

**RELIABILITY
SOLUTIONS**
PROFITABLE RESULTS®

Hands-On Hard Skills Services



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Field Service & Sales
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www.reliabilitysolutions.net

Field Service Offerings

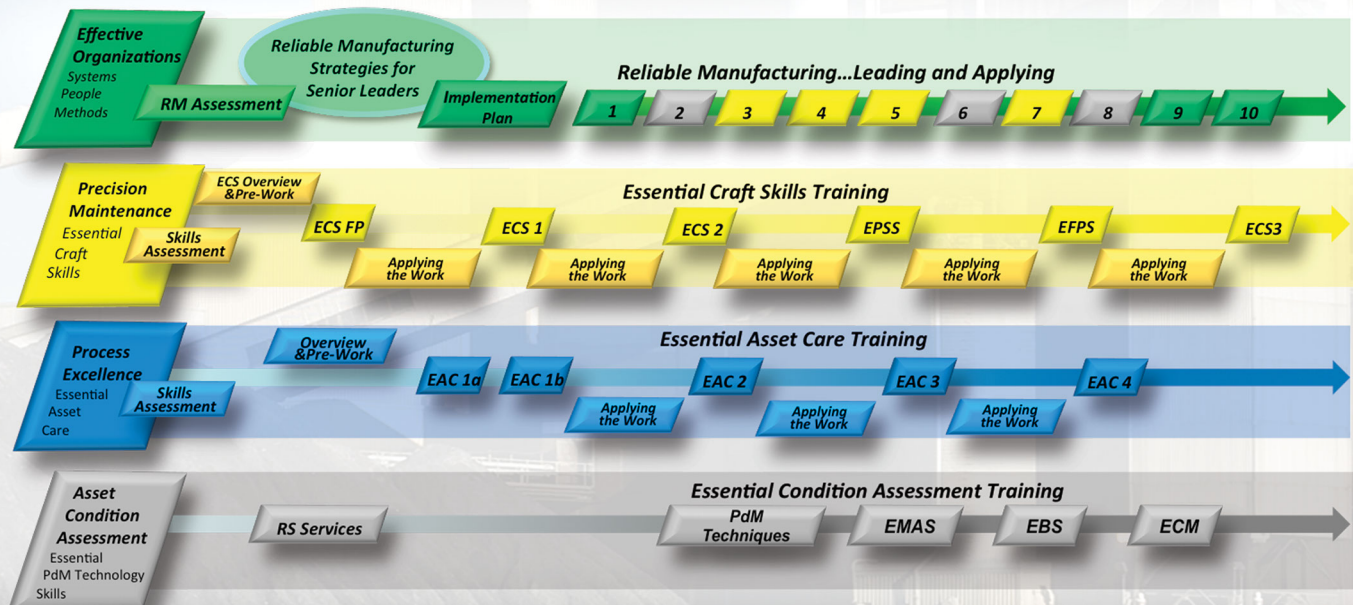


We at Reliability Solutions Maintenance are proud and pleased to introduce you to our “On-The-Floor” field services to accompany you in your Reliable Manufacturing® journey. As plant reliability becomes more demanding, the focus tends to drift away from required skill sets, both internally and externally, thereby leaving craftsmen and operators without the application of essential skills they need to perform their duties efficiently and effectively. Our company is a world leader in the teaching and application of Essential Craft Skills and we, as a Maintenance organization, specialize in the application of those skills. We Practice What We Teach.

As a company we take great pride in our ability to safely provide “On-The-Floor” precision results to not only help you improve reliability but to assist you in solving problems that continue to absorb your profit dollars.

Thank you for your interest in Reliability Solutions Maintenance and we look forward to working with you on your Journey to Reliable Manufacturing. We are just a call or email away from assisting you in your reliability improvement efforts.

RELIABLE MANUFACTURING® ...The JOURNEY



*Process
Excellence
Essential
Asset
Care*

Essential Asset Care Mentoring

Essential Asset Care Mentoring

Upon completion of our **Essential Asset Care** training for operators, we offer EAC mentoring and actually come to your facility and work with your operators in the field on your equipment to make sure they are safely, effectively and efficiently applying the lessons learned from the classes.

We independently work with each facility to understand their goals and objectives and can adjust the mentoring needs based on those goals and objectives. We can assist in the development of inspection tasks you already have or help you develop the tasks and the routes for multiple areas. This also includes developing a preliminary asset strategy for each piece of equipment inspected. We then work with the operators to make sure they know how and where to safely obtain the required data and work with them to make sure they understand the application of effective essential asset care.

