of the work as well as the period of asbestos work, (i.e. the planned dates of work for the project).

Copies of notification correspondence shall be kept on site for AIA verification and auditing purposes.

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6.3.2 Maintenance work

If the maintenance work constitutes the disturbance or removal of the asbestos material, an asbestos plan of work shall be formulated, describing the measures necessary to ensure the health and safety of the persons at the workplace, and to prevent the emission of fibres into the air.

6.3.3 Demolition and asbestos work

An Asbestos Contractor, approved by the Department of Labour, shall conduct all asbestos work and/or the removal of any ACM.

6.3.4 Use of high-pressure jetting

High-pressure jetting may lead to significant disturbances of fibres, which increase the risk of exposure to airborne asbestos. This practice should be prohibited.

6.3.5 Emergency response

Ensuring the containment of and the minimised exposure of people and the environment to asbestos fibres in emergency situations requires the following:

- The identification of potential emergencies that may result in the unplanned release of asbestos and ACM; and
- The preparation in advance of emergency plans, addressing each identified potential situation and taking into consideration the applicable legal requirements and best practices.

6.3.6 Transportation of asbestos and ACM

Asbestos and ACM must be transported in accordance with the minimum requirements of this standard as well as in accordance with SANS 10228 and SANS 10229.

6.3.7 Disposal

Asbestos must be disposed of in accordance with the minimum requirements as per the Asbestos Regulations (Sub-regulation 20) of the OHS Act and the relevant environmental requirements.

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6.3.8 Asbestos cement sheeting

It should be noted that reasonable caution should be taken in the handling of asbestos cement sheeting, due to the inherent risk of releasing and exposure to asbestos fibre.

Asbestos cement sheeting must be handled in accordance with the requirements of this standard as well as the minimum requirements of the Asbestos Regulations (Sub-regulation 15) of the OHS Act.

6.3.9 Plan of work requirements

The minimum contents of the plan of work requirements are summarised in Appendix A. It is advisable to check all calculations made in the plan of work to ensure that it includes all asbestos and ACM in applicable areas.

Asbestos-related work requires the use of and compliance with international best practices or methodologies. Some of these are summarised in Appendix B.

At least four copies of the asbestos plan are required, and should be distributed as follows:

- Copy 1 to go to the record of the AIA, as required by the Department of Labour in terms of the quality system;
- Copy 2 to go to the records of the Provincial Office of the Department of Labour;
- Copy 3 to go to the records of the applicable Eskom OU/BU or subsidiary's SHEQ/SHE/OHS Manager, on site;
- Copy 4 to go to the applicable mandatory (e.g. Approved Asbestos Contractor) involved in the asbestos work, where relevant.

All of the above copies shall be signed in full on the relevant Approval Page, and all other pages shall be initialled by the person representing the AIA approving the plan, an OU/BU representative, as well as the applicable mandatory person.

Each plan, including annexes, shall be issued with a unique referenced number, as well as a revision number and printed on each page.

6.3.10 Execution of work

Whether the nature of the work involves repairs or alterations to or the removal of ACM, the OU/BU Responsible Manager shall take the following precautions:

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6.3.10.1 Workplace isolation and preparation

The registered asbestos contractor, on behalf of the OU/BU Responsible Manager, shall –

- isolate the workplace for the duration of the work by completely sealing off all openings and fixtures in the workplace, such as doors, windows, ventilation ducts and lighting. Strong plastic sheeting, with a thickness of not less than 250 microns, with all joints carefully sealed and securely taped in place, provides an effective form of isolation;
- provide double barriers of plastic sheeting or other suitable means (air locks) at all entrances to and exits from the workplace, so that the workplace is always closed off by one barrier when employees enter or leave;
- post the relevant warning, prohibition and compulsory safety signs conspicuously providing information about the requirements pertaining to the management of the site (e.g. access control, safe practices, the correct use of personal protection equipment, etc.);
- vacuum clean all removable items and equipment that is not attached to ACM with HEPA Filtration vacuum cleaners; remove them from the workplace and only return them to the workplace after the work has been completed. Follow best practices for the vacuum cleaning of all removable items and equipment in order to minimise the risk of re-exposure after vacuuming (i.e. vacuum at exits from the workplace).

6.3.10.2 Decontamination facilities and personal hygiene

Where asbestos-related work is performed, the OU/BU Responsible Manager shall set up a decontamination facility outside the workplace, for the exclusive use of the employees exposed to asbestos. The requirements for this decontamination facility have to fulfil the provisions of the Facilities Regulations as well as the Asbestos Regulation as stipulated in the OHS Act.

These facilities shall consist of a "clean" change-room, toilet/shower facilities and a "dirty" decontamination change-room with vacuum cleaners (HEPA Filters) for the preliminary vacuum cleaning of protective clothing.

Decontamination facilities should be provided at a reasonable distance for the employees involved in the removal or phase-out of ACM. More information about the requirements for the Decontamination Facility is given in Appendix D.

The run-off water from decontamination facilities shall be handled in a manner that does not cause the contamination of any water source or pose a threat to the public.

