FUNCTIONAL ARRANGEMENT ITAAC

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Question !

- When referenced, do the TIER 1 Figures and Tables limit the scope of inspection required for the Functional Arrangement ITAAC ?
  - Let's see!

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Why the question ?

- **Differing views, with respect to the required scope of inspection, were identified:**
  - **Only SSCs provided in the Tier 1 figure (or tables)**

vs.

  - **All SSCs necessary for the system to perform the function(s) described in the design description, whether or not shown in the Tier 1 figures and tables.**

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AP 1000 Definitions -

- **Functional Arrangement (for a system) means the *physical arrangement of systems and components to provide the service* for which the system is intended, and which is *described in the* system *design description*.**

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The Staff's Position -

- **A licensee is required to verify the physical arrangement of systems or components not explicitly referenced in any tables or figures if that component is necessary to provide the intended system service as described in the design description.**

Table 2.1.2-4 Inspections, Tests, Analyses, and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The functional arrangement of the RCS is as described in the Design Description of this Section 2.1.2.	Inspection of the as-built system will be performed.	The as-built RCS conforms with the functional arrangement described in the Design Description of this Section 2.1.2.

Design Description

The reactor coolant system (RCS) removes heat from the reactor core and transfers it to the secondary side of the steam generators for power generation. The RCS contains two vertical U-tube steam generators, four sealless reactor coolant pumps (RCPs), and one pressurizer.

The RCS is as shown in Figure 2.1.2-1 and the component locations of the RCS are as shown in Table 2.1.2-5.

1. The functional arrangement of the RCS is as described in the Design Description of this Section 2.1.2.

What is the impact ?

- Does not require anything beyond current processes for system walkdown & turnover.
- Consistent with revised and accepted ICN.
- Establishes a common expectation of what the ITAAC requires.

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AP 1000 Revision 19

- 45 Functional Arrangement ITAAC (Systems)
- 1 Physical Arrangement ITAAC (Buildings)
  - 24 Refer to a Figure and Table
  - 13 Refer only to a Table
  - 2 Refer only to a Figure
  - 7 Do not refer to either

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AP 1000

Table only

- FHS Fuel Handling
- **RXS Reactor**
- MHS Mech Handling
- VLS H2 Control
- DAS Diverse Actuation
- WSS Solid Waste
- DTS Demin H2O
- CAS Comp air & IA
- CDS Condensate
- ZOS Diesel Generators
- VAS Rad Vent
- VCS Cont. Cooling
- MTS MN Turbine

Figure only

- PSS Primary Sampling
- WRS Equip & Floor Drains

No Figure or Table

- FWS Startup FW
- **PLS Plant Control**
- **DDS Data Display & Process**
- IIS In-core Instrument
- SMS Special Monitoring
- SJS Seismic Monitoring
- ELS Lighting

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2.1.3 Reactor System

Design Description

The reactor system (RXS) generates heat by a controlled nuclear reaction and transfers the heat generated to the reactor coolant, provides a barrier that prevents the release of fission products to the atmosphere and a means to insert negative reactivity into the reactor core and to shutdown the reactor core.

The reactor core contains a matrix of fuel rods assembled into fuel assemblies using structural elements. Rod cluster control assemblies (RCCAs) are positioned and held within the fuel assemblies by control rod drive mechanisms (CRDMs). The CRDMs unlatch upon termination of electrical power to the CRDM thereby releasing the RCCAs. The fuel assemblies and RCCAs are designed in accordance with the principal design requirements.

The RXS is operated during normal modes of plant operation, including startup, power operation, cooldown, shutdown and refueling.

The component locations of the RXS are as shown in Table 2.1.3-3.

1. The functional arrangement of the RXS is as described in the Design Description of this Section 2.1.3.

2. a) The reactor upper internals rod guide arrangement is as shown in Figure 2.1.3-1.

   b) The rod cluster control and drive rod arrangement is as shown in Figure 2.1.3-2.

   c) The reactor vessel arrangement is as shown in Figure 2.1.3-3.

2.5.3 Plant Control System

Design Description

The plant control system (PLS) provides for automatic and manual control of nonsafety-related plant components during normal and emergency plant operations. The PLS has distributed controllers and operator controls interconnected by computer data links or data highways.

1. The functional arrangement of the PLS is as described in the Design Description of this Section 2.5.3.

2. The PLS provides control interfaces for the control functions listed in Table 2.5.3-1.

Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.5.3-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the PLS.

2.5.4 Data Display and Processing System

Design Description

The data display and processing system (DDS) provides nonsafety-related alarms and displays, analysis of plant data, plant data logging and historical storage and retrieval, and operational support for plant personnel. The DDS has distributed computer processors and video display units to support the data processing and display functions.

1. The functional arrangement of the DDS is as described in the Design Description of this Section 2.5.4.

2. The DDS, in conjunction with the operator workstations, provides the following function:

   The DDS provides for the minimum inventory of displays, visual alerts, and fixed position controls, as identified in Table 2.5.4-1. The plant parameters listed with a "Yes" in the "Display" column and visual alerts listed with a "Yes" in the "Alert" column can be retrieved at the remote shutdown workstation (RSW). The controls listed with a "Yes" in the "Control" column are provided at the RSW.

3. The DDS provides information pertinent to the status of the protection and safety monitoring system.