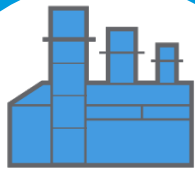


# Our Experience

## ORAP<sup>®</sup> Studies

### Engineering



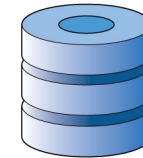
- 50 Hertz Experience
- 50+ MW Units in Peaking Duty
- 7B RAM - Goals, Expectations & Benchmarking
- 7E/EA RAM Data
- 7F RAM Assessment
- 7FA Cost Reduction Study
- 7FA Plant RAM Assessment
- 7H RAM Data Support
- 9F Overspeed Study
- ABWR (Advance Boiling Water Reactor) Generator Study
- Aero Peak Duty RAM for Maint. & Upgrade Planning
- Aeroderivative and Frame RAM
- Aeroderivative and Heavy Frame Reliability Study
- Aeroderivative RAM for Benchmarking
- Air v. Hydrogen Cooled Generator RAM
- Superheater Tube Failure - Weibull Analysis
- Boiler Feed Pump RAM Data Special Request
- Catastrophic Failure/Failure Rate Study (V84)
- Check Valve Reliability
- Combined-Cycle Plant RAM Assessment
- Combined-Cycle Plant RAM Assessment & Equipment Contribution to Downtime
- Combined-Cycle RAM - Utility v. Non-Utility
- Combined-Cycle RAM (Focus on Fuel System & HRSG)
- Combined-Cycle RAM Assessment
- Combustion System RAM Data
- Common Causes of Low Frequency High Impact Events

### Reliability



- Control System Standardization
- Tailored Collaboration - Plant Reliability (India) RAM Assessment
- DAC Summary
- Site (V84.2) RAM
- DLN Study
- Effect of NOx Suppression On Plant RAM
- Equipment Breakdown Structure
- Failure To Start Study
- F-Class Outage Details (Ped Matrix)
- Frame 5 Controls Upgrade Study
- FT4 Maintenance Contract Requirements Review
- FT8 Liquid Fuel System Design Assessment
- FT8 Engine Removal Projections
- FT8 RAM Assessment
- Fuel Impact on RAM
- Gas Turbine Demographics
- Gas Turbine Generator Study
- GE Frame 5 & Frame 7 Data for Spares Planning
- GE MS5001, MS6001B, MS7001EA RAM Review
- GE Purge System Study
- Generator Failure Study
- Generator Flexible Leads Study
- GT Generators RAM Study
- GT RAM Assessment
- GT RAM Assessment by Size
- GT RAM for Future Additions Planning

### Data



- GT RAM for Life Extension Evaluations
- GT Risk Assessment
- GT11N Libe Oil System Reliability Assessment
- GT/HRSG RAM by Size
- GT24 RAM
- GT26 White Paper
- High Level Plant RAM Assessment
- HITAF (High Temperature Advanced Furnace) Study
- 7B v. 7E/Mark IV Units
- Controls Project
- Outage Report
- HRSG & BOP RAM
- IGCC Plant Performance Assessment
- CHP RAM Data
- Industry RAM for Benchmarking
- Industry RAM Standards Review
- Inspection Interval Assessment
- LM6000 Data Assessment
- Lube Oil Study
- Lube Oil System RAM Assessment
- Maintenance Cost Data
- Major Causes of Planned and Unplanned Downtime
- Mark V Study
- MARS
- Mexican Project Plant Design RAM Assessment
- MHTGR - GT RAM Assessment
- MMWEC Analysis

# Our Experience ORAP<sup>®</sup> Studies

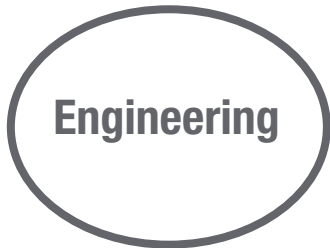


- MS5001 & MS6001 RAM Study
- MS5001 Combustion Hardware Experience
- MS5001 RAM for Life Extension & Maint. Planning
- MS5001N O&M Data
- MS6001 Data
- MS6001 Proposal Input
- MS6001 RAM To Support Operations & Maintenance
- MS6001B Base/Cont. Duty v. Cycling Duty RAM
- MS6B, MS7EA, & MS7F Inspection Intervals
- MS7001B Life Extension Assessment
- MS7001E/EA Historical RAM
- MS7001E/EA Peaking Duty and Baseload Duty RAM
- MS7001E/F (7X) Study
- MS7001EA Starting Reliability & Forced Outage Factor
- MS7001FB Study
- NERC v. ORAP Assessment
- New Technology Introduction: Expected Lifecycle Reliability
- O&M Costs of US 4-10MW Gas Turbines
- O&M Data Analysis - Defining Best In Class Practices
- Operating Practices Guide Book
- Parts Tracking Tool Assessment
- Peaking Duty RAM Review

- Pedigree Matrix
- Pedigree Matrix Data Updates
- PG7241FA Study
- Plant Design RAM Assessment
- Plant Level RAM Data
- Purge System Task Force
- RAM Assessment (Arbitration Support)
- RAM Assessment of Plant Arrangements
- RAM Assessment To Support Configuration Decisions
- RAM Data Study
- RAM Info
- RAM of Steam Turbines in C.C. Plants
- RAM Review (V84.2) Goals & Expectations
- RAM Review of GT's Greater Than 50MW
- RAM Review of Plant Designs
- RAM Statistics
- Relative Risk of Gas Turbines and New Product Introductions
- CHP Plant Assessment
- Single-Shaft v. Multi-Shaft Combined-Cycle RAM
- ST18 Brazilian Project Plant Assessment
- ST18 RAM Assessment
- Standard Plant Design RAM Assessment

- Steam Cycle C&A Study
- Steam Turbine Shaft Driven v. Motor Drive Lube Oil System
- Total Plant RAM for Qualifying Facility Evaluations
- Transition Piece RAM Assessment
- Understanding and Reducing Maintenance Costs
- V84 Flashback Study
- V84.2 Controls and Accessories RAM Assessment
- V84.2 RAM Assessment
- V84.3A Fuel & Combustion System Assessment
- W501F Starting Reliability
- Refinery Plant Design RAM Assessment

*\*\*Actual customer names have been removed to protect confidentiality*



There is no system in the world that collects power plant data in such a comprehensive way as ORAP. Using the detailed operating and reliability performance information contained in the database and over 30+ years of experience, SPS provides reliability engineering and benchmarking analyses to clients around the world.

Want to know more? email [inquiries@spsinc.com](mailto:inquiries@spsinc.com)