All employees entering the asbestos work area, without exception, shall –

- remove personal clothing in the "clean" change-room and put on clean protective clothing, gum boots and respirators before entering the workplace;
- vacuum clean the protective clothing prior to the removal of any protective clothing and gum boots in the "dirty" decontamination change-room, when leaving the workplace. While still wearing their respirators, the employees should proceed to the showers, and only remove their respirators while showering. All such employees shall use soap and water during showering;

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- Employees shall not eat, drink or smoke in the workplace. Before eating, drinking or smoking, employees shall comply with the decontamination procedure before re-entering the workplace;
- All other persons, not involved in asbestos work, entering the asbestos workplace shall wear approved respirators for asbestos, as well as protective clothing and footwear. Before leaving the asbestos workplace, they shall comply with the decontamination procedure;
- All contaminated clothing and footwear shall be left in the decontamination change-room and be stored in suitable containers immediately, prior to disposal or laundering. Contaminated respirators shall first be rinsed down, then removed in the showers and disposed of in the designated asbestos waste bags or made fit for re-use. Re-use should only be practised on specific types of respirators designed for this purpose, e.g. re-usable face masks, with particulate filter cartridges;
- The collection of protective clothing, footwear and respirators shall be strictly controlled.

The additional requirements for the decontamination of the workplace as discussed in paragraph 5.3.10.2, paragraph 6.3.4 and Appendix D of this standard, shall also be fulfilled.

6.4 Prohibition on import and export of asbestos and ACM or equipment

The Environmental Conservation Act of 1989, prohibits the use, manufacturing, import and export of asbestos and ACM. Eskom Holdings SOC Limited and its subsidiaries may not use ACM or asbestos-containing equipment in new infrastructure and no ACM or asbestos-containing equipment shall be exported. No ACM or asbestos-containing equipment shall be imported into or hired/rented/borrowed by Eskom sites or to the sites of its subsidiaries. It is the responsibility of the OU/BU Responsible Manager to communicate this requirement to the relevant procurement staff and to ensure compliance in this regard.

7. Strategy for monitoring, analysis and control of airborne asbestos

7.1 Monitoring of airborne asbestos

The AIA shall remain accountable for the entire process of monitoring and take full responsibility for the validity, accuracy and correctness of the measurement results.

A person certified competent by the Eskom or external AIA to take measurements should conduct all air sampling. That person shall be registered with SAIOH.

The decision about the number and duration of samples vests in the Assessor in conjunction with the AIA. Guidance is provided in the HSE document HSG248: Asbestos: The analysts' guide for sampling, analysis and clearance procedures.

The air-monitoring strategy should be based on the principle of controlling the concentrations of asbestos fibre exposure to levels as low as reasonably practicable. This should be based on the results of personal exposure and/or static sampling results and/or the previous results of similar work.

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In terms of MDHS 39/4, various sampling applications should be followed. These applications are as follows:

- **Compliance sampling** used to assess whether or not the personal exposure of workers is in compliance with the 4-hour OEL (TWA) of 0,2 regulated asbestos fibres per millilitre of air, or the 10-minute Short-Term Exposure Limit (STEL) (TWA) of 0,6 regulated asbestos fibres per millilitre of air.
- **Background sampling** used to establish fibre levels prior to any activity which may lead to airborne asbestos contamination. The background sampling should be conducted a day before the commencement of any asbestos work, or where this is not feasible, in the morning of the day on which asbestos work is to be conducted.
- **Leak/enclosed check sampling** used to check that the environmental control systems are adequate. This measurement is taken outside the enclosed area, during the performance of asbestos removal work.
- **Assessment of the suitability of respiratory protection.** This measurement is taken inside enclosures during the performance of asbestos removal work to assess the effectiveness of the dust suppression measures and the suitability of the respiratory protection.
- **Clearance indicator sampling** is used to indicate the extent to which an area has been cleared after asbestos has been removed or encapsulated. Note: for the purposes of issuing the Clearance Certificate, the result of the Clearance Sample should not exceed the result of the Background Sample.
- **Reassurance sampling** is used to confirm that the residual asbestos fibre concentrations are < 0,01 f/ml of air sampled. The monitoring may be conducted in certain circumstances such as when an enclosure has been removed.

All monitored asbestos samples have to be counted by a SANAS-accredited facility as per the SANAS 17025 Standard.

All reports shall be kept with the records of the asbestos work.

Asbestos monitoring and reference to OEL shall be based solely on MDHS 39/4 and the Asbestos Regulations promulgated under the OHS Act 85 of 1993. This also applies to international contractors for asbestos work who are involved in demolition work, including the handling, removal and disposal of asbestos and ACM and asbestos-containing articles.

The requirements for the asbestos work to be done by international entities are addressed in the Asbestos Clause for Foreign Contractors in the commercial contracts.

7.2 Independence of the AIA

In order to ensure impartiality and to protect any Eskom employee or contractor involved in asbestos-monitoring practices, any work conducted by an external AIA (external to Eskom Holdings SOC and subsidiaries) shall be conducted in full by that AIA, and the AIA may not contract the work out to any Eskom employee, nor may the external AIA instruct any such employee or OHP to conduct work on its behalf.

