	<b>Specification</b>	
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for Work at Height Specification**

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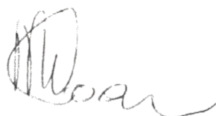
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## **Contents**

	Page
1. Introduction .....	3
2. Supporting clauses .....	3
2.1 Scope .....	3
2.1.1 Purpose .....	3
2.1.2 Applicability .....	3
2.1.3 Effective date .....	3
2.2 Normative/Informative references .....	3
2.2.1 Normative .....	3
2.2.2 Informative .....	4
2.3 Definitions .....	4
2.4 Abbreviations .....	6
2.5 Roles and responsibilities .....	7
2.6 Process for monitoring .....	7
2.7 Related/Supporting documents .....	7
3. Personal Protective Equipment for Work at Height Specification .....	7
3.1 General requirements .....	7
3.2 Minimum requirements of a fall arrest system .....	8
3.3 FAS rescue kit .....	11
3.4 Hard hat .....	11
3.5 Additional back support .....	12
3.6 Aerial bucket work .....	12
3.7 Kit: telescopic stick .....	12
3.8 Test and certification requirements .....	12
3.9 Instructions for use, maintenance, periodic examinations, repair, marking, and packaging .....	12
4. Acceptance .....	13
5. Revisions .....	13
6. Development team .....	13
7. Acknowledgements .....	13

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## **1. Introduction**

This specification was compiled to satisfy the need for simplification and standardisation of Eskom's personal protective equipment for work at height. In the event that specific work-at-height personal protective equipment is not covered in this specification, the onus is on the division/operating unit (OU)/business unit (BU) to ensure that all safety requirements are complied with in accordance with the relevant standards, regulations, or codes of practice for that specific work-at-height equipment requirement.

## **2. Supporting clauses**

### **2.1 Scope**

#### **2.1.1 Purpose**

The purpose of this specification is to prescribe the minimum requirements for personal protective equipment for work at height in Eskom. The operating/business units may determine additional requirements to suit their own needs or working conditions, provided that the minimum requirements as set out in this specification, as well as the relevant legislation, are met and such additional requirements do not expose an employee or a member of the public to any risk.

#### **2.1.2 Applicability**

This specification sets out the minimum requirements for personal protective equipment for work at height to be met by employees, and it shall apply throughout Eskom Holdings SOC Limited, its divisions, subsidiaries, and entities where Eskom has a controlling interest. In cases where Eskom does not have a controlling interest, this procedure shall apply only if no such similar document exists.

#### **2.1.3 Effective date**

This document is effective with immediate effect after its authorisation.

### **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] 240-62196227 Life-Saving Rules Standard
- [2] 240-62582234 OHS Roles and Responsibilities and Statutory Appointments Standard
- [3] 32-288 Policy Procurement and Supply Chain Management Standard
- [4] 32-599 Standard Procurement and Supply Chain Management Standard
- [5] 32-727 SHEQ Policy
- [6] Eskom Corporate Identity Manual ESK AM AAA 1, Rev. 1

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- [7] ISO 9001 Quality Management Systems
- [8] Occupational Health and Safety Act 85 of 1993

### **2.2.2 Informative**

- [9] SANS 50353-2: Personal Protective Equipment against Falls from a Height – Guided-Type Fall Arresters on a Flexible Anchorage Rope
- [10] SANS 50354: Personal Protective Equipment against Falls from a Height – Lanyards
- [11] SANS 50355: Personal Protective Equipment against Falls from a Height – Energy Absorbers
- [12] SANS 50358: Personal Equipment for Work Positioning and Prevention of Falls from a Height – Work Positioning Systems
- [13] **SANS 50361: Personal Protective Equipment against Falls from a Height – Full Body Harness**
- [14] SANS 50362: Personal Protective Equipment against Falls from a Height – Connectors
- [15] **SANS 50363: Personal Protective Equipment against Falls from a Height – Fall Arrest System**
- [16] SANS 50365: Personal Protective Equipment against Falls from a Height – General Requirements for Instructions for Use and for Marking
- [17] SANS 50795: Protection against Falls from Height – Anchorage Devices; Requirements and Testing
- [18] SANS 50795: Protection against Falls from Height – Anchor Devices; Requirements and Testing
- [19] SANS 50341: Personal Protective Equipment against Falls from a Height – Descender Device
- [20] SANS 1397: Safety Helmets for Industrial Use and for Firemen
- [21] SANS 10085: The Design, Erection, Use, and Inspection of Access Scaffolding
- [22] British: The Work at Height Regulations 2005
- [23] AS/NZS 1891.4: Industrial Fall-Arrest Systems and Devices – Selection, Use, and Maintenance

