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 RECIP. NAME RECIPIENT AFFILIATION
 DENTON, H. R. Office of Nuclear Reactor Regulation, Director (post 851125)

SUBJECT: Requests exemption from design basis for main steam noble gas effluent radiation monitors located downstream of PORV. Range reported in 851015 ltr clarified. Fee paid.

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INDIANA & MICHIGAN ELECTRIC COMPANY

P.O. BOX 16631
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September 8, 1986
AEP:NRC:0678Z

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
MAIN STEAM NOBLE GAS EFFLUENT RADIATION MONITORS
REQUEST FOR EXEMPTION

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

The purpose of this letter is to request an exemption from the design-basis range for the main steam noble gas effluent radiation monitors located downstream of the power-operated relief valves (PORVs) and to clarify the range reported in a previous letter dated October 15, 1985.

In our letter to you dated October 15, 1985 (AEP:NRC:07730), it was reported that the range of the main steam noble gas monitors was 3 uCi/cc (microcuries per cubic centimeter) to 20×10^5 uCi/cc. The range reported was based solely upon the monitors' response to Xe-133, not a Xe-133 equivalent mixture.

The Xe-133 equivalent mixture is determined by the steam generator tube rupture (SGTR) accident scenario, which results in a release of radioactivity. In the attachment to our letter AEP:NRC:0678W, dated June 23, 1986, we indicated that the only credible accident scenario for determining the main steam radioactivity concentration was a steam generator tube rupture. The noble gas monitors' response to this mixture and therefore the monitors' range are dependent on the geometry of the system and the relative quantities of the various radionuclides released. In this case the geometry is a thick-walled carbon steel pipe surrounding the steam effluent which is several inches from the monitor itself. This geometry leads to a high degree of attenuation of low-energy gamma rays (Xe-133) in the pipe walls, which are essentially overshadowed by the dose contribution from the high-energy gamma rays seen by the monitor. Therefore, the monitor must be calibrated to account for these low-energy gamma rays. The calibration constant calculated for a given accident scenario directly limits the range capability of the monitor.

Based upon the referenced accident scenario, the maximum radioactivity concentration expected in the main steam effluent released from the PORV is 0.263 uCi/cc Xe-133 equivalent. This value corresponds to a total count rate of 323 cpm, taking shielding of the pipe into account.

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Studies of mockups of the PORVs by our consultant show that the maximum count rate remains essentially linear up to 200,000 cpm for these monitors. Based upon this maximum count rate and shielding from the pipe, the monitors' response at 200,000 cpm would correspond to 162 uCi/cc Xe-133 equivalent. In practice, however, we believe it imprudent to require that these monitors operate beyond the linear region of their response curves. Therefore we request an exemption from the design-range maximum of 10^3 uCi/cc listed in NUREG-0737 Table II.F.1-1, with respect to these monitors. In place of the above value, we wish to use 10^2 uCi/cc Xe-133 equivalent activity. As discussed above we believe this value will adequately cover any credible accident release, since our calculated release from an SGTR is only 0.263 uCi/cc.

Pursuant to the requirements of 10 CFR 170.12(c), we have enclosed an application fee of \$150.00 for review of this exemption request.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to insure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,


M. P. Alexich *BR5*
Vice President *9/8/86*

cm

Enclosure

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Bruchmann
G. Charnoff
NRC Resident Inspector - Bridgman

10/10/77