



POWER AND ELECTRICAL TRAINING

Transformer Operation, Maintenance, Testing and Diagnosis

5 day course

Classroom, online or in-house

Course overview

A power transformer is the most expensive single item in most substations and the one with the longest replacement lead time, so its condition governs both reliability and capital planning. This course covers keeping it in service. Delegates work through construction and operating principles, cooling and loading including the effect of overload on insulation life, and the protection and monitoring around it. Testing is the core: insulation resistance and polarisation index, turns ratio, winding resistance, power factor and capacitance, frequency response analysis, and what each result actually indicates. The course closes on interpreting a set of test results together to decide whether a transformer stays in service, and on planning life extension.

What you will learn

- Explain transformer construction, operating principles and cooling
- Assess the effect of loading and overload on insulation life
- Specify protection and monitoring appropriate to a unit
- Carry out and interpret the main electrical diagnostic tests
- Apply frequency response analysis to detect winding movement
- Read a full set of test results together to reach a condition judgement
- Plan maintenance, life extension and replacement

Who should attend

- Electrical and substation engineers
- Maintenance and testing technicians
- Asset managers in utilities and heavy industry
- Commissioning engineers
- Technical staff responsible for transformer fleets

Course outline

- 01 Transformer construction, principles and cooling
- 02 Loading, overload and insulation ageing
- 03 Protection and condition monitoring
- 04 Insulation resistance and polarisation index
- 05 Turns ratio and winding resistance testing
- 06 Power factor, capacitance and dielectric testing
- 07 Frequency response analysis and winding movement
- 08 Interpreting results together and deciding on service
- 09 Life extension and replacement planning

Upcoming dates

Dates	Venue	Format	Fee per delegate
26 to 30 October 2026	Lusaka, Zambia	Classroom	USD 1,325
11 to 15 January 2027	Online	Online	R8,500
25 to 29 January 2027	Pretoria, South Africa	Classroom	R19,950
1 to 5 March 2027	Kigali, Rwanda	Classroom	USD 1,325



Fees and how to register

This 5 day course is **R8,500** per delegate online, **R19,950** in the classroom in South Africa, Botswana, Namibia, Lesotho and Eswatini, and **USD 1,325** in the classroom elsewhere in Africa. In-house training is quotation on request. Book 2 or more delegates on this course and save 10%.

To register or request an in-house proposal, visit www.afrisciencegroup.com, email info@afriscience.co.za, or WhatsApp us on **+27 63 479 1136**.

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