### **2.3 Definitions**

Definition	Description
<b>Additional back support</b>	Padding that wraps over the existing portion of the work positioning belt to allow for added back support when working long hours at height or in case of back sensitivity.
<b>Attachment element (SANS 50361 EN 361)</b>	Specific connecting point for components or subsystems, for example, buckles and D-rings.

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<b>Attachment strap</b>	A webbing strap used to attach a safety lanyard to a structure (SABS EN 795:1996 Protection against falls from a height – Anchor Devices – Requirements and testing).
<b>Connector (SABS EN 362:1992)</b>	A connecting element or component for a fall arrest system. A connector may be a karabiner or a pylon hook.
<b>Energy absorber (SABS EN 355:1992)</b>	A component of a fall arrest system. An energy absorber guarantees the full ability for the safe arresting of a fall from a height in all cases of recommended application.
<b>Fall arrest system (SABS EN 363:1992)</b>	The basic personal protective equipment to protect against falls from a height, comprising a full body harness, a safety lanyard, a work positioning belt, attachment straps, karabiners, and a connecting subsystem for all fall arrest purposes.
<b>FAS live work (LW)</b>	A fall arrest system that allows live line workers to perform their maintenance and construction duties without the FAS system compromising their safety while working live or unduly inconveniencing the workers. This FAS live work, therefore, has the same components and specialised attributes as specified in this document.
<b>Full body harness (SABS EN 361)</b>	A body support for all fall arrest purposes, that is, a component of a FAS. The full body harness may comprise straps, fittings, buckles, or other elements suitably arranged and assembled to support the whole body of a person and to restrain the wearer during a fall and after the arrest of a fall.
<b>Karabiner</b>	A component that connects elements of the FAS; self-closing with a locking mechanism.
<b>Lanyard (SABS EN 54:1992)</b>	A connecting component or element of a fall arrest system.
<b>Pylon hook</b>	A connector with a self-closing and self-locking or manual locking facility intended to connect the FAS to a secure position.
<b>Rope access system</b>	An Eskom-specified system that allows the worker to ascend and descend a structure by attaching his/her FAS to a secured rope, thereby eliminating the need for use of energy-absorbing lanyards while ascending and descending.
<b>Rope grab system</b>	A system used to ascend and descend while attached to a rope system that has been secured to a structure.
<b>Rescue system</b>	A system that complies with the Eskom rescue system specifications (SABS EN 341, SABS EN 1891) for the purpose of allowing safe descent of workers who have been injured or trapped at height.
<b>Safety lanyard/Energy-absorbing lanyard (SABS EN 355:1992)</b>	A lanyard with the sole purpose of safely arresting a fall from a height in all cases of recommended application.

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<b>Work-at-height helmet</b>	A helmet that allows reduced levels of risk to workers working at height by ensuring secure attachment (webbing, three-point), reduced risk of accidental removal (marginal peak and gutters), and improved comfort (webbing harness).
<b>Work positioning belt</b>	The belt covering the back and kidneys as a body support while leaning and working at height.
<b>Work positioning lanyard</b>	The lanyard is the component that loops around the pole or structure and attaches onto the work positioning belt.
<b>Work positioning system (SABS EN 358:1992)</b>	Includes a back padded work positioning belt and an adjustable work positioning lanyard for positioning the worker onto a structure.

