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ZIEMANN,D.L. Operating Reactors Branch 2

SUBJECT: Forwards summary of status of mod & insp program re 731101 evaluation of OL effects of postulated high energy line breaks outside containment.All mods completed & inservice insp program initiated.

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LEON D. WHITE, JR.
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June 27, 1979

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis L. Ziemann, Chief
Operating Reactors Branch No. 2
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: High Energy Line Breaks Outside Containment
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Ziemann:

In response to a letter from the AEC dated December 18, 1972, Rochester Gas and Electric submitted an evaluation of the effects of postulated high energy line breaks outside of containment on November 1, 1973. In that evaluation and subsequent evaluations we committed to perform certain modifications and to implement inspection programs. In response to a request from a member of your Staff, this letter summarizes the status of those modifications and inspection programs.

Generally, all modifications have been completed and an inservice inspection program has been initiated. Selected modifications, because of their interface with other licensing related reviews such as fire protection or the structural review in the Systematic Evaluation Program, have been incorporated into those programs. The attachment to this letter provides a description of the status of each of the modifications.

Very truly yours,

Leon D. White, Jr.

Leon D. White, Jr.

LDW:np
Attachment

Attachment

Based on the evaluation of the effects of postulated high energy line breaks outside containment, an augmented inservice inspection program was proposed and a number of modifications were committed to. The augmented inservice inspection program was approved by the Nuclear Regulatory Commission in Amendment No. 7 to the Ginna license, issued May 14, 1975. The status of each of the modifications, and a page reference to our November 1, 1973 report, is as follows.

1. Standby Auxiliary Feedwater System (page 1-2)

   This system is described in our letters to the NRC dated May 20, 1977 and July 28, 1978. The system is complete.

2. Modification of the existing auxiliary feedwater system (5-1, 5-2)

   Check valves were added to the existing auxiliary feedwater lines near the connections to the main feedwater lines to minimize the auxiliary feedwater piping which is pressurized during normal operation. A crossover line between the motor driven pump discharge lines was equipped with two parallel remotely operated valves for additional capability of these systems. These modifications are complete.

3. Protection of service water piping (5-4)

   A jet shield in the form of a large metal plate was installed underneath the main steam header in the Intermediate Building. This plate will protect the service water piping from a postulated crack break in the main steam line. This modification is complete.

4. Relocation of instrument lines (5-4, 5-5)

   Cabling for some instrument channels (see the response to question 6 in our letter to the NRC of May 24, 1974) was relocated to areas where it will not be subject to postulated breaks. This modification is complete.

5. Relocation and protection for heating and ventilating

   A number of separate tasks are listed on pages 5-6 and 5-7 of our report, "Effects of Postulated Pipe Breaks Outside the Containment Building," submitted by our letter of November 1, 1973.

   a. The control room lavatory exhaust duct was relocated to a position above the control room ceiling and penetrates the east wall of the control building rather than discharging into the turbine building. This modification is complete.

b. Initially, RG&E had intended to extend ducting from the control building mechanical ventilation equipment room relief opening to the east wall of the Turbine Building and from the battery room relief opening to the east wall of the Turbine Building. Following a review of this design it was decided instead to install automatic closing fire dampers in each of the openings. These dampers would be designed to close automatically upon sensing of high temperature in the Turbine Building. The dampers have been installed.

c. The east end of the cable tray tunnel which connects the Intermediate Building and the relay room of the Control Building has been sealed with a barrier and fire resistant material.

d. Openings around eight pipes which penetrate the Control Building mechanical ventilation equipment room wall; openings around cable trays which penetrate the relay room; areas around cable trays which enter the battery room; and the openings around heating, steam, and condensate pipes, and cable trays entering the diesel generator building have all been sealed to prevent steam leakage in the event of a steam or feedwater line break in the Turbine Building.

e. Ducting which interconnects the Intermediate Building and the Auxiliary Building has been modified by the installation of fire dampers. This prevents steam leakage from one building to the other in the event of a pipe break in one building. A total of 3 dampers were installed. Completion of electrical connections is in progress.

6. Steam generator blowdown lines rerouting

To eliminate potentially detrimental effects of breaks in the steam generator blowdown lines, these lines were rerouted. The lines originally traversed the Intermediate Building from a containment penetration to the Turbine Building at the basement level. The rerouting employs the same basement level penetrations but the intervening piping has been relocated to the sub-basement of the Intermediate Building. This results in a minimization of the length of the blowdown line on the basement level. This modification is complete.

