

Hanwha Convergence USA

Your Trusted O&M Partner for
Excellence in Renewable Energy





Empowering Renewable Energy with Innovation and Excellence in Operations & Maintenance

Commitment to Excellence

Welcome to Hanwha Convergence USA, where we are revolutionizing the renewable energy O&M industry. With an unwavering commitment to excellence and innovation, we provide top-tier O&M services that set new industry benchmarks.

Explore our exceptional Solar & Battery Energy Storage System (BESS) O&M services, where engineering excellence meets advanced IT solutions. Backed by Hanwha’s comprehensive solar value chain—consistently a top performer in the U.S., from module manufacturing to EPC services—we possess unparalleled knowledge and expertise across the entire renewable energy ecosystem.

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Company Overview

Our Service Area:

We offer comprehensive O&M services for a wide range of renewable energy projects, including:



Utility-scale solar farms



Battery Energy Storage Systems (BESS)



Commercial & industrial rooftop solar systems



Technical Services & Warranty Works for Inverters and Batteries

Detailed Service Offerings

Patrick Allen,
Head of O&M



Our OEM-certified technicians deliver tailored O&M solutions that meet the unique needs of each client. With our expertise, your renewable energy assets receive the highest level of service, maximizing performance and reliability. Supported by advanced monitoring systems, you can trust us to keep your operations running smoothly and efficiently.



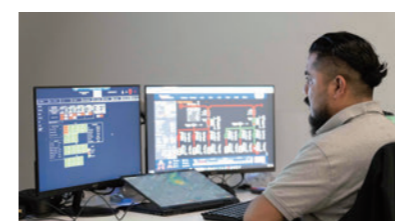
Preventive Maintenance

Regular maintenance by our highly skilled technicians minimizes downtime and extends the lifespan of renewable energy assets.



Corrective Maintenance & Repair

Swift resolution of system issues ensures minimal disruption to operations and maximum uptime.



Data-Driven Performance Optimization & Reporting

Powered by HEIS 2.0, our advanced energy platform, we optimize system performance and provide clear reports, empowering informed decision-making.

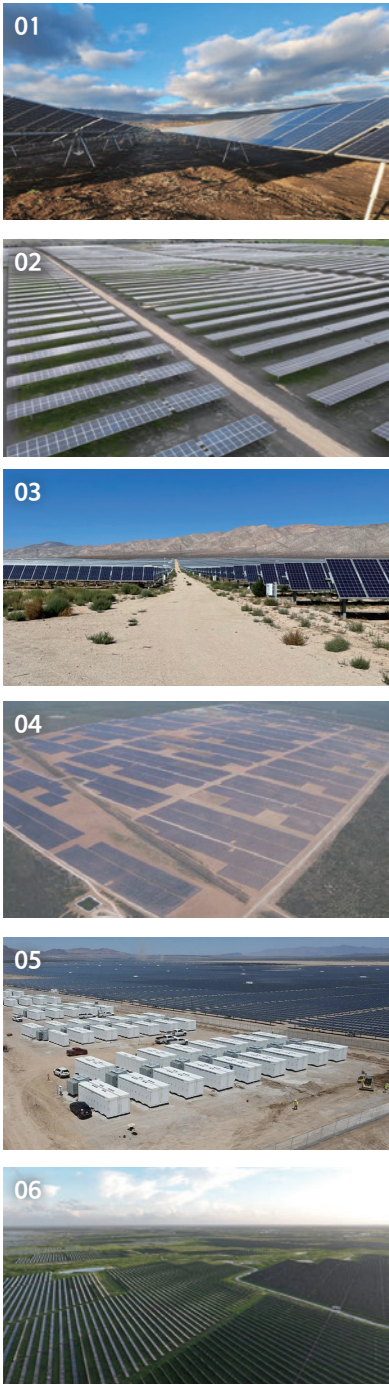


24/7 System Monitoring & Performance Analysis

Supported by our state-of-the-art ROC, our monitoring systems ensure proactive issue detection and continuous performance optimization.

Proven Track Record

Explore our portfolio to see how our highly trained team consistently delivers exceptional results across projects of all sizes and complexities. Our proven global record in solar and BESS O&M includes operating facilities with a total capacity of 1,423 MW PV and 464 MW / 1,669MWh BESS.



