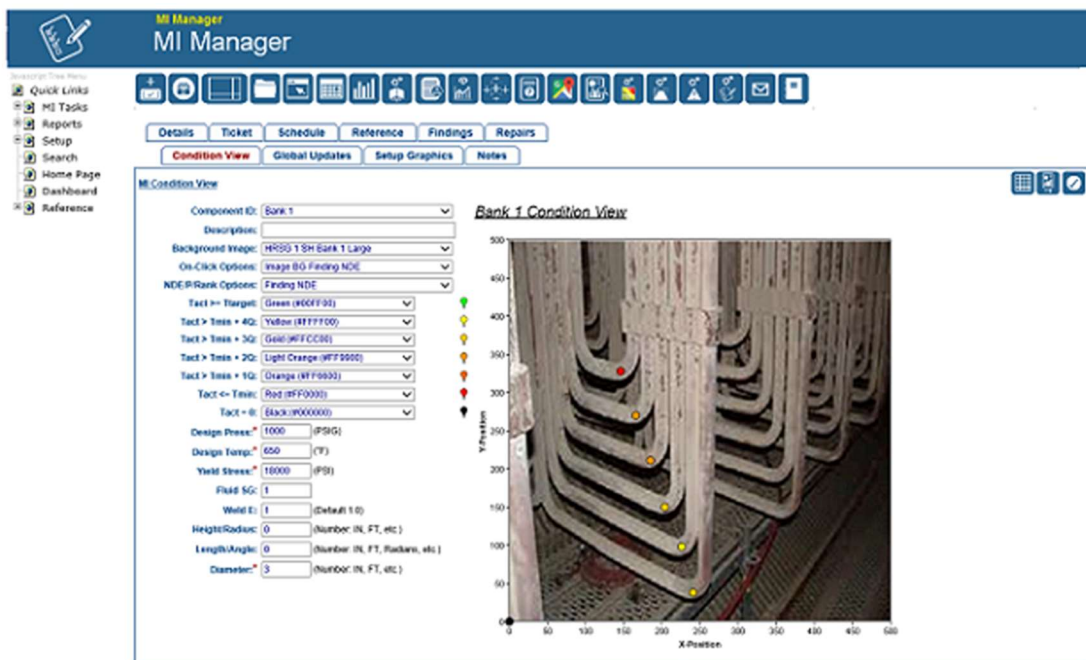# HCI Systems, Inc.
Software Solutions

HRSG, Boiler and Furnace Tube End-of-Life Tool

Example Furnace Tube MI Screen. HCI Systems, Inc.

Projecting end-of-life (i.e., tube rupture) of HRSG, boiler or furnace tubes is a little tricky. On one hand you have the data gathering and input process. On the other hand is the technical assessment of what the Tmin really is. The principal failure mode we are addressing is tube wall loss by particulate erosion.

The data gathering component is similar to that discussed in one of my earlier articles, "API Tank MI Time Saving Tools". First, you need to get your hands on a Olympus 38DL datalogger. http://www.olympus-ims.com/en/38dl-plus/. Using this device you can pre-program your data points in advance and then take your UT readings as indicated by your MI diagram. The background of the MI diagram can be a sketch or photo. When you dock your the 38DL to your PC using the supplied GageView software application, you can view your data for a reality check.

For the analysis, you need to install another component tool called MI Manager, offered by HCI Systems, Inc., http://www.hcisoftware.com/ MI Manager can import the 38DL data directly into the MI Manager database. The data can then been presented visually as shown above. Data point colors are user configurable. Material loss trends can be plotted and end-of-life projections can be assessed.

Olympus Model 38L Datalogger

Now here's the tricky part, the hoop stress calculation must take into consideration the fact that the "banks" closest to the heat source run hotter than the banks further down the stream. So you have to adjust the yield stress by the average bank temperature to obtain the "real" Tmin by tube bank.

You need at least two sets of data to draw a material loss curve. With Tmin determined, you can set a safety factor date prior to the calculated end-of life date.

This solutions works for refinery furnaces, HRSGs and power plant boilers.

If your MI application does not do this, contact HCI for upgrade at sales@hcisoftware.biz.