



# HRSG Life Monitor

## Hardware + Software Online Monitoring Solution

*Improve reliability and availability, reduce O&M costs, and support long-term repair and upgrade decision making*

Heat recovery steam generators (HRSGs) endure significant cyclic and long-term high temperature operation, resulting in fatigue and creep damage to critical components. While design features help maximize component durability, actual plant operation can deviate from design assumptions. This can lead to premature wear, long periods of expensive downtime and increased O&M costs.

The HRSG Life Monitor (LM) is a hardware + software online solution that provides you with a way to quantify lifetime consumption so you can make informed decisions relating to your critical components' overall life expectancy. The user-friendly software interface can be accessed via login from any system on the plants network [Fig. 2].

### Benefits

**Short/medium-term risk mitigation and operational optimization.** Avoid premature degradation and failures (cracks), improve reliability and availability, and reduce O&M costs by moving from reactive to preventative maintenance.

HRSG LM is used between inspection cycles to determine if process and/or operational changes have had a significant impact on the design life of critical components.

**Long-term lifetime optimization and repair/upgrade planning.** Optimize the design life consumption of the HRSG and plan for future maintenance before issues become critical.

HRSG LM replaces the standard offline desktop study typically used to determine the current consumed lifetime of components and significantly reduces the detailed engineering effort required when planning major upgrades (eg. pressure part replacements).

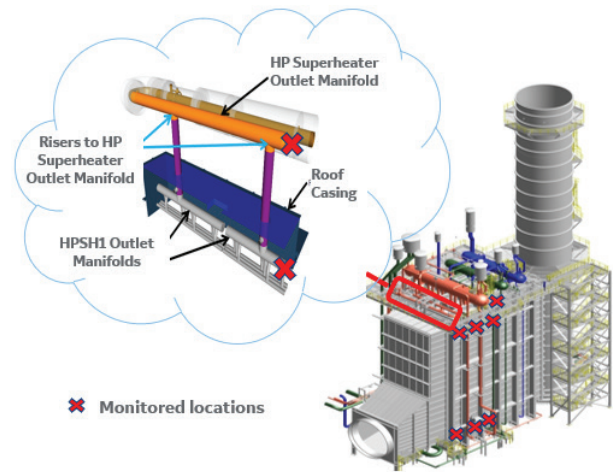


Figure 1: HRSG LM monitored locations

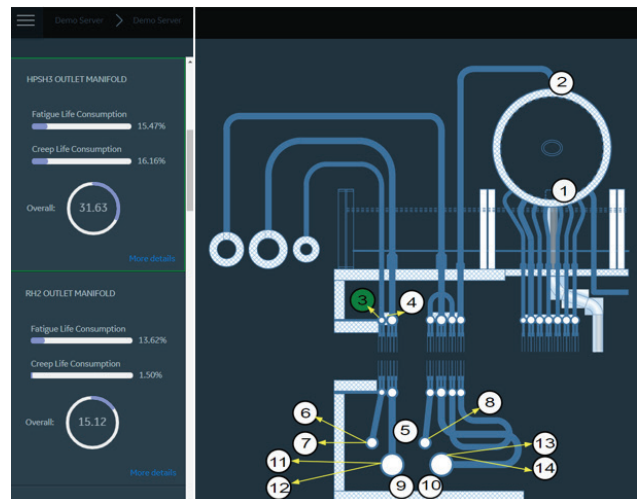


Figure 2: Software user interface

## Monitored Components

The HRSG components with the highest failure risk are:

- Subjected to rapid temperature changes and pressure fluctuations during startup and shutdown.
- Subjected to prolonged operation at high temperature and pressure.
- Thick-walled and of complex geometry.

The key components are identified by a design life assessment and based on experience with similarly designed units. Standard plant instrumentation for pressure, temperature and steam flow are used in the algorithm, in combination with the unit specific component geometries and material properties. The calculated lifetime outputs for Fatigue and Creep are consistent with the methodology presented in EN codes 12952-3 & EN 12952-4.

### Typical components meeting these criteria are:

Component Name	Fatigue Assessment	Creep Assessment
HP drum	X	
HPSH outlet manifold	X	X
HPSH outlet harp header	X	X
RHTR inlet manifold	X	
RHTR outlet manifold	X	X
RHTR outlet harp header	X	X

Figure 3: Typical components

In addition to the typical monitored component locations [Fig. 3], the HRSG LM can provide significant value with the installation of additional instrumentation. For instance, strategically placed thermocouples can detect common issues such as condensate accumulation and attemperator overspray. Such issues often go undetected by conventional DCS instrumentation and can cause significant damage with rapid rises in steam temperature during fast starts. The required locations are identified during design audits and operational data reviews.

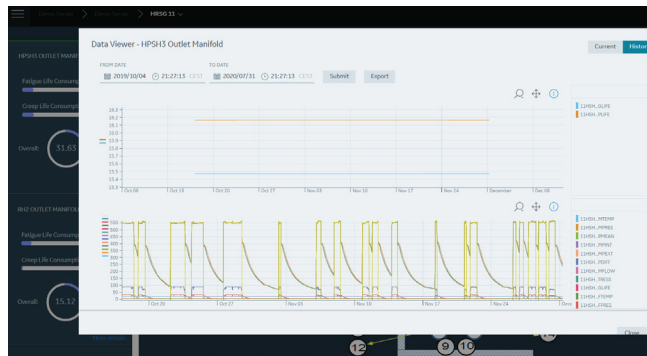


Figure 4: Online analysis

## Product Options

### Instrumentation:

The HRSG LM can use standard DCS instrumentation with the option to install additional instrumentation for monitoring attemperator overspray and areas susceptible to condensate accumulation.

### Connectivity:

GE's stand-alone package includes the option of engineering services from component mechanical integrity subject matter experts (SMEs) who periodically analyze the calculation results [Fig. 4] and provide valuable insights.

## Fleet Applicability & Cycle

The HRSG LM can be installed on any HRSG in a GE combined cycle gas plant.

The typical installation cycle without additional instrumentation is 8 months. Additional instrumentation installation will be installed during next planned plant shutdown. It is recommended to align with the GT Hot Gas Path or Major Inspection.



To learn more about this offering, contact your GE representative.