Another key component of mentoring is to help the operator improve his/her communication skills. This is done through improved work requests utilizing data obtained so there is a clear understanding of the problems found which will aid in work order prioritization, planning, and execution.

Successes: During the first week of mentoring at one facility we developed routes, preliminary asset strategies and worked with the operators to generate 83 work orders. Four of the 83 problems found generated a loss prevention savings of approximately \$40,000.

Operator Statement: "I have learned more about my equipment in one day with you than I have in the entire five years I've been on this job".



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**Precision
Maintenance
Services**

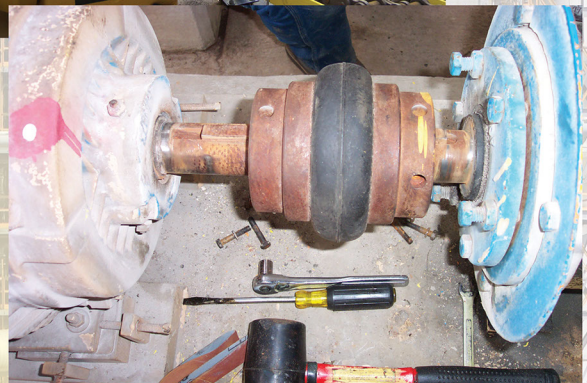
Essential Craft Skills Mentoring

Upon the completion of the Essential Craft Skills training for maintenance employees, we offer ECS mentoring. During this process we work side by side with your maintenance employees performing work at your facility on your equipment to make sure they are safely, effectively and efficiently performing the lessons learned from our ECS classes.

The objective of the ECS mentoring is to review and apply the precision techniques and applications taught in the classes and assist the technicians and trades/craft personnel in being successful in achieving precision results. This is an excellent strategy to energize the focus of performing work correctly and achieving positive results with documentation to support those efforts.

Another key component of ECS mentoring is to help the craftsperson produce and better understand the importance of good documentation. Craftsmen capture the as-found information along with the as-left information with vibration, temperature, speed and amp draw readings reductions to help you document and produce quantifiable cost saving results.

Successes: During an ECS mentoring event at a facility, we were given the opportunity to work with the technicians and craftsmen to improve the reliability of 5 over hung fans. All five fans were running very high overall amplitude but one in particular was in excess of 0.5 in/sec. overall. At the conclusion of the work all fans were running in a precise state of less than .075 in/sec and the mechanics that performed the work were ecstatic about their accomplishments.



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**Precision
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Coupling Inspections

Coupling Inspections

Due to reduced manpower, many of the historical equipment maintaining programs are not being completed. One of these "lost," or not "completed" programs is the routine inspection and maintenance of applied facility couplings. How are you maintaining your couplings? Reliability Solutions Maintenance can provide assistance in setting up your coupling inspections program, inspecting your couplings, and tracking couplings that are due to be inspected. Our process includes disassembly of the couplings, cleaning and documenting the current condition. If a problem is found, we notify our contact person immediately. We hand pack the coupling with your grease of choice, replace all gaskets and seals, torque all bolts to the specified torque, and orientate the keys to the correct location. Each coupling is documented in a detailed report of the as-found and as-left condition with bolt torque and recommendations if problems were noted. Reliability Solutions Maintenance can provide this service on a single coupling or the entire plant and totally manage or provide any level of assistance you need to be successful.

Comments from our Customers

- "Your crew leaves their work areas cleaner than they found them"
- "Your guys torque every bolt, that's great!"
- "Your crew is very professional and does a great job!"



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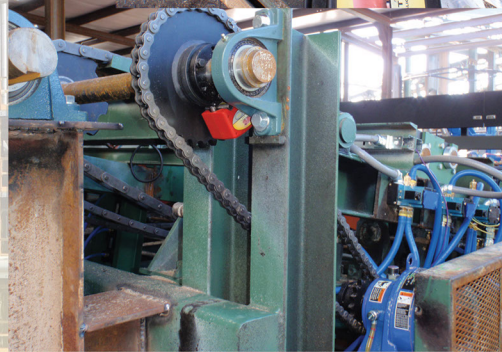
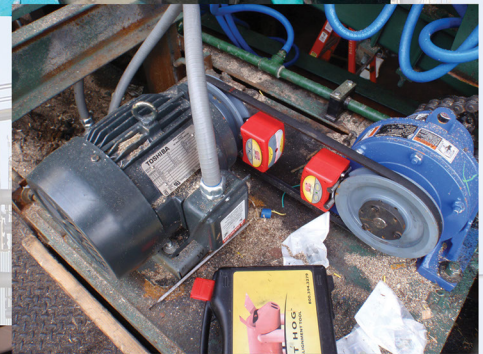
**Precision
Maintenance
Services**

