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CRUTCHFIELD,D.M. Operating Reactors Branch 5

SUBJECT: Forwards response to NUREG 0737 Item II.F.1 re noble gas effluent monitor per 801230 ltr. New monitor to be installed by 820101 will meet TMI action plan requirements.

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JOHN E. MAIER
VICE PRESIDENT

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January 30, 1981

Director of Nuclear Reactor Regulation
Attn: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Clarification of TMI Action Plan
Requirements (NUREG 0737)
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

NUREG 0737 contained requirements for submittal by January 1, 1981 of documentation on several of the TMI Action Plan items. Our letter dated December 30, 1980 committed to provide additional information concerning Item II.F.1, Attachment 1, Noble Gas Effluent Monitor, by February 1, 1981. Preliminary information concerning noble gas effluent monitoring was submitted on December 15, 1980. At that time we indicated that our intent was to upgrade an existing monitor on the condenser air ejector to extend its range. We now plan instead to install a new monitor which is independently capable of meeting the NUREG 0737 requirements. Attachment A to this letter is intended to demonstrate that the systems to be installed by January 1, 1982 will comply with the NUREG 0737 requirements. Even though a pre-implementation review of modifications performed for this item has not been indicated, we request that you review the information in the attachment and provide us with any comments you have at an early date to avoid any waste of effort and resources.

Very truly yours,

John E. Maier

JEM:ng

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ATTACHMENT A

Rochester Gas & Electric Corporation

Response To
NUREG 0737 Item II.F.1, Attachment 1
Noble Gas Effluent Monitor

January 30, 1981

RG&E Response to NUREG 0737 Item II.F.1, Attachment 1, Noble Gas Effluent Monitor

NRC Position

Noble gas effluent monitors shall be installed with an extended range designed to function during accident conditions as well as during normal operating conditions. Multiple monitors are considered necessary to cover the ranges of interest.

(1) Noble gas effluent monitors with an upper range capacity of 10^5 μ Ci/cc (Xe-133) are considered to be practical and should be installed in all operating plants.

(2) Noble gas effluent monitoring shall be provided for the total range of concentration extending from normal condition (as low as reasonably achievable (ALARA)) concentrations to a maximum of 10^5 μ Ci/cc (Xe-133). Multiple monitors are considered to be necessary to cover the ranges of interest. The range capacity of individual monitors should overlap by a factor of ten.

Changes to Previous Requirements and Guidance

This requirement was originally issued by letters to all operating power plants dated September 13 and October 30, 1979. Significant changes in requirements or guidance are:

(1) Deletion of specific range overlap requirement.

(2) Specifies that offline monitoring is not required for safety valve and dump valve discharge lines.

(3) Implementation date changed from January 1, 1981 to January 1, 1982.

(4) Specifies that inline sensors are acceptable for concentrations between 10^2 μ Ci/cc to 10^5 μ Ci/cc of noble gases.

Clarification

(1) Licensees shall provide continuous monitoring of high-level, post-accident releases of radioactive noble gases from the plant. Gaseous effluent monitors shall meet the requirements specified in the enclosed Table II.F.1-1. Typical plant effluent pathways to be monitored are also given in the table.

(2) The monitors shall be capable of functioning both during and following an accident. System designs shall accommodate a design-basis release and then be capable of following decreasing concentrations of noble gases.

(3) Offline monitors are not required for the PWR secondary side main steam safety valve and dump valve discharge lines. For this application, externally mounted monitors viewing the main steam line upstream of the valves are acceptable with procedures to correct for the low energy gammas the external monitors would not detect. Isotopic identification is not required.

(4) Instrumentation ranges shall overlap to cover the entire range of effluents from normal (ALARA) through accident conditions.

The design description shall include the following information.

(a) System description, including:

(i) instrumentation to be used, including range or sensitivity, energy dependence or response, calibration frequency and technique, and vendor's model number, if applicable;

(ii) monitoring locations (or points of sampling), including description of methods used to assure representative measurements and background correction;

(iii) location of instrument readout(s) and method of recording, including description of the method or procedure for transmitting or disseminating the information or data;

(iv) assurance of the capability to obtain readings at least every 15 minutes during and following an accident; and,

(v) the source of power to be used.

(b) Description of procedures or calculational methods to be used for converting instrument readings to release rates per unit time, based on exhaust air flow and considering radionuclide spectrum distribution as a function of time after shutdown.

Applicability

This requirement applies to all operating reactors and applicants for operating license.

Implementation

Implementation must be completed by January 1, 1982.

Type of Review

A post-implementation review will be performed.

Documentation Required

Licensees and licensing applicants should have available for review the final design description of the as-built system, including piping and instrument diagrams together with either (1) a description of procedures for system operation and calibration, or (2) copies of procedures for system operation and calibration. Operating Reactors--By January 1, 1981 operating reactors should have available for review the final design details of the implementation of the above position and clarifications. If deviations to the above position or clarification are necessary, provide detailed explanation and justification for the deviations by January 1, 1981.

