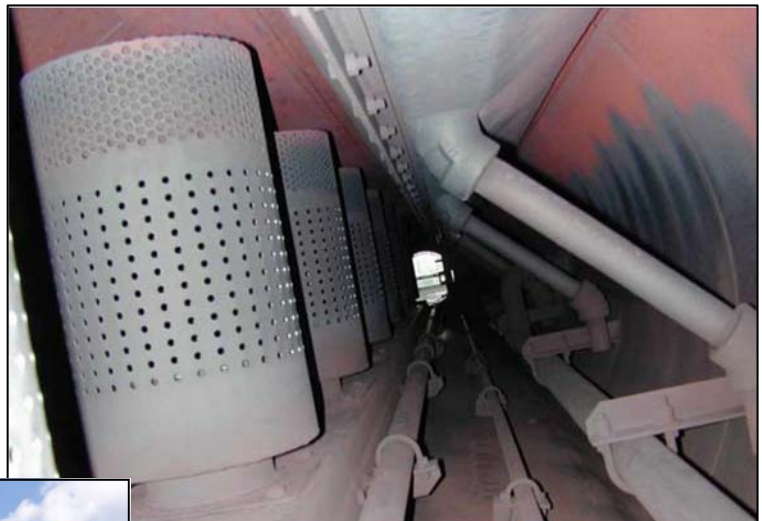


# HRSG CONDITION ASSESSMENT SERVICES



- ***Gas-Side and Water-Side Inspections of Your HRSG***
- ***Visual, NDE, and Metallurgical Analysis***
- ***Water/Steam Chemistry Review and Troubleshooting***



## **Outage Inspection**

Mechanical & Materials Engineering provides an experienced set of eyes to examine the health of the gas side and waterside of your Heat Recovery Steam Generator (HRSG). We provide you, the owners, and your insurance company, with an independent assessment of the HRSG condition to assure you and them of reliable future operation.

- We examine the gas side of the tubes, ductwork, support structure, and duct burners, looking for corrosion, cracking, and wear.
- We examine the waterside headers and steam drums for corrosion, cracking, and areas that can cause problems downstream.

- We examine the steam drums, headers, and risers for signs of flow accelerated corrosion, under-deposit corrosion, and other corrosion problems common to HRSGs.
- We work with nondestructive testing crews to fully document the condition of the HRSG.

During the outage, we provide recommendations for immediate repair and focused testing and inspection strategies. Following the outage, a detailed report of our findings will be provided both in hard copy and electronically. We recommend water treatment programs that will prevent waterside corrosion problems and provide recommendations for future repair, replacement, and inspection.



---

***M&M Engineering  
doesn't sell chemicals  
or equipment. We  
work for you.***

---

***For more information contact:***



**Mechanical & Materials Engineering**  
4616 Howard Lane, Bldg. 2, Suite 500  
Austin, Texas 78728-6302  
(512) 407-8598  
(800) 421-9185

[www.mmengineering.com](http://www.mmengineering.com)  
[info@mmengineering.com](mailto:info@mmengineering.com)

## **Water Chemistry is Critical**

While HRSGs typically lack the heat flux of a standard pulverized coal unit, they are by no means problem-free when it comes to chemistry-related corrosion. In fact, experience has shown that these units seem to have more tube failures than their coal-fired counterparts. Common causes include flow accelerated corrosion (FAC), under-deposit corrosion (hydrogen damage, gouging, and pitting), and corrosion fatigue. The complex flow patterns, quick starts and stops, extended lay-up periods, all combine to make proper chemical treatment of HRSGs different than for the equivalent-pressure fossil-fired boiler.

Both cycling stresses and water chemistry affect reliability. Mechanical & Materials Engineering has the expertise to evaluate your current chemistry program and make constructive and practical recommendations. We don't sell chemicals or equipment. We work for you.

With high natural gas prices, many HRSGs that were anticipated to be operated as base-loaded units are cycling or spending extended lengths of time in hot or cold-standby.

Mechanical & Materials Engineering can design and help implement a lay-up strategy for periods of hot and cold standby to protect your HRSG from corrosion.

## **Don't Patch It — Fix It**

When failures do occur, it is tempting to plug the tube and move on, but understanding the failure mechanism—the “why”, is critical to understanding the potential for further failures. A true root cause analysis of the failure is essential to getting rid of the problem completely.

Mechanical & Materials Engineering has over 30 years of experience in failure analysis in a all types of power and industrial boilers, as well as steam and gas turbines. We are experts in the analysis of steam and combustion turbine blade failures. We also understand the process, materials, and operational constraints and will work to find a way to eliminate failures in the future.

## **Training**

Personnel at many combined cycle plants wear many hats. They operate, maintain, troubleshoot and treat their units. To do it right, they need to know more than just what to do, they need to know the “why to do”. Mechanical & Materials Engineering can provide on-site training, tuned to your personnel and plant, for a number of areas including water and steam chemistry, materials and corrosion issues, and damage repair options.