Initial Test Program

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Division of Construction Inspection & Operational Programs
Office of New Reactors, U.S. NRC

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Introduction

- Last initial test program meeting held on 6/19/2013
- Next ITP public meeting scheduled for 11/20/2013 at the Vogtle site training center
- Update on NRC inspection guidance for pre-operational tests
- First of a Kind (FOAK) tests
- Start development of NRC inspection guidance for startup and power ascension
- NRC Feedback from China Trips on “Commissioning”

NRC Inspection Guidance For AP1000 Initial Test Program (ITP)

NRC Inspection Objectives for the Preoperational Test Program

- Sampling inspections that are performance based. All FOAK tests are targeted for inspection.
- Verify that construction tests are completed before preoperational tests begin.
- Preoperational Tests in the AP1000 Design meet Preoperational Test Inspections, Tests, Analyses and Acceptance Criteria (ITAAC)
- Verify that Preoperational Tests in the AP1000 Design meet DCD/FSAR Test Commitments and Test Acceptance Criteria in DCD/FSAR Section 14.2

NRC Inspection Guidance For AP1000 Initial Test Program (ITP)

NRC Inspection Plans for Vogtle Units 3 and 4 V.C. Summer Units 2 and 3

- NRC HQ/RII staff developed:
  - IP 70367, Inspection of the Preoperational Test Program
  - IP 70702, Inspection of the Preoperational Test Performance
  - IP 72401, Inspection of the Startup Test Program
  - NRC Inspection Planning Tool for the AP1000 Combined License Preoperational Test Program, System Level Preoperational Testing ITAAC and License Condition Preoperational Testing
- The NRC inspectors may expand the scope of Preoperational Tests to risk significant NT-ITAAC if licensee performance problems are found with completion of Preoperational Test T-ITAAC.

FOAK Tests

FOAK Tests include:

- UFSAR Subsection 14.2.9.1.3, Passive Core Cooling System Test
  - Item (h), IRWST Heat Up Test
  - Item (k), Core makeup Tank Heated Recirculation Test
  - Item (s), Automatic depressurization system (ADS) Blowdown Test
  - Item (w), Core Makeup Tank Transition from Recirculation Mode to Drain-down Mode after Heat Up
- UFSAR Section 14.2.9.1.7, Item (d), Pressurizer Surge Line Stratification Evaluation
- UFSAR Section 14.2.9.1.9, Reactor Vessel Internal Vibration Testing (Prototype Plant Test)

FOAK TEST

Passive Core Cooling System Test, UFSAR Subsection 14.2.9.1.3 , Item (h), IRWST Heat Up Test

A. Simulation of the reactor vessel cooling during a severe accident/IRWST drain line flow test (T-ITAAC 2.2.3.9a.i)

- During this test the regional inspectors will observe the performance of the IRWST drain line flow resistance test using the guidance in the IMC 2503 and IMC 2504 Inspection Procedures.
- The inspector will verify that the calculated flow resistance meets the acceptance criteria listed in the ITAAC.

B. Heat-up characteristics of the in-containment refueling water storage tank water

- This test is performed to verify heat-up characteristics of the in-containment refueling water storage tank water by measuring the vertical water temperature gradient that occurs in the in-containment refueling water storage tank water at the passive residual heat removal heat exchanger tube bundle and at several distances from the tube bundle, during testing of test items (e) which is prerequisite to test item (h).
- The inspector will verify that the RCS safe shutdown temperature meets the acceptance criterion provided in DCD subsection 19.E.4.10.2. Note that this verification is required only for the first plant.

FOAK TESTS

Passive Core Cooling System Test, Item UFSAR Subsection 14.2.9.1.3, item (h), IRWST Heat Up Test

C. Passive core cooling system emergency makeup and boration function

- The passive core cooling system emergency makeup and boration function is verified through test items (c), (f), (g), (I), (k) and (w) that are prerequisite to test item (h).

- The inspector should observe at a minimum the test items (c) to verify readiness of safety related components listed in item (c).

Startup & Power Ascension Tests

- Developing inspection procedure for NRC inspection of the “Startup & Power Ascension Test Program”
- Similar to Part 50 experience since all ITAAC have been completed prior to the initial fuel load
- NRR involvement – transition between NRO/NRR
- Inspection procedure(s) planned for the implementation of startup & power ascension tests
- Plan to complete by July 1, 2014

Recent NRC Trips To China on "Plant Commissioning"

Purpose

- Establish a working level information exchange on ITP activities between the vendor, licensee & regulator
- Two recent trips: EPR design multinational design evaluation programme (MDEP) meeting; and, an NRC/China Bilateral meeting at the Sanmen Site
- Gain better understanding of lessons learned from China's ITP
- Discuss and compare regulatory and licensing processes for the ITP
- Discuss cooperative Inspector exchanges for inspection preparation and actual ITP test witnessing
- Discuss cooperative information exchanges related to new reactors, vendor, manufacturing and ITP of the AP1000

Recent NRC Trips To China on "Plant Commissioning"

Sanmen Site Visit - Meeting Summary

- Extensive discussions on licensing & inspection of ITP activities, including preoperational test procedure development
  - NRC IP 70702 (in concurrence process)
  - NRC IP 70367 (draft)
  - NRC Preoperational Test Program Inspector Planning Tool (draft)
- Information exchange on component & manufacturing issues
  - RCP Impeller and bolt issues
- NRC Lessons Learned from China's NNSA on inspection findings during construction and operating experience
- Establish Points of Contacts (POCs) for the ITP schedule to coordinate NRC inspection related to the licensees ITP Schedule