Solar Asset Management and O&M Training Course

Professional Development Training Course Outline

Category	Renewable Energy	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Solar Asset Management and Operations & Maintenance (O&M) Training Course is designed to equip renewable-energy professionals with practical capabilities for managing the performance, reliability, safety, profitability, and lifecycle value of photovoltaic (PV) assets. As solar portfolios become larger and more digitally connected, modern asset management is moving beyond reactive fault response toward data-driven performance optimization, predictive maintenance, AI-enabled diagnostics, digital twins, SCADA analytics, condition monitoring, and lifecycle cost management. Recent industry guidance emphasizes standardized O&M practices, performance KPIs, preventive maintenance, quality management, and effective coordination between asset owners, asset managers, and O&M providers.

The course combines technical asset management, commercial asset management, plant operations, preventive and predictive O&M, performance analytics, risk management, contract management, HSE, digitalization, and advanced diagnostics. Participants work through realistic solar asset management and O&M case studies, enabling them to translate theory into operational decisions involving inverter failures, performance-ratio losses, soiling, degradation, warranty claims, spare-parts planning, downtime, production forecasting, and contractor performance. Emerging approaches such as AI-driven diagnostics, multimodal inspection, digital twins, remaining-useful-life estimation, and prescriptive maintenance are increasingly relevant to modern PV asset-management strategies.

Programme Curriculum

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Course Duration

5 days

Course Objectives

By the end of the course, participants will be able to:

1. Understand the complete solar asset lifecycle, from commissioning through operations, optimization, repowering, and decommissioning.
2. Develop effective technical asset-management strategies for utility-scale and distributed PV portfolios.
3. Apply modern O&M best practices to improve safety, reliability, availability, and energy yield.
4. Interpret SCADA, monitoring, weather, metering, and plant-performance data for data-driven decision-making.
5. Calculate and analyze critical KPIs including Performance Ratio (PR), availability, specific yield, energy losses, MTBF, and MTTR.
6. Implement preventive, corrective, predictive, and condition-based maintenance strategies.
7. Use AI, machine learning, and advanced analytics concepts for fault detection and maintenance prioritization.
8. Evaluate inverter, module, tracker, transformer, cable, monitoring, and balance-of-system failures through structured root-cause analysis.
9. Apply drone, infrared thermography, I-V curve testing, and other advanced inspection technologies appropriately.
10. Manage O&M contracts, SLAs, warranties, performance guarantees, insurance interfaces, and contractor KPIs.
11. Optimize maintenance budgets, spare-parts strategies, workforce planning, and lifecycle operating costs.
12. Strengthen HSE, environmental, cybersecurity, compliance, and operational-risk management.
13. Develop a practical solar asset-performance improvement roadmap using digitalization, predictive analytics, and continuous improvement.

Target Audience

1. Solar Asset Managers
2. O&M Managers and Supervisors
3. PV Plant Operations Engineers
4. Renewable Energy Project Managers

5. Plant Managers and Site Engineers
6. EPC, O&M and Technical Service Professionals
7. Investors, Owners, Financiers and Portfolio Managers
8. Energy Consultants, Analysts and Renewable-Energy Professionals

Course Modules

Module 1 — Solar Asset Management Fundamentals

- Solar asset lifecycle
- Asset-management roles
- Technical vs. commercial asset management
- Portfolio governance
- **Case Study:** Managing a multi-site PV portfolio where inconsistent reporting and contractor coordination create performance and revenue risks.

Module 2 — PV Plant Operations and Performance Management

- PV plant architecture
- Plant monitoring and SCADA-based operational control.
- Performance benchmarking using PR, availability, specific yield and energy-based KPIs.
- Energy-loss analysis covering soiling, shading, clipping, curtailment, equipment downtime and degradation.
- **Case Study:** Diagnosing a sudden PR decline by comparing irradiance, temperature, inverter availability and historical production data.

Module 3 — O&M Strategy and Best Practices

- Designing preventive, corrective, predictive and condition-based O&M programs.
- Maintenance scheduling, work orders, inspections and technician workflows.
- SLA and KPI management.
- Spare-parts management, inventory optimization and critical-component planning.
- **Case Study:** Converting a reactive O&M program into a risk-based maintenance strategy for an aging PV plant

Module 4 — Advanced Monitoring, Diagnostics and Predictive Maintenance

- AI-powered fault detection and anomaly identification.
- Predictive analytics for inverter, module and equipment failure risks.
- Condition monitoring, degradation forecasting and remaining useful life (RUL).
- Digital twins and physics-based/data-driven asset models.
- **Case Study:** Using historical SCADA signals and equipment alarms to prioritize an inverter intervention before a major production loss.

Module 5 — Solar Inspection and Failure Analysis

- Drone inspection and aerial thermography for large-scale PV assets.
- Infrared thermography for hotspots, abnormal temperatures and equipment screening.
- I-V curve testing, electroluminescence and module diagnostics.
- Root-cause analysis for modules, inverters, cables, trackers and transformers.
- **Case Study:** Investigating recurring module hotspots using SCADA data, thermal imagery and field inspection results to determine corrective actions.

Module 6 — Commercial, Contractual and Financial Asset Management

- O&M contracts, SLAs, warranties, guarantees and performance obligations.
- Budgeting, cost control and O&M cost optimization.
- Revenue-impact analysis of downtime, curtailment and underperformance.
- Insurance claims, supplier management and contractual risk.
- **Case Study:** Evaluating whether a recurring inverter failure should be handled through warranty replacement, corrective maintenance or an equipment-upgrade strategy.

Module 7 — Risk, HSE, Compliance and Resilience

- Health, Safety and Environment (HSE) management for solar operations.
- Electrical safety, work permits, site procedures and emergency preparedness.
- Weather, storm, fire, flooding and other operational-risk considerations.
- Cybersecurity and SCADA/OT risk management for connected PV assets.
- **Case Study:** Developing a storm-preparedness and post-event recovery plan for a utility-scale solar plant. Industry guidance emphasizes preventive and pre-storm maintenance as part of effective PV O&M.

Module 8 — Digital Solar O&M and Portfolio Optimization

- Integrated asset-management platforms, CMMS, SCADA and data analytics.
- AI, machine learning and digital-twin applications for fleet optimization.
- Automated dashboards, alerts, reporting and performance benchmarking.
- Prescriptive O&M
- **Case Study:** Build a digital performance-improvement strategy for a 100 MW solar portfolio covering KPI governance, predictive maintenance, contractor optimization, spare parts, downtime reduction and lifecycle value.

Training Methodology

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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