STRAP – A New Risk-Based Analysis Tool for Steam Turbine Decision Making
Part 2

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[Editors Note: Part 1 of this article discussed the development of the STRAP program. This article concludes with risk comparison, testing and a summary of benefits.]

Comparing The Risks
STRAP risk ranking results for a typical turbine are displayed in Figure 3. This chart displays the percent-age of risk by major component and also ranks the subcomponent risk contribution to the total component risk and ranks the failure mode contribution percentage for each specific subcomponent. From this information, the risk drivers for each of the subcomponents can be identified and appropriate recommendations established to reduce risk in these areas.

In addition, the major failure mode contributors can also be ranked so that the drivers for turbine failure can be identified before the turbine may fail. From this information, risk reduction recommendations and "what if" analysis capabilities are provided in the model, as well as the ability to evaluate the return on investment for implementing the recommendations.

The total risk for the steam turbine can be compared on a relative basis with other steam turbines in a company’s inventory, and the industry as a whole. Figure 4 shows the risk distribution/benchmarking for a sample turbine. A turbine can be compared with other units in its class, within your company, with comparable industry units, with similar manufacturers’ units, and with similar driven equipment. This information is important because the results can be used to develop risk-driven inspection plans and to prioritize maintenance actions, spares support, and other turbine decisions for a plant’s or corporation’s turbine fleet.

STRAP Program Testing
The STRAP program completed beta testing in which 39 different turbines representing nine different manufacturers were analyzed. One major petro-chemical company saved more than $300,000 for spares as a result of STRAP analyses that were conducted during the beta-testing phase. Spares that normally would have been procured were found to be low in risk (not critical) by STRAP, thereby justifying not making the purchase and saving the company money.
The use of risk-based analysis tools meets the needs of industry concerns today — combining the technical and reliability factors of equipment with financial consequences so that limited company resources can be applied to the equipment with the most need. This means being able to take advantage of STRAP for steam turbines to:

- Identify the Right Equipment to Apply Resources
- Do the Right Maintenance
- Do Maintenance at the Right Intervals
- Make the Right Plant Improvements/Upgrades
- Buy the Right Spares
- Make the Right Comparisons
- Procure the Right Assets

About the Author

John Latcovich is Hartford Steam Boiler’s Fleet Manager for Rotating Equipment. He has more than 27 years experience with rotating machinery and works with HSB inspection specialists and clients on rotating equipment technical, operational and maintenance issues.