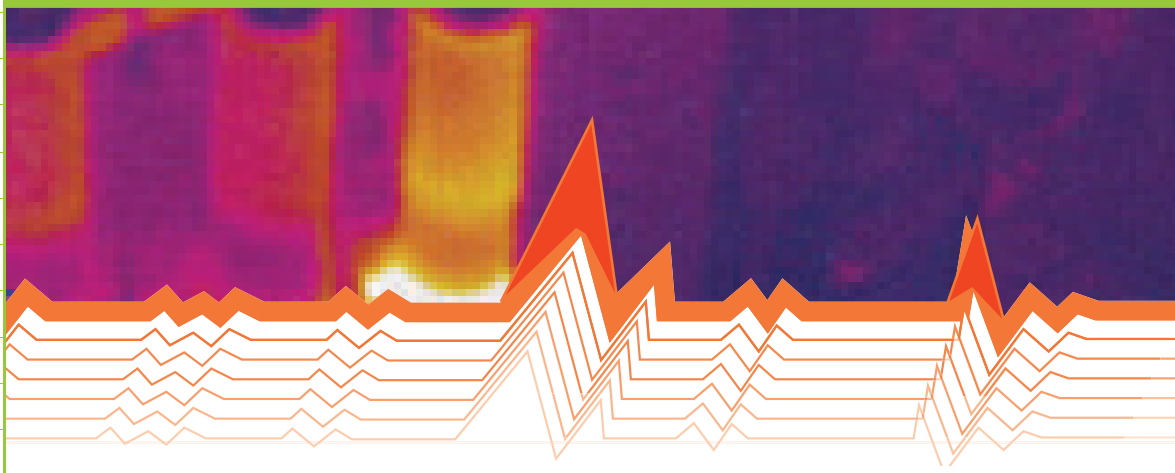


Solutions
BeforeProblems™
Advanced Technology Solutions™

SERVICE OFFERING

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING

PROGRAM DEVELOPMENT CONSULTING:

Considering making a move to a Predictive Maintenance Program? ATS is ready to assist you in building your program to achieve your vision.

Rather than trying to make the decision on your own, partner with us. ATS will focus on your facility, your people, your vision and can help select the right program and system to fit your budget and expectations. ATS can provide management or support of your program including, but not limited to, training, technology, collection measurements and alarm management that will ensure accurate and detailed communication of results.

We are continually researching the latest condition monitoring products and companies — and will provide the information to you in our unbiased expert opinion.

ATS can ensure your program will work for you now and into the future.

VIBRATION START-UP:

Proper set-up will eliminate confusion and errors in the vibration data collection and analysis process.

ATS' standard start-up procedures include a review of machine safety and accessibility for data collection, machine database set-up, digital pictures and report template set-up, route determination, data collection intervals, and applicable machine research. This start-up does not include the first collection of vibration data or a vibration analysis report.

One individual from your facility will accompany an ATS reliability consultant to review the supplied equipment list.

Solutions BeforeProblems™
Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING

VIBRATION DATA COLLECTION:

Minimizing variances in vibration data collection is critical for accurate analysis.

ATS' vibration data is collected from each machine at both the driving and driven components. A complete set of data from ATS consists of three measurement directions from each bearing location (two in radial and one in axial). Based on bearing type and machine design, multiple measurements are incorporated including, but not limited to, acceleration and velocity. Data is downloaded and reviewed to ensure its integrity and spot imminent failures.

VIBRATION DATA ANALYSIS:

Accurate vibration data analysis measures asset health and leads to improved reliability through early detection of machine faults. Trending of the vibration amplitudes allows for the development of a rate of progression, which facilitates the convenient scheduling of repairs prior to failure. Overall maintenance costs and energy consumption are reduced as a result. Vibration analysis will often eliminate reoccurring problems by detecting the conditions that lead to premature failure, such as misalignment or looseness.

Appropriate vibration measurement specifications are paramount in the ATS data analysis process, which are based on expertise in data acquisition and machine design. ATS vibration analysis utilizes all data collection points without the assistance of alarm levels. The final assessment is based on multiple measurements per direction and at each collected location. The final recommendation will be based not only on the vibration signature, but also on the rate of change observed in relation to historical trending.

Each machine is allotted a full-page report consisting of supporting plots, a digital image, abbreviated explanation of the analysis, severity assessment, and recommended corrective action. Along with the reporting, a monthly summary is available which ranks each piece of equipment based on the assessed severity of identified problems.