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7.3 Control of airborne asbestos exposure

The management of asbestos, as mentioned in paragraph 5 of this standard, describes the long-term management approach, focusing on the elimination of asbestos, the maintenance of existing asbestos to keep it intact and the plans to be implemented in the asbestos-related work. This section of the document deals with the short-term management of airborne asbestos where proactive steps have been proven (through monitoring) to be ineffective, resulting in potential exposure to airborne asbestos. It also addresses cases where there is an immediate risk of exposure as a result of unplanned emergency situations.

The control of exposure to airborne asbestos implies preventing exposure and possible occupational diseases by controlling airborne asbestos dust and lowering the concentrations of airborne asbestos to concentrations below the OEL. This should be done as soon as is reasonably practicable.

7.3.1 Demarcation and barricading of areas with asbestos and ACM

All areas where asbestos work is performed or where ACM are being temporarily stored shall be clearly demarcated and identified by the relevant asbestos warning, prohibition and compulsory safety signs. Prohibition signs must include as a minimum “no eating and no drinking”, “no smoking” and restricted access signs. Compulsory signs must include as a minimum the compulsory wearing of respiratory protection.

Access to areas where asbestos work is performed or where ACM are being temporarily stored should be controlled to ensure that no person enters or comes close to such areas, unless they have been authorised to do so and have taken the necessary protective measures.

The wearing of protective clothing and respiratory protective equipment shall be enforced.

The OU/BU Responsible Manager shall ensure that the respiratory protective equipment issued to any person for protection against asbestos exposure, should only be of the type suitable for asbestos, that it has been approved by the SABS and is in line with Eskom’s requirements as per the Eskom PPE Specification.

7.3.2 Hazard communication and training information

All asbestos, ACM and asbestos-containing articles shall be labelled and marked by means of asbestos signage. This is intended to ensure that all persons are warned of the presence and possible exposure to asbestos fibres. This labelling convention shall use a unique reference system which is clearly visible and consistently reflected throughout all documentation. It could be done as follows:

- Describing an area containing asbestos, i.e. an area where asbestos cable trench-covers are present, or
- A specific article containing the asbestos material.

Employees have to be informed of the meaning of the warnings on these labels as well as the preventive measures that have to be taken.

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Each employee, (including any mandatory, contractor, casual worker or person provided by agents, if applicable) involved in any asbestos-related work where he or she could be exposed to asbestos dust, shall be adequately and comprehensively informed and trained, before such person starts performing the asbestos work.

The competent trainer shall have adequate personal practical experience and theoretical knowledge of all aspects of the work being carried out, and shall be in possession of a valid certificate issued by the Eskom AIA or an external AIA.

The OU/BU Responsible Manager has to ensure that the training includes practical aspects as well as theoretical knowledge about the requirements of the Asbestos Regulations and their enforcement in relation to the asbestos work to be performed.

The OU/BU Responsible Manager shall keep both theoretical and practical records of asbestos training for a period of 40 years or for as long as the employee remains employed at the workplace where he/she is being exposed to asbestos, whichever is the longest.

7.3.3 Personal Protective Equipment

Only SABS-approved asbestos masks/ respiratory protection devices are permitted to be used for asbestos protection. Employees expected to wear the issued respiratory protective devices shall be trained in the correct use and maintenance thereof.

The OU/BU Responsible Manager shall provide regular visual inspections of the employees to ensure the correct usage and maintenance of the respiratory protective devices. No respiratory protection device may be left lying on the surface where it could accumulate asbestos fibres. The issued disposable respiratory protective device (particulate filter) shall be used once only.

Where re-usable respirators are used, the requirements as per paragraph 5.3.10.2 should be complied with.

Personal protective equipment issued to an employee shall be decontaminated and the supervisors responsible for the asbestos work have to ensure compliance with this requirement. Separate containers or storage facilities shall be provided for personal protective equipment, when not in use, and all personal protective equipment, when not in use, may be stored only in the place provided.

No person shall be allowed to remove dirty or contaminated personal protective equipment from the premises. Where contaminated personal protective equipment has to be disposed of, it shall be treated as asbestos waste. Supervisors responsible for the asbestos work have to ensure compliance with these requirements.

The requirements for decontamination facilities mentioned in paragraph 5.3.10.2, paragraph 6.3.4 and Appendix D of this document, shall be complied with.

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7.3.4 Decontamination of the workplace

After asbestos work has been completed, the OU/BU Responsible Manager shall ensure that all surfaces in the workplace are cleaned, preferably by first using vacuum-cleaning equipment with an HEPA filtration efficiency of 99,97 % for particles of one micrometre in size, and then wet mops. After cleaning the workplace, 24 hours shall be allowed for the dust to settle, before repeating the wet cleaning of all surfaces. If the clean-up seems satisfactory, the OU/BU Responsible Manager shall ensure that two static air samples are taken after the clean-up has been completed and within a reasonable time after the area was deemed to be dry, to ascertain whether the workplace is clear of asbestos fibres.

If it is found that the workplace is still contaminated, the OU/BU Responsible Manager shall ensure that the cleaning and air sampling are repeated, until the concentrations of regulated asbestos fibres are less than, or equal to, the background concentration of +0,01 fibres per millilitre of air.

