



# Steam Turbine Service Solutions

*An overview on steam path and blading parts supply and capabilities*

**GE offers a wide range of parts for the steam path of all makes of steam turbine origin.**

## Lifetime Extension and Reduced O&M Costs

**Steam path components are subject to various thermal and mechanical stress conditions of detrimental condition including corrosion, erosion, impact damage and cracking.**

**With many years of experience on servicing of GE and non-GE turbines, we offer effective repair and service solutions including replacement of parts, which can extend the life of the machine and reduce operating and maintenance costs.**

## Background

The steam path of a turbine is an area of high mechanical and thermal stress, frequently exposed to corrosion and erosion and, under worse condition, it is exposed to foreign object damage.

Any deterioration of the blading due to the above mentioned conditions (Fig. 1) will have a direct effect on reliability and performance.

Furthermore, debris ejected by a damaged stage will certainly affect subsequent stages, often with severe consequences. The loss of generating time due to component shortages can have substantial implications on unit profitability.

Specific attention is required by towards the supply chain of the steam path elements. Blades, and especially Last Stage Blades (LSBs) (Fig. 2), can experience long lead times that can affect significantly the unit profitability.

## Solution

GE can provide a large variety of blade types of both impulse and reaction technology.

As an original equipment manufacturer, GE can draw upon our experience to provide substitutes of the original components, like stationary or rotating blades as well as many other required steam turbine parts. Additionally to the replacement of parts, we can enhance the configuration and material upon request.

For fleets from other manufacturers, GE can re-engineer the blade or parts to its exact specification and also improve upon it by modelling the expected operating conditions (Fig. 3).



Fig 1: Blade damage on an IP rotor

We also have the capability to rapidly manufacture and deliver the parts. Investing in strategic spare parts, plant operator can mitigate long outage periods. This is especially applicable to blades such as the first stages of the HP and IP turbines and the LP LSBs.

To cover these, it is advisable to customers and operators of turbines to keep full row sets on stock. Other areas of the steam path may be covered by partial row quantities, only providing for localised repair.

Such "modular spare policy" can cover multiple units of the same technology. GE has already performed contracts for clients with fleets manufactured by GE as well as by other manufacturers.



Fig 2: Last Stage Blade (LSB) for LP cylinder

## Benefits

The turbine operation can benefit from the ready availability of parts, in terms of

- Reduced O&M costs

Maintenance costs are reduced by having spare parts available in the shortest time

- Reliability and availability improvement

The ability to readily replace parts increases the reliability and availability of the turbine

- Outage time reduction

Availability of spare blades and parts may reduce significantly the length of unplanned outages

- Lifetime extension

## Applicability

GE is able to offer comprehensive services and spare parts supply for all types of machines. This offering is applicable to GE and non-GE technology installed worldwide.

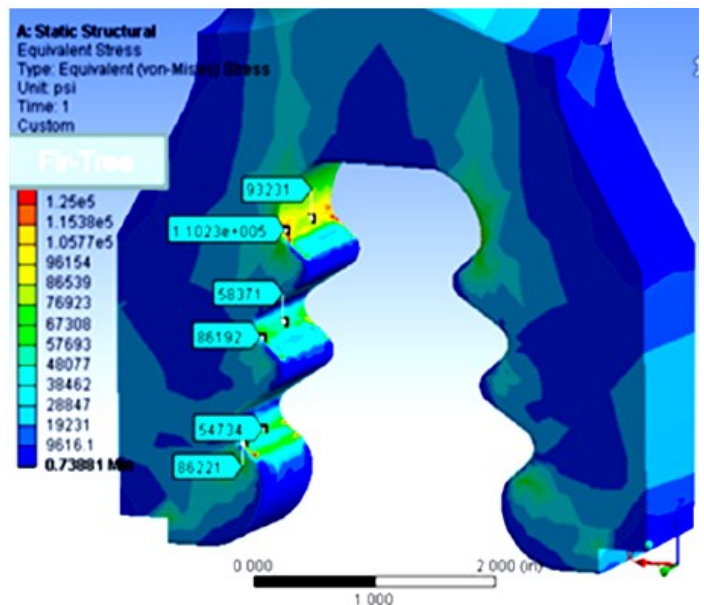


Fig 3: Typical blade root stress modeling