

JAN 13 1992

MEMORANDUM FOR: Charles E. Norelius, Director
Division of Radiation Safety
and Safeguards, Region III

FROM: Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

SUBJECT: REQUEST FOR INTERPRETATION REGARDING ACCEPTABLE SURFACE
CONTAMINATION LEVELS

In response to your memorandum of December 10, 1991, we have reviewed Table 1, "Acceptable Surface Contamination Levels," in the 1987 Office of Nuclear Material Safety and Safeguards guidelines for decontamination of facilities and equipment (Enclosure 1). You requested an interpretation of Table 1 as it relates to alpha and beta-gamma emitting radionuclides. Specifically, whether the limits for alpha and beta-gamma emitters should be applied separately in the case of U-238, U-235, U-nat, and associated decay products.

In Table 1, "associated decay products" of uranium refers to alpha emitting daughters only. The beta emitting daughters are treated as any other beta-gamma contamination. Footnote A to Table 1 states that "where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently." This applies in all cases, including those such as U-238, U-235, and U-nat, where the beta-gamma emitters are potentially short-lived daughters in secular equilibrium with a parent.

If you have any questions, please contact me at (FTS) 964-3342 or David N. Fauver at (FTS) 964-2554.

(SIGNED) RICHARD L. BANGART

Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated

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PDR YES
PDR NO
ACNW YES

Category: Proprietary or CF Only

SUBJECT ABSTRACT: REQUEST FOR INTERPRETATION REGARDING ACCEPTABLE SURFACE
CONTAMINATION LEVELS

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TABLE 1
ACCEPTABLE SURFACE CONTAMINATION LEVELS

| NUCLIDES ^a | AVERAGE ^{b c f} | MAXIMUM ^{b d f} | REMOVABLE ^{b e f} |
|---|---|---|---|
| U-nat, U-235, U-238, and associated decay products | 5,000 dpm α /100 cm ² | 15,000 dpm α /100 cm ² | 1,000 dpm α /100 cm ² |
| Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129 | 100 dpm/100 cm ² | 300 dpm/100 cm ² | 20 dpm/100 cm ² |
| Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133 | 1000 dpm/100 cm ² | 3000 dpm/100 cm ² | 200 dpm/100 cm ² |
| Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above. | 5000 dpm $\beta\gamma$ /100 cm ² | 15,000 dpm $\beta\gamma$ /100 cm ² | 1000 dpm $\beta\gamma$ /100 cm ² |

^aWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^bAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^cMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

^dThe maximum contamination level applies to an area of not more than 100 cm².

^eThe amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

^fThe average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.