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October 24, 1999

POST OFFICE  
USP

Via e-mail

Nuclear Regulatory Commission  
Washington DC

'99 OCT 26 05:07

REGARDING: Release of Solid Materials at Licensed Facilities: Issues Paper, Scoping Process for Environmental Issues, and Notice of Public Meetings

AGENCY: Nuclear Regulatory Commission.

ACTION: Request for comment on issues paper and scoping process, and notice of plans for public meetings.

Gentlemen,

With respect to your request for comments for the scoping of the issue of disposal of volumetrically contaminated radioactive materials by release for uncontrolled use by the public, I am pleased to provide my opinions. They are as follows:

The NRC should develop a rule basis for the release of radioactive materials with low levels of surface and volumetric contamination.

The basis for the release of materials should be generic in nature and should be based on measurable quantities using normal survey equipment.

The criteria may be dose based but should be stated not as dose, but as measurable quantities.

The dose basis should protect the critical exposed group in the same manner as the effluent guidance does now, but should not be so restrictive as to be impossible to measure or to be based on impossibly

low exposures to the median exposed person. Thus, if the exposure limit for an individual member of the public is 100 mrem/year, then for the critical group, the same type of value should be applied.

Current practice uses the exposure of the critical group to establish the guidance for the entire population. This is much too conservative and leads to the impossible values listed in the current reports.

The issue of public safety is important, but public safety that is safe beyond the risk associated with other risks of the same nature adds a cost

associated with that safety aspect that is out of proportion to the additional safety provided.

EPA and NRC must agree on the basis for the guidance. Currently the bases used by both organizations are not derived from common principles. This should be the first order of business. Common sense should be applied to the bases.

In Issue No. 2, the question of the dose to use is discussed. The appropriate dose to apply to the critical group is 100 to 500 mrem per year (1 to 5 mSv/yr). If this dose is achieved for the critical group, all others will be significantly less (orders of magnitude). The

John Andrews Comments, October 24, 1999

Page 1

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dose to the median public person should be less than 1 mrem/year, but this is a more difficult estimate to make. The Monte Carlo calculations (NUREG-1640) now being done for critical groups to determine the average or median exposure to that group are inappropriate to establish population exposure estimates. The basis for the criteria for critical group estimates is that the estimate for the entire population is an impossible task, so the exposure to the critical group will be estimated. Fine, but now we have the relatively easy Monte Carlo calculation to use for entire populations. With this method, the 0.01 percentile or some other small fraction of the population should be the basis for the dose limit.

Release should not be permitted for materials that would create large groups of exposed individuals. I don't see this occurring in any case.

With regard to the development (or not) of a proposed rule, the NRC should go ahead with the development of a new rule in 10 CFR 20 regarding the release of volumetrically

contaminated materials. This should not be done for individual licensees as it is too expensive and the rules are unclear and cannot be accommodated by smaller licensees. The rule should cover the release of materials for unrestricted release and the release of materials for disposal into a sanitary land fill. These are the principal pathways. The NRC should also carefully consider the release of materials for use in recycled products. This would include iron and steel, copper, aluminum and other relatively valuable materials. The NRC should also look at using rubble of possibly contaminated materials with half lives less than 100 years as fill for industrial sites where the food chain is unlikely and where land reclamation for industrial use is the practical alternative. The basis should be a low risk of exposure in the food chain through this pathway.

The NRC and the EPA should agree in advance on the bases for these rules.

With regard to the dose above background, the rule should be to limit the total

dose to the average person in the critical group to less than 100 mrem per year (1 mSv/y). ALARA should be used to reduce this dose even further if it is cost effective to do so. There should also be an analysis demonstrating that a reasonable expectation of dose to the average member of the public under these cases is less than 1 mrem/year (0.01 mSv/y). In limited applications, the dose can be as much as 10 mrem/year if the cost of other alternatives is too high or if the rule impacts on current accepted practices. NRC should consider NORM in this case.

In every case, the NRC should carefully consider the effect of rules on the ability of industry (not just reactor facilities with large resources) to physically monitor the materials and provide sensible guidelines for the implementation of the rules in the regulations. The NRC should also actively encourage industry to find more cost effective methods to dispose of these materials.