Precision Shaft and Belt Alignment

Precision Shaft and Belt Alignment

We at Reliability Solutions Maintenance specialize in equipment alignment. Precision Alignment is one of the main contributors to improving Reliability. Did you know that misalignment is recognized by most companies as a leading cause of machinery failure? Did you know that pipe strain and thermal growth are rarely considered when most Contractors perform alignment? Did you know that key length and orientation of the keys makes a significant difference in machine vibration? When we perform alignments we are not looking for smiley faces on the machine. We focus on achieving precision results and use 0.002" movement at the feet of the equipment to determine what good is. We factor in thermal growth, pipe strain, short leg, and angular soft foot with every alignment. We inspect and document coupling condition and hand pack with the correct required lubricant. We document the as-found and the as-left readings with amp draw reductions so you can measure the difference and have this information for future reference. This information is then assembled in to a very detailed report for your records and future needs. Let us show you the difference!

Successes: We performed a bearing replacement, sheave and belt replacement, alignment and balance on six fans for one of our customers. These fans were critical to their operation and if one goes down the entire process shuts down costing our customer thousands of dollars per hour. During our last visit to this customer, we asked if they had any problems with these fans as we performed this work the previous year. Their response was "that is why you guys are back; no one has touched these fans since you worked on them last year".



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**Asset
Condition
Assessment
Skills**

Capital Spares Preservation

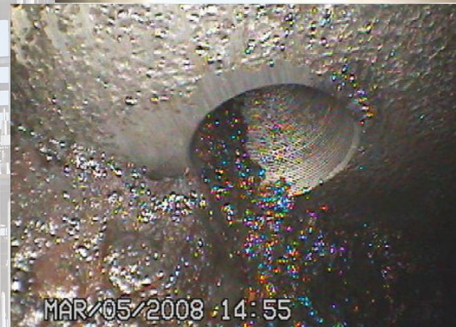
Capital Spare Preservation

In the effort to improve reliability the focus is typically placed on the assets presently being operated. Management is continuously trying to determine how and what we need to do to maintain our assets. We look at failure modes and effects, determine criticality, develop asset strategies, perform countless hours of condition monitoring, and so on and so forth. One component in all of this that is rarely even considered is; when we have a failure is our spare going to be reliable? Have we done a good job maintaining our spares? In most cases the answer is no. Your spare equipment is not as important as the equipment running, **UNTIL YOU NEED IT**. Think about this for just a moment. Does maintaining your spares make sense?

We have been performing these type inspections for over ten years and many times 20% of the capital spares we have inspected are already in a failed state. Is this the kind of reliability you are expecting?

Our process consists of video scoping the internals of your spares yearly, filling with oil with a preservative, and performing rotations on at least a quarterly basis. We provide a detailed report of every unit inspected with photo's so you can actually see the condition of your spares. This piece of mind and reduced down time because your spares will be ready to run is a very important part in the journey to **Reliable Manufacturing**.

Allow us to perform a spares sampling so you can make an informed decision about how you need to manage your spare assets. We perform an audit of your stores area and make recommendations to improve the way you are storing and handling other parts to maximize their life such as bearings, belts, shafts, electrical components and others.



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**Asset
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Precision Balancing

Precision Balancing

Reliability Solutions Maintenance strives to balance all equipment to ISO G1.0 (International Standards Organization); a grade considered the best by industry standards. Rotors of different weights and different speeds will always provide different results but in each case the G 1.0 tolerance will always provide for a better running rotor, resulting in less maintenance cost, reduced energy consumption, less stress and wear on the supporting housings and shafts and a greater asset life cycle.

Our balance technicians have years of experience in balancing most any type of equipment. We can balance in single, dual or multiple planes to achieve the results you need.

Successes: One of our customers called and asked that we help them with an overhung fan rotor balance. When our analyst arrived the fan was running 48 Mils and was about to self destruct. After only two precision correction runs the fan was now performing at 0.8 mils. One of the maintenance mechanics stated that “the shaft must have broken because I can’t hear it running”. The Superintendent called and stated that “our analyst really knew his stuff, that fan has never run like this”.