If the workplace is found to be in compliance with the above, all isolation sheeting, tape, barriers and other debris shall be carefully placed in double impermeable plastic bags for asbestos waste that are properly sealed off, e.g. a cable tie, and disposed of as required.

8. Medical Surveillance Programmes

In order to protect, monitor and promote employees' health status, an occupational health programme is required where exposure to significant risks occurs.

Each employee, including any mandatory, contractor, casual worker or persons provided by agents, if applicable, who is involved in asbestos-related work, shall be enrolled in a medical surveillance programme. The medical surveillance programme shall comply with the legal requirements or as stipulated in the Eskom Medical Surveillance Procedure (240-84733329).

The applicable OU/BU Responsible Manager shall keep a record of the person's exposure history, together with the medical surveillance records, for 40 years.

9. Selling or donation of asbestos-containing structures or equipment (including occupation of Eskom-owned buildings)

All asbestos and ACM or equipment pose a possible health risk and appropriate asbestos management will mitigate the risk. Therefore, no buildings owned by Eskom, or its subsidiaries, or equipment containing asbestos which could create a possible health risk, should be occupied by any person. This includes buildings rented out to a third party. No material or equipment owned by Eskom, or its subsidiaries, which contains asbestos and which could create a possible health risk, may be sold, hired out/rented out/lent to a third party.

Eskom, or its subsidiaries, shall be responsible for conducting assessments of all buildings, as well having such buildings on a planned maintenance and inspection programme, unless it has been agreed on in writing, that the occupant shall comply and that the occupants have the means to comply with the relevant legislation.

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The transfer of any asbestos-containing structures, buildings, articles or materials, etc. shall not be approved by Eskom, if intended for resale purposes. No asbestos or asbestos-containing material, equipment, plant or article should be sold, donated, marketed, advertised or displayed unless written recommendation has been obtained as required from the OU/BU Responsible Manager, SS OHS as well as the approval of the applicable GE, or representative. Only cases with special merit should be considered, but when considering such cases, the Environmental Conservation Act 1989, Regulations for the prohibition of the use, manufacturing, import and export of asbestos and ACM should be consulted for the list of prohibited asbestos transactions.

Eskom shall evaluate each application in terms of the technical, legal and financial knowledge, as well as the means of the new owner to comply.

The new owner has to apply in writing for the transfer of the property and must include all of the following:

- An agreement of sale undertaking from the new owner, stating that he/she shall comply with the legal requirements;
- An indication of the intended use of the asbestos structure/article;
- Proof of training of all workers in the relevant hazards and safe practices prior to performing the asbestos work;
- A description of the measures that the new owner will introduce to ensure that no asbestos shall be released which could endanger the public or the environment;
- Proof that all asbestos waste shall be transported in accordance with the SANS 10228 and SANS 10229;
- Details of how records will be kept on the permitted or licensed asbestos disposal sites;
- All the documentation of the collector and transporter in line with the Waste Act, 2008, before the contract for the disposal is approved, and
- Any other relevant information as Eskom may request in alignment with the requirements stipulated in the OHS Act or this standard.

If the new owner does not have the ability and the means, infrastructure or knowledge to comply with the relevant requirements, the transfer of property should not be approved, and if such a transfer does not take place, Eskom shall remain liable for complying with the relevant requirements.

Eskom shall not be obliged to give any reason or explanation to any person or body, regarding the approval or rejection of any application.

If and when the application is approved, prior to transfer, Eskom shall supply an assessment report to the new owner as part of its due diligence audit. The property shall be removed from Eskom's inventory as per Asbestos Regulation 14 (1) (b) and the onus will be on the new owner to record and update its own inventory. The new owner shall supply Eskom with a receipt to serve as proof of change of inventory.

Where these structures have deteriorated and are therefore not suitable for occupation and may create a risk, or where there are other problems such as illegal occupation, Eskom should arrange for such structures to be demolished, and the asbestos material/asbestos-containing material disposed of. Cost could be recovered by selling the non-asbestos materials, provided that these have been inspected and cleared as asbestos-free, in writing, by an Eskom AIA representative, prior to removing the materials from site.

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The agreements at the point of sale or transfer shall include all these conditions to ensure that all liabilities are completely transferred at the registration of the sale. All documentation should be available for audit purposes.

10. Environmental control

10.1 Transportation of asbestos and ACM

Asbestos and ACM will be transported in accordance with best practices to limit the risk of the potential exposure of people and the environment to asbestos fibre. The requirements and details of the following elements have to be well defined, practised and recorded in order to ensure safe transportation practices:

- Names of the responsible persons and relevant contact details
- Instructions issued by the Eskom Responsible Person
- Safe handling practices for asbestos and ACM
- Approved waste contractor registration and certificates
- Route description of the transportation and disposal
- Hazardous waste site registration and certificates
- Temporary waste storage site and security requirements
- Identification and classification of vehicle(s) used (including the labelling of the vehicle(s))
- Safety notices
- Requirements for waste removal containers and bags (including their labelling)
- Cleaning of waste spillages
- Permit / certificate of removal
- Certificate of safe disposal
- Training requirements and records
- PPE requirements and records

10.2 Asbestos waste management

The OU/BU Responsible Manager has to ensure that steps are taken to prevent the release of asbestos. This should include filtration systems. Any substance, which forms part of the filtration system when discarded, must be disposed of as asbestos waste. Attention should be given to transport practices to prevent the release of asbestos fibres into the environment arising from the transport of asbestos. All asbestos waste shall be transported in accordance with SANS 10228 and SANS 10229.

