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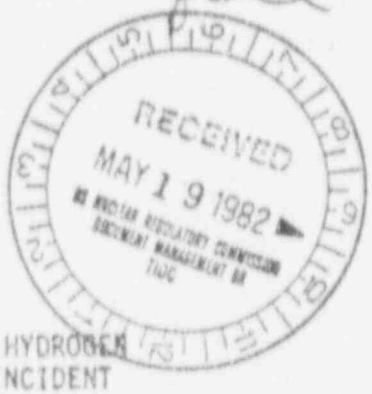
MAY 13 1982



MEMORANDUM FOR: Gus Lainas, Assistant Director
for Safety Assessment
Division of Licensing

FROM: William V. Johnston, Assistant Director
Materials & Qualifications Engineering
Division of Engineering

SUBJECT: EVALUATION OF THE LICENSEE'S ANALYSIS OF HYDROGEN TRANSFER DURING STEAM GENERATOR RUPTURE INCIDENT

Plant Name: R.E. Ginna Nuclear Power Plant
Supplier: Rochester Gas & Electric Company; Westinghouse
Licensing Stage: OR
Docket No.: 50-244
Responsible Branch & Project Manager: ORB #5; James Lyons
Reviewer: K. Parczewski
Description of Task: Incident Evaluation; Hydrogen Transfer
Status: Action Completed on TAC-47911

By memo dated April 26, 1982 from the Director of the Division of Licensing, NRR the Chemical Engineering Branch was requested to review the section dealing with hydrogen transfer in the licensee's Incident Evaluation Report of April 12, 1982. Our preliminary review indicated some calculational inaccuracies which were corrected by the licensee on May 7, 1982. We have reviewed the licensee's analysis of May 7, 1982 and concur with his conclusion that there was no hydrogen or oxygen formation during the steam generator rupture incident, and that all the hydrogen found in the pressurizer and the faulted steam generator's vapor space came from the hydrogen inventory originally dissolved in the primary coolant.

William V. Johnston, Assistant Director
Materials & Qualifications Engineering
Division of Engineering

Enclosure: As stated

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Safety Evaluation Report by the

Office of Nuclear Reactor Regulation

R.E. Ginna Nuclear Power Plant

Docket No. 50-244

On April 12, 1982 Rochester Gas and Electric Company submitted an incident evaluation report for the Ginna steam generator tube failure incident which occurred on January 25, 1982. In this report, the licensee has included a hydrogen transfer analysis. The purpose of this analysis was to show that the amount of hydrogen found in the pressurizer and in the vapor space of the faulted steam generator was from the hydrogen dissolved originally in the primary coolant. The licensee has also indicated that there was no oxygen present in the waste gas removed from the primary system. The licensee concluded that at no time during the steam generator tube rupture incident was hydrogen generated in the core. The concentrations of hydrogen in the pressurizer and the steam generator vapor space were determined when the reactor was in cold shutdown condition. The hydrogen concentration in the faulted steam generator vapor space, originally reported by the licensee in the submittal was in error. However, this error was corrected and the final analysis was provided on May 7, 1982.

The licensee's analysis consisted of a hydrogen mass balance performed for the primary coolant system and for the secondary side of the steam generator. Hydrogen transfer from the primary

system to the secondary side of the steam generator through the ruptured tube was considered. Also, hydrogen losses to the condenser and the pressurizer relief tank were included. By this mass balance the licensee demonstrated that the hydrogen inventory existing at different locations in the primary and secondary systems after the incident could be accounted for by the hydrogen which was originally dissolved in the primary coolant and then released during the incident. The licensee concluded that the steam generator tube failure incident did not promote any reactions which could result in the production of hydrogen. Hydrogen could be generated either by metal-water reaction of zirconium or by radiolytic decomposition of reactor water. The metal-water reaction requires fairly elevated temperatures which can occur only if the core is at least partially uncovered. Radiolytic decomposition of water would, in addition to hydrogen, generate stoichiometric amounts of oxygen. Since no core uncovery occurred during the incident, and since no oxygen during the incident, and since no oxygen was detected in the gases transferred from the primary systems to the waste gas system, there is no evidence that these reactions occurred. Based on our independent evaluation we agree with the results of the licensee's analysis and conclude that there was no generation of hydrogen during the tube rupture incident.