LSA material in §173.403 and claimed there was a reduction in the specific activity limits in the proposed rule. RSPA notes that the proposed and final rules for shipping SCO-I contain the same limits for fixed radioactive surface contamination as were present in the previous definition of LSA material. The difference in the SCO–I definition is the addition of the normal package limits on removable external contamination. The change from existing regulations is the addition of the definition of SCO-II for solid objects which are more heavily contaminated on their surfaces then SCO-I objects.

Some commenters also requested that the definition of LSA-I be expanded to include material generated from the extraction of uranium or thorium. Another commenter recommended that the term "contaminated soil" in LSA-I be expanded to include "soil, earth, concrete rubble and other bulk debris." Another commenter expressed concern that mill tailings exceeding  $10E-6A_2/g$ could not be shipped in bulk under the proposed rule. The commenter recommended that either mill tailings be specifically included in the definition of LSA–I without an activity or concentration limit, or the specific activity limit for LSA-I be increased to  $4x10E-6A_2/g$ .

RSPA agrees that ore-like materials (materials with highly uniform distribution of small quantities of radionuclides) should be transported as LSA-I material. Accordingly, the definition of LSA-I is expanded from "contaminated soil" to "contaminated soil, mill tailings, concrete rubble and other debris \* \* \* '' RSPA believes that mill tailings will meet the proposed  $10E-6A_2/g$  specific activity limit, and therefore, has not increased the limit. For clarity, the proposals contained in §§ 173.411 and 173.414 have been combined into §173.411. In §173.427, reference to IP packagings is followed by a parenthetic reference to §173.411 to show where the requirements for industrial packagings are found. One commenter requested that the record keeping requirements for IP packagings not apply to IP-1's. RSPA concurs and has revised the final rule accordingly. Some commenters requested that an IP packaging be required to be marked in order to identify that the packaging does meet the appropriate packaging standard. Though RSPA agrees with the commenter's point, RSPA did not propose a marking requirement and, therefore, considers this recommendation outside the scope of the rulemaking. However, RSPA may propose such a requirement in a future rulemaking.

## C. International System of Units (SI)

In the NPRM, RSPA proposed that the activity of a package of radioactive materials be described in SI units (i.e., becquerels), consistent with IAEA SS6-85, in lieu of the customary units of curies. Several commenters requested that the use of SI units on shipping papers and labels be required for international shipments only, with domestic shipments using customary units as the standard. The basis of this request appears to be for ease of training of transport workers, emergency responders, and personnel in industry and local governments. It was also noted that most emergency response radiation detection instruments specify readings in customary units only.

U.S. policies and procedures for conversion to the metric system were formalized by the Metric Conversion Act of 1975 (Pub. L. 94-168, 15 U.S.C. 205a). The Act declared that U.S. policy shall be to coordinate and plan the increased use of the metric system. From a safety standpoint, the need for consistency in radioactive materials package identification is critical. All parties potentially having contact with the package must be able to understand the units used in order to establish proper controls. It is recognized that the U.S. conversion to metric units may create special problems since, in order to succeed without jeopardizing safety, the new units must be used, or at least understood, universally.

It is also recognized that the use of SI units for radioactive material has proceeded internationally. IAEA SS6–85 allows the use of both units with SI units controlling. The International Civil Aviation Organization's Technical Instructions and the International Maritime Dangerous Goods Code (IMDG Code) have required the use of the SI units for several years. The fact that international shipments use SI units could give rise to safety concerns if the U.S. fails to accommodate SI units to or from countries using the internationally accepted units.

RSPA recognizes the additional training required by this change; however, the safety benefits exceed the costs and it is necessary to proceed with the change to SI units. However, for domestic shipments, shipping papers and labels may be allowed to contain either SI units or the combination of SI and customary units. In addition, RSPA is delaying mandatory compliance with this requirement until April 1, 1997.

Several commenters were also concerned about the inconsistencies between RSPA and NRC proposed rules with regard to units of measurement. RSPA proposed regulatory requirements using SI units followed by customary units in parenthesis. NRC proposed the reverse order. NRC, in its final rule, agreed with RSPA that SI units must be stated first.

## D. Expansion of Radionuclide List and Changes in Radionuclide Limits

The table in § 173.435, which provides  $A_1$  and  $A_2$  values, has been expanded by nearly 100 entries to include all radionuclides that have the potential to be transported. Because there now should be few instances where unlisted radionuclides would be transported, the rules for calculating values for unlisted radionuclides have been simplified. However, the determination of limits for unlisted radionuclides, except in a few cases, is subject to RSPA approval.

IAEA SS6-85 modified the system for determining  $A_2$  and  $A_2$  values. Although this system is based on achieving essentially the same limitations on potential radiological accident hazards as the previous system, the new system has the following advantages:

1. It states more clearly the radiation protection criteria employed;

2. It incorporates the data and conclusions on metabolic pathways provided during the years 1977–1981 by the International Commission on Radiological Protection (ICRP);

3. It includes dosimetric routes through human organs not previously considered; and

4. It harmonizes IAEA SS6–85 with ICRP recommendations on radiological safety in Publications ICRP–26 and ICRP–30.

The effect of the adoption in IAEA SS6–85 of this new system for calculating  $A_1$  and  $A_2$  values, and the subsequent incorporation of the new values in the HMR, is that most current  $A_1$  and  $A_2$  values have been amended. Of the 284 radionuclide entries in § 173.435,  $A_2$  values have been raised in 129 cases and lowered in 95 cases. Of the  $A_1$  values, 144 have been raised and 73 lowered. Several commenters objected to the proposal to lower the  $A_2$  value for molybdenum-99 from 0.8 TBq (20 curies) to 0.5 TBq (13.5 curies).

Commenters stated that shipments of Mo-99\Tc-99m generators to hospitals would increase significantly in order to comply with this lower limit. Instead of being able to ship 0.6 TBq (16 curies) in one generator, manufacturers would have to ship two different generators which would increase their costs and the costs to the hospital. In addition, the commenters contended, these additional shipments would increase the level of radiation exposure for those workers