

Kendal Power Station Emergency Response Team Personal Protective Equipment Specification

STRATURAL FIRE FIGHTING SUIT (NFPA 1971-2018 edition)

A. Standard Design:

- i. The complete suit shall comply fully with all relevant standards as set in the NFPA 1971
- ii. Standard on Protective Ensemble for Structural Fire Fighting, 2018 edition.
- iii. The suit shall consist of a tunic and trousers
- iv. The minimum overlap between the tunic and trousers shall be 250mm.
- v. Each garment shall consist of a composite of an outer shell, moisture barrier, and thermal barrier with lining.
 - Current and valid certificates of compliance issued by an accredited test house, certifying that the outer shell, vapour barrier and thermal barrier comply fully with NFPA1971, Standard on Protective Ensemble for Structural Fire Fighting, 2018 edition, must be included with the tender.**(Failure to do so will render the tender null and void)**
- vi. The moisture barrier, thermal barrier shall form the inner shell and shall be detachable from the outer shell.
- vii. The suits shall be made in eight (8) sizes labelled: XSmall / Small / Medium / Large / XL / 2XL / 3XL / 4XL and Special size. Special size suits shall be made to fit for individual personnel, where standard sizes will not fit and protect adequately.

B. Fabric and Garment Requirements:

1. Outer Material (Shell):

- i. NFPA 1971 (2018 editions) - 225gsm - Comfort (Twill) - 67% Para Aramid / 33% Meta-Aramid.
- ii. The colour supplied: Khaki
- iii. The fabric shall withstand at least 3000 cycles @ (200N x 200N) on the Taber Abrasion Machine without the material holing (90% of material weight retained).
- iv. The TPP (Thermal Protective Performance) shall be no less than 43 cal/cm² on the composite of the material on offer.
- v. Degradation temperature to be no less than 1050°F (565.6°C)
- vi. The garments shall comply with the NFPA 1971(2018) standards for :
 - Seam Strength,
 - High visibility,
 - Hardware and
 - Label legibility.
- vii. Only yarns guaranteed by the manufacturer to 360°C and SABS /NFPA shall be used.
- viii. Yarns to be of same colour as outer material.
- ix. All raw edges and seams shall be over locked by using at least five (5) strands of yarn.
- x. Seam strength to be at least 200 N.
- xi. **Proof of the certificate (UL) must be included.**

2. Moisture Barrier:

- i. Nomex IIIA woven substrate laminated to a breathable membrane.
- ii. The fabric shall have NFPA 1971-2018 approval for:

- Flame resistance,
 - Heat resistance,
 - Water resistance,
 - Liquid resistance,
 - Viral resistance (Bacteriophage) Strength.
- iii. Resistance to penetration by fire ground chemicals.
- iv. **Proof of the certificate (UL) must be included.**

3 Thermal barrier and Lining

- i. Thermal barrier – 50% Aramid & 50% Viscose FR Face Cloth quilted to two (2) layers of needle punched 80% Aramid & 20% Meta Aramid Batting.
- ii. Total weight is 7.8 oz/yd².
- iii. The fabric shall have NFPA 1971-2018 approval for:
 - Flame Resistance,
 - Heat resistance,
 - Thermal resistance,
 - Cleaning shrinkage, Strength & Tearing Resistance.
- iv. **Proof of the certificate (UL) must be included.**

C. Requirements for Protective Tunic:

- i. DRD (Drag Rescue Device) incorporated at the back of the jacket (Required)
- ii. The outer shell shall be of a single layer construction throughout.
- iii. All seams shall be double stitched
- iv. The coat shall have a double closure front with 50mm Velcro and a heavy duty zip. The zip shall comply with the standards as set in NFPA 1971-2018.
- v. There shall be no seams on the shoulders. Sleeves shall be constructed in such a way as afford maximum movement.
- vi. The sleeve cuffs shall be reinforced.
- vii. The arms of the tunic shall be designed to facilitate the maximum amount of free arm movement.
- viii. Elbow padding is required. The padding shall consist of polymer-coated Kevlar with a heat resistant material sandwiched between the shell and the Kevlar. The padding shall be stitched onto the outer shell using double stitching.
- ix. The vapour barrier, thermal barrier and lining together shall form the inner garment.
- x. The inner jacket shall be attached to the outer jacket by means of a heavy-duty zip and Velcro with snaps at the arms.
- xi. The inner jacket shall be equipped with wristlets and thumb loops in accordance with the NFPA 1971-2018 standards.
- xii. The jacket shall include inverted pleats. The two pleats shall be set in the back of the outer shell.
- xiii. The tunic shall be bunny style in front and longer toward the back (Tail).
- xiv. Pockets:
 - Two (2) pleated waterproof side pockets shall be fitted to the tunic. The size of these pockets shall be 220mm x 180mm with a 75mm pocket-flap held down by two (2) Velcro squares.