With regard to NUREG-1640, I find that the application of the guidance

to ascertain the dose to the average member of the critical group to be prohibitively expensive in some cases. I also believe that this NUREG should be carefully reviewed to be sure the assumptions are realistic. In particular, the analysis method should be applied to the entire population when calculating the dose at the limit, not just a easily modeled critical group.

In the description of the dose alternatives in the notice *Release of Solid Materials at Licensed Facilities: Issues Paper, Scoping Process for Environmental Issues, and Notice of Public Meetings*, the doses are referred to without qualification. It is unclear who is potentially exposed the doses quoted. The notices should explicitly state that the dose limits apply to the average person in the population or to a member of a critically exposed group.

The environmental impact of shipping low level radioactive wastes due to accidents must be a normal consideration. To that end, the NRC and the DOT should provide tables of accident rates and severity

to use for calculating harm from shipping radioactive materials due to accidents that may or may not release radioactive materials.

With respect to the potential for multiple sources of radioactive waste being transferred to a single recycler. I believe we should accept the risk as a normal part of doing business. Unless it can be determined initially that all of a particular contaminated product will go to a single recycler, then we should not be concerned. If it can, then we should propose a rule to limit averageing of contamination to the extent that it is practicable. I personally see no particular concern for this issue.

Concern, confusion, and fear by the public is a real issue that the NRC must address. The popular press has for years built up the fear of radioactivity in the minds of many people. It is therefore, reasonable for these people to have concern for something that they do not understand well. The NRC process for public discussion that I am participating in right now is a good example of the thing that the NRC and the EPA should pursue.

One of the things to do is to bring forward the issue of a threshold for harm as different from the risk of something harmful. It is fairly clear to me after almost 45 years in this industry that there is very little harm from radioactive materials as we handle them today. By and large the harmful incidents always occur with quite large quantities of materials that are mishandled. Nothing in the discussion of the issues currently being discussed address these harmful situations.

Economic impacts occur subtly in the industry. Colleges and universities cut back on the use of nuclides for research and teaching because of the regulatory concern for risk of violations, not harm to individuals. Such reductions slow the development of technology in ways that cannot be measured. But look what has happened since the advent of available nuclides for the study of biological products. The medical advances are beyond comprehension and almost all of it is due to the use of radioactive materials and radiation in the study of molecular processes.

Inhibition of this process due to fear and concern is more destructive than the possible harm that could be caused.

The levels of activity to be introduced into commerce are so small as to be dwarfed by the realities of natural background. Buildup is not likely with radioactive materials that, by definition, go away all by themselves!

The NRC and EPA along with the NIST should work to produce standard materials with known concentrations of nuclides that are well above any limiting conditions so the materials can be used to quickly test and approve the process of monitoring for the limiting values. The available concentrations should be at least 100 times the limiting concentration for any nuclides.

NCRP should provide a handbook of acceptable methods for monitoring bulk activity. I still use

Handbook 58.

If ANSI or ASTM produces a consensus standard, the NRC should adopt it rather than build a separate standard or method.

The use of solid materials for some uses is generally a useful idea. One of the areas that I have considered in the past is placement of contaminated materials containing NORM in the base of the interstate highway system. The purpose is to isolate the material for a long period of time and to provide a future pathway for dilution and dispersion along with other similar materials such that no perceptible harm would occur. This mode is similar to that for disposal of materials in a land fill. The process should be designed to simplify the permitting and to reduce the cost to that applicable to the risk of harm.

I have discussed release of material for unlimited use,

release for disposal in a landfill and release for recycling. In none of these cases should the NRC continue involvement. The release should be unrestricted once the material is processed, disposed or released.

The issue of disposal of contaminated soil should be addressed to reduce the unreasonable costs associated with moving soil from one pile to another as is done in many cases.

With respect to mixed materials, the NRC should consider the most harmful of the materials in the subject material and treat all the material as if it only contained that one material. All other constituents would not be considered because the control for the most harmful would also control all others. Mixed waste should disappear under this concept.

I hope my thoughts are useful to you in developing this process. Thank you for the opportunity to contribute.

Sincerely,

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