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Dear Sir:

The following are comments on RSPA-99-6283, or in some cases questions of interpretation, that need to be addressed in the proposed rule making. The section numbers below refer to paragraphs in IAEA ST-1.

#214: The definition of contamination is such that radioactive material on a surface at levels of less than 0.4 Bq/cm<sup>2</sup> could not be considered "contaminated." While activity present at levels less than this number might be phrased as to be "within contamination limits," denying that such surfaces are contaminated creates credibility problems in terms of the common sense understanding of the term, even among the technical community. If this definition is retained, then a term is needed for those surfaces having radioactive material present at levels less than 0.4 Bq/cm<sup>2</sup>, e.g., "radiologically blemished." Usurping a common word by giving it a special, technical meaning contrary to its normal meaning would seem to be poor practice. Forty years of usage does not make this usage right.

#223: Note that a source shipping cask meets the definition of a "freight container." Does this create any rules interpretation anomalies? [Note also that paragraph 23 1 explicitly permits freight containers to be packaging.]

#226(a)(iv): This portion of the definition of LSA-I does not specify the physical form of the material. In particular, there are circumstances where volumes of liquids can meet these requirements, e.g., water contaminated with tritium oxide, where the LSA-I categorization would be advantageous. Please clarify this definition in LSA-I(ii).

#230: In addition to this list, 49CFR defines a "small quantity package." This should be added for completeness in the DoT implementation. For many research organizations, this is a very useful option.

#236: As with the comment in paragraph 214, this definition attempts to redefine reality by asserting that radioactive material at levels less than paragraphs 401-406 is not radioactive material. The current rules use the same wording. A better term would be "regulated radioactive material" or "Class 7 radioactive material," thereby relegating the amounts less than the 401-406 levels to the non-regulated category (or non-Class 7 category). On the other hand, such a terminology revision would force the world to face reality, particularly in those transport situations where "radioactive material" is totally banned, e.g., tunnels, and hence force the use of proper technical terms.

#301-305: The program requirements should be consistent with current DoT and NRC rules. In particular

- for #305(c) the threshold should be 5 mSv per year.
- for #303 the provisions of 49CFR 173.4 should be retained.

#401-406: Table I uses the terminology "exempt material" and "exempt consignment," but nowhere in these paragraphs, in the definitions (Section II), nor in 49CFR 173.400 is "exempt" defined. Presumably, paragraph 236 is referring to these values for defining radioactive material. Further, the word "exempt" is a poor choice to describe material that simply is not required to be subject to the hazardous material transportation rules, i.e., is not classed as hazardous material (not Class 7 material). Exempt implies a waiver from rules that would otherwise apply, when in fact the intent is that the rules have no need to apply.

#406: The Table II entry for unknown alpha emitters seems to be controlled solely by Ac-227, the only entry in Table I with a value less than 1 Bq/g. It is suggested that a footnote be added that if Ac-227 can be excluded, then

this value can be taken as 1 Bq/g. At a particular facility, process knowledge could easily exclude Ac-227, and the added factor of 10 for this entry could then save lots of expensive radioanalysis.

#408(b): Having to meet both the concentration criteria and the consignment activity to be classed as Class 7 material adds much needed flexibility and reality to the rules. This revision will be of great value particularly for research institutions that frequently need to transfer small quantities and low concentrations of radioactive materials.

#408(b): However, the historic 2 nCi/g criterion in Table I provides a very useful simplicity for many users. Most non-alpha emitters have values greater than this and those that are less have a tabulated value of 10 Bq/g (a factor of 7 less but probably less than a factor of 7 in reality for many of the entries). We suggest that this difference is of little consequence and the utility of retaining the 2 nCi/g for non-alpha emitters would be a significant benefit for many users. We suggest that both options be retained for U.S. shipments. Basically, this is the same as adding a footnote to Table II, raising the Table II entry to 74 Bq/g from 10 Bq/g for domestic U.S. shipments.

#417: The definition of a Type C package is identical to that of a Type B package. Additional details distinguishing these should be provided for clarity.

#506: The segregation requirement of this paragraph and in the current rules appears to be unnecessary for normal conditions of transport. Radiation emitted from radioactive consignments should not have any effect on other hazardous material shipments, and the reverse would seem true. And segregation could seem to be of little benefit in accident situations (at least for highway shipments). This rule seems to simply complicate life with little benefit. Further, the ambiguity of the meaning of “segregate” in a practical sense in effect makes the application of this rule, and its enforcement, highly uncertain.