7. Addition of jet impingement shields (5-9, 5-10)

Pipe whip restraints were added near the refueling water storage tank for protection against the potential effects of postulated breaks in the two inch charging lines and postulated breaks in the seal water lines. The restraints have been installed.

An investigation into the jet impingement shielding requirements in the Intermediate Building has been completed and several areas requiring shielding have been identified. To protect the Service Water Line from a crack break in the main steam line, a shield was placed under the main steam header (see item 3 above). Jet shielding has been installed to protect vital equipment from crack breaks in the portions of the steam generator blowdown lines near the Containment and Turbine Building penetrations which are still above the Intermediate Building basement floor. Shields have been installed to protect the following equipment: containment isolation valves for five containment penetrations near the blowdown line penetrations, the motor generator sets, transfer switches, engineered safeguards cable trays above the blowdown lines near the Turbine Building penetration, terminal boxes and associated wires for nine containment penetrations, pressure transmitters and associated tubing at one containment penetration, and the reactor trip breakers.

Jet shielding was installed to protect the two main steam bypass valves and their associated 3" piping from crack breaks in the 36" main steam line. Jet shielding was installed to protect the feedwater flow instrumentation tubing from crack breaks in the feedwater and main steam lines. Jet shielding is also required to protect the following from crack breaks in the feedwater line: one atmospheric steam dump valve, all steam generator code safeties, and the two main steam bypass valves and their associated 3" piping. These modifications will be installed in conjunction with the Systematic Evaluation Program due to the close relationship of the modification with the SEP Seismic Review.

8. Environmental protection (5-9)

An analysis has been conducted to determine the capability of safety related equipment in the Auxiliary Building to withstand the steam-air environment which might exist following a postulated crack break in moderate energy piping within the building. Crack breaks in the plant heating steam lines or in the primary letdown line upstream of the non-regenerative heat exchanger, the only moderate energy piping in the Auxiliary Building, could cause two types of problems: high humidity and resulting condensation on electrical conductors, and high temperature effects of electrical insulation. A review of equipment qualifications revealed that corrective action must be taken to prevent the existence of a 100% humidity, 212°F environment in the Auxiliary Building.

Equipment within the Auxiliary Building which requires auxiliary steam includes:

1. Unit heaters - located on the operating floor
2. Air handling unit - located on the operating floor
3. Boric acid evaporator - located in the basement
4. Waste evporator - located in the basement
5. Boric acid batching tank - located on the operating floor
6. Gas stripper - located in the basement
7. Steam cleaner - located in the decontamination pit

In addition, as described in our letter of February 24, 1978 we identified the fact that protection must also be provided from breaks in the steam heating lines in the diesel generator rooms and the screen house in the vicinity of safety related equipment.

Regular inspections are being performed to reduce the likelihood of a failure creating an adverse environment. These inspections, performed during each plant operating shift, would detect any leakage. Plant procedures call for isolation of the affected piping promptly upon detection of the leakage. In addition, confidence of the low likelihood of an adverse environment in the vicinity of safety related equipment is provided by the fact that, in almost 10 years of plant operation, no adverse environment has been created in any of these areas by any mechanism, including failure of the steam heating line.

9. Protection from flooding (5-15)

An analysis of the feedwater line break in the Intermediate Building was performed to determine the drain area necessary in the basement floor of the Intermediate Building to prevent flooding of safety related equipment. The necessary area, 6.69 ft.^{2}, required to maintain water at acceptably low levels is afforded by the installation of open grating in two 24 inch manholes and by existing drains. The grating has been installed and this is complete.

10. Steam line pressure & feed flow transmitters (p5-14)

The transmitters have been relocated.

11. Pipe breaks in the turbine building

An evaluation has been performed of the effects of postulated high energy line breaks in the Turbine Building

on the Control Building and the Diesel Generator Building. The evaluation and proposed modifications are described in our letters dated February 6, 1978, August 25, 1978, October 11, 1978, and May 17, 1979. The modification will be completed following receipt of NRC approval.

The impact of high energy line breaks in the Turbine Building on the Intermediate Building wall has not been completely resolved. The analysis of the pressure transient for the Turbine Building presented in the letters referenced above is applicable to this wall as well. Modifications to the Intermediate Building wall are being deferred until the conclusion of the Systematic Evaluation Program to permit an integrated assessment.