May 15, 2006

MEMORANDUM TO: George Pangburn, Director
Division of Nuclear Materials Safety, RI

FROM: Scott C. Flanders, Deputy Director ***/RA/***
Environmental & Performance Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

SUBJECT: RESPONSE TO TECHNICAL ASSISTANCE REQUEST DATED FEBRUARY 10, 2006, FOR BEST MEDICAL INTERNATIONAL, INC.

Region I submitted a Technical Assistance Request (TAR), dated February 10, 2006, requesting screening criteria or a dose assessment for samarium-145 (Sm-145) for the release of facilities which may have residual contamination on building surfaces at the Best Medical International, Inc. site.

As stated in the TAR, Best Medical International, Inc. is authorized to possess 3 curies of Sm-145 (half-life of 340 days) in oxide form to perform research and development activities. Also stated in the TAR, Best Medical International, Inc. currently possess 0.77 millicuries of Sm-145 in dry waste and has decided to cease further research and development activities using this material. Therefore, a screening value is needed for Sm-145 to determine an acceptable level of residual radioactivity that can remain on interior building surfaces for compliance with the requirements of 10 CFR 20.1402.

In general, acceptable screening values for radionuclides are either derived by appropriately using the DandD code or are taken directly from screening tables provided in NRC's decommissioning guidance documents. The DandD code is intended to be a screening tool for demonstrating compliance with the dose criteria in Part 20, Subpart E and to simplify decommissioning in cases where low levels of contamination exist on the site. The conceptual models within DandD are expected to provide a conservative representation of site features and conditions.

In this case, the DandD code can not be appropriately used to derive the screening value of Sm-145 because Sm-145 is not listed as a potential site contaminant in the DandD code. In addition, there is not a published screening value for Sm-145 in relevant guidance documents. To appropriately derive the screening value of Sm-145 for building release, the staff used RESRAD-BUILD version 3.3 and implemented the process described in NUREG/CR-6755,

"Technical Basis for Calculating Radiation Doses for the Building Occupancy Scenario Using the Probabilistic RESRAD-BUILD 3.0 Code," to emulate the conceptual model of the DandD code to the extent possible. Additionally, the staff performed benchmarking analyses to verify that the results using RESRAD-BUILD were consistent with DandD results.

For Sm-145, staff considers 2.1E6 dpm/100 cm^2 as the likely screening value which would be consistent with the DandD code for building surfaces. The derived Sm-145 screening value is an acceptable and reasonable level in which residual radioactivity can remain on interior building surfaces for compliance with the dose criteria requirements of 10 CFR 20.1402.

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