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Docket Nos. 50-213
50-245
50-336

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

References: (1) W. G. Counsil letter to D. G. Eisenhut, dated October 18, 1979.
(2) W. G. Counsil letter to H. R. Denton dated November 21, 1979.
(3) D. G. Eisenhut letter to All Operating Nuclear Power Plants, dated September 13, 1979.
(4) H. R. Denton letter to All Operating Nuclear Power Plants, dated October 30, 1979.

Gentlemen:

Haddam Neck Plant
Millstone Nuclear Power Station, Unit Nos. 1 and 2
Increased Range of Radiation Monitors

In References (1) and (2), Connecticut Yankee Atomic Power Company (CYAPCO) and Northeast Nuclear Energy Company (NNECO) responded to References (3) and (4), by indicating that both organizations were committed to comply with the intent of Recommendation 2.1.8.b, Increased Range of Radiation Monitors. In the long term, CYAPCO and NNECO are committed to install high-range radiation monitors at the effluent release points in accordance with the criteria set forth in References (3) and (4). In the short term, the NRC Staff has requested that interim procedures be implemented for estimating noble gas and iodine release rates if the existing effluent instrumentation goes off-scale.

In Reference (2), it was indicated that the Haddam Neck Plant and Millstone Unit Nos. 1 and 2 have had such procedures in effect for the past several years. The reference included a brief description of these procedures. However, since these procedures did not follow the specific recommendations of the Staff (i.e., dose rate measurements at some location along the effluent flow path), the Staff verbally requested that more detailed written information be docketed to ensure that the current procedures comply with the specific intent of References (3) and (4). Accordingly, the following information is provided.

The existing procedures at the Haddam Neck Plant and Millstone Unit Nos. 1 and 2 consist of the following methodology:

(1) If the existing monitors are off-scale, personnel use tables which were developed for these procedures which specify predetermined release rate values. These release rates are categorized by type of accident and time of the accident with relation to power history. They are based on Regulatory Guide assumptions and plant-specific design information. Values are given for both iodines and noble gases. The methodology is established such that these release estimates will be conservative.

(2) Using these estimated release rates and meteorological conditions, offsite dose rates and concentrations at specific downwind locations are calculated. At present, there is a work sheet for completion of these calculations by hand. This calculation is currently being computerized and is expected to be operational in early, 1980. This computer calculation will provide noble gas dose rates and iodine concentrations (among other information) in greater detail.

(3) As time permits, using the results from onsite and offsite field measurements, the projected levels are compared with the measured levels at specific locations.

(4) If the two values vary significantly, the release estimates may be readjusted.

The procedure suggested by the Staff consists basically of the following methodology:

(1) Obtain a dose rate measurement from a preselected location along the effluent flow path.

(2) Use predetermined conversion curves to convert these dose rate measurements to radioactivity concentrations of noble gas.

(3) Combine this information with flow rates to determine release rates.

The intent of the interim procedures is to be able to estimate noble gas and iodine release rates should the existing radiation monitors go off-scale due to insufficient range. The importance of this information in determining the appropriate actions to take during the course of an emergency is recognized. CYAPCO and NNECO have closely examined both the existing procedures and those recommended by the Staff. Although advantages and disadvantages exist with both methods, it is emphasized that the existing procedures afford the higher degree of conservatism and safety to the public for the following reasons:

(1) The releases of significance may not always be via the normal monitored effluent path. For example, after a postulated LOCA at the Haddam Neck Plant, because of the station design, the major contribution to the offsite dose is leakage from the containment and not releases from the stack. Thus, a dose rate measurement taken at the stack, as per the NRC method, could result in a false indication that releases are not of any significance, when the actual releases may be very significant. The existing procedures take containment leakage into consideration.

(2) Recommendations and planning for protective actions must be made as rapidly as possible. Therefore, the method used to estimate offsite doses should require as little time as possible. The present procedures simply require the individual to estimate release rates from a preprinted table.

The method recommended by the NRC would require an individual to take the dose rate measurements, determine flow rates, and then perform the necessary calculations to estimate releases. Such a procedure is judged to require significantly more time than the current procedures.

(3) A dose rate measurement taken on a gaseous flow path has a high probability of error due to the plateout of particulate noble gas daughters (Cs-138 and Rb-88) on the walls of the ductwork and/or sample line.

For example, the Isolation Condenser incident at Millstone Unit No. 1, which occurred in February, 1976, involved measurable levels of noble gas release. The detector response was due primarily to the noble gas daughters deposited on the effluent pipe. Only a detailed analysis of the accident scenario along with the detector response yielded estimates of noble gas releases. Had an isolated dose rate measurement been used at the time of the incident, it would have yielded false and misleading estimates of the noble gas release.

Since noble gas daughters always exist in the presence of noble gases, and since no method exists of preferentially shielding against them, the probability of obtaining inaccurate data is relatively high.

(4) Dose rate measurements on effluent system piping taken onsite are subject to wide variations in background interference. Although the detector could be located in a shielded collimator, it is not feasible to render all potential interferring sources insignificant. For example, dose rates for Millstone Unit No. 2 vent releases would have to be taken near the ventilation filters. Dose rates for the Haddam Neck stack would be taken near the Refueling Water Storage Tank and some large ECCS pipes. Dose rates from this equipment could be in the range of several thousand R/hr. It is not feasible to sufficiently shield the detector from these sources to levels which would not result in inaccurate estimates of releases. Field team dose rate measurements taken offsite would not be subject to interference from other sources.

(5) The preselected pipe location, although carefully chosen for design accidents may be inaccessible under actual accident circumstances. It is not desirable to have crucial calculations rely on this information. The existing methodology is not subject to this phenomenon.

(6) The present procedure has been in effect for several years. The emergency response personnel have been trained in the use of these procedures and have effectively used it during drills. It is very important for personnel involved in emergency response to be familiar and comfortable with the procedures they must use.

If changes are made to existing procedures, all personnel involved must be trained in the new procedure. Effective utilization of procedures requires time and practice. Since this interim procedure would be in effect only for a period of six to twelve months, it may be during this interval that lack of familiarity may further degrade the emergency response of plant personnel.

(7) With the Staff method, there is still no feasible way to obtain a direct measurement of iodine releases. In many cases, iodine is the most significant nuclide for consideration of offsite protective actions.

In summary, the importance and the desire to have a direct measurement of the releases from measured effluent points during emergency situations is recognized and acknowledged. However, please recognize that the ability to obtain representative and accurate results is a complex problem. Therefore, CYAPCO and NNECO are expeditiously investigating the designs for sophsiticated high-range monitors, required to be installed by January 1, 1981, which will fulfill this capability. It is currently intended that these monitors will be installed well before the required date, on a schedule consistent with the 1980 refueling outages for all three units.

CYAPCO and NNECO also recognize the need to have interim procedures until this high-range capability is available. In fact, the existence of these procedures for several years is indicative of CYAPCO's and NNECO's recognition of this need. The present procedures are judged to fully comply with the objectives of the subject requirement. In fact, based on the technical arguments noted above, CYAPCO and NNECO have concluded that the present method affords a higher degree of public safety than the alternative proposed by the Staff.

We trust you find the above considerations sufficient to concur with our determination, and to agree that the intent of the requirement has been fulfilled. These procedures are, of course, available for your detailed review should you find such review desirable. We remain available to further elaborate on our conclusions and bases therefor, as you require.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
Vice President