REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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FACIL:50-261 H. B. Robinson Plant, Unit 2, Carolina Power and Ligh 05000261
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RECIP.NAME RECIPIENT AFFILIATION
VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Responds to 811222 request for technical justification re noble gas monitors. Main vent stack noble gas monitoring sys meets requirements of NUREG-0737, Item II.F.1. Sys description encl.

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TITLE: Response to NUREG-0737/NUREG-0660 TMI Action Plan Rqmts (OLs)

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	NRR/DL/ORAB	18	3	3	NRR/DSI ADRS	27	1	1
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	NRR/DSI/RAB		1	1	NRR/DST DIR	30	1	1
	NRR/DST/ADT	32	1	1	REG FILE	04	1	1
EXTERNAL:	ACRS	34	10	10	FEMA-REP DIV		1	1
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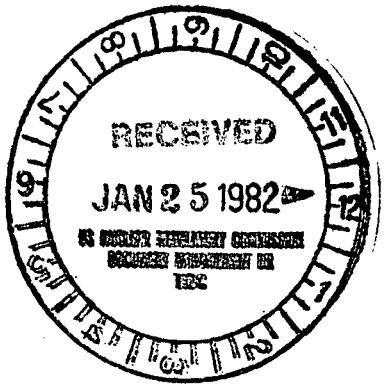
January 20, 1982



File: NG-3514(R)

Office of Nuclear Reactor Regulation
ATTN: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
United States Nuclear Regulatory Commission
Washington, D.C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
EFFLUENT MONITORING - TECHNICAL JUSTIFICATIONS

Dear Mr. Varga:

In your letter dated December 22, 1981, you requested further technical justification regarding noble gas monitors for the H. B. Robinson Steam Electric Plant (HBR) as discussed previously in your letters of October 31, 1980, August 12, 1981; our letter of March 3, 1981; and subsequently in a conference call between members of your staff, our staff, and the staff of Exxon Nuclear Idaho Company, Inc. on January 7, 1982. Carolina Power & Light Company (CP&L) understands that the specific concerns of your staff and your staff contractor are that the mid-range "on-line" detector will not detect Xe-133 gas concentrations below 10^2 µCi/cc and that the low range "in-line" detector is not shielded.

CP&L's position is that an "on-line" detector can indeed measure Xe-133 gas below a concentration of 10^2 µCi/cc. Hand calculations and independent computer model calculations both agree that a Xe-133 gas concentration of 2×10^{-3} µCi/cc can be detected by an "on-line" detector. This is assuming a rolled steel stack of 3/16" thickness with an internal diameter of 54 inches. The computer program used was "QAD MOD-G".

In reference to the second concern regarding the "in-line" low range detector, HBR is not using an "in-line" detector for the main vent stack low range noble gas monitor. The low range monitor used is an "off-line" type monitor. This monitor is an Eberline PING-2A, which is capable of monitoring Xe-133 between 5×10^{-7} µCi/cc and 4×10^{-2} µCi/cc.

In an effort to minimize any further confusion, we are enclosing a detailed description of the planned Main Vent Stack Noble Gas Monitoring System. Please recognize that the as-built system, when completed, may change due to unforeseen variables (e.g., equipment unavailability, construction interference, etc.), but strictly within the scope of the requirements stated in NUREG-0737, Item II.F.1, Attachment 1.

[redacted]et • P. O. Box 1551 • Raleigh, N. C. 27602

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S1/1

We believe, based on the conference call on January 7, 1982, that this response, with the detailed description, will resolve your concerns and that our system meets the requirements of NUREG-0737, Item II.F.1, Attachment 1.

In your letters of September 30, 1981 and October 29, 1981, you requested that we submit proposed changes to the HBR Technical Specifications (TS) by January 1, 1982. This request was waived until the concerns addressed in your December 22, 1981 letter were resolved.

In light of the implementation schedule for the completion of the monitoring system the TS change will not be required until May, 1982. We request an extension for submittal of the proposed changes until February 5, 1982.

If you have any further questions regarding these items, please contact a member of our staff.

Yours very truly,

S. R. Zimmerman
Manager
Licensing & Permits

DCW/lr (8426)

Enclosure

cc: Mr. J. P. O'Reilly (R-II)
Mr. W. J. Ross (NRC)

Sworn to and subscribed before me this 20th day of January, 1982.

