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F. Cardile

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COMMENT ON
NUREG 1640 - Radiological Assessments for Clearance of Equipment and Materials From Nuclear Facilities

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Comment Summary

I would like to provide the NRC Staff with comments regarding NUREG 1640. The NRC should be commended for initiating the rulemaking process to establish a dose based national standard for the release of equipment and materials from nuclear facilities. A proposed rule has been anticipated with great enthusiasm. The vagaries of the current 'detectability' guidance should be replaced with more definitive dose based 'clearance' screening values. However, review of NUREG 1640 shows that the screening values are overly conservative and as a result are not possible to implement.

The assumptions used to determine the clearance values are over-conservative instead of reasonable. Adoption of the proposed screening values will cause a significant increase in the generation of radioactive waste for disposal to limited burial space incurring greater expense to the rate-paying public and to nuclear generating utilities and deny society the benefits of recycling.

The staff should revise clearance screening values by incorporating more reasonable assumptions. Clearance values consistent with the recommendations of other international radiation safety organizations such as the European Commission and the soon to be published ANSI N13.12 are workable and provide an adequate margin of safety for the public. Alternatively, the NRC should adopt ANSI HPS N13.12 *Surface and Volume Radioactivity Standards for Clearance* which uses a reasonable approach to determine clearance screening values.

Discussion

The NUREG states that the rule is to be comprehensive for equipment and materials. Therefore, it impacts not only items stored for disposition, but items used in the day-to-day operation and maintenance of licensed facilities. Equipment and materials are brought into and released from radiologically controlled areas (RCAs) routinely. The proposed rule in its current form threatens the ability of licensees to be able to move material and equipment out from RCAs. Without the ability to free release material and equipment, the space within the RCA would soon become filled or each item used in the RCA would require disposition as radioactive material.

Table 2.3 *Comparison of derived NRC surficial clearance levels with Regulatory Guide 1.86 acceptable contamination levels* establishes a clearance value for Co-60 of 280 dpm/100 cm^2. By comparison, Reg. Guide 1.86 provides a value of 5000 dpm/100 cm^2. Co-60 is a major component of licensed radioactive material produced at commercial nuclear power facilities. Regulatory Guide 1.86 was based principally on the detection capabilities of readily available instrumentation at the time the guides were developed and not on the potential dose to an individual that may result from coming in contact with the released materials. Therefore, it is in the best interest of the public and the licensees to have a dose based process for controlling the release of equipment and materials. I promulgating such a process, it needs to be understood that the conditions under which Regulatory Guide 1.86 were written have not changed significantly. Although more sophisticated laboratory instrumentation has been developed, field instrumentation has remained basically the same. Guidance provided by Reg. Guide 1.86 and IEN 81-07 have been adopted by the licensed community to produce a free release standard based on detectability of Co-60 for field instrumentation at 5000 dpm/100 cm^2. The type of field instrument utilized when these

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documents were produced remains an essential part of radiological survey programs at many licensed facilities. That is because a high percentage of items requiring free release are too large to be measured by lab instruments. Additionally, in order to control and contain contamination at the source, field instruments must be used to perform surveys near contaminated area boundaries. These field instruments are not capable of measuring to the proposed clearance values. The capability of a frisker probe (the standard field instrument for survey of equipment and materials that cannot be measured by laboratory instrumentation) about 100 ccpm on a 15.5 cm^2. That is equivalent to 5000 dpm/100 cm^2. Introduction of a standard requiring measurement capability to 280 dpm/100 cm^2 would be equivalent to about 6 ccpm on a frisker probe – to which any trained individual will attest cannot be measured.

Modeling assumptions were reviewed for reasonableness. Many examples were found where conservative assumptions compounded other conservative assumptions, which caused production of unrealistic clearance values. For example, all scrap from nuclear facilities was assumed to be contaminated at 100% of the clearance limit. However, the EPA data referenced, estimates that only 16% of scrap metal from nuclear facilities is potentially contaminated. Additionally, industry experience has demonstrated that control for dose and radioactive contamination normally results in levels substantially below the limits. Therefore, contamination levels on materials released for scrap can be expected to average substantially below the clearance limits. Additionally, the 'critical member' of the public – a truck driver – was assumed to drive cleared material for 1000 hours per year. This is possible if the driver only moves material from licensees. However, scrap from nuclear facilities is a factor of 20,000 less than the total amount of scrap produced in this country. It is unreasonable to assume that a driver or a recycling facility would only deal with material from licensed facilities. A great deal of 'dilution' would occur. Finally, a resuspension factor was chosen for the trucker's cab to be consistent with other typical workplace scenarios where contamination may become available for inhalation or ingestion. However, the truckers cab is not like the typical workplace for which resuspension factors were developed. A cab is subject to more extreme drafts and the availability of contamination in the cab of a truck cannot be likened to the inside of a building. It should not be assumed that materials and equipment without detectable smearable (loose) activity is released, that a resuspension factor to the drivers cab is appropriate. When combining all of these conservative assumptions it is easy to see how an overly conservative clearance value of 280 dpm/100 cm^2 was derived.

It should be noted that the detailed pathway development in the proposed rule is certainly an achievement. However, the assumptions and pathways need to be reassessed for reasonableness in order to make this into a workable rule.

As stated in the Issues Paper released by the NRC to initiate the scoping process: "Public Law 104-113 (passed by Congress in 1995) requires Federal agencies to use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical." The ANSI HPS N13.12 *Surface and Volume Radioactivity Standards for Clearance* has been approved and is scheduled for publishing early in 2000. Because it has not yet been published, it may not be cited and therefore no values will be stated. However, I have also reviewed that document in detail. The values in that standard are consistent with RG 1.86, IEN 81-07 and the European Commission. The N13.12 values provide assurance that dose to critical members of the public due to the release of materials within the clearance guidelines will be trivial – that is less than 1 mrem in a year. This provides an adequate margin of safety for members of the public and assures that the potential additive affects from multiple pathways will not exceed 100 mrem from all licensed activity.

Robert M. Leib, MS, RRPT, CHP

From: Carol Gallagher
To: Adria Byrdsong, Frank Cardile
Date: Tue, Dec 21, 1999 2:41 PM
Subject: Issues paper comment

Here's another comment on Frank's issues paper. It's from:

Robert M. Leib, MS, RRPT, CHP
10411 Stuart Drive
Concord, OH 44077

Carol