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Standard Review Plan for Spent Fuel Dry Storage Facilities

Final Report

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2.4.5 Subsurface Hydrology

10 CFR 72.122 requires that measures be taken to preclude the transport of radioactive materials to the environment through subsurface characteristics. The SAR should contain adequate information for an independent review of all subsurface hydrology-related design bases and compliance with dose radiological exposure standards.

If the site is located over an aquifer which is a source of well water, the groundwater aquifer(s) beneath the site, the associated hydrologic units, and their recharge and discharge areas should be described. The results of a survey of groundwater users, well locations, source aquifers, water uses, static water levels, pumping rates, and drawdown should be provided. A water table contour map showing surface water bodies, recharge and discharge areas, and locations of monitoring wells to detect leakage from storage structures should also be provided. Information on monitoring wells should include: wellhead elevation, screened interval, installation method, and representative hydrochemical analyses. An analysis bounding the potential groundwater contamination from site operations should be provided. A graph of time versus radionuclide concentration at the closest existing or potential downgradient well should be included.

2.4.6 Geology and Seismology

10 CFR 72.102 requires that the SAR describe the geological and seismological setting of the site and surrounding region. Conditions which may influence the design and operation of the facility should be identified, and sources of all information should be stated. Enough information for an independent evaluation of the potential ground vibrations and the seismic and fault displacement hazards at the site area should be provided. Design bases for ground vibration, surface faulting, subsurface material stability, and slope stability should also be provided.

2.4.6.1 Basic Geologic and Seismic Information

Basic geologic and seismic characteristics of the site and vicinity should be provided. The geologic history of the area should describe its lithologic, stratigraphic, and structural conditions. A large-scale geologic map of the site area showing the surface geology and the location of major facilities should be provided. A stratigraphic column and cross-sections should also be provided. Planar and linear features of structural significance such as folds, faults, synclines, anticlines, basins, and domes should be identified on a geologic map showing bedrock surface contours. A description of the site geomorphology should include areas of potential landsliding or subsidence, and a topographic map showing geomorphic features and principal site facilities should be provided. The results of pertinent geophysical investigations in the area, such as seismic refraction, seismic reflection, aeromagnetic, or geoelectrical surveys, should also be provided.

The SAR should evaluate geologic features from an engineering geology perspective. Detailed static and dynamic engineering properties of soil and rock underlying the site should be provided, with the results integrated to provide a comprehensive understanding of the surface and subsurface conditions. A small-scale map should show major features of the installation and the locations of all borings, trenches, and excavations. Small-scale cross-sections should