

AMPS Unit Trial Performance – Oman Well Site

Duration: First 2,000 Hours



Overview

This report summarizes the performance of the AMPS Power Reliability System (“PRS”) during a 2000-hour trial in Oman. The PRS was integrated with a 160 kW diesel generator to ensure seamless power to a critical Electric Submersible Pump (“ESP”).

The system’s objective: Deliver uninterrupted power with high quality, optimized generator usage, and 100% ESP uptime – zero deferment for the duration of the trial.

The PRS ensured the generator only ran at optimum load to charge the batteries then shut down reducing diesel consumption by 30% and hours run per day by 44%.

Key Performance Highlights

- Uninterrupted Operations – ESP ran continuously without any damaging start-stop cycles.
- 100% load uptime maintained throughout the trial – zero oil deferment.
- The VSD pump ran continuously except for a single 4-hour planned maintenance window.
- The AMPS PRS operated flawlessly during 13 generator outage events, both planned and unplanned (oil leaks).

Generator Efficiency & Usage

- Generator runtime: 13.4 hours per day, down from 24 hours per day.
- Due to generator life (> 50k hours) and prior failures, generator loading was reduced from 50% to 35% capacity (56 kW).
- 13 generator trips events: 11 remotely resolved, 2 required on-site visits.
- ESP ran successfully on battery during every generator service without interruption.

Power Quality Enhancements

- Voltage & Frequency Stability were achieved.
- Maintained steady 415 V and 50 Hz.
- Variations were < 0.001, indicating excellent regulation by the AMPS PRS.

Power Factor & Harmonics

- Power Factor improved from 0.88 to nearly 1.00 (unity).
- Total Harmonic Distortion (THD) reductions:

Voltage: from 4.83% to 3.17%

Current: from 48.7% to 12.6%

System Responsiveness & Adaptability

- During one incident, the AMPS PRS intelligently dropped the lower battery state of charge threshold to 23%, ensuring continuous power through diagnostics.
- System design supports remote generator restart, limiting dependency on field personnel.

Operational Metrics Summary

Metric	Value
Total Operating Time	2000 hours
Generator Runtime	1120 hours
Battery System Runtime	2000 hours
Generator Trips (Total)	13 (0 downtime to load)
Load Uptime	100%
Voltage/Frequency Stability	< 0.001 deviation
Power Factor	Improved to 100%
THD Reduction (Voltage)	1.55x improvement
THD Reduction (Current)	3.85x improvement

Conclusion

The AMPS PRS successfully demonstrated:

- Seamless power supply with zero downtime.
- Enhanced generator performance and reduced runtime.
- Significant power quality improvements, making it a robust solution for mission-critical applications.

This trial affirms the AMPS Power Reliability System's viability for scalable, reliable, and autonomous power delivery to ESPs in harsh environments.