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RECORD 73

TITLE: Surveys of Wastes Before Disposal From Nuclear Reactor
Facilities

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

December 2, 1985

IE INFORMATION NOTICE NO. 85-92: SURVEYS OF WASTES BEFORE DISPOSAL FROM
NUCLEAR REACTOR FACILITIES

Addressees:

All production and utilization facilities, including nuclear power reactors and research and test reactors, holding an operating license (OL) or construction permit (CP).

Purpose:

The purpose of this information notice is to supplement the guidance of IE Circular 81-07 as it applies to surveys of solid waste materials before disposal from nuclear reactor facilities. It is expected that recipients will review the information for applicability to their facilities. However, this information notice does not constitute NRC requirements; therefore, no specific action or licensee response is required.

Description of Circumstance:

Some questions have arisen concerning appropriate methods of surveying solid waste materials for surface contamination before releasing them as nonradioactive (i.e., as wastes that do not contain NRC-licensed material).

Discussion:

The need to minimize the volume of radioactive waste generated and shipped to commercial waste burial sites is recognized by the NRC and industry. Some nuclear power plants have initiated programs to segregate waste generated in radiologically controlled areas. Such programs can contribute to the reduction in volume of radioactive waste; however, care should be taken to ensure that no licensed radioactive material is released contrary to the provisions of 10 CFR Section 20.301. In practice, no radioactive (licensed) material means no detectable radioactive material.

In 1981, IE Circular 81-07 was issued by the NRC. That circular provided guidance on the control of radioactively contaminated material and identified the extent to which licensees should survey for contamination. It did not establish release limits. The criteria in the circular that addressed surface contamination levels were based on the best information available at the time and were related to the detection capability of portable survey instruments.

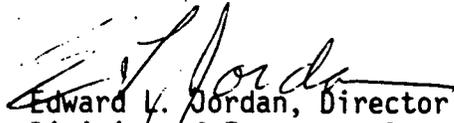
equipped with thin-window "pancake" Geiger-Mueller (G.M.) probes, which respond primarily to beta radiation. Monitoring of aggregated, packaged material was not addressed. In 1981, there was no major emphasis on segregating waste from designated contamination areas. As a consequence, large volumes of monitored wastes were not being released for unrestricted disposal. However, because of recent emphasis on minimizing the volume of radioactive waste, current practices at many nuclear power facilities result in large volumes of segregated, monitored wastes, containing large total surface areas, being released as "clean" waste.

When scanning surfaces with a hand-held pancake probe, there is a chance that some contamination will not be detected. (See the papers by Sommers,¹ for example.) There is the chance also that the total surface area will not be scanned completely. Thus, when numerous items of "clean" material (e.g., paper and plastic items) are combined, the accumulation of small amounts of contamination that have escaped detection with the pancake probe may be detected using a detector that is sensitive to gamma radiation (e.g., by using a sensitive scintillation detector in a low-background area). Such measurements of packaged clean waste before disposal can reduce the likelihood that contaminated waste will be disposed of as clean waste, then found to be contaminated after disposal. (Some operators of sanitary landfills have begun to survey incoming waste for radioactivity using scintillation survey meters which in some cases are supplemented by portable gamma-ray spectrometers.²)

In order to preclude the unintentional release of radioactive materials, a good monitoring program likely would include the following:

1. Careful surveys, using methods (equipment and techniques) for detecting very low levels of radioactivity, are made of materials that may be contaminated and that are to be disposed of as clean waste. These survey methods should provide licensees with reasonable assurance that licensed material is not being released from their control.
2. Surveys conducted with portable survey instruments using pancake G.M. probes are generally more appropriate for small items and small areas because of the loss of detection sensitivity created by moving the probe and the difficulties in completely scanning large areas. This does not preclude their use for larger items and areas, if supplemented by other survey equipment or techniques.
3. Final measurements of each package (e.g., bag or drum) of aggregated wastes are performed to ensure that there has not been an accumulation of licensed material resulting from a buildup of multiple, nondetectable quantities (e.g., final measurements using sensitive scintillation detectors in low-background areas).

The foregoing does not constitute NRC requirements; therefore, no specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate NRC regional office or this office.


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and Engineering Response
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Attachments:

1. References
2. List of Recently Issued IE Information Notices

REFERENCES

- ¹ Sommers, J. F., (a) "Sensitivity of Portable Beta-Gamma Survey Instruments," Nuclear Safety 16 (No. 4), 452-457, July - August 1975, (b) "Sensitivity of GM and Ion-Chamber Beta-Gamma Survey Instruments," Health Physics 28 (No. 6), pp. 775-761, June 1975.
- ² Anonymous, "LA Nuclear Medicine Community Improves Radiation Monitoring at Landfills," J. Nuclear Medicine 26 (#4), 336-337, April 1985.