01 PV
Skysol Project
Size: PV 66.4MV
Location: Oregon, USA
* COD: Jan. 2024
* Commercial Operation Date

02 PV
Coniglio Project
Size: PV 168MV
Location: Texas, USA
COD: Aug. 2021

03 PV
Barren Ridge Project
Size: PV 78MV
Location: California, USA
COD: Apr. 2015

04 PV
Oberon 1A/B Project
Size: PV 231 MW
Location: Texas, USA
COD: Jun. 2020

05 BESS
Silverpeak Project
Size: BESS 1,116 MWh
Location: Nevada, USA
COD: Oct. 2024

06 PV
Cottonwood Bayou Project
Size: PV 456 MW
Location: Texas, USA
COD: Sep. 2024



Experience the Pinnacle of Quality

Witness the pinnacle of quality through our:

- **Industry recognition:** We are consistently recognized for our outstanding service and innovative solutions.

“Hanwha Convergence USA is widely recognized in the industry for its exceptional O&M services. Their OEM-certified technicians and advanced HEIS platform set a benchmark for maintenance and monitoring excellence. Industry experts praise Hanwha’s ability to deliver outstanding reliability and operational performance, making them a trusted leader in the field.”

- **Glowing client testimonials:** Our clients speak volumes about the exceptional value we deliver.

"I've worked with many O&M teams over the last 10 years, and I can confidently say that Hanwha Convergence USA has built a great team. Everyone at HCU has an ownership mindset—performance and safety come first, and then the bill. I've never felt our relationship was purely transactional. I truly appreciate the support and everything HCU's team does for us."

Ravi Singh, Sr. Director of Operating
Asset Management at 174 Power Global

O&M
Services
Overview

Quality Matters

At Hanwha Convergence USA, quality is non-negotiable. We take pride in our team of highly skilled and OEM-certified technicians, who undergo rigorous training and adhere to the highest industry standards. Our commitment to quality ensures that your renewable energy assets operate reliably and efficiently, maximizing their performance and longevity.



1
O&M Key
Management
Points

- **Specialized Management Systems:** Our team provides proactive services that maintain a consistent state
- **Optimal System Stability and Conditions:** We promptly respond to abnormalities and address customer maintenance requests

Solar PV

Maximize Power Generation

- Remove shading factors
- Module cleaning schedule management
- Thermal de-rate monitoring



System Life Cycle Extension

- Expedient and certified parts replacement
- Detailed spare parts tracking and replenishment
- Monitoring and prevention against moisture, dust and animal intrusion



Preventive Maintenance

- Dedicated site technicians
- Smart inspections directed by project analytic
- Scheduled maintenance during no to low generation periods to minimize production losses



Prompt Incident Response

- Utilizing Hanwha national technician network
- Emergency dispatch and immediate recovery



2
BESS Key
Management
Points

- **Global Operational Excellence and Expertise:** Within all our markets Hanwha Convergence provides services globally (Ranked No.1 in BESS O&M in Korea)

BESS

Stable BESS Operations

- Temperature monitoring and maintenance ($23 \pm 5^{\circ}\text{C}$)
- Humidity monitoring and maintenance ($48 \pm 5\%$)



Prevention of Fire Accidents

- HVAC system inspection
- Corrosion protection
- Fire detection system monitoring



BESS System Performance
Maintenance

- Charge efficiency and balancing
- Availability and performance monitoring
- Battery capacity assessment



Prompt Incident Response

- Utilizing Hanwha national technician network
- Emergency dispatch and immediate recovery



O&M Service Highlight

1

Dedicated Personnel

Unmatched Expertise

Our strategic alliances with leading OEMs in modules, inverters, transformers, trackers, and substation equipment provide us with unparalleled industry insights and resources. We leverage these partnerships to stay at the forefront of technology and deliver superior solutions.

Commitment to Sustainability and Reliability

At Hanwha Convergence, we prioritize a sustainable energy future. We understand that the best ability is availability, ensuring dependable renewable energy is at the heart of our mission.

Expert Maintenance with a Focus on Safety

Our skilled electrical workers are dedicated to each site, guaranteeing that both corrective and preventative maintenance are performed safely and promptly, maintaining top-notch reliability.