- A radio pocket shall be fitted onto the left chest. The pocket shall be so positioned not to hinder the Breathing Apparatus shoulder straps. The pocket shall feature a pocket flap with an insertion for the antenna. The pocket flap shall be closed with a Velcro square.
- All pockets shall be of the same material as the outer shell.
- A pocket shall be placed on each side on the inside of the inner shell. These pockets shall be constructed of the same material as the inner shell.

xv. Collar:

- The collar shall be of a double layer of the same material as the outer shell and shall have a layer of the quilted thermal barrier in the middle thereof.
- A storm-flap constructed the same as the collar shall be fitted in such a way as to ensure a "Dry Suit".
- The area over the chin shall have a layer of Nomex Knit.

D. Requirements for Protective Trousers

- The trouser shall be shaped in such a way that it will provide a tailored fit.
- The trousers shall extend no less than 150mm above the waist.
- Super heavy-duty suspenders shall be permanently fitted to the trousers. A mechanism to prevent the straps from sliding from the shoulders shall be incorporated into the suspenders. Reflective to be weaved into suspenders.
- The main body of the suspenders shall be constructed of non-elastic webbing.
- The suspenders shall be no less than 50mm wide.
- The suspenders shall be equipped with two non-slip thermoplastic slide fasteners for adjustment.
- On the back 50mm wide elastic webbing shall be stitched to the non-elastic webbing. The left and right suspender belt shall be connected with 50mm elastic webbing at the back.
- Provision shall be made for a fly flap in the trousers. This fly flap shall be fastened with Velcro along the entire length. The fly flap shall taper from top to bottom.
- The cuff area of the trousers shall be reinforced.
- The leg ends shall be wide enough to fit over the bunker boots. The bottom leg seam of the inner shell shall be fitted with an elastic band.
- The knee area shall be reinforced with polymer coated Kevlar squares.

E. Reflective Trim

- Retro-reflective fluorescent trims in accordance with the NFPA 1971 (2018) shall be fitted to the suit.
- All trims shall be 3M type.
- The trims shall be 50mm or 76.2mm wide throughout.
- All trims shall be double stitched.
- The colour of the trims shall be lime-yellow with a silver strip in the centre.
- The trims shall be positioned as specified in NFPA 1971-2018 edition.

F. Marking:

- Each Tunic and each pair of trousers must have a white printed label of a nominal size of 60mm x 40mm. All cut edges must be turned in and the label securely sewn centrally to the

inside of the back of the inner shell at the top of both the tunic and trousers. The label must provide the following information printed in legible block letters.

- The manufacturers name or trade mark or both.
- The composition of the materials.
- All materials NFPA 1971-2018 compliant.
- The year of manufacture.
- Washing instructions.
- Size.
- Destination.

G. Insignia – Required:

- i. Back Logo: “Kendal Power Station” 50mm capital letter set in black stitching.
- ii. Left Upper Arm: “South African Flag” (25mm x 35mm) in full colour stitching.
- iii. Left Upper Chest: Combat fabric material name tag of 20mm x 110mm attached by means of black Velcro. Personalised name tags with YELLOW letter set on BLACK background material. Name tag material may not affect or impact performance of the fire tunic performance rating.

Special Instructions:

- i. Measurement for size requirements to be confirmed during site meeting within five (5) working days after Purchase Order has been issued but prior to delivery to site.
- ii. The garment shall have no metal clips or rivets.
- iii. The manufacturer must undertake to do repairs on a material cost basis.
- iv. The suit shall be constructed in such a way that damaged panels can be replaced.
- v. All layers must be designed to allow for this.
- vi. It is a condition of the tender that all tenderers submit a SABS Manufacturing Capability Report Certificate which is not older than twelve (12) months, which certifies the capability to manufacture the specific items tendered for with their tender. **(Failure to submit this report will render the tender null and void).**

FIRE FIGHTING BOOTS

<u>Key Features</u>	<ul style="list-style-type: none"> • Extra comfort non-woven para/meta aramid FR lining excellent flame resistant property. • 16" tall Snug-fit design and ergonomic insole, plus the optional felt insole to adjust fit. • Highly chemical resistant rubber upper. • Flame retardant rubber upper.
<u>Technology</u>	<ul style="list-style-type: none"> • Viking NJV outsole – abrasion-, chemical- and slip-resistant chloroprene rubber outsole. • Shaft to be lined with polyaramide for protection. • Extra comfort non-woven para/meta aramid FR lining with excellent flame resistant property. • Highly chemical resistant rubber upper. • Flame retardant rubber upper.