## 2.4 Abbreviations

<b>Abbreviation</b>	<b>Description</b>
FAS	Fall arrest system
FBH	Full body harness
HV	High voltage
kN	kilonewton
m	Metre
mm	Millimetre
MV	Medium voltage
OHS Act	Occupational Health and Safety Act 85 of 1993
PPE	Personal protective equipment
PVC	Polyvinyl chloride
WP	Work positioning
WAH	Work at height
WAH WG	Work at Height Work Group
SANS	South African National Standard
SETA	Sector Education and Training Authority
SWL	Safe workload

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T&Q	Technical and quality
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## **2.5 Roles and responsibilities**

The delegated employer, in terms of section 16(2) of the OHS Act, together with the appointed responsible managers, as per the OHS Roles and Responsibilities and Statutory Appointments Standard (240-62582234), shall be responsible for ensuring compliance with this specification in their designated area of responsibility.

## **2.6 Process for monitoring**

Compliance with the requirements of this specification shall be audited by the operating unit/business unit at least annually as part of an internal review process.

All records shall be audited by the Assurance and Forensic Department (A&F) or any person delegated by A&F to carry out the audit and at a frequency determined by A&F.

## **2.7 Related/Supporting documents**

- [1] 240-103139003 Fall Arrest System and Rescue Checklist
- [2] 240-100979553 Appointment of a Fall Arrest System Inspector
- [3] 240-103763416 PPE for Work at Height Specification Leadership Questionnaire

# **3. Personal Protective Equipment for Work at Height Specification**

## **3.1 General requirements**

- a) An employer shall ensure that all information, instructions, and training on the usage of PPE for work at height are communicated to all applicable employees prior to its use. This shall include the limitations of identified equipment/accessories.
- b) An employer shall not require or permit any employee to work, unless such an employee is issued with the required work-at-height safety equipment and makes proper use of it.
- c) The warranty shall be at least 12 months for each component of the fall arrest system supplied.
- d) The marking on all FAS components shall be as described in SANS 50365.
- e) The marking on all FAS components shall have a transparent cover to preserve markings for the duration of the unit.
- f) The marking on all FAS components shall have a serial number for traceability.
- g) The harness shall:
  - be comfortable;
  - have adequate buttock support;

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- have strap guides to prevent the end of loose straps flapping;
  - be circumferential;
  - have a chest support that joins shoulder straps in the front; and
  - have ease of fastening and fitting.
- h) Adjustment has to remain constant. No movement is allowed after fitting.
- i) There is a preference for relatively lighter-weight units. That is relative to what a worker can comfortably wear on a structure and various products that are available in the marketplace.
- j) The FAS unit must be supplied in a hold bag.
- k) The life expectancy of the work-at-height equipment shall be determined by the manufacturer.

### **3.2 Minimum requirements of a fall arrest system**

#### **3.2.1 Full body harness**

- a) The full body harness shall be manufactured according to Eskom-specified sizes. A means of adjustment shall be provided.
- b) The full body harness shall not be easily disassembled. It is required that it shall be so constructed that it is not possible to disassemble it without the use of a tool or equipment.

#### **3.2.2 Lanyards**

##### **3.2.2.1 Sewing threads**

- a) The sewing threads shall be of the same material as the webbing, but shall be of contrasting colour to facilitate visual inspection.

##### **3.2.2.2 Work positioning lanyard**

- a) Work positioning lanyards made from chains or wire ropes shall not be used.
- b) The work positioning lanyard shall have a protective sleeve of not less than 600 mm and shall be made of webbing. The protective sleeve shall be able to slide open for inspection purposes.

##### **3.2.2.3 Safety lanyards**

- a) The maximum force that is allowed during the braking period of a fall shall not exceed 6 kN for the safety lanyards.
- b) The length of a lanyard shall not be more than 1,75 m. The safety lanyard shall be made from synthetic fibre rope or webbing.
- c) Wire rope and chain lanyards shall not be used.