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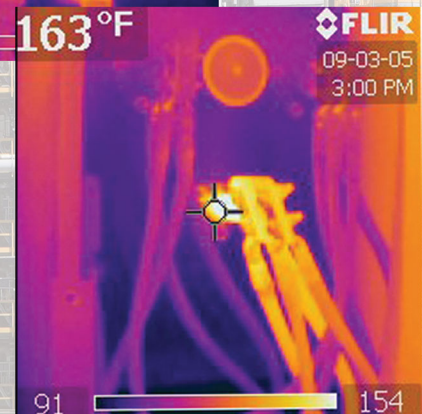
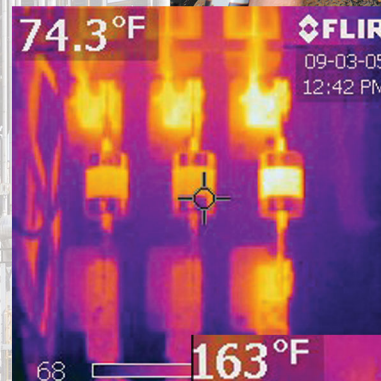
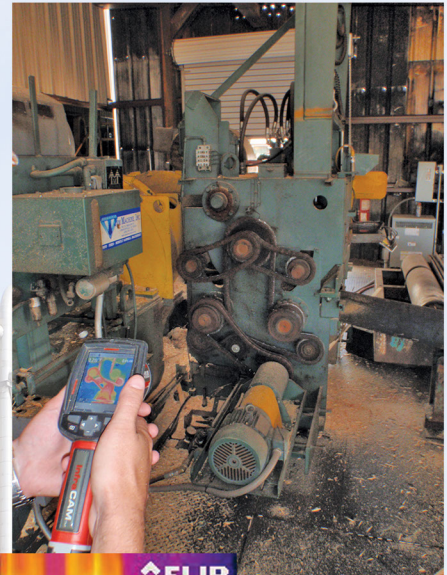
Infrared Surveys

Infrared Surveys

Thermal or infrared (IR) imaging in industry has been used to inspect electrical systems for some time now and its use has steadily grown. Since components in electrical systems almost always overheat before they fail, problem areas are easily and safely found when viewed through an IR camera.

During an inspection, electrical equipment, such as distribution panels, switch boards, contacts, transformers, and service and control panels can be examined through an IR camera. By viewing apparent temperature differences, inspectors can identify and document problems, such as loose connections and over loaded circuits, which are the most common cause of electrical fires. Other issues, such as transformer cooling problems, induced currents, arcing, and motor-winding faults, also become readily apparent. Because viewing apparent temperature differences through an IR camera requires no physical contact and can cover a lot of space in one sweep, no other technology allows electrical faults to be found as safely and as quickly as thermal imaging.

We at Reliability Solution Maintenance can assist you with finding these type problems that can yield savings in reduced down time and early problems detection. This type of survey ensures safety and can save your profit dollars that might otherwise be spent on extensive repairs.



**Asset
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Ultrasonic Surveys

Ultra Sonic Testing

Reliability Solutions Maintenance employs both direct contact and airborne ultrasonic testing. Direct contact ultrasonic testing is a very valuable tool to measure noise output in decibels to determine bearing performance and establish history for future reference.

Airborne non-contact ultrasonic testing can be used in multiple areas such as high voltage equipment to detect arcing, tracking and corona discharge. It is also very useful for leak detection in valves, vacuum systems, steam traps, vessels, heat exchangers, gaskets and seals as well as duct work and compressed air systems.

Compressed air is one of the most costly utilities in a facility today. A simple program of leak inspection and repair can go a long way towards reducing excessive energy cost. Here is an example of the cost associated with air leaks: If you are operating your air system at 100 PSIG at \$0.22/MCF for 8760 hours per year, a ¼" leak is costing you approximately \$11,904.00 per year. How many of these do you have?

Reliability Solutions Maintenance has the capability to perform inspections on one piece of equipment or set up inspections for an entire facility. Let us help you reduce the waste and save your hard earned profit dollars!