#533(d,e): Using a Yellow-III label and category to identify a package transported under special arrangement is a misuse of the labeling system. The Yellow-III label is intended to impart radiation-level information. Using that label for other purposes simply creates confusion and uncertainty regarding a particular shipment. If some sort of special labeling is needed to identify shipments under special arrangement, then a unique label should be provided. On the other hand, if the phrase “assigned to category Yellow-III” is not meant to require labeling as Yellow-III, then please clarify this requirement.

#533): The contact dose rate criterion for packages shipped via an exclusive use mode is at best an unneeded rule and more likely one that simply costs a lot of radiation exposure.

- 1) Exclusive use shipments are such that an extended, intimate contact exposure is unlikely.
- 2) Existence of the rule forces detailed and time-consuming surveys over all surfaces of a container in order to demonstrate compliance. When the dose rates are near the limit, this results in significant exposures with no benefit except to demonstrate compliance to the rule.
- 3) Contact measurements are very geometry dependent. A small size source on an inside surface can result in very different readings on the outside surface, depending on the kind of survey instrument used. This is not a hypothetical issue. It has happened. The result was the shipment was surveyed prior to departure, was surveyed upon receipt, was further checked by regulatory personnel, and then had to be surveyed again with our instrumentation to demonstrate compliance. This was totally unnecessary in terms of public exposure control. And shipments that are a significant fraction of the surface dose rate limit are almost universally the type that are well segregated from the public by procedural controls.
- 4) We suggest that only the #572(b) and (c) conditions are needed to reasonably control public exposure and that #572(b) in fact places reasonable limitations on the contact dose rate of the package.

#562(b): Same comment as for #506.

#563: This statement should not apply to exclusive use shipments. Given the lack of a definition for a “courier,” presumably anyone accompanying an exclusive use shipment could be so classed. If retained the applicability of this to an exclusive use shipment should be clarified. Vans, and similar vehicles, are convenient types of vehicles for small organizations to use to transport selected packages and such transport may include ancillary personnel with some sort of peripheral relationship to the shipment. Such usage should not be excluded by these rules.

#568: The last sentence refers to “. . . stored . . . at least 6 m . . .” Presumably, “stored” refers to storage at locations other than on a transport vehicle. If not, the 6-m spacing requirement is egregious. In addition, even in non-transport storage, the 6-m requirement is an unnecessary added measure to a criticality classification scheme that is already very conservative. It places an added unnecessary burden on the transport industry with no meaningful added safety benefit.

#569: The 6-m requirement seems to explicitly apply to spacing on a conveyance. This would seem to require two packages, each with an index of 50, to be spaced 6 m apart. In effect this requirement nullifies the 100 allowance for an exclusive use vehicle transport. Two packages would require a 6-m trailer, presuming one was willing to put once package at the very (vulnerable) end of the vehicle. Three packages would require a 12-m vehicle, etc. As in the comment on #568, this is an excessive conservatism that has the end result of requiring more vehicles to be on the road to transport materials that, by this system of index calculation, are small fractions of critical masses. Even a simplistic risk-benefit calculation would demonstrate that the risk of the added vehicle-mileage (and the associated injury/death rate) is greatly in excess of any criticality incident risk.

#569: “. . . from other conveyances.” This seems to assert that the driver of one vehicle has to somehow determine what other vehicles carrying radioactive material might be on the road and somehow stay 6 m away.

- 1) How does another radioactive material shipment have any impact on a fissionable material shipment? Even shipments of neutron sources are shielded by dose constraints to the point where these sources have no impact on criticality issues.
- 2) How does the driver stay 6 m away from oncoming traffic, which might have a conveyance concern?
- 3) If the issue is the impact of an external neutron source on the quality of the fissile material then this should be an issue of concern to the shipper, not the regulations.

If the issue of paragraph 569 is conveyances, e.g., freight containers, in a mode of transport other than highway then this section needs to be clarified.

#570: This constitutes a rather drastic change in the placarding requirements. This would seem to be out of proportion to and inconsistent with the placarding requirements for other hazardous materials. Will all quantities of any hazardous material in excess of limited quantities require placarding? If not, what is the rationale for just doing this for radioactive materials?

#573: If the intent is to simply ban hitchhikers, why not say so? If the intent is to ban other classes of workers, then the term “assistant” needs to be defined and clarified, since that word describes anyone who “assists,” which could be anyone (including a hitchhiker). If this restriction is intended to apply only to common carrier shipments, and not to exclusive use shipments, then it should be so stated.

#573: Further, this restriction makes no provision for persons who do nothing to assist the driver, yet whose presence is required by the originating organization. For our institution, this would only arise for exclusive use shipments, but where it does arise, this rule creates unreasonable problems with no radiological benefits.

#681: Wording a bit less cryptic than used here would be useful. “N” presumably refers to the number of packages to be assembled in multiples of five for the criticality test. But this is not explicitly stated.

Sincerely,



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