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MECREDY,R.C. Rochester Gas & Electric Corp.
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SUBJECT: Part 21 rept re CCW HXs mfg by Atlas Industrial Mfg Co.As result of eddy current exam performed during 1993 refueling outage,tubes w/measurable defects at tube plate locations that exceeded 70% of tube wall thickness removed from svc.

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ROCHESTER GAS AND ELECTRIC CORPORATION ○ 89 EAST AVENUE, ROCHESTER N.Y. 14649-0001

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Vice President
Ginna Nuclear Production

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July 20, 1993

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

SUBJECT: 10CFR21 30 Day Report
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

In accordance with 10CFR21, Reporting of Defects and Noncompliance, Section 21.21(c), which requires "written notification to the NRC" "on the identification of a defect or a failure to comply", the attached 10CFR21 report is hereby submitted.

Very truly yours,

Robert C. Mecredy

Robert C. Mecredy

xc: Regional Administrator
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
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U.S. NRC Ginna Senior Resident Inspector

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10CFR21 30 DAY WRITTEN REPORT

I. NAME AND ADDRESS OF THE INDIVIDUAL INFORMING THE COMMISSION:

NAME: Robert C. Mecredy
Vice President
Ginna Nuclear Production

ADDRESS: Rochester Gas & Electric Corporation
89 East Avenue
Rochester, New York 14649

II. IDENTIFICATION OF THE FACILITY, THE ACTIVITY, OR THE BASIC COMPONENT SUPPLIED FOR SUCH FACILITY WHICH FAILS TO COMPLY OR CONTAINS A DEFECT:

The basic component is the Component Cooling Water (CCW) Heat Exchanger. These heat exchangers were installed as original plant equipment at the R.E. Ginna Nuclear Power Plant.

III. IDENTIFICATION OF THE FIRM CONSTRUCTING THE FACILITY OR SUPPLYING THE BASIC COMPONENT WHICH FAILS TO COMPLY OR CONTAINS A DEFECT:

The CCW heat exchangers were manufactured by:

Atlas Industrial Manufacturing Company
81 Somerset Place
Clifton, New Jersey 07012

IV. NATURE OF THE DEFECT OR FAILURE TO COMPLY AND THE SAFETY HAZARD WHICH IS CREATED OR COULD BE CREATED BY SUCH DEFECT OR FAILURE TO COMPLY:

The purpose of this notification is to advise the industry of a condition that was not considered in the original design of this component. While this condition was not considered in the original design specifications, it does present a potential mechanism that could occur with heat exchangers supplied under design criteria prevalent with the vintage of this component.

The defect identified in the design of the Component Cooling Water (CCW) Heat Exchangers was the potential for through wall tube failures to occur while operating at the heat exchanger's rated design conditions. A review of the CCW Heat Exchanger design using current heat exchanger design criteria indicated that, at the design shell side flow, the CCW Heat Exchangers were susceptible to localized high shell side velocities for tubes in the immediate vicinity of the shell inlet and outlet nozzles. These high velocities could result in flow induced vibrations leading to tube thinning from fretting damage at tube support plate locations. These conclusions were confirmed by discussions with Atlas Industrial. Atlas Industrial recommended that the heat exchanger tubes be examined to check for the presence of fretting damage.

Although no CCW Heat Exchanger tube leaks had been experienced at Ginna, the potential for flow induced vibration damage coupled with the presence of a small number of fretting defects during a 1989 tube inspection and the vendor's recommendation caused RG&E to schedule an inspection of CCW Heat Exchanger tubes during the 1993 Refueling Outage. A full length eddy current examination was performed of tubes in the vicinity of the shell inlet and outlet nozzles. This examination confirmed the presence of tube thinning due to fretting at tube support plate locations for tubes in the immediate vicinity of the shell inlet nozzle. No tube thinning due to fretting was seen at tube support plate locations in the vicinity of the shell outlet nozzles.

Tube thinning due to fretting could, over time if undetected, result in tube leaks and potentially in complete tube severance at the fretting locations. Tube leaks and/or severance could result in the CCW Heat Exchangers becoming inoperable when called upon to perform their safety function. Loss of CCW Heat Exchangers would directly affect the functionality of the Residual Heat Removal System resulting in a degradation in the ability of the plant's safety related systems to meet their long term cooling requirements.

V. THE DATE ON WHICH THE INFORMATION OF SUCH DEFECT OR FAILURE TO COMPLY WAS OBTAINED:

The information was obtained on April 19, 1993, at the completion of the review of Eddy Current test data for the CCW heat exchangers.

VI. IN THE CASE OF A BASIC COMPONENT WHICH CONTAINS A DEFECT OR FAILS TO COMPLY, THE NUMBER AND LOCATION OF ALL SUCH COMPONENTS IN USE AT, SUPPLIED FOR, OR BEING SUPPLIED FOR GINNA STATION:

There are two CCW heat exchangers, permanently installed in the Auxiliary Building at Ginna Station.

VII. THE CORRECTIVE ACTION WHICH HAS BEEN, IS BEING, OR WILL BE TAKEN; THE NAME OF THE INDIVIDUAL OR ORGANIZATION RESPONSIBLE FOR THE ACTION; AND THE LENGTH OF TIME THAT HAS BEEN OR WILL BE TAKEN TO COMPLETE THE ACTION:

As a result of the eddy current examination performed during the 1993 Refueling Outage, RG&E removed from service all tubes with measurable defects at tube support plate locations that exceeded 70% of the tube wall thickness. All tubes that were removed from service in 1993 due to fretting defects were stabilized with a tube stake and then plugged. The number of tubes removed from service during the 1993 Refueling Outage due to tube defects was less than 2% of the total number of tubes in the CCW Heat Exchangers. The design heat removal requirements of the CCW Heat Exchangers are still satisfied with this number of tubes plugged, since the heat exchanger design included approximately 10% margin for tube plugging.
Due to the localized nature of the flow induced vibration concern, RG&E plans on performing periodic examinations of the tubes in the vicinity of the shell nozzles to monitor for fretting damage at tube support plate locations. All tubes with defects exceeding the plugging criteria will be stabilized and plugged. RG&E is responsible for determining the frequency of future periodic tube examinations. Additionally, RG&E is evaluating the feasibility of reducing the CCW Heat Exchanger shell side design flow to decrease the potential for localized flow induced vibration damage to tubes.

VIII. ANY ADVICE RELATED TO THE DEFECT OR FAILURE TO COMPLY ABOUT THE FACILITY, ACTIVITY, OR BASIC COMPONENT THAT HAS BEEN, IS BEING, OR WILL BE GIVEN TO PURCHASERS OR LICENSES:

The present CCW Heat Exchangers were designed and built in the late 1960's prior to the development of existing criteria for heat exchanger design to preclude flow induced vibration concerns. Heat exchanger designs from this period may be susceptible to flow induced vibration damage depending upon the design philosophy used by individual manufacturers. Either review of the original design against today's standards or periodic examination of tubes for flow induced vibration concerns would provide an indication that unexpected damage to tubes is occurring due to flow induced vibrations.