THE CINCINNATI GAS & ELECTRIC COMPANY

CINCINNATI OHIO 45201

Docket No. 50-358

December 13, 1979

Mr. S. A. Varga
Acting Assistant Director for LWR's
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: RESPONSE TO NRC REQUEST FOR COMMENTS ON PROPOSED REVISION 2 TO REGULATORY GUIDE 1.97

Gentlemen:

In response to the November 23, 1979 letter from Mr. Varga to Mr. E. A. Borgmann (received November 28, 1979), CG&E wishes to submit the attached comments on proposed Revision 2 to Regulatory Guide 1.97 "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident".

CG&E will be represented at the December 14 meeting which the NRC has scheduled for BWR OL Applicants to discuss proposed Revision 2.

Very truly yours,

THE CINCINNATI GAS & ELECTRIC COMPANY

By James D Flynn
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COMMENTS ON PROPOSED REVISION 2 TO
REGULATORY GUIDE 1.97

The following comments apply to Table 3 - "BWR Variables":

1. High Range Containment Area Radiation Monitor.

Comments

High range post accident radiation monitors located inside primary containment (in-containment) have several limitations:

1) Continuous exposure to undesirable environmental conditions, e.g.,temperature and humidity (under normal power operating as well as accident conditions).

2) Detectors and/or detector shields are subject to severe radiological contamination under accident conditions. Questions were raised following the TMI-2 accident concerning the validity of the containment monitor readings.

3) There is no possibility of changing out malfunctioning detector(s) in the early post accident atmosphere, nor during normal power operations (without a plant shutdown and primary containment entry).

4) The licensee must depend on "electronic" calibration for most ranges of the instrument. Radiation source calibration is limited to one or two decades.

Recommendations

Regulatory Guide 1.97 should include provisions to allow ex-containment post-accident monitors on BWR plants having secondary containment buildings. A description of such a system and how it is used follows:

The system consists of redundant ionization chambers which, with the exception of range and location, meet the design criteria of proposed Revision 2 of Reg. Guide 1.97. The range of these detectors is 0.1 to 10^7 mR/Hr. The monitors are located outside of primary containment and "look at" the contents of a 3/4 in. sample line which circulates the primary containment atmosphere. This sample line is also used to obtain hydrogen and oxygen samples.

Because of the location of the monitor downstream of a moisture separator used to prepare the H_2/O_2 samples, it has been conservatively assumed that only noble gases will reach the line downstream of the sample point. Therefore,

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any other radioactive materials (e.g., iodine, cesium, etc.) reaching the monitor area will provide an overestimate of the radiation environment in containment.

Calibration of the monitor is based on the following assumptions:

(i) The release of fission products airborne in the primary containment is a fraction (f) of the TID-14844 mixture (i.e. 100% noble gases, 25% radioiodines).

(ii) Only noble gases reach the post accident monitor.

(iii) The reading (mR/hr) at the monitor location determines (f) with the noble gases and iodines present in the ratio described in (i).

The monitor reading described above provides a conservative estimate of the extent of the radiation environment in the drywell. This estimated radioactive environment, both noble gas and radioiodine, is assumed to leak to the secondary containment at the design-basis leak rate, to be mixed in the secondary containment by the mixing fans, to be processed (radioiodine and particulates only) by the Standby Gas Treatment System (SGTS) at the design basis efficiency, and to be released to the environment at the SGTS discharge flow rate as a semi-infinite ground-level cloud.

Emergency action levels have been developed for monitors based on the assumptions described above for the dose commitments specified in draft NUREG 0610.

One of the major advantages of locating the monitor outside the primary containment (ex-containment) is the significantly lower radiation levels which the radiation monitor must be designed for. Using the assumptions of Regulatory Guide 1.3 for conservative radioisotopic releases and technical specification leak rates, this monitor would have to read 2×10^4 mR/hr in order to deliver 10CFR100 doses at the site EAB. Using realistic estimates for the LOCA condition, the detector would be expected to read 100 mR/hr.

Other advantages of ex-containment monitors for this application counter the previously described limitations of in-containment monitors. The thermal, relative humidity and radiological environment in secondary containment is much less severe. Malfunctioning detector(s) are more accessible for change-out.

The instrument can be calibrated with a radiation source to at least midscale on the 10^5 mR/hr range using commercially available self-contained radiation source "calibrators".

2. Standby Gas Treatment System Vent Noble Gas Monitor

<u>Comment and Recommendation</u>

Some nuclear plants do not utilize the standby gas treatment system as a "normal" release path. Separate filter trains are used to process containment purge gases and they are released to the normal station vent after processing. The SGTS system has a separate stack and the total system is designed to be used for accident purposes only.

Because two or more separate radiation monitoring systems are currently required to provide detectability over the 10^{-7} to 10^5 μCi/cc ranges, those facilities that do not use SGTS to process "normal" releases should not be required to monitor for "normal" untreated effluent releases, e.g., from 10^{-7} to 10^{-3} μCi/cc.