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- d) The sewing thread shall be of the same material as the webbing, but shall be of contrasting colour to facilitate visual inspection.
- e) The energy absorber and the lanyard shall form an integral part of the lanyard (no loop on the connecting point sun brim).

### **3.2.3 Connectors and attachment elements**

- a) All metallic components (excluding karabiners and pylon hooks) shall be of stainless steel or aluminium alloy construction.
- b) All metallic components shall bear a serial number and an SWL value plus the name of the manufacturer.
- c) The connectors shall be capable of being opened only by at least two consecutive deliberate manual actions (no screw-gate connector). The connector shall withstand a force of 15 kN without tearing or rupturing when tested as described in SABS EN 362:1992 paragraph 5.1.
- d) Karabiner and pylon hooks must be of a weatherproof, non-corrosive alloy (not weatherproof-coated), for example, aluminium alloy or stainless steel.
- e) Pylon hooks shall be lightweight and durable and have a minimum gate-opening aperture of 60 mm.

### **3.2.4 Attachment straps**

- a) The attachment straps supplied for fall arrest purposes shall comply with SABS EN 795:1996 and SABS EN 566.
- b) The attachment strap shall have a lined cover sleeve for the purpose of:
  - wear protection; and
  - grip to vertical undressed poles and structures.
- c) The lined cover sleeve shall have:
  - a standard warp/wet weave with acrylic finish, which has proven to work best for adhesion and workability on poles; and
  - cover material constructed from polyester yarn.
- d) The attachment strap cover shall be 45 mm wide and shall be black in colour.
- e) The attachment strap shall not have any metallic constituent material in it.

### **3.2.5 Fall arrest system live work**

- a) All the basic components are the same as the normal FAS used by non-live work members, but shall have the following attributes that are specific to HV/MV live work equipment.
- b) The live work unit shall also:
  - be flame-resistant;
  - have non-conductive webbing; and

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- be labelled as flame-resistant and non-conductive.

### **3.2.6 Rope access system**

- a) The rope access system shall be able to integrate with the existing specified FAS system.
- b) The rope shall comply with SABS EN 341 Class A 10-11 mm and PrEN 12841 Type C 10-13 mm.
- c) The size of the rope grab device shall range from 8 mm to 12 mm.
- d) A low-stretch/static inner shroud rope, 11 mm, is to be used with an ultimate tensile strength (UTS) of at least 2 040 kg.
- e) The length of rope shall be according to the requirement of the specification.
- f) The colour of the rope shall be any colour, except red, which is exclusively reserved for the rescue kit.
- g) The knot in the rope shall be sealed on the one end.
- h) The pylon hook on the rope shall be sealed on the other end.
- i) The rope shall be marked with a serial number.

### **3.2.7 Protector bags**

- a) The protector bag for the fall arrest system shall be labelled according to the supplier's details.
- b) The bag shall be easy to carry.
- c) The bag may be any colour, except red, which is exclusively reserved for the rescue kit.
- d) The bags shall be labelled as follows:
  - "Fall Arrest System – Power Lines" for power line FAS
  - "Fall Arrest System – Live Work" for live work FAS
  - "Fall Arrest System – Subs and Aux" for substation FAS
  - "Fall Arrest System – Rope Access" for rope access systems
  - "Fall Arrest System – Retractable" for retractable FAS
  - "Fall Arrest System – Rescue" for rescue kit
  - "Fall Arrest System – Climb Safe" for climb safe FAS
- e) For cylinder/round-type bags, the size of the top of the bag shall be 420 mm for ease of packing and unpacking of the harness.
- f) For carry bags with zip opening, the bag size shall be 420 mm for ease of packing and unpacking of the harness.

