



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 25, 1997

Charles Thomas Smit
P.O. Box 103
Wabasha, Minnesota 55981

Dear Mr. Smit:

As the lead manager for dry cask issues in the Office of Nuclear Reactor Regulation (NRR), Nuclear Regulatory Commission (NRC), I am responding to your letter dated January 18, 1997, to Earl Easton.

In regard to your question regarding environmental radiation associated with independent spent fuel storage installations (ISFSIs), licensees are required to provide an annual report of effluents released from the reactor facilities and ISFSIs. The annual effluent reports for the Prairie Island ISFSI for 1995 and 1996 are provided as Enclosures 1 and 2. The reports for the Prairie Island ISFSI are typical for the other ISFSIs in the United States in that radioactive effluents have not been released from dry storage casks. In order for radioactive material to escape from a dry storage cask, an unlikely event or condition would need to occur and cause a failure of the integrity of the storage cask. The safety analysis report for the Prairie Island ISFSI includes an analysis of a hypothetical loss of confinement barrier that assumes the total inventory of radioactive gases within a cask are released. This hypothetical scenario results in a maximum individual whole body dose of 0.15 rem for a member of the public. Any credible accident involving a dry storage cask at Prairie Island would result in less exposure to the general public than does this hypothetical scenario. A general study of the possible offsite consequences of possible accidents involving spent fuel was provided in NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees." A copy of that report is provided as Enclosure 3.

On the basis of its reviews of specific cask designs, expected doses associated with direct radiation from storage casks, and possible radiological consequences of hypothetical accidents, the NRC staff has determined that the safeguards included in the existing designs are adequate to ensure that ISFSIs do not pose an undue risk to public health and safety. Therefore, additional measures, such as ISFSI enclosures or additional cask shielding, are not required to satisfy the regulatory requirements established by the NRC.

Since dry storage casks prevent the release of radioactive materials from the stored spent fuel assemblies, the expected radiological dose to a member of the public from an ISFSI has been limited to the radiation from the spent fuel assemblies that penetrates the shielding provided by the cask and transverse the distance between the ISFSI and the individual. The 1995 Annual Radiological Environmental Monitoring Report for Prairie Island and its associated ISFSI, Enclosure 4, provides information regarding measurements of

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the radiation levels taken at various sites near that facility. Chapter 7 of the safety analysis report for the Prairie Island ISFSI provides the results of analyses related to the offsite dose as a result of direct radiation and skyshine (radiation emanated upward and scattered by air into the surrounding area) and is provided as Enclosure 5. As mentioned in NRC Technical Issue Paper 18, "Monitoring Environmental Impacts of Nuclear Power Plants" (Enclosure 6), the NRC maintains a network of thermoluminescent dosimeters (TLDs) around each commercial power reactor and provides measured radiation levels on a quarterly basis in NUREG-0837, "NRC TLD Direct Radiation Monitoring Network." A copy of the most recent report is provided as Enclosure 7. In addition, selected portions (those parts related to ISFSIs) of reports describing environmental monitoring programs at the Calvert Cliffs and Robinson facilities (April 29, 1996 submittal from Baltimore Gas & Electric and August 29, 1996, from Carolina Power & Light) are provided as Enclosures 8 and 9. General information regarding ISFSIs at various reactor sites is provided in Enclosure 10, NUREG-1571, "Information Handbook on Independent Spent Fuel Storage Installations."

The installation of the berm around the Prairie Island ISFSI is intended to offer additional shielding from the direct radiation coming from the storage casks. As discussed in the enclosed chapter from the Prairie Island ISFSI safety analysis report, the berm effectively eliminates direct radiation from the casks as a source for offsite exposure. An opening in the berm was required to provide access to the ISFSI but is oriented to minimize the potential impact on radiation doses received by members of the public. In regard to the specific placement of casks within the ISFSI, the dose estimates presented in the safety analysis report continue to be conservative with respect to the actual loading pattern implemented at Prairie Island. Monitoring data recorded around the Prairie Island ISFSI will provide information regarding the radiological effect of adding the sixth and seventh casks.

Regulatory responsibility for spent fuel transportation safety is shared by the NRC and the U.S. Department of Transportation (DOT). DOT regulations in Part 173 of Title 49 of the Code of Federal Regulations (49 CFR 173) limit the radiation level at the cask surface to 1000 millirem/hour, 200 millirem/hour at the vehicle surface, and 10 millirem/hour at 2 meters from the vehicle surface. Additional information related to the transport of spent fuel is provided in Enclosure 11, NUREG-0725, Rev. 11, "Public Information Circular for Shipments of Irradiated Reactor Fuel," and Enclosure 12, NRC Technical Issue Paper 30, "Transportation of Radioactive Materials."

Mr. Charles Smit

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I hope the information provided will be useful to you. Please contact William Reckley on 301-415-1314 if you have any additional questions or concerns.

Sincerely,

Original signed by:

Gail H. Marcus, Project Director
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos.: 50-282, 50-306, 72-10

Enclosures: As stated (12)

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Mr. Charles Smit

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