

Regulatory Expectations & O&M Standards for PV Plants

A Path to Operational Excellence and Sustainability



02 June 2026
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1. INTRODUCTION

This Presentation provides:

1. Actionable overview of what NERSA and South African law expect from PV plant owners with regards O&M;
2. highlights real audit findings from recent NERSA compliance audits;
3. Outline practical O&M standards and best practices to ensure compliance, safety, and high performance.

Some information is extracted from the NERSA audit report (Q3 2024/25) and external industry standards.

2. Regulatory Landscape: NERSA Expectations

- **Legal Framework**

- The Electricity Regulation Act (ERA) and the South African Grid Code (SAGC) set the foundation for compliance.
- All licensed generators are subject to regular NERSA audits covering license conditions, grid code, and best engineering practices.
- Grid Connection Code for Renewable Power Plants (GCCRPP)

- **Key Compliance Areas**

- Maintain separate accounts and submit annual reports to NERSA
- Notify NERSA of any changes in company details, processes, or operational status
- Comply with all sections of the Grid Code and the Grid Connection Code for Renewable Power Plants (GCCRPP)
- Retest grid code compliance every six years (GCCRPP requirement)
- Retain operational and maintenance data for at least five years
- Conduct regular environmental and health & safety audits

3. NERSA Audit Findings: Lessons from the Field

- **Who Was Audited?**
 - Recent audits included Aurora Rietvlei Solar Power Park (10.88 MW) and Vredendal Solar Power Park (9.52 MW), among others.
- **Positive Findings for PV Plants**
 - Both Aurora Rietvlei and Vredendal Solar Power Parks fully complied with license conditions and the GCCRPP.
 - Maintenance strategies were in place, based on OEM recommendations and managed via Computerised Maintenance Management Systems (CMMS) or SAP.
 - Outage management was proactive and coordinated with distributors.
 - Asset registers and internal labelling standards were maintained; spares were available on-site.
 - Environmental and safety compliance was strong, with regular audits and trained officers.

3. NERSA Audit Findings: Lessons from the Field

- Performance: Aurora Rietvlei exceeded estimated performance; Vredendal met expectations.
- **Common Gaps (Other Technologies):**
 - Some plants failed to confirm six-year compliance retesting (GCCRPP requirement).
 - Inadequate data archiving (less than five years).

4. O&M Standards: What Should PV Plants Do?

Based on NERSA requirements, international standards (IEC 62446, IEC 61724), and industry best practice:

- **Preventative and Predictive Maintenance:**
 - Routine visual inspections of modules, inverters, transformers, and cabling
 - Real-time performance monitoring (SCADA or equivalent)
 - Thermographic inspections to detect hotspots or faulty modules
 - Regular cleaning of modules, tailored to site conditions
- **Documentation and Record-Keeping:**
 - Maintain detailed logs of all maintenance activities
 - Document and investigate all faults, outages, or safety incidents
 - Archive operational and maintenance data for at least five years

4. O&M Standards: What Should PV Plants Do?

- **Compliance and Testing**

- Perform initial and periodic (every six years) grid code compliance testing
- Follow OEM-recommended maintenance schedules
- Implement and regularly review safety procedures; ensure staff are trained and certified

- **Asset and Outage Management**

- Keep an up-to-date asset register and ensure spares are available
- Plan outages to minimize production loss and coordinate with grid operators

- **Environmental Management**

- Conduct regular environmental audits
- Ensure proper disposal of replaced modules, batteries, and hazardous materials

5. Conclusion

The latest NERSA audit shows that South African PV plants can achieve full compliance and high performance when they:

- Follow robust O&M strategies based on OEM and regulatory requirements
- Maintain thorough documentation and data retention
- Prioritize safety, environmental, and asset management

However, even well-run plants must remain vigilant about periodic compliance testing and data archiving to avoid regulatory risks.

6. Practical Takeaways for SAPVIA Members

- **Use a CMMS or SAP system** to schedule and track all maintenance activities.
- **Conduct annual internal compliance audits** using the NERSA audit questionnaire as a template.
- **Schedule GCCRPP retesting every six years** and retain all test reports.
- **Maintain a digital archive** of operational data, accessible for at least five years.
- **Invest in staff training** for compliance, safety, and technical skills.
- **Engage with SAPVIA** for updates on regulatory changes and industry best practices.

By embedding these simple practices, PV plant owners can ensure regulatory compliance, optimize plant performance, and reduce operational risks.

THANK YOU

