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Proposed Guidance for Calibration and Surveillance Requirements to Meet Item II.F.1 of NUREG-0737

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See the memorandum from D. G. Eisenhower to Regional Administrators dated August 16, 1982. This memo includes "Proposed Guidance for Calibration and Surveillance Requirements for Equipment Provided to Meet Item II.F.1," prepared by the Division of Systems Integration, NRR.

Presented below is a brief description of the Proposed Guidance. It is strongly recommended that the entire document be reviewed. The health physics position was written in the context of 10 CFR 20.201, but it also applies to "new" 10 CFR 20.1501 (a) and 20.1501 (b).

The noble gas effluent monitors, particulate and radioiodine samplers, and in-containment radiation monitors described in NUREG-0737, Item II.F.1, Attachments 1, 2, and 3, are substantial departures from conventional designs and operating concepts in detecting and measuring plant radiological conditions. The nature and purpose of these monitors and samplers dictates an approach to calibration and surveillance requirements that differs widely from existing requirements and procedures established for conventional monitors. The proposed guidance addresses concerns relative to review of licensees implementing procedures and provides guidance on certain matters pertaining to calibration.

APPLICATION OF ANSI N323-1978:

ANSI N323-1978 Recommendations as requirements for the review of fixed area and effluent monitors are not appropriate for either normal range or NUREG-0737 monitors. The standards contained in ANSI N323-1978 specifically address hand-portable survey instrumentation and are not applicable to fixed area or effluent monitors.

MC 2515, INSPECTION PROCEDURE 84710:

MC 2515, Inspection Procedure 84710 was written specifically for monitors designed to operate at very low concentrations of radioactive materials and is not appropriate for use in conjunction with NUREG-0737 noble gas effluent monitors for the following reasons: (1) ALARA considerations limit the handling of gamma-emitting noble gases in concentrations sufficient to perform onsite upper range calibration of these monitors; (2) Inspection Procedure 84710 suggests using Kr-85, a gas not suitable for calibration of most NUREG-0737 effluent monitors; (3) the only practicable means of in-place calibration of NUREG-0737 effluent monitors in the upper ranges, "solid" sources, is not consistent with 84710; and (4) release of calibration gases to the environment after calibration could result in violations of plant Technical Specifications.

NRR STAFF RECOMMENDATIONS FOR CALIBRATION OF NOBLE GAS EFFLUENT MONITORS:

An acceptable approach calls for a one-time "type" calibration of a limited number of production-model monitors using radioactive gases, an acceptable alternative to in-place testing with radioactive gases due to ALARA considerations. The calibration, at either the manufacturer's facility or suitable contractor facility, would use NBS-traceable radioactive gas sources of the appropriate emissive characteristics at a minimum of three on-scale values separated by not less than two decades of scale. One or more "Laboratory Standard Sources" could be established using solid radioactive source material having emissive radiation characteristics similar to those of the calibration gas. The solid sources could then be used to develop "Secondary Calibration Sources" used for on-site in-place

calibration. It is suggested that periodic confirmation or verification of calibration source values be made a part of surveillance procedures.

IN-CONTAINMENT HIGH-RANGE RADIATION MONITORS:

NRR recommends that licensees verify monitor design characteristics by requiring type-testing at sufficient points to demonstrate linearity through all scales up to 106 R/hr. In addition, licensees should specify that each production detector be tested at 103 R/hr to assure satisfactory response to high levels of radiation.

PARTICULATE AND RADIOIODINE SAMPLING FROM EFFLUENT GAS STREAMS:

NRR would accept empirical data on sampling line losses based on actual tests of either the installed system or a full-scale mockup in lieu of calculations based on ANSI N13.1-1969 appendices.

NRR recommends OIE revise MC 2515, Inspection Procedure 84710 or consider preparation of a separate inspection procedure or temporary instruction for NUREG-0737 items. The suggested guidance in NUREG-0737 and this memorandum with its attachments should provide the basis to initiate action.

Regulatory references: 10 CFR 20.201, 10 CFR 20.1501, NUREG-0737, Technical Specifications

Subject codes: 6.4, 7.3, 12.16

Applicability: Reactors

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