Enhanced Support with Specialized Data Analytics

Our unique advantage lies in our dedicated back-office team, specializing in data analytics and site integration. They ensure seamless monitoring and maintenance, enhancing reliability, uptime, and energy generation.



2

Training Capabilities

Expert Training from Industry Leaders

Drawing on the expertise of key Hanwha Convergence personnel, including former Supervisors of Training and Learning at Sungrow, we provide top-tier training for senior onsite technicians. This includes comprehensive instruction on both corrective and preventative maintenance, essential for daily operations.

Skilled Technicians Driving Exceptional O&M

At Hanwha Convergence, our skilled workforce is pivotal to our outstanding O&M solutions. Our technicians, already or soon-to-be qualified, bring the expertise and training necessary to excel in project execution.



Inverter Repair &
Troubleshooting



Tracker Repair &
Troubleshooting



NFPA 70E



OSHA 10/30



Qualified Electrical
Worker (QEW)



String Repair and
Troubleshooting



SCADA / Telemetry
Repair and
Troubleshooting



Met Station
Repair and
Troubleshooting



O&M Service Work scope

1 Preventative O&M

Client–Centric Approach

We understand that every project is unique, which is why we take a client–centric approach to service delivery. Our dedicated team works closely with clients to understand their specific needs and objectives, tailoring solutions that address their specific challenges and exceed their expectations.

Hanwha Convergence is continually finding a way to maximize the efficiency of a system to reach its potentially optimum rate.

Visual Inspection

Hanwha Convergence will conduct a visual inspection at every scheduled preventive inspection session. This will include Site, Structure, PV Module, Inverter, DC&AC Wiring, DAS, E–House.

Curve Test

I–V Curve of ten percent (10%) of string will be measured annually to evaluate the string's performance status. And the Fill Factor will be compared as the performance Indicator, which is in a range of STC condition.

Insulation Resistance Test

Insulation resistance for ten percent (10%) of strings will be measured annually to detect abnormal string. The insulation resistance for 1,000 V or less should be at least 1 MΩ.

Ground Test

Conduct a ground continuity test using a ground tester by connecting the AC and inverter ground points. Results are given in Ω. Earth ground values will be measured with two poles placed 5 meters from the ground box.

IR Inspection

An IR camera will be used to check the tightness of each string and to detect the abnormal components.

