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

Hydroelectric Power Plant Operations

Custom Courses / Energy, Oil and Gas

Unit Standard AATICD-0486 · NQF Level 5 · 6 Credits · 3 Days

COURSE OVERVIEW

This course equips participants with the comprehensive knowledge and practical skills required to safely and efficiently operate hydroelectric power plants. It covers the fundamental principles of hydropower generation, plant components, operational procedures, and maintenance strategies. By the end of the course, participants will be able to contribute to the reliable and sustainable operation of hydroelectric facilities.

Category	Custom Courses
Subfield	Energy, Oil and Gas
Unit Standard	AATICD-0486
Accreditation	SAQA Accredited · NQF Level 5 · 6 Credits
Duration	3 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Apply the fundamental principles of hydropower generation to plant operations.
- Analyze the functions and interactions of key hydroelectric plant components, including turbines, generators, and control systems.
- Implement safe and efficient operational procedures for start-up, shutdown, and normal operation.
- Evaluate plant performance and troubleshoot common operational issues.
- Design preventive maintenance schedules to ensure plant reliability and longevity.
- Demonstrate compliance with environmental, health, and safety regulations in all operational activities.

WHO SHOULD ATTEND

- This course is designed for operators, technicians, and supervisors working in or entering the hydroelectric power generation sector.
- It is also suitable for maintenance personnel and engineers seeking to enhance their understanding of hydroelectric plant operations.

COURSE OUTLINE

Day 1: **Fundamentals of Hydroelectric Power**

- Overview of hydroelectric power in South Africa and globally
- Basic physics: potential energy, kinetic energy, and conversion to electricity
- Major components: dam, penstock, turbine, generator, and control systems
- Types of plants: run-of-river, storage, pumped storage, and micro-hydro
- Water management and hydrology fundamentals
- Environmental considerations: fish passage, sedimentation, and downstream flow
- Safety basics in a power plant environment

Day 2: **Operational Principles and Control Systems**

- Detailed operation of turbines (Pelton, Francis, Kaplan) and generators
- Governor systems and speed regulation
- Control systems: SCADA, PLCs, and manual controls
- Synchronization with the grid and load management
- Start-up and shutdown sequences
- Monitoring parameters: flow, head, vibrations, temperatures, and electrical output
- Troubleshooting common operational issues
- Emergency procedures and safety protocols

Day 3: **Maintenance, Optimization, and Practical Integration**

- Maintenance planning: preventive, predictive, and corrective
- Condition monitoring: vibration analysis, oil analysis, thermography
- Efficiency optimization: adjusting head, flow, and load
- Environmental compliance and water use licensing
- Human factors and operational best practices
- Case studies of operational challenges and solutions
- Review and assessment of key competencies

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 **6 NQF credits** at **NQF Level 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 13,900.00	**R 13,900.00**
1	In-House	R 18,700.00	**R 18,700.00**
1	On-Campus (Pretoria)	R 20,800.00	**R 20,800.00**

UPCOMING SESSIONS

Start	End	Method	Venue
01 Dec 2026	03 Dec 2026	On-Campus	Shenzhen, China
01 Dec 2026	03 Dec 2026	On-Campus	Cape Town, South Africa
02 Dec 2026	04 Dec 2026	On-Campus	Durban, South Africa
02 Dec 2026	04 Dec 2026	On-Campus	Lagos, Nigeria
07 Dec 2026	09 Dec 2026	On-Campus	Maseru, Lesotho
07 Dec 2026	09 Dec 2026	On-Campus	Kigali, Rwanda
07 Dec 2026	09 Dec 2026	On-Campus	Accra, Ghana
07 Dec 2026	09 Dec 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 QUOTATION OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard AATICD-0486) and click **Get A Quotation**. 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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