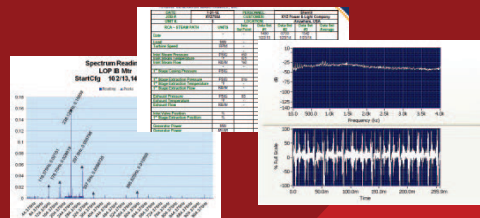


# RUNNING CONDITION ASSESSMENT

**Maximum Unit Availability** – That is the key to profitability for independent power producers and facilities generating power to support manufacturing or mining. A forced outage during peak season can be disastrous, but even a planned outage that is extended for unforeseen repairs can be very costly. The pressure to return a turbine to service sometimes results in reduced operation efficiency and can even lead to another forced outage before the next scheduled maintenance.



## BENEFITS

**Identify Imminent Failures** – Results can indicate major problems such as wiped journal bearings, loose foundations, contact between rotating and stationary parts, and split joint leaks. Minor examples are noisy bearings, overheating motors and fans, dirty lube oil, ineffective coolers, and sticking or leaking valves.

**Identify Heat Losses** – Thermal imagery can identify heat losses from steam leaks or poor insulation which rob efficiency.

**Prep For Planned Outage** – Identification of possible repairs allows you to secure spare parts or sources for remanufacturing, develop contingency plans, better estimate outage duration, schedule appropriately, and secure contingency funding.

**Pre- and Post-Outage Benchmarks** – Assessments before and after the outage confirm that the problems were solved and efficiency was restored.

## METHODOLOGY

### Ultrasonic Analysis

Ultrasonic analysis can recognize or confirm indications of rubs, steam leaks, bearing failure or any rhythmic condition.

### Visual Analysis

Visual analysis directs or confirms other analysis. It can also reveal problems that operators have overlooked or not recognized.

### Vibration Analysis

Portable vibration equipment is used to analyze components which do not have embedded probes. The portable equipment can also enhance the analysis of embedded probe data by capturing movement on additional axes.

### Thermal Analysis

Thermal analysis adds another dimension to the visual analysis. Heat signatures can identify improper heat transfer, failing equipment and lost efficiency.



## CONSISTENT DATA COLLECTION

Assessments are planned for consistent data gathering to reduce external variables which can affect the analysis. Factors include ambient temperature, turbine generator load, extraction volume and steam temperature and quality.



## REVIEW OF REPORTS

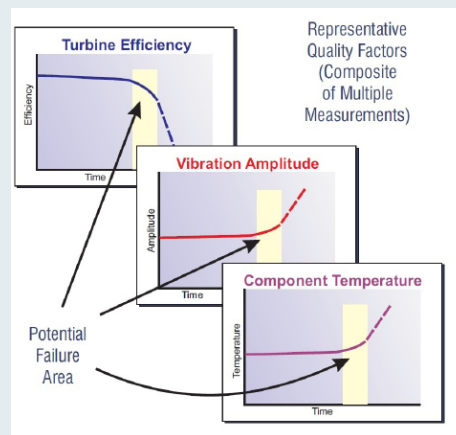
Final reports provide assembly data and visuals of past problems which may reveal clues to present problems and future unit failure. Since the assessment is performed while the unit is running, the pictures and measurements from previous Final Reports allow a view into the internal conditions of the unit.

## GENERATOR GRADING

PSG will review past testing reports to provide an overall assessment of generator condition and future need for repairs. This analysis, combined with additional tests, can be used to develop a rationale and plan for extending the life of your generator.

## Trend Analysis

PSG offers a Running Condition Assessment as a stand-alone item. However, the greatest benefit will be obtained through an ongoing trend analysis of regularly scheduled Running Condition Assessments. Multiple assessments will mark the decline of the turbine generator characteristics over time. The next outage should be planned and scheduled accordingly. Understanding this relationship will allow PSG to more accurately anticipate potential failures.



## SUMMARY

Power Services Group has developed a Running Condition Assessment program which can reduce unscheduled outages, identify future repairs, shorten planned outages through contingency planning and increase the overall reliability of the equipment. The program allows plant management to better predict maintenance and capital costs, enhance unit availability and efficiency, and allow better decision making when scheduling major and minor inspections.