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Waste shall be disposed of only on waste disposal sites specifically designated for this purpose in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), (ECA, 1989) or the National Environmental Management Waste Act, 2008 (Act 59 of 2008), (NEMWA 2008).

Waste shall be deposited in such a manner as to minimise dust dispersal and the need for further disturbance of the waste. The permit conditions for each site shall be adhered to. The waste should be covered with at least 200 mm of topsoil or sand, or other suitable material capable of forming a seal to prevent the dispersal of dust.

All asbestos waste materials shall only be disposed of on sites specifically designated for this purpose in terms of the ECA, 1989, and NEMWA, 2008, and in such a manner that it does not cause a hazard on or outside the site concerned. Details of the registered asbestos disposal site for the disposal of any waste during as well as after removal should be kept on record. All contracts with the disposal contractor shall meet the requirements of NEMWA, 2008.

Eskom OUs/BUs with asbestos dumping sites should ensure that no asbestos waste is left uncovered at the end of a workday.

All used air filters from vacuum cleaners, air conditioners and ventilation equipment shall be placed in impermeable bags, or similarly effective containers. These containers shall be sealable for disposal (the outside of all containers shall be cleaned before leaving the workplace).

Liquids or sludge containing asbestos shall be collected in collecting tanks, from which it may be pumped into sealable drums, or a closed type tanker, for transit to the waste disposal site. Transport and disposal shall take place in such a way that there is no risk of the material drying out before it has been disposed of, and is covered to minimise dust dispersal.

High-density materials such as asbestos, cement products and sheets containing asbestos, are not likely to release asbestos dust when handled by hand. However, a hazard may arise if the waste is subjected to pounding by vehicles passing over it, or tipping from the vehicle, and such waste should therefore also be covered.

The OU/BU Responsible Manager concerned with the collection, transport and disposal of asbestos waste, is responsible for complying with the provisions of the OHS Act, 1993, and the Asbestos Regulations and NEMWA, 2008.

11. Investigation of Incidents

If the OEL is exceeded, or there is a significant negative change in the trend of the results, which is not in line with the principle of controlling the asbestos to levels as low as reasonably practicable, the reasons should be identified, investigated and recorded. All findings must be recorded and communicated to the relevant OU/BU Health and Safety Committee and the employees/contractors involved.

Steps should immediately be taken to lower the concentration of asbestos fibres in the air, so that it does not exceed the OEL by means other than respiratory protective equipment.

All cases of asbestos-related diseases shall be investigated and recorded in terms of the Environmental, Occupational Health and Safety Incidents Management Procedure (32-95).

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If an employee or ex-employee at any time alleges that he or she or any other person was or could have been exposed to asbestos dust, while working for Eskom or its subsidiaries, the allegation must be investigated in full by the OU/BU in question. The Safety, Health and Environmental Incident Management Procedure (32-95) must be consulted for the protocol on the investigation of occupational diseases. All records, including updated inventories and assessment reports, must be made available for the investigation.

12. Legal process and management of the media

Any adverse publicity related to any asbestos exposure or allegations of possible asbestos exposures must be referred to the Corporate Affairs Division.

In cases where international/national contractors are required to perform work on asbestos, asbestos-containing structures, etc., the contract between Eskom and these contractors shall not be signed if the Eskom AIA has not been consulted for comments.

The contract must address items such as the prescribed OEL, asbestos control measures where traces of asbestos fibres are found but do not exceed the OEL and Action Level. The contract should also stipulate that all asbestos work shall be governed by the Asbestos Regulations stipulated under South African law.

Requirements for the asbestos work to be done by international entities are addressed by the Asbestos Clause for Foreign Contractors in the commercial contracts.

13. Document and records management

The following have to be in place in the Eskom OU/BUs for all facilities:

- Risk Assessment Reports
- Asbestos Inventories
- Asbestos Phase-out Plan
- Asbestos labelling details
- Approved Asbestos Work Plans
- Asbestos work area access control
- Asbestos Monitoring Reports and Results
- Asbestos Contractor Registration Certificates
- Approved Waste Disposal Site Certificates
- Waste disposal permits and/or licences
- Safe disposal certificates
- Medical surveillance
- Training

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- All other documents and records mentioned in this standard have to be maintained according to the relevant document and record-keeping system
- Calibration certificates of the asbestos monitoring equipment

All records have to be kept for a minimum period of 40 years.

