Draft

Request for Additional Information No. 104 (1344, 1447, 1468, 1475), Revision 0

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U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.03 - Inspections, Tests, Analyses, and Acceptance Criteria
SRP Section: 14.03.11 - Containment Systems and Severe Accidents - Inspections, Tests, Analyses, and Acceptance Criteria
SRP Section: 14.03.07 - Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: FSAR Ch. 14

QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)

14.03-1

a. Primary Containment

1. FSAR Section 6.2.1.1 describes possible events which might produce a negative containment pressure. Provide as an ITAAC requirement, verification that the as built containment can withstand the design maximum negative differential pressure across the containment building external wall.

2. The Containment Building is separated into a central portion containing the reactor system and a peripheral lower temperature portion containing equipment. Separation is accomplished by compartment walls, foils, doors, and dampers. The foils are located above the steam generator compartments and are designed to open at a fraction of a psi. The doors and dampers, located at lower elevations, must also open to avoid stratification so that steam flowing to the containment dome can circulate down the containment walls to reach the heat structures and the containment lower elevations. The doors and dampers are designed to open at various pressures from a few psi to greater than 13 psi. Provide as an ITAAC requirement verification that the opening characteristics of the foils, doors and dampers assumed in the analyses will be present for the as-built plant.

3. The size of the vent openings between containment compartments is important in analyses of containment mixing following design basis events as well as in beyond design basis events evaluated for hydrogen control. In addition the vent opening size is important for the evaluation of the short term pressure increase within containment subcompartments. Provide an ITAAC dealing with the flow areas of vent openings which will ensure that the vent openings are consistent with the values assumed in the safety analyses for containment mixing and for short term subcompartment pressure analysis.

4. For the containment subcompartments containing high energy lines for which an overpressure analysis was performed as described FSAR Section 6.2.1.2, provide

an ITAAC to verify that the subcompartments were built to withstand pressures up to the design pressures assumed in FSAR Section 6.2.1.2.

b. Accident Response Instrumentation

1. FSAR Table 14.3-7 describes safety-significant containment instrumentation as containment pressure, containment water level, containment hydrogen concentration and containment radiation intensity. Provide justification that this instrumentation is sufficient for operators to deal with design and beyond design basis containment related events and justify that the information provided in Tier 1 adequately describes the test, analysis and acceptance criteria for this equipment for the as-built plant.

14.03.11-1

a. Hydrogen Generation and Control System

1. Expand FSAR Tier 1 Table 2.3.1-2, combustible gas control system (CGCS) ITAAC, to include the number and location of all the rupture and convection foils assumed in the severe accident analysis. Provide as an ITAAC requirement that this equipment will be present for the as-built plant.

2. Complete FSAR Tier 1, Table 2.3.1-1, CGCS Equipment Design to include every passive autocatalytic recombiner (PAR) assumed in the severe accident analysis and the location of each.

b. Hydrogen Monitoring System

1. Provide the high range hydrogen monitoring system (HMS) equipment to Table 2.4.14-1, so that the HMS ITAAC will verify both the low range and the high range HMS equipment.

c. Containment Isolation

1. Review FSAR Tier 2, Table 6.2.4-1, Containment Isolation Valve and Actuator Data, and provide the ITAAC for the required containment isolation valve closure times in the DCA Tier 1 Chapter 2 or Chapter 3.5. Correct any discrepancies in FSAR Tier 1 Table 6.2.4-1.

2. Provide an ITAAC for the containment isolation valves (CIVs) outside containment that would verify that the CIV location does not exceed the maximum allowable distance from the containment wall to the first outside CIV. These distances are expected to be provided in FSAR Tier 2, Table 6.2.4-1. This ITAAC should be provided in the affected sections of FSAR Tier 1, Chapter 2 and FSAR Tier 1 Section 3.5.

14.03.11-2

Analysis Input Parameters Cross Reference

Tables 14.3-1 through 14.3-8 should be expanded and / or completed to include all key parameters and insights from design basis and severe accident analyses. ITAACs should be

provided to verify these parameters. For example, Table 14.3-1, DBA (Safety Significant Features) and Table 14.3-2, Radiological Analyses (Safety Significant Features) should include the containment isolation valve closure times used as input in the transient or accident analyses. Table 14.3-6, PRA and Severe Accident Analysis, should include a debris screen in the SAHRS suction line in the IRWST.

14.03.07-1

HVAC systems Tier 1 entry criteria

The HVAC systems are described in FSAR Tier 2 Chapters 6.2.3, 6.4, and 9.4. The Tier 1 information is described in Chapter 2.6. There are a number of functions of the HVAC systems that are not identified in Tier 1 or verified through ITAAC. Additionally, the EPR FSAR has seven HVAC systems that do not have Tier 1 Section 2.6 entries. There are also no ITAAC items identified for them. These seven systems are: Nuclear Auxiliary Building Ventilation System, Access Building Ventilation System, Radioactive Waste Building Ventilation System, Smoke Confinement System, Main Steam and Feedwater Valve Room Ventilation System, Switchgear Building Ventilation System, and Turbine Building Ventilation System.

For the following functions please provide appropriate ITAAC at a level of detail commensurate with the safety significance, or provide a description of why the functions do not need to be verified through ITAAC. Additional guidance can be found in SRP 14.3.7.

- Tornado and Missile protection (GDC-4)
- Control of radioactive material (GDC-60)
- Alarm, control and indication (Regulatory 1.97)
- Seismic and structure capability (GDC-2 including non-safety systems)
- Fire protection (GDC-3)