Small and Large-Scale Solar PV Systems Under SANS 10142-1 Edition 3.3 (2026)

Design, Installation, Commissioning and Maintenance

DATES
27 – 28 October 2026

CPD POINTS
2 Points

O	ATTEND REMOTELY **Live Online Training** **R 7 999** per delegate
H	IN-PERSON **Birchwood Hotel, Boksburg** **R 8 999** per delegate

Course Overview

As demand for renewable energy continues to grow, so does the need for professionals who can design, install, commission and maintain safe, efficient and compliant solar photovoltaic (PV) systems. This comprehensive course equips delegates with the practical knowledge and technical skills required to implement both small and large-scale Solar PV systems in accordance with current industry best practice and South African standards.

The course has been fully updated to incorporate the requirements of SANS 10142-1 Edition 3.3, published June 2026. This edition represents a significant advancement in the regulation of renewable and alternative energy installations, introducing important compliance requirements for Solar PV systems, Battery Energy Storage Systems (BESS), generators, Uninterruptible Power Supply (UPS) systems and other alternative energy sources, intended to enhance electrical safety, improve system reliability and ensure the safe integration of multiple energy sources into a single electrical installation.

Who Should Attend

- Solar PV Installers and Technicians
- Electrical Engineers and Technicians
- Renewable Energy Consultants
- Solar System Designers
- EPC Contractors
- Electricians
- Maintenance Technicians
- Compliance and Testing Professionals

Why You Should Attend

By the end of this course, delegates will be able to:

- ✓ Interpret and apply the Edition 3.3 requirements specific to solar PV, battery storage and multi-source installations
- ✓ Correctly design and size rooftop PV systems, from load assessment through to final specification
- ✓ Design large-scale (solar farm) PV plants, including DC/AC system design and grid connection
- ✓ Complete the new Annex S (PV/Battery Generating Plant) test report accurately
- ✓ Apply the updated N-E bonding, conductor identification and fault-loop impedance requirements
- ✓ Correctly commission a PV installation and identify common module degradation and failure modes
- ✓ Build a compliant, cost-effective operations and maintenance (O&M) plan

DAY 1: Regulatory Framework, Solar PV Theory and Rooftop Systems

Modules 1 to 5

1 Regulatory Framework: SANS 10142-1 Edition 3.3 and Solar PV Compliance

- Overview of PV standards: SANS 10142-1:2026 Section 7.12 and SANS 60364-7-712:2018 Edition 2
- Conductor identification and colour-coding rules
- Requirements for multiple sources (PV, generator, battery, BMS) operating in parallel
- Neutral-to-earth bonding issues and mixed supply conductors in multi-core cables
- Earth fault detection, disconnecting devices and fault-loop impedance at the main switch
- Insulation resistance testing, structural/fire safety requirements and the new Annex S test report for generating plants

2 Solar PV Theory and Cell Technologies

- Energy from the sun, solar power plants and active/passive solar heating
- I-V curve, P-max control and estimating power output
- PV cell technologies: mono-crystalline, poly-crystalline and thin-film
- Mechanism of generation and current direction inside a PV cell
- Effects of temperature and insolation intensity on efficiency
- Effects of shading on modules and the PV technology hierarchy

3 Rooftop PV System Components and Sizing

- Solar module/array selection, panel sizing and panel generation factor
- Battery basics, capacity, series/parallel configuration and sizing
- Inverter basics, specification and single-phase/three-phase bridge types
- Calculating daily watt-hours needed and the number of panels required
- Controller basics, sizing and additional features

4 PV Wiring, Installation and SANS 10142-1 Compliance

- Wiring components, series and parallel connections and wire sizing
- DC conductors and battery protection methods
- Overcurrent protection, grounding and safety equipment
- Additional requirements for off-grid, on-grid and alternative-supply PV installations

5 Solar Site Selection and Mounting

- Altitude, azimuth and tilt-angle selection
- Mounting options: pole, roof and tracking (passive versus active)
- Solar access and site-selection considerations
- Categories of PV systems: off-grid, hybrid and grid-tied

DAY 2: Solar Farm Design, Commissioning and Maintenance

Modules 6 to 9

6 Large-Scale Solar Farm Design and Layout

- Site selection and solar farm design principles
- Plant layout design: tilt angle, module configuration, inter-row spacing and orientation
- PV simulation and design software
- Technology selection: modules, inverters, transformers and mounting structures

7 DC and AC System Design for Solar Farms

- DC system design: PV array design, inverter sizing and cable selection/management
- AC system design: cable selection, switchgear and transformer sizing
- Combiner boxes, string fuses/MCBs and DC switching
- Plant substation, earthing, surge protection and grid connection

8 PV System Commissioning

- Commissioning of the PV system and commissioning checklist
- General start-up procedure and system walkthrough

9 PV Module Degradation, Maintenance and O&M Planning

- Common degradation and failure modes: hot spots, corrosion, discolouration, delamination, cracking, PID, bubbles and junction box failure
- PV battery maintenance
- Visual module inspections and cleaning of solar PV
- Building an O&M plan: maintenance tasks, recommended intervals and O&M cost classifications

Includes practical exercises throughout and a final course assessment.

Registration Form

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R 7 999
Live Online

R 8 999
Birchwood Hotel

ATTENDANCE OPTION

☐ **Live Online**
Online Training — R 7 999 per delegate

☐ **In-Person**
Birchwood Hotel, Boksburg — R 8 999 per delegate

In-person venue: Birchwood Hotel, 44 Viewpoint Rd, Bartlett, Boksburg

BOOKING CONTACT (APPROVING OFFICIAL)

FULL NAME (MR / MRS / MS) _____ POSITION _____

COMPANY NAME _____ VAT NUMBER _____

TELEPHONE _____ EMAIL _____

ADDRESS _____

SIGNATURE _____ DATE _____

FINANCE & PAYMENT

PERSON RESPONSIBLE FOR FINANCE _____ DIRECT TEL NO. _____

DATE OF PAYMENT _____ PURCHASE ORDER / REFERENCE NO. _____

ACCOUNT HOLDER	BANK	BRANCH	ACCOUNT NO.
Independent Training Management (Pty) Ltd	FNB South Africa	Randburg (251650)	62685879276

DELEGATES ATTENDING THIS WORKSHOP

#	FULL NAME	POSITION	EMAIL
1			
2			
3			
4			
5			

TERMS & CONDITIONS

1. **Fees** are current at time of print; Independent Training reserves the right to change them.
2. **Additional delegate rates** apply for bookings made at the same time, on the same course.
3. **Confirmation**: on receipt of this form and payment/PO, you will receive email confirmation with venue details, map and start times.
4. **Attendance**: no learner may attend without proof of payment or an order number.
5. **Substitution**: delegate substitutes may be made at any time at no penalty — please notify us in writing.
6. **Payment** is due 5 working days before the course by cheque or EFT, quoting the invoice reference and organisation name. Cancellations must be emailed to Independent Training; please notify us immediately of any reschedule or cancellation.

CANCELLATION CHARGES

11 – 30 days before course	10%
6 – 10 days before course	20%
4 – 6 days before course	30%
1 – 3 days before course	50%