PMLevyCOLPEm Resource

From: Anderson, Brian
Sent: Tuesday, June 01, 2010 10:12 AM
To: LevyCOL Resource
Subject: FW: Information for Progress Energy Levy June 8 Telecon with NRC
Attachments: NRC June 08, 2010 Public Telecon Presentation.ppt

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From: Waters, David [mailto:David.Waters@pgnmail.com]
Sent: Friday, May 28, 2010 11:28 AM
To: Spicher, Terri
Cc: Anderson, Brian
Subject: Information for Progress Energy Levy June 8 Telecon with NRC

Terri

The attached file is what Progress Energy plans to discuss with the NRC staff on the proposed June 8, 2010 public-noticed call regarding RCC testing plans. I will confirm that you got this E-mail.

Dave Waters
Progress Energy Nuclear Plant Development - Licensing
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Hearing Identifier: Levy_County_COL_Public
Email Number: 662

Mail Envelope Properties (B46615B367D1144982B324704E3BCEED21F13276C4)

Subject: FW: Information for Progress Energy Levy June 8 Telecon with NRC
Sent Date: 6/1/2010 10:12:08 AM
Received Date: 6/1/2010 10:12:10 AM
From: Anderson, Brian

Created By: Brian.Anderson@nrc.gov

Recipients:
"LevyCOL Resource" <LevyCOL.Resource@nrc.gov>
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Files	**Size**	**Date & Time**
MESSAGE	549	6/1/2010 10:12:10 AM
NRC June 08, 2010 Public Telecon Presentation.ppt	597570	

Options
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NRC Public Telecon
Levy Units 1 and 2
NRC Letter 086 RAI 03.08.05-04

RCC Test Program

June 08, 2010

Progress Energy

NRC Letter 086 RAI 03.08.05-4
RCC Test Program Outline

- RCC Test Program description will be submitted as the initial response to NRC Letter 086 RAI 03.08.05-4. Test program will consist of the following:
  - RCC Test Program and Results from Large Commercial Construction Project
  - LNP RCC Mix and Bedding Mix Design
  - LNP Laboratory Specialty Testing
  - LNP RCC Pad Test for Constructability
  - LNP RCC Quality Control Tests during Construction
- Schedule
  - July 2010 – Initial response to RAI 03.08.05-4

NRC Letter 086 RAI 03.08.05-4
Large Commercial Project - RCC Testing

- RCC Test Program and Results from Large Commercial Construction Project (RCC Dam)
  - RCC Mix and Bedding Mix design process and mix constituents
  - Compressive strength, direct shear strength, and thermal property test results
  - RCC Pad Test – testing and inspections performed
  - RCC Quality Control Tests performed during Construction
- Schedule
  - Summary Report (July 2010) – Initial response to RAI 03.08.05-4

NRC Letter 086 RAI 03.08.05-4
LNP RCC Mix and Bedding Mix Design

- LNP RCC Mix and Bedding Mix Design
  - Series of RCC trial mixes to evaluate strength (f'_c) and workability
  - Series of Bedding trial mixes for strength and workability
  - Select two RCC mixes and one Bedding mix for the Specialty Laboratory Testing Program
- Schedule
  - 56-day Strength Test Report (January 2011) – Supplement 1 to RAI 03.08.05-4 response
  - 365-day Strength report (December 2011) – Supplement 3 to RAI 03.08.05-4 response

NRC Letter 086 RAI 03.08.05-4
LNP RCC Mix Design

- LNP RCC Mix Design
  - Series of RCC trial mixes
  - Evaluate effects of water/cementitious ratio and admixtures on strength and workability
  - For Strength, use 30 cylinders cast per mix for strength testing
    - Compressive Strength (3, 7, 28, 56, 90, 180, 365 days)
    - Split Tensile Strength (3, 7, 28, 56, 90, 180, 365 days)
    - Modulus of Elasticity (3, 7, 28, 56, 90, 180, 365 days)
    - Accelerated Compressive Strength (14 days)
  - For Workability inspection plus Vebe tests will be used
    - Workability will be further verified during pre construction RCC Pad Test