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**Asset
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Vibration Analysis

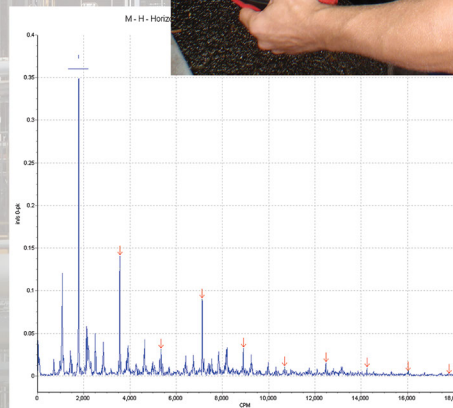
Vibration Analysis

Vibration analysis is a key component in condition monitoring to understand change and to detect and define problems to give you the time needed to correctly plan and execute repairs. Setting up your vibration data base to capture the correct information along with alarms and good reporting are requirements to having a good program. Analyst must be able to evaluate the data and determine what is causing the problem. Without these elements and implementing, and sustaining them correctly, you are wasting valuable resources and profit dollars.

How many failures are you having that you had no prior warning? Did you know that unplanned repairs typically cost you three times the amount of a planned job? What are unidentified emergencies actually costing you?

Reliability Solutions Maintenance can help! Our vibration analyst is certified ISO Level III and has years of experience analyzing and identifying vibration problems. We can perform analysis on a single piece of equipment, set up a program for your entire facility or work with you on any level to assist you in building the vibration program you want and need.

Successes: We were asked to assist one of our customers at a very large paper mill with a reoccurring gear failure in one of their dryer sections. Upon arrival our technician performed a brief survey of the running machine; he reviewed the customer collected data, and discovered a loose gear in the section that the customer was not capturing during their routine data collection. The vibration from the loose gear was causing the failing gear to resonate at critical amplitudes. A bump test was performed on a new gear to verify findings. Repairs were made based on our technicians recommendations and the problem was corrected. The combination of several troubleshooting techniques, a comprehensive approach, and a database review saved this customer countless more hours of downtime and profit dollars.



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**Asset
Condition
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Video Scope Inspections

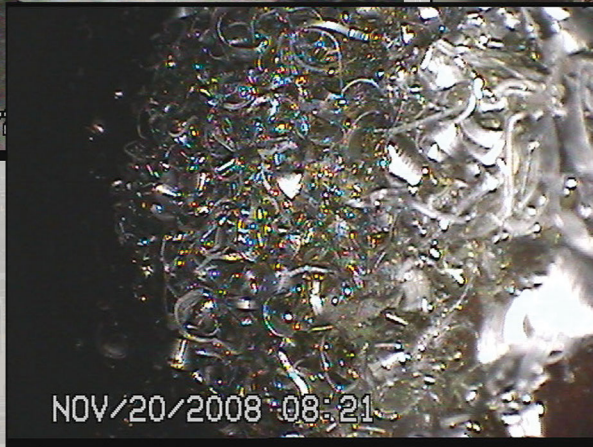
Video Scope Inspection

Have you ever been in a situation that you needed to see the internals of a piece of equipment, look into a valve or piping system to look for wear or simply find a missing part that may have traveled through the system? At Reliability Solutions Maintenance we use digital photography with a very high quality bore scope to answer these questions. We use this tool when performing all of our capital spare inspections and photos produced are revealing.

A simple scope inspection before any major replacement of equipment can thwart unscheduled downtime and needless use of manpower. Many consider this inspection as the part of a well planned replacement work order.



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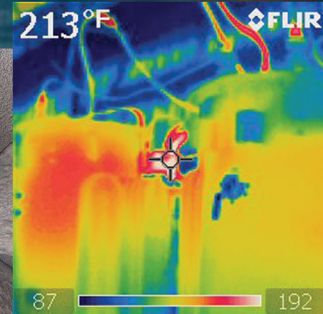
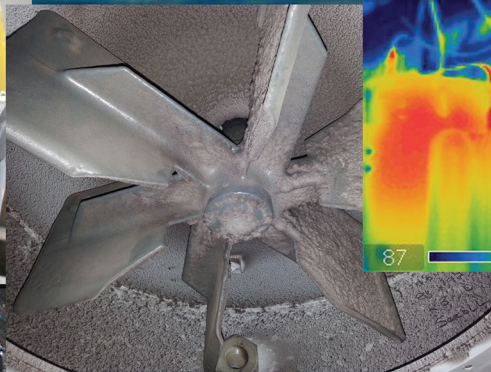
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Place
Stamp
Here



Thank you for your interest in Reliability Solutions Maintenance. We welcome your inquiry about any of our services and would be happy to discuss with you the many available options we have.



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