SCREENING SPENT NUCLEAR FUEL (SNF)

QUESTION: Can Spent Nuclear Fuel (SNF) in dry storage casks be excluded from the emergency management technical planning basis by applying non-dispersibility arguments in the hazardous materials screening process? Some casks used for this purpose were constructed specifically for the static storage function, whereas others were originally designed as Type B shipping containers but the package certification is not being maintained current.

ANSWER: Consistent with limitations specified in the safety analysis, spent nuclear fuel in dry cask storage may be excluded based on non-dispersibility if it has been demonstrated, in the authorization basis safety analysis or elsewhere (e.g., in analyses performed by the cask manufacturer), that the cask would not be breached by an operational accident, handling mishap, human error, age or use-related material failure. This exclusion applies to casks originally designed as Type B shipping containers even if the package certification is not being maintained current.

Effects of malevolent acts, external events and extreme natural phenomena need not be considered when determining whether or not a cask would fail. However, if a malevolent act against the dry storage casks has been examined in a Safeguards and Security Vulnerability Analysis (VA) and quantitative estimates of radiological consequences have been made, the emergency management program should reflect the results of the VA [by inclusion of appropriate Emergency Action Levels (EALs) and planned protective actions] even though the malevolent act is not analyzed in an EPHA.

The basis for this position is detailed below.

1. The Order explicitly provides for the exclusion of certain materials from consideration based on non-dispersibility, including radioactive materials characterized as follows:

   - Sealed sources that meet “special form” criteria
   - Stored in DOT Type B shipping containers with overpack, if Certificates of Compliance are current and the materials stored are authorized by the Certificate
   - Solid form for which there is no plausible dispersal mechanism

   According to the Emergency Management Guide (EMG), “plausible” dispersal mechanisms and processes are those that might apply to the material under its normal conditions of storage and/or use (e.g., operational accidents, handling mishaps, human error, age or use-related material failures). Catastrophic or extremely

energetic initiating events (e.g., aircraft crashes) are not to be considered "plausible" mechanisms for release of otherwise non-dispersible solids.

2. In general, radioactive material in Type B containers (with overpack) can be screened out only if the Certificates of Compliance are maintained current. However, for casks dedicated to static storage of SNF, maintenance of the Certificates of Compliance is less important to the overall safety of the stored material than for Type B containers in general because:

    - Most SNF is inherently less dispersible than other radioactive materials that might be transported and stored in Type B containers, and

Any Type B container suitable for SNF storage will typically be much more massive and structurally robust than a Type B container designed for transport of materials that are not significant sources of gamma radiation.