for liquids and gases. The NRC approves only Type B and fissile material packages. The NRC also notes that fissile material packages must be evaluated for hypothetical accident conditions more severe than the tests for liquids. Furthermore, there are currently no NRC-licensed packages designed for gaseous fissile materials and NRC does not anticipate any future applications for such packages. These additional provisions would complicate regulations that are presently adequate. IAEA standards on absorbent material and double containment have been selectively included in DOT regulations.

Eight comments disagreed with the NRC view that §71.43(f) should continue to restrict to "no significant increase" any change in external surface radiation levels, as a result of subjecting a package to the defined normal conditions of transport. The comments argued that the 20 percent increase specified in IAEA regulations is a safe, reasonable, and practical number that could not reasonably be lower, and that specifying a value in the rule provides the package design engineer and the NRC review engineer a measurable goal that is consistent both with IAEA and with engineering practice.

Type B and fissile material packages can be readily designed so that normal conditions of transport result in no significant increase in dose rates, and that a twenty percent increase in dose rates because of normal handling is excessive. In addition, if a package were designed so that the external dose rate could increase 20 percent during normal handling, the package could exceed the dose rate limits in §71.47 during transport, and would be an item of noncompliance. NRC and DOT have therefore decided to not adopt the IAEA "20 percent increase" provision, and to retain the current "no significant increase" provision.

Four comments suggest the addition of the special provisions of IAEA regulations pertaining to the transportation of radioactive material by the air mode. NRC has determined that special requirements for transport of packages by air should be excluded from Part 71 because these provisions are properly incorporated in the carrier restrictions imposed by the Department of Transportation.

Two comments suggested that the phrase "Account must be taken of the behavior of materials under irradiation" be clarified and quantified, perhaps in a regulatory guide, or deleted from Part 71. Although there is no regulatory guidance now available relating this requirement to transportation packages, it is clear that any effects of irradiation on materials used in the package must be taken into account. These effects could be the accelerated aging or embrittlement of elastomers or elastics and may result in requiring a frequent change of gaskets, for example.

One comment suggested the performance requirement of § 71.43(f) be changed to include a numerical sensitivity for the requirement that there be "no loss or dispersal of radioactive contents" as a result of subjecting a package to the specified normal conditions of transport. The equivalent paragraph in the IAEA regulations for Type A packages is paragraph 537, and does not contain a numerical sensitivity. Paragraph 548, of IAEA Safety Series #6, is the equivalent of 10 CFR 71.51, for Type B package leaktight sensitivity. Both those provisions require Type B packages to be leaktight to a sensitivity of 10-6 A₂/h.

Three comments noted that IAEA no longer prohibits continuous venting of packages in its 1985 edition and urged the NRC to allow the practice domestically for Type B packages. The commenters argued that although NRC took a strong position, in the preamble to the proposed rule, that continuous package venting is "poor engineering practice," NRC did not explain why. The commenters noted that DOT regulations do not prohibit continuous venting for Type A packages, leaving the acceptability of continuous venting to be decided by performance requirements. The commenters stated that in some cases it would make good sense to allow continuous venting to provide pressure equalization and discharge of organically generated hydrogen gas.

NRC is continuing its ban on continuous venting of Type B packages for the following reasons:

1. Venting of a package containment system during normal conditions of transport defeats the purpose of the containment system;

2. It is practical to design packages that do not rely on venting, to relieve pressure under normal conditions of transport;

3. The use of a vent does not necessarily prevent the generation of potentially flammable or explosive gas mixtures; and

4. The reliability of filters under temperature extremes, varied operating conditions, and sustained service has not been established.

Two comments stated that Mo-99/Tc-99m radiopharmaceutical generators are open to the atmosphere to allow changes in ambient pressure and that the generators do not vent radioactive material. The comments recommended that the prohibition against venting be limited to venting radioactive material only and that NRC continue current practices.

NRC believes these comments arise from concern over the reduction in the A_2 quantity for Mo–99 from 20 curies to 13.5 curies in the proposed rule. NRC recognizes that the shipment of Mo–99/ Tc–99m generators is a special case, and is retaining the 20 curie A_2 value for Mo–99, to permit the continuation of current practices.

Section 71.47 External Radiation Standards for All Packages

NRC used the term "accessible external surface" in its proposed rule for determining radiation levels on package surfaces, whereas DOT used the term "external surface" in its proposed rule. Four comments argued that the NRC and DOT regulations for radiation level limits on package surfaces should be identical. Most believed that a limit on accessible surfaces was the more reasonable standard.

DOT has indicated that it is considering a petition for rulemaking to add the word "accessible" to its radiation level regulations and will consider that complex issue in a separate action. Pending completion of the DOT separate action, NRC has deleted the word "accessible" from this section of the final rule but does not intend to alter its practices regarding this provision.

One comment stated that this paragraph tends to be confusing in that it establishes a limit of 2 mSv/h (200 mrem/h) for package surface radiation levels, yet § 71.47(b)(2) seems to state that packages transported on a flatbed trailer can exceed 2 mSv/h (200 mrem/ h), provided the radiation level at the planar edges of the trailer is less than or equal to 2 mSv/h (200 mrem/h).

Section 71.47 establishes a generally applicable 2 mSv/h (200 mrem/h) Package surface radiation-level limit. The section further establishes that, if a package is shipped as exclusive use, the radiation level may exceed 2 mSv/h (200 mrem/h), provided the applicable provisions of paragraphs (a) (with repect to Transport Index) through (d) are met. Paragraph (b)(2) restricts the radiation level at any point on the vertical planes projected by the outer edges of a flat-bed style vehicle to 2 mSv/h (200 mrem/h) (the same limit imposed in paragraph (a) for the outer surfaces of closed transport vehicles). Thus, provided packages are shipped as exclusive use, external radiation levels may exceed 2 mSv/h (200 mrem/h) at the surface of packages on flatbed trailers, but not at the outeredge planes of the vehicle.