Report

Monthly, Quarterly, and Annual report

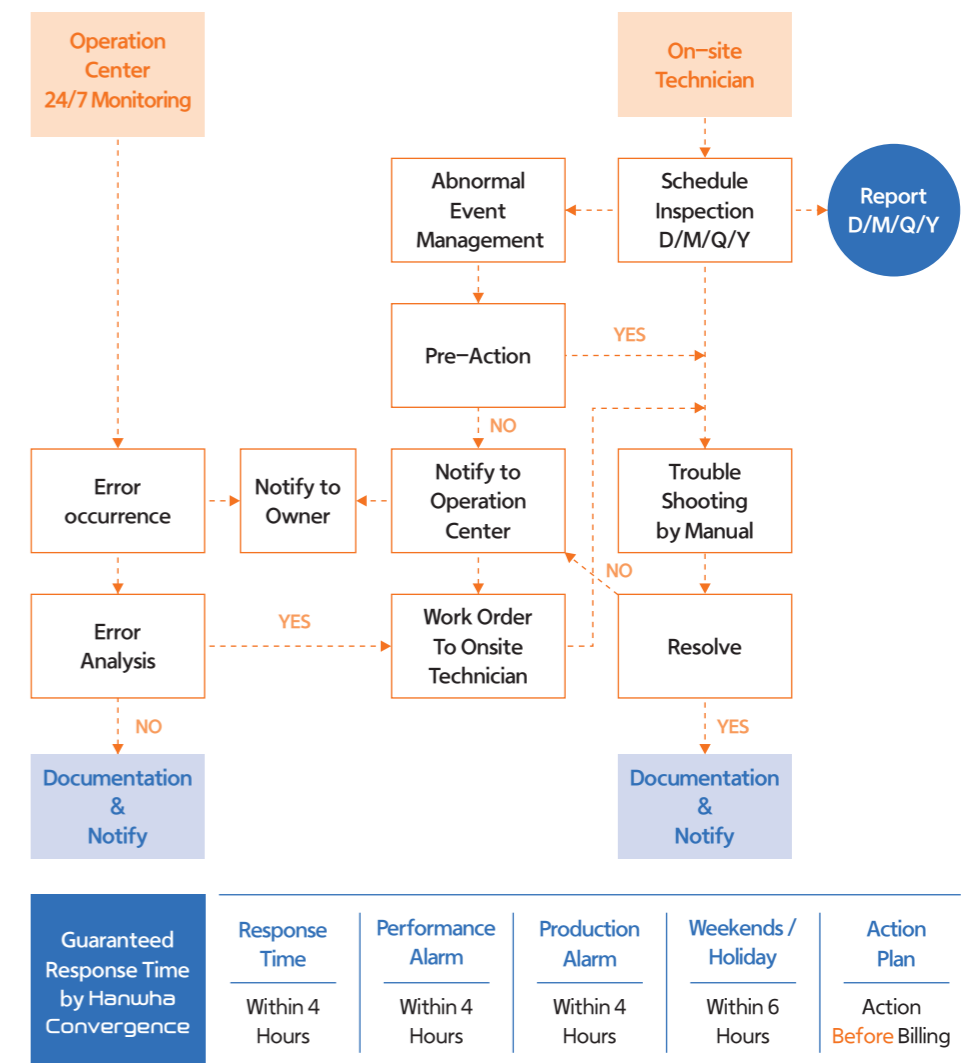


2 Unscheduled maintenance

Hanwha Convergence utilizes real–time emergency truck–rolls to maintain a stable generation.

Action Plan

Hanwha Convergence guarantees both Response–time and availability.



*Response time based on business days

Monitoring Service Overview

Cutting-Edge Technology

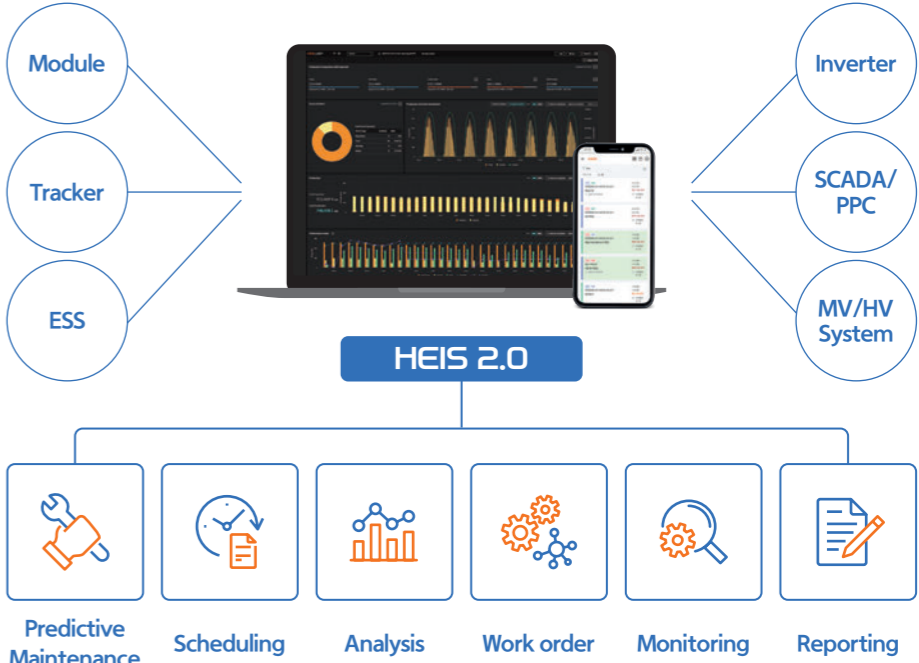
Discover our revolutionary Hanwha Energy Integration System (HEIS) 2.0, an integrated energy control, performance analytics and CMMS platform that empowers us to deliver unmatched services. HEIS 2.0 positions us as technology leaders in the industry, enabling proactive monitoring, predictive maintenance, and real-time optimization.

