



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

September 6, 1991

Docket No. 50-206

MEMORANDUM FOR: James E. Dyer, Director
Project Directorate V
Division of Reactor Projects - III, IV, and V, NRR

FROM: LeMoine J. Cunningham, Chief
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SUBJECT: TECHNICAL ASSISTANCE ON SAN ONOFRE NUCLEAR GENERATING STATION
LOWER LIMITS OF DETECTION FOR RELEASE OF OIL (TAC NO. M80449)

This memorandum is in response to your request for NRR to provide technical assistance to Region V in the reevaluation of the appropriateness of NRC Health Physics Position No. 221 (HPPOS No. 221) for using a lower limit of detection (LLD) for the release of potentially contaminated oil consistent with that of environmental sample media stated in the standard Radiological Environmental Technical Specifications (RETS). The basis of the Region's request appears to be the perceived limited radiological exposure pathway to man from the waste oil.

My staff reassessed the guidance provided in the HPPOS No. 221 and in previously issued memoranda and generic communications. As a result of this review, we did not find a sufficient basis for changing the policy position.

NRC regulations, with one exception (10 CFR 20.306), provide no minimum level of radioactivity in waste from a licensee's facility that may be disposed of in a manner other than as normal radioactive waste, regardless of the potential exposure pathway to man. If radioactive material is detectable then it must be handled as radioactive material.

In recognition of this restrictive policy, efforts were taken to provide guidance on acceptable survey methods to determine "how hard to look". The guidance in HPPOS No. 221 states that the LLD used for laboratory measurement of environmental samples is the "operational state of the art" value. It is the LLD value given in the standard RETS for environmental samples. This is the detection level below which the probability of undetected radioactivity is negligible and can be disregarded when considering the practicality of detecting such potential radioactivity from natural background.

This guidance recognizes the fact that there are technological limitations in the ability of radiation detection equipment and associated counting procedures used to detect radioactive material at very low levels. The guidance in the position paper was based in part from previously issued Information Notices. IE Circular No. 81-07, Control of Radioactivity Contaminated Material, was

issued May 14, 1981. It provided guidance on the minimum level of beta-gamma activity that can be routinely detected under a surface contamination control program using direct survey methods. It was based on de facto industry standard contamination monitoring techniques and currently available radiation detection equipment.

Additionally, the guidance in the position paper was used and clarified further in a memorandum provided to Region II for the Grand Gulf Nuclear Power Plant. In that situation, the licensee considered approximately 14,050 gallons of treated turbine lubricating oil to be non-radioactive since the oil was determined to have detectable radioactivity below the effluent LLD of $5E-7$ uCi/ml for gamma-emitting radionuclides. The oil was incinerated at a sister fossil fuel plant. In that case the licensee failed to obtain permission from Mississippi (an NRC Agreement State) under 10 CFR 20.302 for their actions. It was decided that if a licensee disposed of material after it was analyzed and contained no radioactive material in concentrations above the most restrictive LLD, then from NRR's perspective, the material is not radioactive. Otherwise, the material could be radioactive in the sense that concentrations may be present in excess of the most restrictive LLD; thus, a 10 CFR 20.302 application (or possibly a Technical Specification amendment) would be required for disposal.

For the situation at San Onofre, the waste oil was being processed to remove its radioactivity and sold to a waste recycler. Therefore, the oil is no longer under licensee control. It is not known what the recycler does with the oil (reuse, incinerate, etc.), so the potential pathway for exposure to man from the oil is not known. However, neither is it totally relevant, since the objective is to determine whether a sample has any detectable activity based on a set of prescribed conditions (counting time, sample size, etc.). Exposure pathways are a second order consideration. In order for the licensee to comply with existing regulations, no radioactive material can be detected in the waste oil after being sampled, measured, and evaluated for all potential radionuclides using the environmental LLD for each radionuclide prior to unrestricted release. Given the current availability of radiation detection equipment capable of performing measurements at the environmental LLD, this requirement is reasonable. Therefore, based on our review of Inspection Report Nos. 50-206/91-10, 50-361/91-10, and 50-206/91-10 in conjunction with the guidance provided herein, the licensee's measurements are not adequate; that is, an LLD consistent with that of the environmental LLD should have been attained. For H-3, an LLD of 3000 pCi/l may be used, as provided by footnote in the Standard Technical Specifications, Table 4.12-1, Detection Capabilities For Environmental Sample Analysis Lower Limit of Detection (LLD). With regard to Sr-90 and Fe-55, we are not in a position to determine whether specific analyses of the waste oil were warranted. (For example, was adequate knowledge of precursor waste streams available? - see discussion which follows).

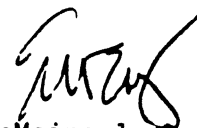
licensee

We consider it a separate issue whether the licensee should have analyzed for H-3, Sr-90, Fe-55 and other difficult to measure radionuclides. However, it must be emphasized that an analysis should be conducted for all radionuclides that could potentially be in the waste oil. The licensee is responsible to document that the material has been analyzed for all "typical" radionuclides found in plant systems that the oil came into contact with. In the case of these difficult to measure radionuclides, the licensee need not perform a specific analysis for the waste stream in question if it is known from analysis of precursor waste streams that they are unlikely to be present in concentrations at or above the environmental LLD.

If the licensee does not have the requisite level of knowledge about the their concentration, then an analysis must be performed. Once the typical radionuclide mixture is established, then subsequent analysis by the licensee need only concentrate on them. Periodic reexamination of the waste stream need only be done when the source of the oil has changed or has come into contact with uncharacterized areas of the plant.

In keeping with the precedence established by the previously discussed guidance, there is no justification to change the policy of requiring licensees to use the environmental LLD for release of potentially contaminated materials, regardless of the pathway to man.

If you have any further questions on this matter, please let me know.


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