



Multi-MW IPP Improved Reliability by Centralizing PM & Inverter Health Monitoring

CLIENT PROFILE

A multi-MW Solar Independent Power Producer (IPP) operating utility-scale solar farms across several states. Their asset portfolio includes thousands of modules, string inverters, central inverters, HT/LT electrical equipment, SCADA infrastructure, and plant-wide monitoring systems.

As a power producer selling energy under long-term PPAs, the IPP depends heavily on high plant availability, strong inverter reliability, and consistent generation output.

CHALLENGE

Despite having experienced on-ground teams, the IPP struggled with persistent operational issues:

- Repeated inverter faults, especially fan failures, communication faults, DC insulation issues, and string dropouts.
- PM tasks being missed or inconsistently executed across contractors and sites.
- No unified system to track inverter service history, last maintenance date, or fault recurrence.
- Technicians closing jobs without proper documentation or inspection evidence.
- Fragmented logs across WhatsApp, Excel sheets, and handwritten registers.
- Difficulty identifying faulty equipment patterns across MW blocks, inverter makes, and plant clusters.





Solution Provided by Asset Infinity

Asset Infinity deployed a unified Solar O&M Reliability System, combining preventive maintenance automation, inverter health analytics, and real-time fault tracking.

Centralized Preventive Maintenance (PM) System

- Standardized PM checklists across all sites and contractors.
- Mandatory checks: filter cleaning, fan operation, torque checks, thermal scans, AC/DC readings, and firmware validation.
- Automatic reminders and escalations for overdue PMs.
- PM compliance dashboards for cluster heads and management.

Unified Fault Logging & Repair Tracking

- All inverter faults recorded via mobile app with photos, readings, and cause-of-failure notes.
- Faults auto-tagged by inverter ID, make, model, location, and string.
- Supervisors gained visibility into faults across the entire MW portfolio.

Inverter Health Monitoring Dashboard

- Highlighted repeat offenders, inverters with high failure frequency.
- Identified fault clusters across plants (e.g., fan issues in an entire block).
- Trend analysis for ageing inverters, weak strings, or environmental impacts.

RCA (Root Cause Analysis) Visibility

- System grouped repeated faults by category:
 - DC overcurrent
 - AC imbalance
 - String dropout
 - Thermal derating
 - Communication failure
- Enabled deeper investigation into recurring patterns and systemic weaknesses.



Spare-Part Consumption Traceability

- Logged spares used for each repair, fans, PCBs, communication cards, fuses, connectors.
- Helped identify bad-quality spares or high-consumption components.
- Ensured technicians followed correct repair protocols.



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MEASURABLE BENEFITS

61% reduction in repeated inverter faults within 5 months.

Higher plant availability and fewer breakdown-driven outages.

PM compliance improved sharply across all sites and vendors.

RCA analytics enabled fast decision-making and long-term reliability planning.

Reduction in emergency breakdown costs and repeated spare replacements

IMPLEMENTATION & ROLLOUT

- Full rollout across all solar plants in a phased 6-week deployment.
- On-site and virtual training for technicians, cluster leads, and O&M supervisors.
- Seamless adoption without impacting daily operations.
- Integration with plant SCADA alerts for synchronized fault notifications.

OUTCOME & IMPACT

The IPP gained a robust, data-driven O&M framework:

- Repeated fault cycles were broken, improving system reliability.
- Inverter performance stabilized across blocks and clusters.
- Long-term inverter health insights supported CAPEX forecasting and life-cycle planning.
- Enhanced operational discipline improved overall PLF (Plant Load Factor) and revenue consistency.



CONCLUSION

By centralizing preventive maintenance, digitizing inverter fault logs, and implementing RCA-driven health analytics, Asset Infinity helped the Solar IPP achieve a 61% reduction in repeated faults, ensuring higher reliability, stronger generation stability, and measurable revenue protection.