



# Magnetec Monthly Chronicle

" From the Field "

Issue No.1

Jan 2005

## Noteworthy Discovery On Site During Inspection of HE-1311

HE-1311 – Turbine Exhaust Condenser Background:

**This condenser was shut down due to the inability to run to design standard capacity. There was a poor condensing environment. In monitoring condensate measurements detected contaminants / primary vapor-to-secondary cooling water leakage somewhere in the system. Tube leaks were suspected when the unit was shut down.**

A rather perplexing event has occurred which mainly brings rise to the question of how or what caused the results. Collapsed tubing at the roll of 63 tubes and cracks to 2 tubes in what is otherwise good condition material (as per ECT / supplemental inspection processes performed by Magnetec Inspection) appearing still pure and ductile with otherwise little corrosion/problems or conditions other than what might be expected in a Condenser of this design. There was little to no significant corrosion to note in the region of the failed tubes. No Dezincification bad enough to aid in cracking. After considering Eddy Current inspection results (which indicated only light I.D. pitting to some tubes mainly toward Exchanger bottom rows & De-aerator section) and examining the condition of the material of a sample tube section extracted from the Condenser it was surmised that there should be no areas where pit initiated cracking would have stemmed. Examining the crack face of the sample sections available it appeared that no pitting was related to the cracking. It appears that no O.D. condensate grooving would have initiated the cracks and as it was the cracks in the 2 failed tubes

were apparently away from support locations as per sample tube sections extracted. What may have caused the collapsed areas in the roll of 63 tubes? This collapsed effect is something that apparently had to have been initiated from some event which occurred on the shell side. The collapses are present more towards the rear of the roll area in each tube affected. It is Magnetec Inspection's hypothesis that there was an immensely severe event that caused this all to occur. After some investigation (which includes reports from operations personnel about an event approximately 8-12 months ago which may have caused all this), it was considered that maybe there was a severe event involving a shocking condensate/steam hammer mechanism. Reports from operations confirm such an event which could have been the culprit. Witnesses stated that they saw piping (from outside the building there) which ultimately feeds the Condenser move/thrust many inches upon an accidental surge of steam/condensate upon a line possibly rather full of condensate (at the condenser end) at that time. This may have caused a hammer effect at the circuit end within

## Magnetec Inspection, Inc.

Excellence in Eddy Current Inspection Technology & Failure Analysis

Phone# 815-929-1565 Cell# 847-542-2810 ew@magnetec-inspection.com

Scroll 1 of 3

# Magnetec Monthly Chronicle

Issue No.1

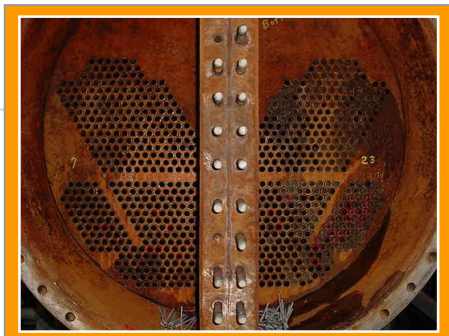
" From the Field "

Jan 2005

the Condensers limits where so much energy would have to be absorbed. Collapsed and cracked tubing resulted.

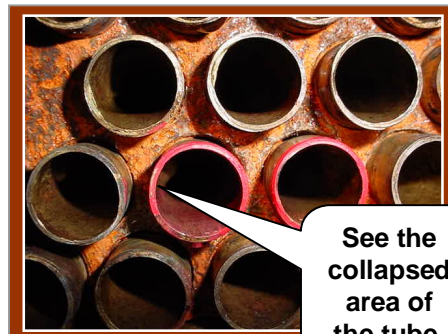
Recommendations:  
**This was considered an isolated incident. The tubes with the collapses should be replaced and/or plugged and the unit Returned to extended Service.**

Actions Taken:  
**The affected tubes were individually replaced and 3 tubes were plugged. The unit was Returned to Service.**



See the collapsed area of the tube?

See where a collapse caused a breach?



See the collapsed area of the tube.

## Magnetec Inspection, Inc.

Excellence in Eddy Current Inspection Technology & Failure Analysis

Phone# 815-929-1565 Cell# 847-542-2810 ew@magnetec-inspection.com

Scroll 2 of 3

# Magnetec Monthly Chronicle

Issue No.1

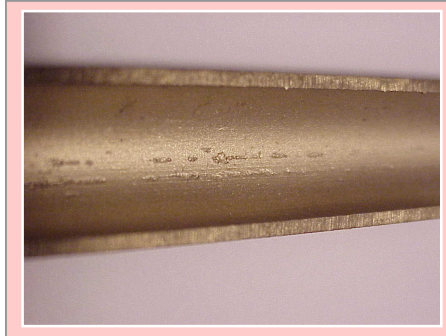
" From the Field "

Jan 2005

**Sections from the Cracked Tubes**



I.D. Surface from Sample Tube Section



O.D. Surface from Sample Tube Section



## Magnetec Inspection, Inc.

Excellence in Eddy Current Inspection Technology & Failure Analysis

Phone# 815-929-1565 Cell# 847-542-2810 ew@magnetec-inspection.com

Scroll 3 of 3