

3.6 Design Reliability Assurance Program

Design Description

The Design Reliability Assurance Program (D-RAP) is a program that will be performed during the detailed design and equipment specification phase prior to initial fuel load. The D-RAP evaluates and prioritizes the structures, systems and components (SSCs) in the design, based on their degree of risk significance. The D-RAP will identify the dominant failure modes for the risk-significant SSCs. The D-RAP will also identify the key assumptions and risk insights for the risk-significant SSCs.

The D-RAP scope includes risk-significant SSCs as determined by probabilistic, deterministic, or other methods used for design certification to identify and prioritize risk-significant SSCs.

The D-RAP purpose is to provide reasonable assurance that the plant design proceeds in a manner that is consistent with the original bases and design assumptions for the risk insights for the risk-significant SSCs.

The D-RAP objectives are to provide reasonable assurance that the plant is designed such that: (1) it is consistent with the assumptions and risk insights for these risk-significant SSCs, (2) the risk-significant SSCs will not degrade to an unacceptable level during their design life, (3) the frequency of transients that challenge these SSCs will be acceptably low, and (4) these SSCs will function reliably when challenged.

Inspections, Tests, Analyses and Acceptance Criteria

Table 3.6 provides a definition of the inspections, tests, analyses, and associated acceptance criteria, which will be performed for Advanced Boiling Water Reactor (ABWR)D-RAP.

Table 3.6 Design Reliability Assurance Program

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The Design Reliability Assurance Program (D-RAP) includes: scope, purpose, objectives; the process used to evaluate and prioritize the structures, systems and components (SSCs); and the list of SSCs designated as risk-significant at the time of COL issuance. For those SSCs designated as risk-significant, the process used to determine dominant failure modes considered industry experience, analytical models, and applicable requirements. Also, for those SSCs designated as risk-significant, their design is consistent with the key assumptions and risk insights from probabilistic, deterministic, and other methods of analysis used to identify and quantify risk, and considered operations, maintenance, and monitoring activities.	1. Inspections of the design reliability assurance program (D-RAP) will be conducted. Also, an analysis is performed to demonstrate that the initial design of all D-RAP SSCs has been completed in accordance with the D-RAP.	1. a. Documentation exists that describes the scope, purpose, and objectives of D-RAP used during plant design, and concludes that the detailed initial design of risk-significant SSCs identified at the time of the COL issuance is consistent with the D-RAP Design Description, and has been subject to the applicable reliability assurance activities of the D-RAP. b. Documentation exists and concludes that the process (probabilistic, deterministic, or other methods) used to evaluate and prioritize the SSCs in the design is based on the risk– significance of the SSCs. c. A list of SSCs exists that is based on the risk-significance of SSCs.

Table 3.6 Design Reliability Assurance Program (Continued)

	<div>d. For those SSCs designated as risk significant:<div><div>i) Documentation exists and concludes that the process to determine dominant failure modes considered industry experience, analytical models, and applicable requirements.</div></div></div> <div>1. Documentation exists and concludes that the key assumptions and risk insights from probabilistic, deterministic, or other methods considered operations, maintenance, and monitoring activities</div>
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