14. Acceptance

This document has been seen and accepted by:

Name	Designation
Alex Stramrood	Senior Manager, SS, Group Sustainability
Ben Botha	Senior Consultant, Risk Management, Generation Group
Beverley Monametsi	Senior Advisor, SS, Group Sustainability
Deidre Herbst	Senior Manager, SS, Group Sustainability
Esme Lazenby	Registered Occupational Hygienist, Matla Power Station, Generation Group
Hannes Botha	Senior Advisor: Occupational Hygiene, SS, Group Sustainability
Karen Terblanche	Chief Advisor: OHS Interventions, SS, Group Sustainability
Kenneth Hlungwane	Occupational Hygiene Technologist, Kusile Power Station, Group Capital Division
Jace Naidoo	Senior Manager, SS, Group Sustainability
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Roley McIntyre	Middle Manager SHEQ, Generation Group
Sheryl Isaacs	OHS Manager, Group Capital Division
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SN Middel	Senior Consultant, SS, Group Sustainability

15. Revisions

Date	Rev.	Compiler	Remarks
September 2014	1	H Botha	Previous 32-303 procedure reviewed and changed to a Standard. Content was updated to align it to Eskom's business requirements

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16. Development Team

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

- SN Middel
- Hannes Botha
- Mpapadi Monyela
- Beverley Monametsi

17. Acknowledgements

- Eskom Steering Committee (ESC) (Environmental Management)
- OHS Steering Committee

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Appendix A – Contents of the Plan of Work

A.1 Contents of the Plan of Work (Specific Plans for Routine Work)

The plan of work shall contain the following minimum information:

1. Name and address of the approved Asbestos Contractor who intends to conduct the asbestos-related work to be carried out;
2. Certificate of approval, issued by the Department of Labour, of Approval as an Asbestos Contractor;
3. Name and contact details of the person who is in charge of the work;
4. Name and contact details of any mandatory person (if applicable);
5. Name and address of the AIA that should approve the plan of work and who will take charge of air monitoring;
6. Air-monitoring strategy;
7. The address and description of the building(s) or structure(s), including size/area;
8. Location/description of the building or structure;
9. Scope of the work to be performed (e.g. removal of panels or lagging material), clearly describing the nature of the work to be performed, e.g.
 - Alterations
 - Demolition
 - Removal
 - Disposal
10. Type of surfaces, e.g. pipe sections, panels, etc.;
11. Work to be performed on interior or exterior;
12. Approximate mass or volume of asbestos and ACM present;
13. Scheduled dates of commencement and completion;
14. Site preparation plan with special reference to the following:
 - Demarcation of the workplace
 - Safety notices
 - Access control measures
 - Means of draining run-off water.
15. The detailed procedures that shall be employed, describing step by step how the registered asbestos worker will demolish, alter, strip, remove, repair or clean of any spilt asbestos or the high-pressure water jetting of any structure containing asbestos materials. This information shall be provided by the registered asbestos worker on behalf of the OU/BU Responsible Manager;

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16. References to the latest nationally and/or internationally recognised methodologies/ best practices to be utilised and referred to in the plan (e.g. high-pressure jetting, dry removal, wet removal), where applicable;
17. Detailed procedures that shall be employed describing step by step how the decontamination facility and processes for a specific application shall apply (see Appendix D for more information and a diagram);
18. Describe first aid arrangements/points and list the names of trained first aid staff members;
19. Indicate the fire or emergency escapes;
20. Temporary transit site for asbestos waste and/or temporary storage arrangements as well as time-frames for temporary transit/storage;
21. The procedures that shall be employed to collect and dispose of asbestos-containing waste, with specific reference to the collection, transport and disposal procedures, as well as procedures for the protection of employees. Prohibitions on the selling or donation of asbestos-containing structures/equipment as per paragraph 8 of the standard, should be adhered to;
22. Routes to be followed on-site and off-site to prevent asbestos contamination of other working areas, people and the environment;
23. How service providers transporting asbestos and asbestos-related material will be monitored/checked for their compliance with the transport-related requirements;
24. The name and address of the disposal contractor, and the name and address of the disposal site shall be furnished, together with the registration certificates for these. Arrangements for checking and controlling of waste. How disposal certificates will be made available for inspection purposes;
25. How a record book for logging any comments, complaints or incidents, and access control, will be kept and made available for anyone to use;
26. A list of tools and equipment (and if applicable, serial numbers), shall be attached to be used during the asbestos work;
27. Certified copies of vacuum cleaner equipment, with filter specifications (HEPA Filter with filtration efficiency of 99,97%, for particles of one micrometre in size), have to be attached.

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Appendix B – Methods for the handling of asbestos and ACM e.g. lagging or insulation

B.1 General comments

The removal of lagging or insulation is not advised, if this is removed for no other reason than it contains asbestos. Where adhesion to the substrate is good and the exposed surface is also in a good condition and sufficiently compacted, sealing with a suitable polymeric or bituminous coating is often an equally acceptable solution.

Sometimes, as a result of impact, a portion of the surface may become exposed, thus releasing asbestos fibres. In such a case it may be more effective to repair the damage and seal/encapsulate the surface to prevent further release of fibres, instead of attempting removal.

To ensure that asbestos fibres are contained during and after repairs or alterations, or the removal of ACM, the following methods can be used under controlled conditions as outlined in the Asbestos Regulations and summarised below:

- Sealing/encapsulation
- Wet removal as a better practice than dry removal
- Removal by use of high-pressure water jets
- A combination of the above methods

B.2 Sealing or encapsulation

Encapsulation refers to coating the ACM with oil-based paint, a bonding or sealing agent, or creating a permanent casing covering the affected area (e.g. false ceilings and walls). This should not be considered a permanent solution, as the sealing agent used may deteriorate or become damaged; and when the building is renovated or demolished, the containment and/or removal of the asbestos fibres must be given careful attention. Depending on the risk, sealing should be done on both sides of structures/panels.