<u>Safety standards</u>	<ol style="list-style-type: none"> 1. NFPA : 1971 - 2018 protective footwear for structural fire fighting. 2. NFPA : 1992 - 2018 liquid splash-protective against hazardous material emergencies. 3. CSA Z195-14 / ASTM F2413-11 Grade 1 Steel toe and plate. 4. CSA Z195-14 "Green Fir Tree" chainsaw protection - Chainsaw Protection (Highest Class 3 (28m/sec chainsaw speed as per EN ISO 17249:2013). 5. CSA Omega - Electric shock resistant 18kV.
<u>Ideal Use</u>	<ul style="list-style-type: none"> • Regular and Auxiliary Firefighters. • Forest fire workers. • Motor vehicle accidents around dangerous flammable liquids.

Special Instructions:

- i. Number of boot sizes to be confirmed during site meeting within five (5) working days after Purchase Order has been issued but prior to delivery to site.
- ii. 16" tall Snug-fit design and ergonomic insole, plus the optional felt insole required for adjusted fit to be supplied.
- iii. Reinforced backstay for heel tendon protection.
- iv. Metatarsal, shin impact, and chainsaw protection through multiple layers of polyaramide, and rubber.
- v. Ankle padding protection and foam midleg padding for additional support.
- vi. Ultra flexible capable of exceeding 305,000 Flex Rating.
- vii. Safety reflective patch on the back of the boot.
- viii. Heavy-duty rubber pull straps.
- ix. **Proof of the certificate (NFPA ; CSA) must be included.**


FIRE FIGHTING GLOVES

<u>Key Features</u>	<ul style="list-style-type: none"> • Flame Resistant and Waterproof. • Resistant to Viral and Blood Borne Pathogens as well as Industrial Chemicals in Accordance with ASTM F903. • Eight (8) layer knuckle guard system featuring 100% Kevlar® fused with silicone carbide. • Palm Layers Stitched Down with High-Burst Kevlar® Thread to Strengthen Grip. • Flexible Finger Sidewalls of Kevlar® and Nomex® Maximize Dexterity.
<u>Technology</u>	<ul style="list-style-type: none"> • 100% Modacrylic knit inner-liner. • 100% Kevlar® hi-burst thread throughout. • Water-resistant & fire-retardant suede goatskin leather. • NFPA Certified Porelle® PTFE breathable barrier. • NFPA Certified Porelle® FR 540 liner for blood borne pathogen/liquid resistance.
<u>Safety standards</u>	<ol style="list-style-type: none"> 1. NFPA 1971-2018. 2. ASTM F903.
<u>Ideal Use</u>	<ul style="list-style-type: none"> • Regular and Auxiliary Firefighters.

Special Instructions:

- i. Number of fire glove sizes to be confirmed during site meeting within five (5) working days after Purchase Order has been issued but prior to delivery to site.
- ii. Fire gloves to stay soft and maintain dexterity after use and washing.
- iii. Fully Knitted 100% Modacrylic Inner Liner for Easy Don and Doff.
- iv. Fire gloves to incorporate leather pull tab for easy don and doff.
- v. Fire gloves to exceed NFPA Requirements in All Categories.
- vi. Highest Level Breathability of any Structural Glove Moisture Barrier.
- vii. Advanced Multi-Layer Design Reinforces Vulnerable Areas and Features Exclusive Knuckle Guard.
- viii. Fully Lined with Kevlar® for added cut resistance.
- ix. Stays soft and flexible after drying NFPA 1971 Compliant Porelle® PTFE Moisture.
- x. **Proof of the certificate (NFPA ; ASTM F) must be included.**

FIRE FIGHTING BALACLAVA / FLASH HOOD

<u>Key Features</u>	<ul style="list-style-type: none">• Centre Seam with a three (3) ply Hood Top and two (2) ply Bib.• Overall Length: 21"• Size: Universal.• Colour: Black with Blue Stitching and Embroidery.
<u>Technology</u>	<ul style="list-style-type: none">• 93% Nomex.• 5% Kevlar.• 2% Anti-Static (Knitted 1 x 1 Rib).• Weight: 240 g/m² (single layer).• Thread: 100% Nomex (Blue).
<u>Safety standards</u>	1. NFPA 1971-2018
<u>Ideal Use</u>	<ul style="list-style-type: none">• Regular and Auxiliary Firefighters
<u>Illustrative sample</u>	

Special Instructions:

- i. A manufacturer's label must be affixed to the inside cuff detailing the following information printed in legible block letters:
 - a. The manufacturer's name or trade mark or both.
 - b. The composition of the materials.

