APR 22 1992

MEMORANDUM FOR: Vandy L. Miller, Assistant Director
for State Agreements Program, SP

FROM: John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

SUBJECT: TECHNICAL ASSISTANCE REQUEST - STATE OF OREGON QUESTIONS ON IMPACTS TO WORKERS FROM CLEAN-UP OF THORIUM-232 OXIDE IN SEWER LINES

This responds to the October 25, 1991 (Enclosure 1) and November 27, 1991 (Enclosure 2), State of Oregon requests for NRC technical assistance. It appears a more basic question is arising which concerns the understanding of the origin of the requirements in Part 20. Part 20 contains performance and prescriptive requirements as a best fit for most licensed activities which are intended to maintain operations within total effective dose equivalent limits and as low as reasonably achievable (ALARA). If a licensee can not meet a particular requirement, then the licensee can request an exemption. If the applicable dose limits are met, the proposed exemption takes into account ALARA, and the basis for departure from the regulatory requirements at issue are justified, then there would ordinarily be a basis for an exemption which proposes alternative ways of meeting the fundamental requirements, i.e, dose limits and ALARA.

In view of the above, we have attempted to respond to the specific questions asked. Enclosure 3 contains a list of the questions and answers, Enclosure 4 contains a list of critical parameters needed to refine the dose assessments presented, and Enclosures 5 and 6 contain dose assessments completed by the Fuel Cycle Safety Branch. Again, the dose assessments are only as good as the assumptions and are not based on actual dose measurements. It is strongly recommended that actual dose measurements be obtained.

The assessment for clean-up operations in sewer lines (Enclosure 5) demonstrates that external exposure is negligible; however, based on pathway analyses for inhalation exposures and very conservative assumptions used in the assessment, the dose that results from inhalation of radon-220, its daughters, and resuspension of the thorium-232 oxide shows that in some cases, workers entering the pipes may need appropriate respiratory protection. We would recommend that Oregon perform direct measurements of radon-220 and its daughters in the breathing zone prior to and during clean-up operations to assist in confirmation of levels and need for respiratory protection other than for possible OSHA requirements associated with confined spaces. Appropriate respiratory protection (Enclosure 7) should initially be employed for protection against radon-220 daughters and scum which could be aerosolized during clean-up operations in conjunction, if possible, with lapel air samplers. If, as expected, measurements show that the inhalation dose is not significant, respiratory protection could be discontinued from a radiological protection standpoint.

Enclosure 6 provides a dose assessment for compost. The dose assessment for concentrations below 5 pCi/gm of thorium-232 in compost results in low external exposures.

With regard to your proposed response to Oregon's second letter, we understand the Agreement States would conform to the amendments to Part 20 on or before January 1, 1994. Further, the fertilizer which contains 5 pCi/gm thorium-232 would be considered an unimportant quantity of source material (10 CFR 40.13(a)).

If you have any questions or need additional assistance, please contact Patricia A. Santiago at 504-2632.

John E. Glenn, Chief
Medical, Academic, and Commercial
Use Safety Branch
Division of Industrial and
Medical Nuclear Safety, NMSS

Enclosures:
1. Oregon letter, dtd 10/27/91
2. Oregon letter, dtd 11/27/91
3. Response to Oregon's Questions
4. List of Critical Parameters
5. Dose Assessment on Sewer-line Clean-up
6. Dose Assessment on Fertilizer
7. Regulatory Guide 8.15

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