RG&E Response

I.(a) System Description - Plant Vent, Containment Vent, and Condenser Air Ejector* Effluents

(i) Instrumentation to be Used: An Eberline air sampling system has been purchased for installation by January 1, 1982. The system consists of an air sampling unit for each vent stack and central control consoles in the Control Room and TSC.

Range, Sensitivity, Energy Response: Approximately 10^{-7} to 10^{+5} μ Ci/cc for ^{133}Xe; ± 20% 40 Kev through 1.33 Mev.

Calibration Frequency and Technique: The calibration frequency will be in accordance with Technical Specification 4.1 which requires calibration of the radiation monitoring system during each refueling. It is intended that calibration will be performed by correlating monitor response to known gas concentrations introduced in the sampler assembly, or to radiation sources simulating high gas concentrations. Alternatively, on line monitor calibration can be performed by correlating actual sample analysis data with Sping-4 readings.

Vendor Model Number: Eberline Sping-4 Samplers and Control Terminals

(ii) Monitoring Locations: Plant Vent and Containment Vent Air Samplers - Intermediate Bldg. El. 298'4".
Plant Vent Sample Inlet - Intermediate Bldg. El. 310'.
Containment Vent Sample Inlet - Intermediate Bldg. El. 320'.
Air Ejector Sampler - Turbine Bldg. El. 289'6".
Air Ejector Sample Inlet - Turbine Bldg. El. 292'7".

These sample locations monitor the final release points and include all discharge inputs.

* Problems associated with moisture and high temperatures in air ejector exhaust are being investigated.

Representative Sampling: Single probe isokinetic nozzles at vent centerline have been designed in accordance with ANSI-N.13.1-1969.

Background Correction: Each airborne radioactivity channel will automatically compensate for variable background radioactivity.

(iii) Location of Instrument Readouts: Control Consoles in Control Room and TSC.

Method of Recording: Microprocessor controlled printout.

Data Transmission: 3 shielded #16 AWG pairs from samplers to control consoles.

(iv) Assurance of Obtaining Readings at Least Every 15 Minutes: Data, status, and channel number are printed every 10 minutes when status is high alarm or calibrate.

(v) Power Source: Instrument Bus 1B (backed by emergency diesel generator). In addition, each sampler has an internal 8 hour battery backup.

(b) Calculational Procedures for Obtaining Release Rates

The Eberline Control Consoles are located in a low radiation environment and can be programmed with the necessary constants and conversion factors for direct readout of release rates (μ Ci/sec).

II.(a) System Description - Main Steam Safety Valves, Power Operated Relief Valves (PORVs) and Turbine Driven Auxiliary Feedwater Pump (TAFWP) Discharge

(i) Instrumentation to be Used: This system requires instrumentation for monitoring releases from the main steam safety valves, PORVs and turbine driven auxiliary feedwater pump (TAFWP). An Eberline dual steamline monitor consisting of two SA-11 sampling assemblies, two IB-4HTCC interfaces, one dual channel data aquisition module DAM-3, and two CLI-1 communication line isolators will be purchased for installation by 1/1/82. The outputs of the steamline monitors and the open/close status of the release paths (TAFWP, PORVs and safety valves) will be recorded on Texas Instruments chart recorders.

Range, Sensitivity, Energy Reponse: 10^{-1} - 10^{+3} μ Ci/cc for ^{133}Xe; ± 20% 40 KeV through 1.33 MeV.

Calibration Frequency and Technique: The calibration frequency will be in accordance with Technical Specification 4.1 which requires calibration of the radiation monitoring system during each refueling. Calibration of detector to be performed remotely with a CS-137 source calibrator unit.

Vendor Model Number: Eberline - Detector-SA-11
Interface-IB-4HTCC
Data.Aq.Mod.-DAM-3
Isolator-CLI-1
Texas Inst. - Recorder-Tigraph 100

(ii) Monitoring Locations: Intermediate Bldg. El. 298'4" adjacent to each main steamline upstream of relief valves, safety valves and TAFWP supply lines.

Representative Sampling: Detectors view total flow through pipe.

Background Correction: 3" Lead Shielding

(iii) Location of Readouts: Ratemeter - Control Room
Control Console - Control Room
Control Console - TSC
Recorders - Control Room

Method of Recording: Analog chart recorders/Sping-4 Control Consoles.

Data Transmission: Shielded instrumentation cables from detectors to control room.

(iv) Assurance of Obtaining Readings at Least Every 15 Minutes: Outputs are recorded continuously when in alarm.

(v) Source of Power: Instrument Bus 1B (backed by emergency diesel generator). In addition, the DAM-3 has an internal 8 hour battery backup.

(b) Calculational Procedures for Obtaining Release Rates:

The Eberline steamline monitors are compatible with the Sping-4 Control Consoles, therefore, by programming the system with the appropriate conversion factors, a direct readout in μ Ci/sec is possible. Conversion curves have been developed which take into account the radionuclide spectrum distribution as a function of time after the onset of a loss of coolant accident, in conjunction with assumed primary to secondary leakage. The open/close status of the possible release paths (TAFWP, PORVs and safety valves) will be recorded simultaneously with the steamline activity in each main steam loop. By integrating the flow rate and the activity concentration with respect to time, the activity released can be calculated.