subpart H, hazmat employees must receive safety training in all classes of hazardous materials with which they work; therefore, the requirement proposed in § 173.405(c) to train persons as to the hazards of radioactive materials is no longer necessary and is not adopted in this final rule.

## *B. Low Specific Activity Material and Surface Contaminated Objects*

Based on the provisions contained in IAEA SS6–85, RSPA proposed to revise comprehensively the regulations for the shipment of low specific activity (LSA) radioactive material. A new designation for radioactive material called surface contaminated object (SCO) was also proposed. Unlike LSA, which requires a uniform distribution of radioactive material within the material; materials classified as SCO are not inherently radioactive, rather they are objects with radioactive contamination on their surfaces.

The proposals for LSA and SCO consisted of the following:

1. An expansion of the LSA definition to include new types of material;

2. A new definition of "surface contaminated object" (SCO) that is treated in a manner similar to LSA material; and

3. An increase of specific activity limits for nondispersible, nonrespirable forms of LSA material while at the same time limiting the quantity of LSA material that can be shipped in other than a Type B package to 2 times the  $A_1$ value (2 $A_1$ ) for the specific nuclide being transported.

A new type of package, called the "industrial package", was also proposed for the handling of LSA and surface contaminated objects (SCO). Three categories of industrial packages (IP), IP–1, IP–2 and IP–3, were proposed. RSPA proposed to require these packages for the shipment of LSA and SCO instead of currently required packages (i.e., either a modified Type A package or a strong, tight (nonspecification) package.

Commenters raised concerns over various aspects of the proposed regulation of LSA materials, including the proposed definitions, potential increases in packaging costs for LSA materials, and the proposed removal of an exclusive use shipment exception in §173.425(b). Particularly, commenters objected to requiring Type B packages for the shipments of LSA exceeding 2 times the  $A_1$  value of the radionuclide. Commenters claimed that the 2A<sub>1</sub> limit was not a close approximation of the IAEA limit of 1 rem/h at 3 meters. Commenters claimed that a closer approximation of the IAEA limit is 4

times the A<sub>1</sub> value (4A<sub>1</sub>). Commenters stated that the IAEA limit of 1 rem/h at 3 meters, a limit  $4A_1$ , or a combination of the two, should replace the proposed 2A1 limit. One commenter stated that the IAEA limit was impractical and unworkable and favored adoption of a multiple of a  $A_1$  approach (i.e.,  $4A_1$ ). However, the Department of Energy stated that the IAEA approach is very practical and that it has been implemented internationally. Another commenter stated that industry can implement the IAEA limit of 1 rem/h at 3 meters and requested that RSPA replace the 2A1 limit with the IAEA limit.

The IAEA added the limit of 10 mSv/ hour (1 rem/hour) at 3 meters for the radiation level from the unshielded contents of LSA and SCO packages not designed to withstand accidents. This radiation level limit controls the external radiation exposures to individuals if an LSA package is severely damaged in a transportation accident.

The IAEA limit considers the loss of package shielding during an accident, but it does not consider the possibility that a package's contents might be released and redistributed, causing a reduction in self-shielding of the contents. The reduction in self-shielding could result in potential accident radiation levels that significantly exceed IAEA's 10 mSv/hour (1 rem /hour) at 3 meters limit.

The IAEA dose rate limit provides a significant added degree of protection over the 1973 IAEA regulations (which specify no quantity limit for LSA packages). RSPA and NRC did not believe, however that the IAEA limit provided the same level of safety for all types of LSA material, particularly for relatively large quantities of radioactive materials contained in dispersible LSA materials (e.g., resins and other media used in liquid radioactive waste treatment).

In lieu of the radiation level limit, RSPA and NRC proposed a 2A<sub>1</sub> quantity limit for all LSA packages. Although this proposal addressed the accident concern by directly limiting package quantity, it was not compatible with the IAEA provisions. Both agencies received many comments on the proposed  $2A_1$ quantity limit that objected to the impacts on occupational dose and shipping costs. Further, the Advisory **Committee on Reactor Safeguards** (ACRS) issued a letter report, dated December 19, 1994, recommending, inter alia, that the requirements again be reevaluated with the objective of making them equivalent to the IAEA regulations.

After consideration of ACRS and industry comments, RSPA and NRC have agreed to adopt the IAEA LSA provisions. Accordingly, the final rule imposes a limit on the external radiation level at 3 meters from the unshielded contents of LSA–I, LSA–II, LSA–III, SCO–1, or SCO–II packages of 10 mSv/ hour (1 rem/hour).

Numerous comments addressed the proposed removal of the present authorization for use of Type A packages and exclusive use shipments of strong, tight containers for LSA'materials. Commenters stated that LSA materials pose a minor risk to the public and that there is no justifiable safety reason to replace the currently authorized packagings with the industrial packagings. Commenters also cited an increase in the packaging costs for LSA materials without an equivalent increase in public safety if the Type A, and strong, tight packagings were not allowed for transportation of LSA material. Upon further review of the proposal to remove the Type A packaging and the strong, tight packaging as authorized packagings for LSA materials, RSPA has decided to retain these packagings for the transportation of LSA material because the benefits associated with the proposal are not commensurate with the increase in costs. However, industrial packagings are added as an authorized packaging for LSA material and SCO in order to provide the industry greater flexibility and to facilitate international commerce.

Several comments addressed the definition of LSA material and SCO. One commenter requested that dewatered material be defined as a solid for LSA–II. LSA–II is expected to include nuclear reactor process wastes, including filter sludge, absorbed liquids, and lower activity resins. RSPA and NRC believe the LSA–II specific activity limit for solids, rather than that for liquids, applies to dewatered resins. Therefore, RSPA and NRC see no need to define dewatered material as a solid for LSA–II.

Commenters were also concerned about their ability to measure the contamination on inaccessible surfaces of SCO's. Though it is impossible to directly measure the fixed contamination on an inaccessible surface of an object, it is possible to determine the contamination level on the inaccessible surface through physical measurements and mathematical analysis (involving geometric and attenuation factors) of the object.

One commenter compared the new limits for SCO with existing limits for