



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

JUN 19 1980

DOCKET NO.: 70-1151
APPLICANT: Westinghouse Electric Corporation
FACILITY: Commercial Nuclear Fuel Fabrication Plant
Columbia, South Carolina
SUBJECT: ENVIRONMENTAL REVIEW ON LICENSE AMENDMENT TO DELETE
GROSS BETA ANALYSES FOR AIR PARTICULATES

I. Background

By letter dated May 14, 1980, Westinghouse Electric Corporation (the licensee) requested an amendment to License SNM-1107 (Docket No. 70-1151) to delete the requirement for gross beta analyses of environmental air particulates at their Columbia, South Carolina, fuel fabrication facility.

Condition No. 39 of SNM-1107 specifies that the licensee shall perform the environmental monitoring program described in a table taken from the licensee's environmental report. In this table the licensee specified that they would perform gross α and β analyses on particulates collected from environmental air samples. This amendment application requests that the requirement for gross β analyses be deleted.

II. Discussion

The licensee's plant operation includes (1) conversion of UF_6 to UO_2 , (2) processing the UO_2 powder into pellets, (3) encapsulation of the pellets into fuel rods, (4) fabrication of fuel rods into final assemblies, and (5) shipment of final assemblies to the customer's reactor sites. The above operation involves the use of low-enriched uranium, ($\leq 5\%$ wt% U-235). For gaseous effluents released from routine plant operation, the major nuclides emitting beta radiation are from the daughters of U-238, i.e., from Th-234 and Pa-234 with an average beta energy of 0.044 and 0.82 MeV respectively. These beta emitters have rather short half-lives, $t_{1/2}$ (Th-234, $t_{1/2} = 24.01$ days; Pa-234, $t_{1/2} = 1.17$ minutes). The release of these nuclides into the environment does not constitute a major contribution to the individual dose as compared to the alpha emitters, U-234 and U-238. Because

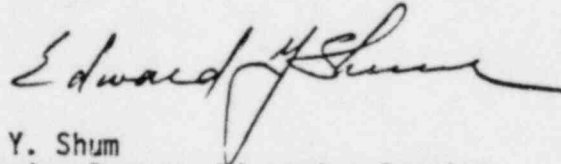
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of their rather short half-lives and their insignificant radiological impact, the analyses of these beta emitters in the environmental air particulates are generally not required in the nuclear fuel fabrication plants. Other minor beta emitters, such as the Tc-99 ($t_{1/2} = 2.1 \times 10^5$ yr; $E_{\beta} = 0.29$ MeV), could also be released in the gaseous effluents. The Tc-99 is a contaminated fission product in the enriched UF_6 from the gaseous diffusion plant involving the use of recycled uranium. During the conversion of UF_6 to UO_2 using the ADU (ammonium diuranate) process, because of the chemistry involved, most of the Tc-99 (if any) will remain in the liquid waste stream. Therefore, its release in the gaseous effluents is expected to be insignificant.

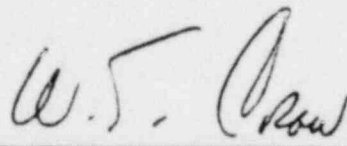
III. Conclusion

The gaseous effluents from a low-enriched uranium fuel fabrication plant do not normally contain any principal beta emitters that would contribute significantly to the individual dose and the analyses for gross-beta of environmental air particulates are generally not required in the fuel fabrication operation. Therefore, it is recommended that the license amendment to delete the gross beta analyses in environmental air particulates be approved.



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Approved:


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