- c. All materials NFPA 1971-2018 compliant.
 - d. The year of manufacture.
 - e. Washing instructions.
 - f. Size.
 - g. Destination.
- ii. **Proof of the certificate (NFPA ; UL) must be included.**

JET STYLE FIRE FIGHTING HELMENT WITH INTERGRADED COMMUNICATION & HEARING PROTECTION

A. Fire Helmet

Size	Size M: 52–62 cm/Size L: 57–65 cm. Head sizes between 58 and 62 should select the best suited size through fitting test.
Weight (basic configuration)	<ul style="list-style-type: none"> Size M – 1450 g (± 30 g). Size L – 1550 g (± 30 g).
Colours	White, Yellow, Red and Black.
Helmet Body Approvals / Certifications	CE Marking according to EN443:2008 “Helmets for fire-fighting in buildings and other structures”. Type B – Full coverage shell. Optional requirements: <ul style="list-style-type: none"> C – Resistance to chemicals. Very low temperatures –30°C. Coverage of front area 3b (through face shield) E2 – Wet helmet insulation. E3 – Surface insulation (depending on front plate model).
Shell Material	High Temperature Thermoplastic material, injection moulded.
Impact Liner Material	Shock absorbing polyurethane foam, with over moulded aramide reinforcement.
Chin trap	Three (3) points, adjustable chinstrap with release buckle.
Interior	Flame resistant, padded headband and chinstrap covers, made of Nomex or Leather.
Face Shield	Shield Clear face guard visor.
Face Shield Material	Coated thermoplastic material, high temperature performance.
Face Shield Approvals	CE marking according to EN14458 “High performance visors” – Face guard. Optional requirements/Use for Fire-fighting: <ul style="list-style-type: none"> N – Anti-fog. K – Anti-scratch. Ω – Electrical properties (Surface insulation).

B. Ocular Visor

Material	Clear Polycarbonate.
Weight	100 g ± 10 g.
Approvals / Certification	EN14458 – Eye guard with following optional requirements:

	<ul style="list-style-type: none"> • K – Anti-scratch. • Ω – Electrical properties (Surface insulation). • T – Extreme of Temperatures ($-30\text{ }^{\circ}\text{C}$ to $+120\text{ }^{\circ}\text{C}$). • UV Filter to EN170 (2–1.2).
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C. Integrated Communication & Hearing Protection System

Overview	<p>Active Hearing Protection headset with built-in communication capabilities, including:</p> <ul style="list-style-type: none"> • Two (2) ear muffs with padding and noise attenuation foam. • Ear cup height adjustment system for optimal wearing position. • Flexible microphone attached to the left muff. • Down-lead Cable with anti-tearing, LEMO connecting plug (green).
Interoperability	<ul style="list-style-type: none"> • Operates with a Push-to-Talk (PTT) module enabling connection to the PMR radio. Connection through LEMO plug with colour codification. • PTT module with Green connector: ATEX system (for use with approved ATEX radios only).
Technical specifications	<ul style="list-style-type: none"> • Microphone: Noise cancelling electret, 100Hz-10kHz, sensitivity -61 dB (nominal) at 50% humidity. • Loudspeaker: 32 Ω, 100Hz-20kHz, max power 100mW. • Material: Cup: PC/ABS, Cushion: Synthetic leather. • Down lead Cable: Fire retardant, shielded cable. • Battery: 2xAAA batteries, Duracell, Varta, Energizer (ATEX versions). • Surrounding sound amplifiers: Omnidirectional, sensitivity -38\pm2dB, • Max input 110dB S.P.L • Operation Temperature: -20$^{\circ}\text{C}$ to +65$^{\circ}\text{C}$, humidity < 98%.
Weight	390 g \pm 10g (including batteries).
Approval / Certifications	<p>EMC performance: ESD/EMI: 10 V/m.</p> <ul style="list-style-type: none"> • Fully watertight – equivalent to IP67. • ATEX (when used with an ATEX certified PTT module). • ATEX level: II 2G Ex ib IIC T4. • SNR value : 26 dB / H=26 / M=23 / L=18.

