

Steam Turbines

Safety, Efficiency and Reliability is our Purpose..!

More than just words, these are the values by which all work performed by RayKer's outage teams are based. These values are the guidelines for all activities that we perform.

Safety, there is nothing more important than the safety of our personnel and all others who work within our environment. Our safety program includes daily safety meetings, job safety analysis for each task performed, and critical lift meetings prior to completing specific task. These steps help to ensure that not only are our personnel secure but also that your equipment is handled in a safe manner.

Efficiency and Reliability, are two values that are interconnected and not only extend throughout the efficient execution of your outage, but also includes the efficient and reliable operation of your equipment upon completion of the outage. It is RayKer's purpose that through a thorough gathering and evaluation of data along with continuous customer communication and planning that we accomplish these goals.

Turnkey Services:

Major and Minor Overhauls, Valve and Bearing Inspections, Forced Outages, Engineered Solutions, Reverse Engineering

RayKer's process of pre-outage planning allows us to arrive at your facility with clear direction and purpose. RayKer arrives with all the necessary equipment and tooling needed to perform your outage in the most efficient manner possible. Our definition of "Turnkey" encompasses scheduling, project management, technical direction and coordination of all activities related to the inspection and repair of your turbine, generator, gearbox, controls and supervisory equipment. Auxiliary equipment associated with the turbine such as gland and air ejector circuits, stop or throttling valves, non-return valves, and other auxiliary equipment essential to the proper operation of your turbine are also included as outlined in the detailed scope of work. RayKer provides manpower that is safety conscious, professional and knowledgeable about the task to be performed.

Communication

Communication with the outage team begins upon receipt of your purchase order and continues until well after the outage is complete. Pre-outage communication will begin immediately to ensure that the proper plan is in place to fit your needs and for RayKer to begin scheduling and procurement of the parts and or services that will be required to complete a successful outage. Daily communication once onsite will consist of a detailed daily report that will outline the activities performed to date, planned activities for the next 24 hours as well as technical comments and recommendations that have been developed. *Daily meetings* during the outage are critical to keeping all involved on the same page and moving in the same direction. Upon the completion of the outage an exit interview will be held to review the outage and identify areas where future outage management can be improved. RayKer makes the pledge that the final report of activities will be in your hands no later than 30 days from the end of the outage. The final report will include all relevant data gathered as well as our recommendations for future maintenance opportunities. RayKer is always a phone call away when needed to support you and to answer any questions that may arise. 573-253-8611.

Evaluation and Recommendations

Along with performing the disassembly and reassembly of the equipment, we perform a detailed and thorough inspection of each component. Evaluation of the data gathered from these inspections allows the appropriate repairs and repair methods to be determined when a component is determined to be outside of acceptable criteria. RayKer will provide repair recommendations based on the "as found" condition of the components and any appropriate analysis if the component was found to have worn abnormally. Analysis is performed to understand the reason for the failure in order to avoid recurrent issues with the same component.



Repairs

If it is determined that repairs are required, RayKer will develop repair solutions for any deficiencies noted during the inspection process, based on the information gathered and tailored to best fit your specific needs. We can manage the necessary repairs for your company either by mobilization of the necessary equipment and personnel to your site to complete the repairs or through cooperation with one of RayKer's approved vendor relationships. Detailed engineering analysis of your steam turbine components, when deemed necessary, can be provided by RayKer. We understand the time sensitive nature of your turnaround and can assist to minimize the impact to your schedule through management of the entire process. Our vendors understand the need to complete repairs and component fabrication in the best duration possible. RayKer will continually communicate with you to keep you up to date with the status of ongoing fabrication of components and repairs and assure that the repairs are completed to specifications and delivered to your plant site on time.

Upgrades

RayKer remains up to date with the latest in technical evolution and upgrade designs for steam turbines and generators. We will make you aware of upgrades that will improve the efficiency of your equipment where available. The most common of these for steam turbines are improved sealing designs or through re-engineered steam path components. Online monitoring of partial discharge and flux probe data collection are examples of predictive maintenance upgrades that can improve the reliability of your equipment.

Engineered Solutions

Have your steam conditions or process requirements in your facility changed? If these changes have resulted in reduced efficiency of your steam turbine RayKer can help. Rayker has the engineering capabilities to provide for any of the following scenarios.

Heat Balance: Analysis of your overall heat balance cycle to determine where improvements can be made.

Auxiliary systems analysis and design improvements if required. (gland or air ejector circuits, Heat Exchangers as well as others)

Re-rates or Steam Path Modifications:

RayKer can perform all facets of the process required to rerate your steam path for improved efficiency or to meet your new steam demand requirements.

- Feasibility Studies to determine if your needed changes can be achieved and how they will affect the existing components.
- Disassembly of the unit and gathering of data required for engineering evaluation.
- Engineered solutions to meet your requirements includes design and analysis of new steam path components, valves, bearings, coupling alignment or other parameters as the design changes require.
- Procurement of materials and fabrication of the new components required for implementation.
- Implementation of changes including field machining of casing or modification of components as needed to meet the demands of the new design.

Warranty

RayKer is confident in our abilities and the quality of the services that we provide. All services provided by RayKer or our vendors as part of the execution of your outage are warranted for a period of 12 months after the unit has been returned to service. Upon notification that an issue has developed, RayKer will return to your facility to review the cause for concern. If determined that RayKer's workmanship is responsible there will be no charge for remediation of the problem.

Rayker Experience by OEM

- ABB, Allis Chalmers, Alstom
- BBC, Dresser Rand, DeLaval
- Elliot, Franco Tosi, Fuji, GE
- Mitsubishi, Murray, Parsons
- Peter Brotherhood, Siemens
- Terry, Toshiba, Westinghouse