Selecting the encapsulation method depends on the following:

- The degree of protection required (e.g. is the area vulnerable to impact or abrasion?);
- The toughness and flexibility required (e.g. does the surface have to be decorated?);
- The temperature to which it will be exposed;
- Whether the adhesion of the ACM to the substrate is adequate;
- Whether the surface of the insulation or lagging is suitable for the adhesion of the sealing agent.

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B.3 Wet removal

Wet removal, i.e. the suppression of dust with water containing a wetting agent, is the most commonly used method for the removal of asbestos.

The ACM shall be wetted throughout its entire depth and maintained in a wet condition. The most effective means of controlling asbestos dust is by completely saturating the asbestos with water, using a special device. The water injection device, which one can make oneself, is inserted into the asbestos material beforehand. Water that has been treated with a wetting agent is allowed to seep into the material at low pressure. Once the material is thoroughly saturated, the device is moved to the next point. Several injection devices may be used simultaneously to save time.

The saturated ACM should be lifted off in sections, and immediately placed in properly labelled containers and sealed. Abrasive techniques such as sanding should not be used, as this allows regulated asbestos fibres to become airborne.

A water spray is useful as a supplementary means of wetting the asbestos if it has not been saturated properly by the first method, or if smaller jobs have to be done. This method should be used for demolishing any pre-fabricated building structures. Once again, the water shall be treated with a wetting binding agent beforehand, and the spray shall be directed straight onto the work.

During the removal process, all power to electric circuits must be isolated and plugs, switches and other sources of electric current should be covered with waterproof protection, so that water cannot penetrate it. A means of draining run-off water from the workplace into containers for safe disposal is also necessary.

B.4 Dry removal

Dry removal should only be considered when wet removal is impractical (e.g. in workplaces where water can damage equipment). This type of removal releases excessively high concentrations of regulated asbestos fibres and may contaminate "clean" areas. For this reason, very strict protection and decontamination measures are necessary.

The following measures are recommended:

- Fully isolate the workplace where the material is to be removed.
- Keep the workplace under a slightly negative pressure by means of local air extraction, filtration and dust collection, to minimise the release of regulated asbestos fibres into surrounding areas outside the isolated workplace.
- Remove material in small pre-cut sections.
- High-speed power tools such as angle grinders, or similar high-speed cutting tools, should not be used because of the large quantities of dust that such equipment creates.
- For general cleaning, use vacuum cleaning equipment, with a filtration efficiency of 99,97%, for particles of one micrometre in size.
- The removal procedure consists of pre-cutting and then lifting the small pre-cut sections of asbestos-containing lagging/insulation off the surface of the structure. This waste is then enclosed in two impermeable bags (one inside the other) or similarly effective containers that are properly sealed to prevent the dust from escaping during handling.

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B.5 Removal by high-pressure water jets

This method employs water jets operating at high pressures, and is usually employed for large-scale operations and at workplaces where other techniques may not be satisfactory. The workplace shall be fully isolated and very strict protection and decontamination measures are necessary.

It is important to soak the ACM through its entire depth by the introduction of water through appropriate applicators, before applying the water jets.

Since the use of high-pressure spraying is dangerous, a manual pressure control valve should control the jet so that the pressure is shut off on release.

A means of draining run-off water and slurry from the workplace into containers for safe disposal is required. Run-off water shall be diverted away from entering drains.