D. Push-to-Talk (PTT) Communication Module

Overview	<p>Push-to-Talk Module (PTT) including:</p> <ul style="list-style-type: none"> • Housing with large size, easy to handle push button. • Down-lead cable to the PMR radio with connection plug. • Headset connection cable with anti-tearing LEMO plug. • Belt / Strap attachment through clip of pincer.
Interoperability	<p>Operates with a Headset, in particular helmet mounted headsets for jet type fire helmets.</p> <ul style="list-style-type: none"> • PTT with Yellow connector: for flexible microphone headsets. • PTT with Green connector: for flexible microphone headset, ATEX (for use with ATEX radios only).
Technical specifications	<p>Amplifier: Adjustable gain (0-26 dB), bandwidth 300Hz-3kHz</p> <ul style="list-style-type: none"> • Nominal output: 50mV RMS, harmonic distortion 5%.

	<ul style="list-style-type: none"> Housing Material: High Temperature Thermoplastic (PA). Operation Temperature: -20°C to +65°C, humidity < 98%.
Weight	Pincer version: approx. 200 g. Clip Version: approx. 160 g.
Approval	<ul style="list-style-type: none"> EMC performance: ESD/EMI: 10 V/m ATEX (when used with an ATEX certified PTT module, blue or green plug). ATEX level: II 2G Ex ib IIC T4 Gb.

Special Instructions:

- i. Supply and deliver complete Jet Type fire fighting helmet incorporating retractable face shield; ocular visor; communications & hearing protection system and PTT radio interface as per specifications provided.
- ii. Number of different colours and sizes to be confirm following a site visit within five (5) working days upon receipt of Purchase Order but prior to delivery to site.
- iii. The fire fighting helmet to meet and/or accede EN443:2008 specifications.
- iv. Each helmet to incorporate clear face shield which meet and/or accede EN14458 specifications.
- v. Each helmet to incorporate an ocular visor which meet and/or accede EN14458 specifications with electrical safety properties.
- vi. Retractable Eye protection visor with incredible field of vision.
- vii. Unique, dual pivot adjustment system for optimal comfort on all head sizes and face shapes, with two integrated handling areas for easy grip.
- viii. Plug and Play concept for quick helmet upgrade or component replacement.
- ix. Each helmet to incorporate Neck Curtains meeting the following requirements:
 - Extension of the helmet protection through ergonomic neck curtains, with unique clicking concept for easy installation and washing.
 - Rear coverage models of Nomex material to be provided.
- x. Fire Fighting helmets must be capable of integrating Communication and Hearing protection without impacting the user's safety during fire fighting.
- xi. Helmet to be supplied with two-speaker communication system incorporating hearing protection as specified above.
- xii. Integrated communication headsets to connect to long range radios.
- xiii. Two way radios are excluded from this scope.
- xiv. Boom microphone with length adjustment and parking position under the shell.
- xv. Push-to-Talk (PTT) Interface as part of communications system to be included in accordance with specifications above.
- xvi. **Proof of the certificate (EN) must be included.**

BUNKER GEAR KIT BAG

Overview	Large style duffel bag comprising: <ul style="list-style-type: none"> Six panel tubular design <ul style="list-style-type: none"> 2x end panels 2x side panels 1x bottom panel 1x breathable insert
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	<ul style="list-style-type: none"> • Full length zip closure on top in centre line and shall be equipped with a grip strap and each end made from the base material. • Retro-reflective fluorescent trims along one side of zip closure. • Adjustable shoulder carry strap of heavy duty nylon with heavy duty clip-on attachments at ends for easy removal. • Two wrap-around heavy duty webbing carry handles with 85 cm loop ends. • At the inside of the straps two quick release buckles with straps shall provide extra strength to carry the inside weight. • One internal pouch with zip closure stitched to the left side of bag.
Technical specifications	<ul style="list-style-type: none"> • Bag Dimensions: Length 830mm by 450mm radius • Body: body runs to 2/3 • Bottom: base runs to 1/3 • Extra-large; one-directional, heavy duty zipper of 10mm synthetic elements to comply to SANS1822. • One breathable insert panel 100mm wide on right side of bag across the length. • Retro-reflective trim: 50mm wide in double stitched to bag on left side along the length. • Internal Pouch Dimensions: Length 300mm by 450mm wide • All seams to be overlocked and double top stitched. • Threads of polyester cotton core-spun type (ticket No.80) to comply with SANS1362 shall be used. • Webbing to be box tucked to bag.
Material Specifications	<ul style="list-style-type: none"> • Body: 300 gsm Military spec waterproof ripstop canvas • Bottom: 550gsm PVC floor • Internal pouch: 550gsm PVC • Breathable Insert: 100% Polyester in Leno weave design • Retro-reflective trims shall be 3M type
Colour	<ul style="list-style-type: none"> • Bag Body: Black or Navy • Breathable Insert: Black • Retro-reflective trim: Lime-yellow with silver strip in centre

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