

SPENT FUEL PROJECT OFFICE
OFFICE OF NUCLEAR MATERIAL SAFETY
AND SAFEGUARDS

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INTERIM STAFF GUIDANCE

ATTACHMENT

INTERIM STAFF GUIDANCE (ISG)

- ISG-1 Damaged Fuel**
- ISG-2 Fuel Retrievability**
- ISG-3 Post Accident Recovery and Compliance with 10 CFR
72.122(I)**
- ISG-4 Cask Closure Weld Inspections**
- ISG-5 Normal, Off-Normal, and Hypothetical Accident Dose
Estimate Calculations for the Whole Body, Thyroid,
and Skin**
- ISG-6 Establishing Minimum Initial Enrichment for the
Bounding Design Basis Fuel Assembly(s)**
- ISG-7 Potential Generic Issue Concerning Cask Heat Transfer
in a Transportation Accident**

Spent Fuel Project Office Interim Staff Guidance - 5

Issue: Normal, off-normal, and hypothetical accident dose estimate calculations for the whole body, thyroid, and skin.

While the staff considers there will be no effluent from a storage cask, the applicant must demonstrate compliance with 10 CFR 72.104(a), 10 CFR 72.106(b), and 10 CFR 72.126(d). It is the staff's assumption that leakage of gases, volatiles, fuel fines, and crud is credible and should be addressed. The analysis should be based on a source term that includes all radionuclides that are greater than 0.1% of the total activity present in the fuel plus iodine (this would result in approximately 95% of the dose if the total inventory were included). The guidance given in Table 4-1 of NUREG-1617 (DRAFT) and technical bases given in NUREG/CR-6487 provide release fractions relative to gases (f_g), volatiles (f_v), fuel fines (f_f), and crud (f_c). NUREG/CR-6487 also provides the basis for determining the quantities of radionuclides for inclusion in the source term. The use of a computer code such as SAS2H to generate this source term or the shielding source term is acceptable to the staff.

An assumed minimum leakage duration for normal and off-normal conditions of one year and a minimum leakage duration for hypothetical accident conditions of 30 days are considered appropriate. The analyses should use the leak rate from tested conditions as adjusted to account for bounding conditions of storage for normal, off-normal, and accident conditions (temperatures and pressures) as an assumed leakage rate for the normal, off-normal, and accident conditions.

For determination of X/Q values, absent site-specific data, use of Class D stability and wind velocity of five m/s meteorological conditions may be used for long-term conditions (normal, off-normal). For short-term conditions (a hypothetical accident), use of Class F stability and wind speed of one m/s meteorological condition is considered bounding.

The staff accepts dose calculations using Dose Conversion Factors from EPA Federal Guidance Reports 11 and 12 on an isotope specific basis. No weighting or normalization of the dose conversion factors is acceptable since this may not be conservative. The resultant dose for normal conditions of storage must be a small fraction of the 25 mrem/yr limit of 10 CFR 72.104(a) to accommodate an array of casks and external direct dose. For off-normal conditions, only one cask need be considered, but the resultant dose must be a fraction of the dose limit so that when added to the dose from normal conditions it still meets 10 CFR 72.104(a).

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Recommendation:

Update NUREG-1536 Chapter 7, Sections 3 and 4, (pages 7-5 - 7-7); Chapter 10, Section V, 3, (page 10-3); and Chapter 11, Section V, 3 (page 11-3) to reflect this new position. NUREG-1567 should also be updated accordingly.

Approved


William F. Kane

Date

10/6/98