

Fixed PM Discipline and RCA Visibility to Stop Repeated Inverter Issues

CLIENT PROFILE

A large Solar O&M (Operations & Maintenance) service provider managing utility-scale and C&I (Commercial & Industrial) solar assets across multiple states. Their portfolio includes string inverters, central inverters, combiner boxes, SCADA systems, transformers, and protection equipment, each essential for smooth generation and grid stability. With SLAs tied to plant availability and guaranteed generation, preventing inverter failures was a top priority.

CHALLENGE

The O&M team was struggling with repeated inverter failures across multiple sites. The underlying issues included:

- Missed or inconsistent preventive maintenance (PM) on inverter fans, filters, terminals, and cooling systems.
- Poor visibility into root-cause analysis (RCA) of recurring faults such as:
 - DC overcurrent
 - AC imbalance
 - Communication failure
 - Fan failure
 - Temperature derating
- Technicians closing tickets without proper logs or evidence.
- Difficulty identifying fault trends across makes, models, and sites.
- No structured view of which inverter was failing repeatedly and why.
- Lack of standardized inspection checklists across sites and vendors.





Solution Provided by Asset Infinity

Asset Infinity deployed a digital O&M workflow that unified fault logging, preventive maintenance, RCA tracking, and inverter health insights.

Preventive Maintenance Standardization

- PM checklists for every inverter type (string & central).
- Mandatory steps: cleaning filters, torque checks, thermographic scans, airflow checks, and firmware validation.
- PM auto-triggered based on runtime, calendar schedule, or energy generation.
- Escalations for overdue PM ensured zero slippage.

Centralized Fault & Breakdown Logging

- All inverter faults logged with codes, photos, temperature readings, and technician notes.
- Faults auto-grouped at inverter, block, and site level.
- Real-time visibility of outages across all assets.

Root Cause Analysis (RCA) Dashboard

- System automatically highlighted patterns:
 - Same inverter failing repeatedly
 - Same component failing across multiple sites
 - Faults linked to poor PM compliance
- Helped supervisors quickly identify systemic issues vs one-off events.

Technicians' Digital Logs

- Detailed repair documentation with timestamps, spares used, and remarks.
- Geo-tagged entries confirmed field presence.
- Videos and thermal images uploaded for audit and validation.



Spare-Part Traceability

- Components such as fans, PCB modules, fuses, and connectors tracked end-to-end.
- Visibility into consumption patterns helped identify poor-quality components.
- Ensured the right spares reached the right inverter at the right time.



MEASURABLE BENEFITS

Reduction in repeated inverter failures within 4 months.

Major drop in DC/AC imbalance issues through structured PM.

Fewer emergency breakdown visits, reducing operational overheads.

Improved RCA visibility gave accurate insights into ageing inverters and OEM component weaknesses.

Higher plant availability and improved PR (Performance Ratio).

IMPLEMENTATION & ROLLOUT

- Rollout across utility-scale solar farms and C&I rooftops.
- Field technicians trained on mobile workflows in regional phases.
- Supervisors adopted centralized dashboards for fault analysis.
- System integrated with SCADA alarms and existing or new ticketing workflows.

OUTCOME & IMPACT

The O&M operator achieved stronger operational control:

- Repeated inverter faults dropped sharply, improving reliability.
- PM discipline rose to near 100% compliance across all sites.
- Decision-makers could pinpoint systemic issues affecting inverter health.
- RCA analytics enabled faster corrective action, before failures escalated.
- Energy output improved, strengthening customer confidence and SLA adherence.



CONCLUSION

By digitizing preventive maintenance, centralizing inverter fault logs, and enhancing RCA visibility, Asset Infinity helped the Solar O&M provider achieve a 34% reduction in inverter failures, improving plant uptime, generation stability, and operational excellence.