NRC Letter 086 RAI 03.08.05-4
LNP Bedding Mix Design

- LNP Bedding Mix Design
  - Bedding Mix trial mixes
  - Evaluate effects of water/cement ratio and admixtures on strength and workability
  - Evaluate effects of aggregate size
  - 10 cylinders cast per mix for strength testing:
    - Compressive Strength (3, 7, 28 days)
    - Split Tensile Strength (3, 7, 28 days)
    - Modulus of Elasticity (3, 7, 28 days)

NRC Letter 086 RAI 03.08.05-4
LNP RCC Laboratory Specialty Test Program

- LNP Laboratory Specialty Test Program
  - Construct RCC pad in the laboratory for direct shear and direct tension samples
  - Test samples from two RCC mixes and one Bedding mix for direct shear and direct tension strength across lift joints to show designed mixes yield adequate strength for design
  - Measure shear wave velocity measurements on test cylinders
  - Measure RCC thermal properties
- Schedule
  - 90-day Specialty Test Report (April 2011) – Supplement 2 to RAI 03.08.05-4 response
  - 180-day Specialty Test Results (July 2011)
  - 365-day Specialty Test Report (December 2011) – Supplement 3 to RAI 03.08.05-4 response

NRC Letter 086 RAI 03.08.05-4
LNP RCC Specialty Testing – Direct Shear

- Direct Shear Testing
  - Determine peak and residual ϕ and C
  - Multiple replicates will be tested at each of three test ages
    - Four mix/joint conditions will be evaluated

MIX / JMV	TESTS @ 90 DAYS	TESTS @ 180 DAYS	TESTS @ 365 DAYS
Mix I / < 2000 Deg hr	✓	✓	✓
Mix I / >3000 Deg hr	✓	✓	✓
Mix II / < 2000 Deg hr	✓	✓	✓
Mix II / >3000 Deg hr	✓	✓	✓

NRC Letter 086 RAI 03.08.05-4
LNP RCC Specialty Testing – Direct Tension

- Direct Tensile Testing
  - Evaluate tensile strength across the lift joint
  - Multiple replicates will be tested at each of three test ages
    - Four mix/joint conditions will be evaluated

MIX / JMV	TESTS @ 90 DAYS	TESTS @ 180 DAYS	TESTS @ 365 DAYS
Mix I / < 2000 Deg hr	✓	✓	✓
Mix I / >3000 Deg hr	✓	✓	✓
Mix II / < 2000 Deg hr	✓	✓	✓
Mix II / >3000 Deg hr	✓	✓	✓

NRC Letter 086 RAI 03.08.05-4
LNP RCC Specialty Testing – Thermal

- RCC Thermal Property Measurement
  - Measure thermal properties of RCC to prevent mass gradient thermal cracking of the RCC Bridging Mat
  - Actual thermal properties will be used in finite element model and in developing temperature specifications during construction
  - Thermal Tests to be Performed:
    - CRD-C 38 – Adiabatic temperature rise in RCC
    - CRD-C 39 – Coefficient of thermal expansion of RCC
    - CRD-C 124 – Specific heat of RCC
    - CRD-C 44 – Thermal conductivity of RCC
    - CRD-C 36 – Thermal diffusivity of RCC

NRC Letter 086 RAI 03.08.05-4
LNP RCC Pad Constructability Tests

- LNP RCC Pad Test
  - Confirm RCC batch mixing and transportation process
  - Confirm construction placement techniques and workability
  - Provide training for construction personnel
  - Perform confirmatory cylinder compressive strength tests, measure RCC Pad temperature during pad construction, and measure shear wave velocity
  - Saw cut RCC pad for placement quality inspection
  - No direct shear or direct tension tests
- Schedule
  - Approximately 2-years prior to start of construction - LNP FSAR commitment

NRC Letter 086 RAI 03.08.05-4
RCC Quality Control Tests During Construction

- LNP RCC Quality Control Tests during Construction
  - Testing of the production mat will be confirmatory with Non Destructive Testing
    - Aggregate testing off aggregate conveyor
    - Drum mixing time
    - RCC density and moisture with nuclear gages
    - RCC cylinders for compression tests
    - Lift surface monitoring and inspection
  - No direct shear or direct tension tests
- Schedule
  - During construction of the RCC Bridging Mat - LNP FSAR commitment