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### **3.2.8 Remote access connector**

- a) The remote pylon hook used shall comply with the requirements for connectors.
- b) The remote connector shall be able to be attached and removed safely by means of a standard Eskom link stick. If the remote connector does not fit onto a standard Eskom link stick, an adapter fitting onto the Eskom link stick shall be provided.
- c) The remote connector shall be able to be attached safely onto standard Eskom plant (for example, MV pole eye bolt, HV pylon structures).

### **3.2.9 Retractable fall arrester**

- a) The retractable FAS shall integrate with the existing basic FAS unit.
- b) The descender device shall:
  - comply with SABS EN 341 Class A 10-11 mm and PrEN 12841 Type C 10-13 mm;
  - have a registered breakable seal, applied to the descender device for inspection purposes;
  - have a minimum load-bearing capability of 150 kg;
  - have a double-brake system; and
  - be attached to a rope, and it should not be required to reeve the rope through the descender device.

### **3.3 FAS rescue kit**

- a) The rescue kit shall be packaged to accommodate easy use and be practicable to take up.
- b) The rescue kit shall be taken up as a standard practice when working.
- c) The rescue kit shall consist of the following:
  - A red bag, labelled "Rescue kit", with shoulder straps
  - A double-brake descending device as per the specification
  - A rope system that is weatherproof, labelled, numbered, and marked
  - Two stainless steel karabiners
  - One webbing cutter

### **3.4 Hard hat**

- a) The hard hat shall:
  - be SANS marked;
  - be suitable for industrial climbing and normal groundwork application;
  - have an adjustable webbing three-point chin strap, using a lock-in type clip;
  - have a shortened sun peak;

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- have a limited side rim/gutter;
- have a webbing suspension harness;
- have a thick sweatband, approximately 4,5 cm; and
- have an adjustable headband (standard size 53 cm to 63 cm).

### **3.5 Additional back support**

- a) A device that wraps over the existing portion of the full body harness belt to allow for added back support when working long hours at height, or for back sensitivity, is required.
- b) Additional back support shall be able to easily attach onto existing FAS (for example, Velcro straps).

### **3.6 Aerial bucket work**

- a) An adjustable single safety lanyard, not to exceed 1,75 m at full extension, with twist-lock karabiner on one end and screw-gate karabiners on the other end may be used.

### **3.7 Kit: telescopic stick**

- a) This is a frog karabiner with telescopic stick, 460 mm long and extendable to 3 200 mm, in a holdall bag.
- b) All the requirements in SANS 795 must be adhered to.

### **3.8 Test and certification requirements**

- a) Type test certificates shall be issued by an accredited third-party laboratory.
- b) A declaration of conformity certificate per product supplied must be issued by the manufacturer.
- c) For each requirement, there shall be an equivalent test certification, unless the tests are already covered in the relevant normative references.
- d) The third-party suppliers shall submit a document to confirm that the test laboratory is duly authorised by an appropriate accredited body.

### **3.9 Instructions for use, maintenance, periodic examinations, repair, marking, and packaging**

- a) The general requirements for instructions for use, maintenance, periodic examinations, repair, marking, and packaging shall be according to the SANS 50365 EN 365 standard.
- b) Documents on the information supplied by the manufacturer shall be according to the relevant standard.
- c) The marking on all FAS components shall have a transparent cover to preserve markings for the duration of the unit.

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d) The FAS shall be:

- kept as a unit at all times (in a bag);
- discarded if it has experienced a fall; and
- inspected every three months by a person appointed in writing as being competent, but that does not absolve the user of the responsibility to inspect the FAS before every usage.

#### **4. Acceptance**

This document has been seen and accepted by:

<b>Name</b>	<b>Designation</b>
Sivi Govender	Chief Advisor OHS Governance and Assurance
Work at Height Work Group	
OHS Steering Committee	

#### **5. Revisions**

<b>Date</b>	<b>Rev.</b>	<b>Remarks</b>
February 2021	02	Revision of an existing document
November 2015	01	New specification developed due to operational requirements

#### **6. Development team**

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

- Work at Height Work Group members

#### **7. Acknowledgements**

- Not applicable

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