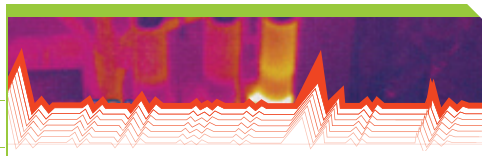
Solutions BeforeProblems™

Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING



MOTION AMPLIFICATION AND OPTICAL VIBRATION:

The Motion Amplification and Optical Vibration System is a powerful diagnostic tool that allows maintenance and engineering personnel to visually see the issues with their equipment. This is the foundation of this technology. Where vibration analysis can narrow down a fault to an area, this technology can show you a fault down to a specific component (motor hold-down bolts, cracked welds on a mounting structure, lack of rigidity, or resonance condition in piping).

ATS will provide the technology and a reliability consultant to operate it. It is recommended that the facility provide a technician to help ATS move the motion capture equipment between units and to be an interface with production, in case units need to be stopped or started.

BALANCING:

ATS provides field-balancing services for rotating equipment. The unit in question will have a set of vibration data collected to verify that the source of vibration is an unbalance condition of the rotor. Once this condition is verified, ATS' reliability consultants will perform field balancing to the customer's requested specification.

INFRARED THERMOGRAPHY PROGRAM:

Infrared analysis is the most important diagnostic tool to identify potential premature electrical circuit failure. Utilizing IR within a predictive maintenance program will provide information that will effectively reduce energy consumption, increase equipment reliability, decrease overall maintenance costs, and increase safety. The survey may include electrical, mechanical, and building applications.

ATS provides accurate and detailed reports by utilizing the latest technology in infrared imaging hardware and software in the hands of professionals with more than 230 years of combined experience.

We request one technician from your facility to accompany our reliability consultant while doing the infrared routes to remove panels or open electrical cabinets.

Solutions BeforeProblems™

Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING

STEAM TRAP SURVEY:

An unmaintained steam system will inevitably have a significant number of steam traps that have failed. Approximately twenty percent of the steam leaving a central boiler plant is lost via leaking traps in a typical space heating system without a proper predictive maintenance program in place. A routine program will detect any waste of energy, efficiency, and dollars. Implementing a steam trap maintenance program will be beneficial. The selection of the assessment equipment is of secondary importance.

Our service reliability consultants can detect plugged, leaking, or blowing steam traps. Thermal imaging is used to identify completely failed traps and traps which underperform. Ultrasonic instruments are used in conjunction with thermal imaging to further define the problem as required. Upon detection, the bad trap location is recorded digitally and a detailed report is created.

OIL PROGRAM:

Oil analysis, provided in cooperation with Polaris and Tribologik Labs, provides extensive testing and analysis of oils, coolants, fuels, and industrial water-based fluids. Reports display itemized data and graphs with historical trends for easy observation of changes in the normal pattern. Industrial packages include testing for, but not limited to, ICP elemental metals, water percentage by Karl Fisher or crackle, viscosity at 40°C or 100°C, total acid number, FTIR, and ISO particle count.

A report is generated for each machine consisting of supporting plots, abbreviated explanation of the analysis, severity assessment, and recommended corrective action. Each report begins with a summary ranking the condition of the machine and lubricant based on the assessment.

Start-up/Oil Assessment: Includes a review of your current equipment list, collection points, and collection procedures. Recommendations will be given on collection frequencies as well as proper intervals and tests for analysis. The first oil collection will be taken at this time.

Contact ATS for specific customized test packages.

Solutions BeforeProblems™
Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING

MOTOR & CIRCUIT ANALYSIS:

Dynamic (online) monitoring combined with comprehensive static (offline) testing enhances motor condition awareness. Both dynamic and static testing are non-destructive methods. Online monitoring of power circuit, overall motor health, load, and performance issues can be achieved with the computer controlled portable Explorer instrument. The offline testing of electrical insulation and circuitry is performed with a computer controlled portable AWA instrument.

Dynamic testing includes, but is not limited to, voltage level, voltage unbalance, voltage distortion, service factor, overcurrent, efficiency, rotor bar, operating point, torque ripple, load history, haystack, and operating condition test.

Static testing includes winding resistance balance, insulation resistance (IR/MegOhm), polarization index (PI), DC high potential (HiPot), and surge testing (exclusive to Baker Instruments). Surge testing is the only way to detect turn-to-turn, phase-to-phase, and coil-to-coil insulation problems.

ATS will perform non-destructive online and offline testing from the motor control center to the motor when possible, otherwise, local disconnects will be utilized. Anomalies will be documented and addressed in a detailed report.

