

§72.124

connected with the other facility; however, the sharing of utilities and services or the physical connection must not significantly:

(i) Increase the probability or consequences of an accident or malfunction of components, structures, or systems that are important to safety; or

(ii) Reduce the margin of safety as defined in the basis for any technical specifications of either facility.

(1) *Retrievability.* Storage systems must be designed to allow ready retrieval of spent fuel, high-level radioactive waste, and reactor-related GTCC waste for further processing or disposal.

[53 FR 31658, Aug. 19, 1988, as amended at 64 FR 33184, June 22, 1999; 66 FR 51842, Oct. 11, 2001]

§72.124 Criteria for nuclear criticality safety.

(a) *Design for criticality safety.* Spent fuel handling, packaging, transfer, and storage systems must be designed to be maintained subcritical and to ensure that, before a nuclear criticality accident is possible, at least two unlikely, independent, and concurrent or sequential changes have occurred in the conditions essential to nuclear criticality safety. The design of handling, packaging, transfer, and storage systems must include margins of safety for the nuclear criticality parameters that are commensurate with the uncertainties in the data and methods used in calculations and demonstrate safety for the handling, packaging, transfer and storage conditions and in the nature of the immediate environment under accident conditions.

(b) *Methods of criticality control.* When practicable, the design of an ISFSI or MRS must be based on favorable geometry, permanently fixed neutron absorbing materials (poisons), or both. Where solid neutron absorbing materials are used, the design must provide for positive means of verifying their continued efficacy. For dry spent fuel storage systems, the continued efficacy may be confirmed by a demonstration or analysis before use, showing that significant degradation of the neutron absorbing materials cannot occur over the life of the facility.

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(c) *Criticality monitoring.* A criticality monitoring system shall be maintained in each area where special nuclear material is handled, used, or stored which will energize clearly audible alarm signals if accidental criticality occurs. Underwater monitoring is not required when special nuclear material is handled or stored beneath water shielding. Monitoring of dry storage areas where special nuclear material is packaged in its stored configuration under a license issued under this subpart is not required.

[53 FR 31658, Aug. 19, 1988, as amended at 64 FR 33184, June 22, 1999]

§72.126 Criteria for radiological protection.

(a) *Exposure control.* Radiation protection systems must be provided for all areas and operations where onsite personnel may be exposed to radiation or airborne radioactive materials. Structures, systems, and components for which operation, maintenance, and required inspections may involve occupational exposure must be designed, fabricated, located, shielded, controlled, and tested so as to control external and internal radiation exposures to personnel. The design must include means to:

(1) Prevent the accumulation of radioactive material in those systems requiring access;

(2) Decontaminate those systems to which access is required;

(3) Control access to areas of potential contamination or high radiation within the ISFSI or MRS;

(4) Measure and control contamination of areas requiring access;

(5) Minimize the time required to perform work in the vicinity of radioactive components; for example, by providing sufficient space for ease of operation and designing equipment for ease of repair and replacement; and

(6) Shield personnel from radiation exposure.

(b) *Radiological alarm systems.* Radiological alarm systems must be provided in accessible work areas as appropriate to warn operating personnel of radiation and airborne radioactive material concentrations above a given

setpoint and of concentrations of radioactive material in effluents above control limits. Radiation alarm systems must be designed with provisions for calibration and testing their operability.

(c) *Effluent and direct radiation monitoring.* (1) As appropriate for the handling and storage system, effluent systems must be provided. Means for measuring the amount of radionuclides in effluents during normal operations and under accident conditions must be provided for these systems. A means of measuring the flow of the diluting medium, either air or water, must also be provided.

(2) Areas containing radioactive materials must be provided with systems for measuring the direct radiation levels in and around these areas.

(d) *Effluent control.* The ISFSI or MRS must be designed to provide means to limit to levels as low as is reasonably achievable the release of radioactive materials in effluents during normal operations; and control the release of radioactive materials under accident conditions. Analyses must be made to show that releases to the general environment during normal operations and anticipated occurrences will be within the exposure limit given in § 72.104. Analyses of design basis accidents must be made to show that releases to the general environment will be within the exposure limits given in § 72.106. Systems designed to monitor the release of radioactive materials must have means for calibration and testing their operability.

§ 72.128 Criteria for spent fuel, high-level radioactive waste, reactor-related greater than Class C waste, and other radioactive waste storage and handling.

(a) *Spent fuel, high-level radioactive waste, and reactor-related GTCC waste storage and handling systems.* Spent fuel storage, high-level radioactive waste storage, reactor-related GTCC waste storage and other systems that might contain or handle radioactive materials associated with spent fuel, high-level radioactive waste, or reactor-related GTCC waste, must be designed to ensure adequate safety under normal and accident conditions. These systems must be designed with—

(1) A capability to test and monitor components important to safety,

(2) Suitable shielding for radioactive protection under normal and accident conditions,

(3) Confinement structures and systems,

(4) A heat-removal capability having testability and reliability consistent with its importance to safety, and

(5) means to minimize the quantity of radioactive wastes generated.

(b) *Waste treatment.* Radioactive waste treatment facilities must be provided. Provisions must be made for the packing of site-generated low-level wastes in a form suitable for storage onsite awaiting transfer to disposal sites.

[53 FR 31658, Aug. 19, 1988, as amended at 66 FR 51843, Oct. 11, 2001]

§ 72.130 Criteria for decommissioning.

The ISFSI or MRS must be designed for decommissioning. Provisions must be made to facilitate decontamination of structures and equipment, minimize the quantity of radioactive wastes and contaminated equipment, and facilitate the removal of radioactive wastes and contaminated materials at the time the ISFSI or MRS is permanently decommissioned.

Subpart G—Quality Assurance

SOURCE: 64 FR 56122, Oct. 15, 1999, unless otherwise noted.

§ 72.140 Quality assurance requirements.

(a) *Purpose.* This subpart describes quality assurance requirements that apply to design, purchase, fabrication, handling, shipping, storing, cleaning, assembly, inspection, testing, operation, maintenance, repair, modification of structures, systems, and components, and decommissioning that are important to safety. As used in this subpart, “quality assurance” comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to