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NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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June 27, 2006

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FROM: William M. Dean *WMD*
Assistant for Operations, OEDO

SUBJECT:

EX 5

Enclosure: As stated

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Act, exemptions 2 & 5
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[Redacted signature]

INDUSTRY AND NRC NEED FOR BURNUP CREDIT DATA

Why does the industry and NRC need the French data supporting burnup credit?

For economic reasons, the industry wants to transport PWR spent nuclear fuel (SNF) in casks with larger payloads (> 24 assemblies). Due to diameter limits, a higher capacity cask must eliminate the spacing for flux traps and closely pack the fuel assemblies. Presently, and until DOE begins its use of the Transportation, Aging, and Disposal Casks (TAD), SNF will continue to be loaded into the higher capacity casks (NRC has approved these casks for storage, but not for transport).

In order to transport the higher capacity casks (without flux traps), burnup credit is needed to show subcriticality when flooded with fresh water in accordance with 10 CFR 71.55(b). Validation of the computer code used for the burnup calculation is a necessary part of the design and the regulatory review. Required data for burnup credit validation are chemical assays and critical experiments. French data provides the chemical assays and critical experiments which U.S. does not have, but it needs to confirm the validity of computer codes used for burnup credit calculations.

Also, the industry has been taking the position that the existing data on U.S. Commercial Reactor Criticals (CRCs) such as data on commercial reactor core configurations during startup after a shutdown, could be used as an integral benchmark which includes fission products.

Staff has not accepted CRCs alone for benchmarking the burnup methodology. The direct applicability of CRCs to calculations in SNF casks has not been adequately demonstrated because conditions in a reactor core are different than those in a SNF cask. The French data could help staff make a determination on the applicability of CRCs.

What strategy will staff pursue to acquire the data?

Staff's efforts to encourage acquisition of the remaining French data will consist of an approach to both the industry and DOE offices.

Because of the direct benefit to the industry, funding for the acquisition of data to expand burnup credit to fission products should be supported by the industry. For economic reasons, a number of nuclear plants are currently loading PWR fuel into high capacity casks for dry storage. The level of

Ex 2 + Ex 5 portions

burnup credit addressed in SFPO ISG-8, Rev. 2, (actinide only) would allow shipment of a limited portion of the spent fuel inventory in high capacity casks. To ship a larger practical portion of the inventory in these casks, a burnup credit analysis with fission products is needed

DOE acquisition of the French data would also be useful to determine the applicability of the CRCs and evaluate their proper role and contribution to the benchmarking process. Additionally, the staff could use the French data (chemical assays and critical experiments) to independently validate an applicant's burnup credit computer codes and would aid in determining whether the biases and uncertainties calculated by industry (when using an indirect method such as CRCs) are bounding

Burnup Credit (Industry & NRC Need). wpd 6/23/06

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