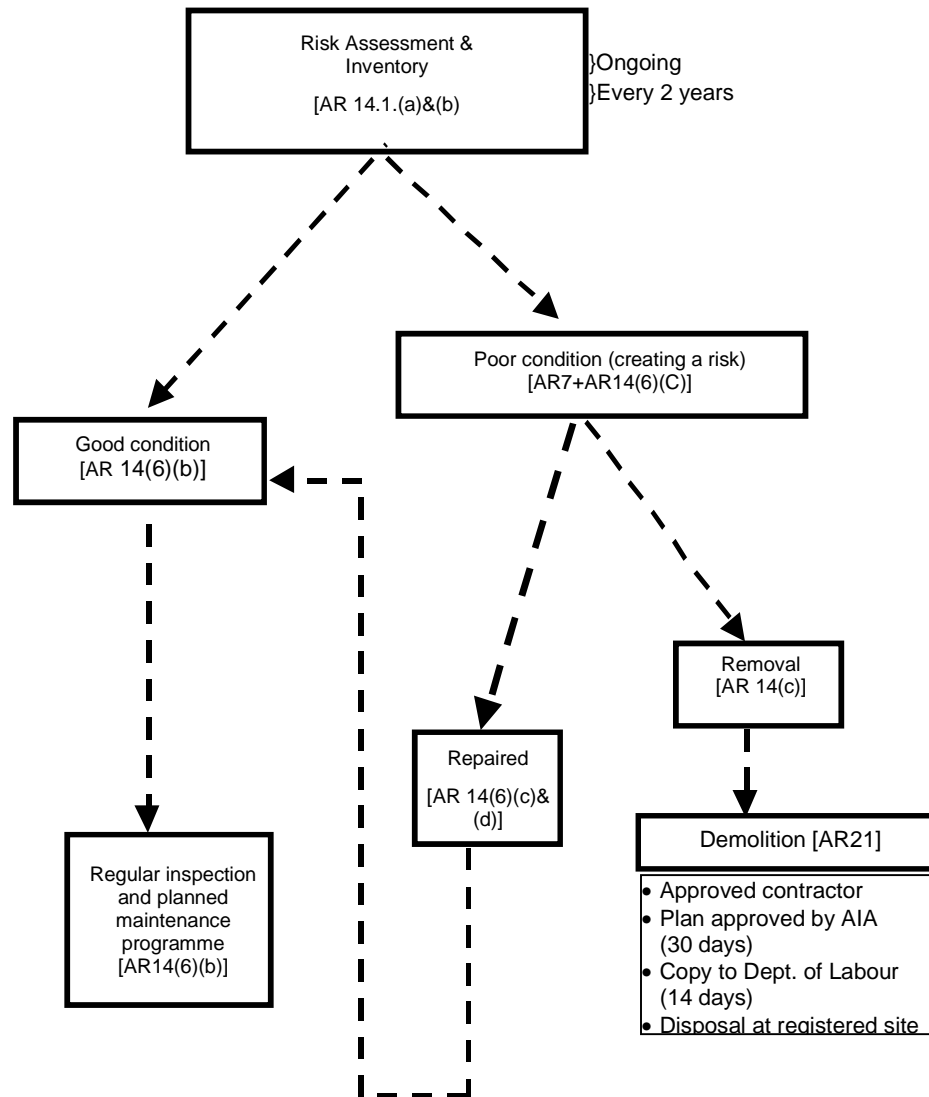
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Appendix C – Asbestos Management Process

The following describes the overall asbestos management process and options.



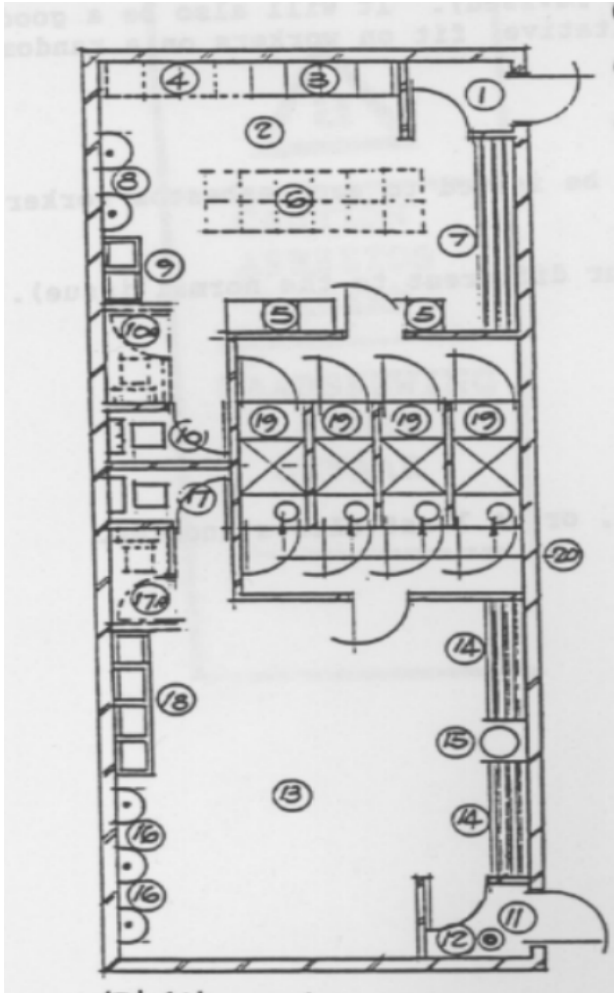
AR = Asbestos Regulations 10 February 2002

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Appendix D – Decontamination Facility



Legend

- 1 Clean entrance
- 2 Clean area with positive air pressure
- 3 Lockers for clean personal clothes
- 4 Position for future lockers like 3
- 5 Lockers for clean overalls
- 6 Position for future lockers like 5
- 7 Slatted bench to standard
- 8 Vitreous wall-mounted urinals
- 9 Fireclay lavatory basins with overlaps
- 10 Vitreous low-level WC unit
- 11 Dirty entrance
- 12 Vacuum areas
- 13 Dirty area
- 14 Solid benches
- 15 Drum for dirty clothes
- 16 Same as 8
- 17 Same as 10
- 18 Same as 9
- 19 Showers
- 20 Drums for masks

PLAN scale 1:100

NOTE:

1. Design specifications shall comply with the requirements of the Department of Labour, and also the National Building Regulations. All doors have to be fitted with door closers.
2. The number of toilets, showers and urinals depends on the number of workers. The above is merely an illustration.
3. No asbestos material may be used as part of the construction of the facility.
4. The facility may be an existing unit, modified to suit the requirements, or a specially erected structure, or a temporary or mobile structure.

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