1

HEIS 2.0: All-in-One Energy Integration Platform

O&M Efficiency

- Streamlines work processes for owners and operators by integrating the entire value chain—from power plant monitoring and control to data collection and O&M operations.
- Increase in O&M efficiency through the automation of work management and power generation forecast



Cost Saving

- Transparent O&M systematic process to ensure cost savings and fosters firm trust among users (operators, managers and site owners)
- Customizable tracking of O&M activities to reduce unnecessary O&M costs



Remote
Operations
Center
Overview

Strategic Expansion

We are strategically expanding with an advanced Remote Operations Center (ROC) in Texas, certified as a NERC/CIP Medium impact control center. This facility positions us to grow alongside the renewable industry and prepare for future advancements. Our Anaheim center remains a backup, built to NERC/CIP standards, ensuring continuity of operations and the same high level of support in the event of local outages or unforeseen issues in Texas.

NERC /CIP Compliant Medium-Impact facility

Unparalleled Support
with 24/7 monitoring



- Effortless Operations: 24/7 real-time visibility, report generation, Work Order management, and Performance Analysis—powered by *HEIS 2.0 (Hanwha Energy Integrated System)
- All-In-One Platform: With HEIS 2.0, gain real-time visibility of your sites, seamlessly generate reports, create and track Work Orders, and conduct in-depth analysis—all from one unified platform.

Enhancing Compliance
& Cybersecurity



- NERC Compliance & Training: In partnership with GridSEC and GridSME, we ensure compliance with NERC requirements for Medium-Impact GOPs, maintaining operational excellence through rigorous operator training.
- Cybersecurity Protection: With GridSEC, we fortify our network against evolving cyber threats, prioritizing the safety and integrity of our infrastructure in today's digital landscape.



Monitoring Site
Performance

Ensuring sites meet expected production levels.



Remote
Fault Reset

Bringing equipment back online remotely.



Reporting

Generating reports as needed.



Personnel
Tracking

Monitoring personnel presence and progress.



Warranty
Support

Assisting with the warranty claim process.



Field
Dispatch

Sending personnel to investigate and troubleshoot faults.



Coordinate
with entities

Collaborating with TO/TOPs and ISOs during outages to restore sites safely and minimize loss of generation.



Safety, Environment & Quality Management

Proven Safety Activities

Since 2018, we've maintained a 0% accident rate through a robust safety management system, thorough risk/ hazard assessments, and ongoing onsite improvements.

Eco-friendly Efforts

Solar panel installation on the factory roof and periodic environmental management and inspection

Quality Commitment

We are dedicated to top-quality management with highly skilled and certified professionals to enhance customer satisfaction.



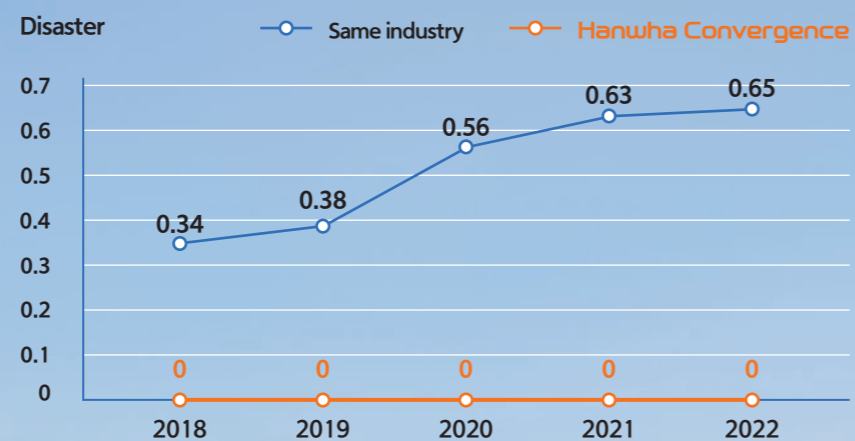
International Safety And Health Management System Certification (ISO 45001)



International Environmental Management System Certification (ISO 14001)



International Quality Management System Certification (ISO 9001)



$$\text{Injury rate (\%)} = \frac{\text{Number of injured persons}}{\text{Number of full-time workers}} \times 100$$

Contact Information

Thank you for allowing Hanwha Convergence USA Corp.
to submit this proposal for services.
If you have any questions, please contact



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Hanwha Convergence USA

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