



T2E3, Inc. – Energy Efficiency Enterprises
LM6000 Performance Characteristics, Testing
and Long-Term Condition Monitoring
Seminar Agenda

Seminar Objective: To provide attendees with an understanding of the GE LM6000 combustion turbine generator and how to best test for and monitor its performance to the benefit of the facility.

Session 1: 3-hours

Introductions

Module 1: LM6000 Engine Performance Characteristics

The first module will provide a foundation in the importance of understanding engine performance and LM6000 Expected Performance Characteristics. A short review of the thermodynamics behind the LM6000 engine cycle as well as the standard instrumentation provided with the LM6000 package will also be covered.

- Facility Economics
- LM6000 Engine Overview
- LM6000 Engine Instrumentation
- Power Generation Thermodynamic Cycle
- Expected LM6000 Performance
 - Differences between SAC (PA, PC) and DLE (PD, PF, PH) engines
 - SPRINT and NOX Water Injection
 - Inlet Air Conditioning Options
 - Variances due to fuel type (gas versus oil)
 - Degradation – New & Clean versus Repairs or Overhauls
- Engine Control System Influences

Module 2: Performance Corrections

The second module will cover Corrections to Performance, including Throttle Push Theory.

- Development of Correction Curves / GE's APPS CycleDeck
- Use of Correction Curves / "Step 1" Corrections
- Throttle Push Theory and Application / "Step 2" Corrections

Module 3: Personal Experiences, Specific Issues

The final module in this session will allow course attendees to bring personal experiences and questions to the group for in-depth review.



Session 2: 3-hours

Module 4: Field Measurements

The fourth module will cover the measurements necessary to calculate corrected performance, and the additional parameters which must be monitored to ensure engine conditions are optimized toward the objective of the end user. Recommended instrument technologies, data collection frequencies and calibration cycles will also be covered in this module.

- Data Sources and Data Collection Methods
- Instrumentation Options
 - Temperature Measurements
 - Pressure Measurements
 - Flow Measurements
 - Power Measurements
- Test Measurements
- Data Collection Frequencies
- Instrument Calibration
- Application of ASME PTC 19.1 – Test Uncertainty

Module 5: Performance Testing - Bringing it All Together

The fifth module will cover what to expect when setting up an engine for testing and how to troubleshoot perceived deficiencies in performance.

- Test Cell Versus On-Site Testing
- Overview of ASME PTC 22 – Performance Test Code on Gas Turbines
- The Performance Test
- Sample Test Analysis
- Getting the Most out of Your Engine

Module 6: Performance Monitoring

The sixth module will cover what to expect when setting up an engine for long-term monitoring and how to troubleshoot perceived deficiencies in performance.

- Monitoring Methods, Frequency of Performance Assessments
- Key Performance Indicators (KPI)
- Data Validation, Advanced Pattern Recognition
- Uses of Performance Monitoring Results
- Sample Monitoring System and Results
- Determination of Degradation

Module 7: Troubleshooting Performance Deficiencies

The final module will present samples of using performance test and monitoring data to troubleshoot performance deficiencies. Class attendees are encouraged to bring their own experiences and/or data for analysis.