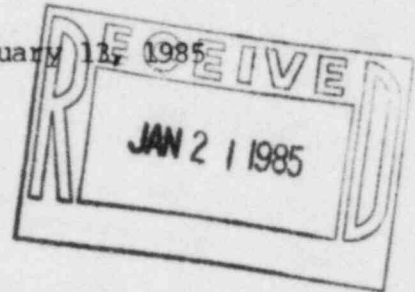




KANSAS GAS AND ELECTRIC COMPANY

GLENN L KOESTER
VICE PRESIDENT - NUCLEAR

January 13, 1985



Mr. R.P. Denise, Director
Wolf Creek Task Force
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

KMLNRC 85-022
Re: Docket No. STN 50-482
Subj: Final 10CFR50.55(e) Report - Microbiologically
Induced Corrosion (53564-K141)

Dear Mr. Denise:

This letter provides the final report submitted pursuant to 10CFR50.55(e) concerning microbiologically induced corrosion (MIC) in heat exchangers at Wolf Creek Generating Station (WCGS). This matter was initially reported on June 1, 1984 with supplemental information provided in the Reference.

In March, 1984 leakage from the Stator Cooling Water System to the Service Water System was discovered. Eddy Current inspections determined that deep pitting characteristic of microbiologically induced corrosion were present. The results of an investigation conducted by the Architect/Engineer concluded that damage to this component was a result of the activities of sulfate-reducing bacteria (SRB), which are responsible for MIC at Wolf Creek Generating Station.

Subsequently, all heat exchangers which utilize lake water for their cooling medium (i.e. components cooled by Service Water, Circulating Water, Essential Service Water) were eddy current inspected to determine the affects of MIC. MIC was found to be present on carbon steel water boxes and copper-nickel tubing (the strain of bacteria that affects stainless steel was not present at Wolf Creek). Badly damaged portions of components were replaced and all remaining portions of components were cleaned using a chemical, steam, or mechanical medium, to remove degraded material and destroy any active SRB, before returning the component to service.

Since Wolf Creek Generating Station's main condenser employs stainless steel tubing, cleaning of the tube side of the condenser was deferred. Plans have been made to hydrolaze the condenser water boxes since they are composed of carbon steel. The condenser hot well was filled with water and its temperature raised above 200 degrees farenheit for approximately fifteen minutes to destroy SRB introduced during the condenser hydrostatic testing which was performed using lake water.

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Mr. R.P. Denise
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All water (Service Water and Circulating Water) reintroduced into cleaned components was chlorinated to a concentration of 0.2ppm free available chlorine (FAC) for thirty minutes every eight hours. Essential Service Water was to be flushed with 0.2ppm FAC periodically.

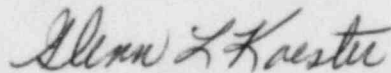
In September, 1984 evidence of MIC was found once again in Component Cooling Water Heat Exchanger A. At this time, visual examinations, chemical/biological analyses, and reviews of chlorination logs were performed. Reinfestation had occurred, but was confined to carbon steel components, primarily water boxes. Carbon steel piping inspections showed no significant pipe wall thinning or pitting.

Virtually the same techniques for removing corrosion were used for a second time on all affected components. After an extensive reevaluation performed by Architect/Engineer using water sampling at various chlorine levels, it was concluded that MIC had reoccurred because of inadequate chlorination levels.

As a result of this recurrence of MIC, Service Water System chlorination levels were increased to between 0.22 and 0.35ppm free available chlorine twenty-two hours per day and Circulating Water System chlorination levels were changed to 0.2ppm total residual chlorine for two hours per day. The Essential Service Water System is receiving a separate chlorination system capable of providing chlorination equivalent to that of the Service Water System. A sampling program is being implemented to determine if control of sulfate-reducing bacteria is being maintained and plans for inspections of equipment are being established to assure the long term effectiveness of the established chlorination program.

The aforementioned corrective actions will preclude any recurrence of MIC at WCGS. If you have any questions concerning this matter please contact me or Mr. Otto Maynard of my staff.

Yours very truly,



Glenn L. Koester
Vice President - Nuclear

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