



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Inspect Assemble Remove Replace Install And Adjust Section Insulator Runners On 3 Kv Dc Overhead Track Equipment Under Live Conditions Training

Physical Planning and Construction / Civil Engineering Construction

Unit Standard 119891 · NQF Level 4 · 14 Credits · 11 Days

COURSE OVERVIEW

This course equips learners with the skills to safely inspect, assemble, remove, replace, install, and adjust section insulator runners on 3 kV DC overhead track equipment under live conditions. It ensures compliance with safety regulations and enhances operational reliability of railway infrastructure.

Category	Physical Planning and Construction
Subfield	Civil Engineering Construction
Unit Standard	119891
Accreditation	SAQA Accredited · NQF Level 4 · 14 Credits
Duration	11 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Demonstrate safe working procedures when inspecting section insulator runners under live conditions.
- Assemble and install section insulator runners in accordance with manufacturer specifications and industry standards.
- Remove and replace defective section insulator runners without interrupting service.
- Adjust section insulator runners to ensure correct alignment and tension for optimal performance.
- Apply relevant safety protocols, including the use of personal protective equipment and live-line tools.
- Evaluate the condition of section insulator runners and identify potential failures.

WHO SHOULD ATTEND

- This course is designed for railway technicians, electrical linesmen, and maintenance personnel responsible for live-line work on 3 kV DC overhead track equipment in South Africa.

COURSE OUTLINE

Day 1: Introduction to 3 kV DC Overhead Track Equipment and Safety

- Overview of 3 kV DC overhead track equipment.
- Section insulator runners: purpose and types.
- Electrical safety fundamentals for live working.
- Relevant OHS Act and SANS standards.
- PPE selection and inspection.
- Emergency response procedures.
- Introduction to live working permits.
- Risk assessment basics.

Day 2: Tools, Equipment and Pre-Work Checks

- Insulated tools: types and ratings.
- Tool inspection criteria and frequency.
- Calibration and certification of equipment.
- Ladder and platform safety.
- Barricading and warning signs.
- Communication equipment and protocols.
- Pre-work checklist completion.
- Storing and transporting tools.

Day 3: Fundamentals of Section Insulator Runners

- Section insulator: components and operation.
- Runner types: fixed, adjustable, and sliding.
- Current collection and arcing.
- Wear indicators and measurement.
- Common faults: cracks, misalignment, contamination.
- Reading manufacturer specifications.
- Schematic symbols and diagrams.
- Case study: runner failure analysis.

Day 4: Inspection Techniques for Section Insulator Runners

- Visual inspection: cracks, pitting, erosion.
- Dimensional checks using gauges.
- Measuring runner gap and alignment.
- Insulation resistance testing.
- Documentation procedures.
- Defect classification: minor, major, critical.
- Inspection intervals and records.
- Practical inspection exercise.

Day 5: Safe Work Procedures for Live Working

- Live working categories: glove and barehand.
- Approach distances for 3 kV DC.
- Isolation points and earthing.
- Permit-to-work systems.
- Team roles and communication.

- Emergency shutdown procedures.
- Simulated live working scenario.
- Review of incident case studies.

Day 6: Disassembly and Removal of Section Insulator Runners

- Isolation and proving dead.
- Disconnecting clamps and droppers.
- Removing runner from insulator.
- Use of tension relief equipment.
- Component handling and storage.
- Waste management procedures.
- Step-by-step removal demonstration.
- Practical removal exercise.

Day 7: Assembly and Installation of Section Insulator Runners

- Pre-installation checks on new runner.
- Assembly sequence: hardware torque.
- Alignment to overhead line.
- Electrical connection: bonding and jumpers.
- Tension adjustment.
- Use of alignment tools.
- Installation demonstration.
- Practical installation exercise.

Day 8: Adjustment and Tuning of Section Insulator Runners

- Gap measurement tools and techniques.
- Height adjustment mechanisms.
- Lateral alignment correction.
- Pantograph interaction simulation.
- Tensioning bolts and locknuts.
- Post-adjustment inspection.
- Recording as-built settings.
- Practical adjustment exercise.

Day 9: Testing and Commissioning After Installation

- Insulation resistance measurement.
- Bonding continuity test.
- Pantograph profile gauge use.
- Thermal imaging for hotspots.
- Dynamic testing with train simulator.
- Commissioning checklist.
- Sign-off procedures.
- Troubleshooting common issues.

Day 10: Fault-Finding and Troubleshooting

- Fault symptoms: arcing, noise, wear.
- Diagnostic tools: multimeter, megger.
- Mechanical faults: misalignment, loose parts.

- Electrical faults: poor bonding, insulation breakdown.
- Root cause analysis techniques.
- Corrective actions and adjustments.
- Case studies of field faults.
- Practical troubleshooting scenarios.

Day 11: Integration, Assessment and Close-Out

- Integrated practical exercise.
- Live working simulation (if feasible).
- Written assessment covering theory.
- Practical assessment with checklist.
- Logbook completion.
- Feedback session.
- Certification requirements.
- Course evaluation and close-out.

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **14 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 38,400.00	R 38,400.00
1	In-House	R 49,900.00	R 49,900.00
1	On-Campus (Pretoria)	R 57,600.00	R 57,600.00

UPCOMING SESSIONS

Start	End	Method	Venue
05 Aug 2026	19 Aug 2026	On-Campus	Johannesburg, South Africa
06 Aug 2026	20 Aug 2026	On-Campus	Mauritius
07 Aug 2026	21 Aug 2026	On-Campus	Cape Town, South Africa
10 Aug 2026	24 Aug 2026	On-Campus	Pretoria, South Africa
11 Aug 2026	25 Aug 2026	On-Campus	Abu Dhabi, UAE
12 Aug 2026	26 Aug 2026	On-Campus	Durban, South Africa
12 Aug 2026	26 Aug 2026	On-Campus	Mauritius
13 Aug 2026	27 Aug 2026	On-Campus	Cape Town, South Africa

Contact us if no suitable date is listed — on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 119891) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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