ULTRASONIC LEAK DETECTION:

Utilizing ultrasonic leak detection within a predictive maintenance program will keep your system running more efficiently. Whether part of an energy conservation program or as fugitive emissions, leaks cost money, affect product quality, and can wreak havoc with the environment. Ultrasonic leak detection can often locate the problem, whether the leakage occurs in a liquid or gas system.

ATS will provide the labor and technology required to survey your facility and identify each leak. Each leak will be tagged and each location documented through digital imaging and a summary report.

Solutions BeforeProblems™
Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING

ULTRASONIC DETECTION ON ELECTRICAL EQUIPMENT:

Utilizing Ultrasonic Detection on electrical equipment can prevent catastrophic failure by detecting phenomena such as arcing, tracking, partial discharge and destructive corona. It is particularly effective on equipment not accessible to infrared scanning, such as high voltage enclosures (that do not have IR windows installed). Unlike Ultrasonic Leak Detection, cost quantification is not the main objective. Due to the nature of high voltage electrical equipment, any issues found using Ultrasonic Detection need to be addressed. This method can also be used on lower voltage enclosures where access is limited.

ATS will provide the labor and technology required to survey your facility and identify each leak. Surveyed systems within the facility will be documented by location and by unit designation. Data files of fault recordings will be documented as well. Images of the unit and fault location may be taken if needed.

COMBUSTIBLE GAS DETECTION:

Utilizing Combustible Gas Detection within a predictive maintenance program will ensure an extra measure of safety. Due to the nature of combustible gases, any leak left to grow can turn into a potentially disastrous situation. A combustible gas leak that reaches 100% LEL (lower explosive limit) near an ignition source can cause untold damage to the facility or even loss of life to nearby personnel. Combustible Gas Detection methods can find these potential hazards, categorize them based on severity and give facilities a road map to alleviate these issues.

ATS will provide the labor and technology required to survey your facility and identify each leak. Surveyed systems within the facility will be documented by location (area and column number) and by unit designation. An ATS leak tag will be attached to the scanned area as close to the leak as physically possible. Two images, one up close and one at a distance, will be taken of the tagged area to further identify the location of the leak.

Solutions BeforeProblems™
Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org

SERVICE OFFERING

CNC PERFORMANCE - BALLBAR ANALYSIS:

Ballbar analysis measures contouring errors in machining centers that are only apparent when the machine is in motion. By converting data into a plot, the true movement of the machine is revealed. From this recorded movement, the actual tolerance of the machine can be calculated and compared to the acceptable part tolerance. This value will drive appropriate corrective action plans.

Ballbar data will quantify faults in the machine center such as servo mismatch, stick-slip error, straightness of the axes, lateral play, backlash, reversal spikes, circularity error, scale, and machine geometry. Each of these conditions can be trended over time.

The ATS report will include a plot of the machine's true movement, table listing of quantifiable errors, and recommendations for how to improve performance. Severity assignments are based on the difference between the actual machine performance and the required part tolerance.

PREDICTIVE MAINTENANCE TRAINING:

Introduction to Predictive Maintenance and Vibration Analysis

Course Description: This course explores key components of a successful predictive maintenance program, real life case studies of several ATS client PdM programs, an introduction to concepts of force and vectors, fundamentals of data acquisition, basics of analog to digital conversion, characteristics of vibration in machinery, diagnostics of common faults in machinery, and instruments for vibration detection. Classes can be conducted on-site or at an ATS training facility. Class size will be limited to ten attendees.

RECOMMENDED IN-HOUSE VIBRATION PROGRAM TRAINING SCHEDULE

ATS will train and assist staff with vibration equipment, collection, and analysis. This will include identifying critical pieces of equipment, establishing collection routes on equipment, identifying appropriate bearing points, creating a machine database, overseeing route collection, downloading of files into database, overview of data collector, and on-site assistance with vibration analysis.

CONTACT YOUR ATS REPRESENTATIVE FOR A CUSTOMIZED TRAINING PROGRAM.

Solutions BeforeProblems™
Advanced Technology Solutions™

Advanced Technology Solutions, Inc.
416 Creek Side Drive
Fairfax, IA 52228
Voice: 319.845.5177 Fax: 319.845.5166
www.ats-inc.org

Advanced Technology Solutions, Inc.
522 Locust Lane #101
Kansas City, MO 64106
Voice: 866.398.9778 Fax: 816.471.7550
www.ats-inc.org