Franklin Murray
Notary Public

My commission expires: Oct. 4, 1986

FRANKLIN MURRAY NOTARY PUBLIC WAKE COUNTY, N. C.

System Description

Main Vent Stack Noble Gas Monitoring System

The planned Main Vent Stack Noble Gas Monitoring System incorporates three subsystems which provide continuous monitoring of noble gas from 5×10^{-7} μCi/cc (ALARA level) to 10^{5} μCi/cc.

Design Considerations

- The Main Vent Stack Low and High Range monitors are "off-line" monitoring systems.

- The Main Vent Stack Mid-Range monitor is an "on-line" monitoring system.

- The Main Vent Stack Low and High Range monitors will have upstream filtration to remove all iodines and particulates.

- Each detector system power supply is from the vital instrument bus.

- Each detector system operates in a continuous real time mode.

- Each detector range overlaps by at least a factor of ten to provide continuous monitoring from ALARA levels to post-accident levels of noble gas.

- The complete Main Vent Stack Noble Gas Monitoring System is capable of functioning both during and following an accident. The system was designed per the NUREG-0737 design-base releases.

- Each detector is shielded.

Main Vent Stack Low Range Detector

The Main Vent Stack Low Range Monitor is an Eberline PING-2A which contains particulate, Iodine, and Noble Gas Analysis channels. The Noble Gas channel

incorporates a β-phosphor type detector and has a range of 5×10^{-7} μCi/cc (ALARA level) to 4×10^{-2} μCi/cc. β- phosphor is sensitive to all β energies associated with the noble gas expected from a TID 14844 source term. The Calibration frequency is once per refueling outage. The Calibration technique is based on the vendor's recommended Calibration procedure. This involves inserting known sources into the detection chambers. The system utilizes isokinetic sampling per ANSI N13.1-1969. The sample air is drawn through the PING-2A's shielded detector chambers. The PING-2A incorporates background detection and subtraction electronics for background correction. The instrument readout is locally mounted on the PING-2A. A recorder is also mounted on the PING-2A. Procedures require information be retrieved and reported to the control room operator or the Emergency Response Personnel. The PING-2A is easily accessible to personnel requiring the information. Exposure rates during Design Base Accidents will not prohibit personnel access of the PING-2A. Thus, capability exists of obtaining readings every 15 minutes during and following an accident.

Main Vent Stack Mid Range Detector

The mid range detector system utilizes a Victoreen Series 855 GM detector system. This detector's range is 2×10^{-3} μCi/cc to 2×10^{2} μCi/cc of effluent activity. Energy dependence is ± 20% between 80 kev to 2.0 Mev. radiation. Calibration frequency is once per refueling outage. The calibration technique is an electronic calibration followed by a source calibration using a point Cs-137 source. The detector is collimated and mounted approximately seven stack diameters or 30 feet above the last effluent entrance into the stack. The collimator is positioned to restrict any possible background radiation from entering the collimator opening. The collimator is constructed of poured lead and reduces design-basis background levels to less than 1 mr/hr at the detector. There are two readouts. One readout is mounted on the base of the vent stack. The other is in the Control Room near the other radiation monitor readouts. Recording is accomplished by a Tigraph-100 recorder mounted in the Control Room near the monitor readouts.

Main Vent Stack High Range Detector

The high range detector system incorporates a CaF_2 scintillation detector in an off-line collimated geometry. The system will detect noble gas between 10^0 - 10^5 μCi/cc. The detector's energy response is ± 20% from 80 kev to 3.0 mev gamma radiation. Calibration is completed each refueling outage by electronic calibration in conjunction with a Cs-137 point source for source calibration. The detector is a Harshaw Chemical Company Model 4.5 S 3/1 - 1/8B-x CaF_2 scintillation detector. The system utilizes isokinetic sampling per ANSI N-13.1-1969. The sample air is drawn through a lead shield which houses the detector. The lead shield acts as both collimator and as a background shield. It is designed to reduce post accident design-base background radiation levels to less than 1 mr/hr at the detector. The readout is in the Control Room near the other radiation monitor readouts. Recording is accomplished by a Tigraph-100 recorder mounted in the Control Room near the monitor readout.