

Residual Heat Removal and Emergency Core Cooling Systems

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NRC Proposed Update to SFR-DC 34

A system to remove residual heat shall be provided. For normal operations and anticipated operational occurrences, the system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core to an ultimate heat sink at a rate such that specified acceptable fuel design limits and the design conditions of the primary coolant boundary are not exceeded.

During postulated accidents, the system safety function shall transfer heat from the reactor core at a rate such that fuel and clad damage that could interfere with continued effective cooling is prevented, sodium boiling is precluded, and the design conditions of the primary coolant boundary are not exceeded.

NRC Proposed Update to SFR-DC 34 (cont.)

Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to assure that ~~for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available)~~ the system safety function can be accomplished, assuming a single failure.

NRC Proposed Update to SFR-DC 34 (cont.)

A passive boundary shall separate primary coolant from the working fluid of the residual heat removal system provided that the primary coolant and the working fluid of the residual heat removal system are chemically compatible such that postulated leakage between the two systems does not result in degradation of structures, systems or components important to safety, or challenge the fuel design limits.

NRC Proposed Update to SFR-DC 34 (cont.)

~~In addition, the working fluid of residual heat removal system shall be at a higher pressure than the primary coolant system.~~

The residual heat removal system shall be designed such that any potential loss of inventory from the primary to residual heat removal system is limited so as to maintain the specified acceptable fuel design limits and the design conditions of the primary coolant boundary are not exceeded.

NRC Proposed Update to ARDC 35

Emergency core cooling. If the system as described in ARDC 34 does not provide continuous effective core cooling during postulated accidents and does not assure that the design conditions of the reactor coolant boundary are preserved; then a system to provide abundant emergency core cooling shall be provided. The system safety function shall be to transfer heat from the reactor core following any loss of reactor coolant such that continuous effective core cooling is maintained.

Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that ~~for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available)~~ the system safety function can be accomplished, assuming a single failure.