

# GAS TURBINE COMPRESSOR HYGIENE ASSESSMENT

Structural Integrity (SI) has decades of experience characterizing and understanding the short term and long term effects of compressor degradation, forced outages, and unforeseen costs. SI is pleased to offer a comprehensive suite of inspections, analyses, and O&M recommendations to support clients in mitigating these debits to support reliable, profitable, and safe operation.

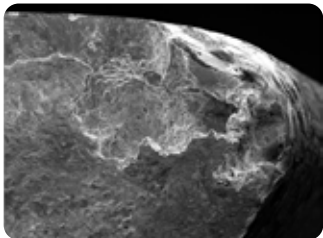
The Combustion Turbine inlet and compressor condition can have strong influences on unit performance, efficiency, reliability, risk, and maintenance costs. Understanding and controlling what enters the inlet and mitigating the effects of accumulated foreign material can have significant ramifications on O&M activities, costs, and unit reliability.



Component  
Pitting

## BENEFITS OF A GOOD HYGIENE PROGRAM

- Reduced operational risk, increased availability
- Reduced blade / vane pitting, erosion damage and liberation risk
- Environmental characterization supporting optimized filtration
- Increased unit output & efficiency with reduced long-term degradation
- Optimized online and offline water wash intervals
- Reduced inspection / maintenance downtime



Pitting Initiated  
Compressor  
Blade Fracture

## WHAT SI CAN DO TO HELP

### Inlet Package and Forward Compressor Detailed Site Survey

- Detailed visual inspection of inlet filter house/inlet ducting assembly
- Pre-filter deposits/debris collection to determine local environmental loading conditions and corrodents
- Collect IGV and forward blade/stator residues to establish contaminants
- Perform mold replication on typical pitting (if applicable) and leading edge (LE) erosion



Compressor  
Wreck

### Blade/Vane Metallurgical Evaluation

- Fracture mapping and origin determination
- Metallurgical assessment including failure mechanism determination
- Blade/vane alloy quality check
- Hardness evaluation
- FOD/DOD material transfer alloy determination

### Laboratory Support

- Inlet pre-filter contaminant species analysis
- IGV/RO/SO surface contamination species analysis
- Pitting mold measurements and size documentation
- LE erosion mold condition/channeling measurements, location and depth documentation

### Data Collection Analysis and Review

- Ambient and unit flow path humidity, temperature, and dew point trending
- Assess pollution, contaminant producers, and environmental wind condition survey (drift)
- Compressor performance trends
- Water wash frequency, duration, and water wash quality checks
- IGV calibration report review
- Annual borescope inspection trends
- Correlate pitting locations with known risk profiles for blade/vane excitation nodal response stresses)

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**Structural Integrity provides comprehensive, fully integrated solutions for life assessment, inspection, failure analysis, and online monitoring of gas turbines, steam turbines, generator equipment, and plant auxiliaries.** SI's multidisciplinary team has decades of experience, with deep understanding of turbine-generator design, operation, maintenance, and industry issues. Our holistic approach ranges from proactive management plans to emergent analysis and inspections and offers unprecedented value with an emphasis on maximizing the life of existing assets in a safe, risk-informed fashion.

## LET US **DEMONSTRATE** THE VALUE OF AN **INTEGRATED TURBINE & GENERATOR ASSET MANAGEMENT PROGRAM**

### RISK ASSESSMENT AND LIFE EXTENSION

- Industry leader in development of advanced analytical tools for rotor lifing
- Hundreds of rotors analyzed, covering every major manufacturer
- Proven capabilities to balance life versus risk to optimize capital planning

### ADVANCED NDE

- Decades of expertise with technology development and application
- Faster, less invasive, and lower cost alternative to OEM inspections
- Complete open/clean/close services in combination with trusted partners

### METALLURGICAL EVALUATION AND ROOT CAUSE ANALYSIS

- Full-service metallurgical lab for sample characterization and failure evaluation
- Demonstrated expertise in causal evaluation and mitigative actions
- Compressor inlet hygiene assessments

### ONLINE MONITORING AND DIAGNOSTICS

- State-of-the-art platform for fleet asset management (PlantTrack)
- SIIQ platform provides advanced hardware and proprietary algorithms for real-time tracking and recommendations
- Data-driven insights to optimize performance and/or avoid damage-likely conditions



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