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AP1000 DCWG Plan for I&C Design Acceptance Criteria (DAC)

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October 25, 2011

Agenda

- I&C DAC Status
- Scope of CIM DAC
- CIM DAC Closure Strategy
- CIM DAC Documentation
- I&C ITAAC Strategy & Schedule
- Future Interactions

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I&C DAC Status

- The following PMS & DAS DACs were completed in the DCD Amendment:
 - PMS 2.5.2-11a – Design Requirement Phase (Completed but new DAC opened for CIM)
 - PMS 2.5.2-11b – System Definition Phase (DAC portion complete; ITAAC for Requirements documents and V&V Report remain)
 - DAS 2.5.1-4 - Design Requirement Phase (Completed)
 - DAS 2.5.1-4 - System Definition Phase (Completed)Other I&C ITAACs are not considered DAC with one exception, see below.
- The following I&C DAC remains open:
 - PMS 2.5.2-14 – CIM Development Process

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Scope of CIM DAC

- CIM architecture and design were technically approved by the NRC.
 - WCAP-17179 Rev. 2 “AP1000 Component Interface Module Technical Report”
 - DCD FSER Supplement 2
- CIM Design Requirement Phase scope is:
 - Provide planning documentation to the NRC for inspection in accordance with NUREG-0800 BTP 7-14 (planning phase of SLC)

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CIM DAC / ITAAC

- Design Commitment (DCD 2.5.2):
The Component Interface Module (CIM) is developed using a planned design process which provides for specific design documentation and reviews.
- Inspections, Tests, Analyses (DCD Table 2.5.2-8, Item 14):
An inspection and or an audit will be performed of the processes used to design the hardware, development software, qualification and testing.
- Acceptance Criteria:
A report exists and concludes that CIM meets the below listed life cycle stages.

Life cycle stages:
 - a. Design requirements phase, may be referred to as conceptual or project definition phase
 - b. System definition phase
 - c. Hardware and software development phase, consisting of hardware and software design and implementation
 - d. System integration and test phase
 - e. Installation phase

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CIM DAC Closure Strategy

The following strategy can be used for closing CIM DAC. We need to reach agreement on schedule needs and consistency with closing ITAACs:

- Since procedures are ready, provide an overarching document (roadmap) for the CIM development process and make the roadmap plus the process plans/procedures ready for an NRC inspection (Apr 2012).

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CIM DAC Documentation

Provide the following for inspection and closure of ITAAC

- CIM planning / overarching document
- BTP 7-14 planning documentation
- CIM-related procedures

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ITAAC Strategy and Schedule

AP1000 I&C Systems

I&C Systems ITAAC

- I&C Systems ITAAC are in Section 2.5.1 and 2.5.2 of Tier 1 of the AP1000 DCD.
- 2.5.1 – Diverse Actuation Systems
 - ITAAC of interest – 2.5.01.04
- 2.5.2 – Protection and Safety Monitoring System
 - ITAACs of interest – 2.5.02.11, 2.5.02.12, and 2.5.02.13

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I&C ITAAC 2.5.01.04

- The DAS hardware and any software are developed using a planned design process which provides for specific design documentation and reviews during the following life cycle stages:

- a) Development phase for hardware and any software
- b) System Test phase
- c) Installation Phase

The planned design process also provides for the use of commercial off-the-shelf hardware and software.

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I&C ITAAC 2.5.2.11 (b,c,d,e)

- The PMS hardware and software is developed using a planned design process which provides for specific design documentation and reviews during the following life cycle stages

- b) System definition phase

- c) Hardware and software development phase, consisting of hardware and software design and implementation

- d) System integration and test phase

- e) Installation phase

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I&C ITAAC 2.5.2.12

- The PMS software is designed, tested, installed, and maintained using a process which incorporates a graded approach according to the relative importance of the software to safety and specifies requirements for:
 - a) Software management including documentation requirements, standards, review requirements, and procedures for problem reporting and corrective action.
 - b) Software configuration management including historical records of software and control of software changes.
 - c) Verification and validation including requirements for reviewer independence.

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I&C ITAAC 2.5.2.13

•The use of commercial grade computer hardware and software items in the PMS is accomplished through a process that specifies requirements for:

- a) Review of supplier design control, configuration management, problem reporting, and change control.
- b) Review of product performance.
- c) Receipt acceptance of the commercial grade item.
- d) Acceptance based on equipment qualification and software validation in the integrated system.

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Timing of closure of the ITAACs

- The four ITAACs have varying closure activities and timing.
 - Definition and management phases are completed early in the process.
 - System Integration Testing is performed before being shipped to the site.
 - Installation Testing would be completed on site and is dependent on construction schedule.
 - As we develop the Plans for ITAAC closure links will be provided in the ITAAC schedule that tie each distinct activity to the ITAAC closure.

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Example I&C ITAAC 2.5.2.11 (b,c,d,e)

- The PMS hardware and software is developed using a planned design process which provides for specific design documentation and reviews during the life cycle phases
 - Schedule:
 - b) System Definition - February 2012 (est.)
 - c) through e): TBD
 - Report: One report plus design outputs for Systems Definition phase, only design outputs for subsequent stages
 - Inspection Documents:
 - b) WCAP-17420 “AP1000 Protection and Safety Monitoring System (PMS) Tracing Methodology for the System Definition Phase”, plus design outputs
 - c) through e): design outputs to be identified

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One Inspection/One Review Concept

- Parts of the ITAAC (Definition/Management Phases, etc.) will be common across the Licensees.
- Parts (Installation, etc.) are definitely Unit specific.
- One Inspection/One Review is most efficient for all parties.
 - Each Licensee would confirm they have not made any changes different than what was reviewed as part of the first inspection.
 - Confirmatory inspection could be utilized for S-COLs that rely on standard documentation
- How could this process be documented within NRC?
 - Standard CIPMS entry that would be applicable to all AP1000s?
 - Standard inspection report that would be documented by Licensee?

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Future Interactions

Questions



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