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*This form is to be filled out (typed or hand-printed) by the person who announced the meeting (i.e., the person who issued the meeting notice). The completed form, and the attached copy of meeting handout materials, will be sent to the Document Control Desk on the same day of the meeting; under no circumstances will this be done later than the working day after the meeting.
Do not include proprietary materials.*

DATE OF MEETING

03/12/2003

The attached document(s), which was/were handed out in this meeting, is/are to be placed in the public domain as soon as possible. The minutes of the meeting will be issued in the near future. Following are administrative details regarding this meeting:

Docket Number(s)	<u>STN 50-528, STN 50-529, and STN 50-530</u>
Plant/Facility Name	<u>Palo Verde Nuclear Generating Station</u>
TAC Number(s) (if available)	<u>None.</u>
Reference Meeting Notice	<u>Notice dated 02/25/2003 (ADAMS ML030520009)</u>
Purpose of Meeting (copy from meeting notice)	<u>The licensee requested the meeting to present the status</u> <u>of its programs for dry cask storage, core reactivity</u> <u>management, and fuel performance for the three units.</u>

NAME OF PERSON WHO ISSUED MEETING NOTICE

Jack N. Donohew

TITLE

Senior Project Manager

OFFICE

Office of Nuclear Reactor Regulation

DIVISION

Division of Licensing Project Management

BRANCH

Project Directorate IV

Distribution of this form and attachments:

Docket File/Central File

PUBLIC

DF01

Nuclear Fuel Update

Palo Verde Nuclear Generating Station

March 12, 2003
Meeting with US NRC



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Review of 2002

- ◆ **May 2002 Meeting with NRR**
- ◆ **Review of Unit 2 Cycle 11**
- ◆ **CENTS Implementation**
- ◆ **Clad Performance Strategy**
- ◆ **CEA Investigation**
- ◆ **Dry Cask Storage Update**



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Agenda Today

- ◆ Reactivity Management
- ◆ CENTS & RSG/Power Uprate
- ◆ Fuel Performance
- ◆ CPC Replacement
- ◆ CEA Replacement
- ◆ Dry Cask Storage Update

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Reactivity Management

- ◆ Overview of INPO AFI
- ◆ Palo Verde Actions
- ◆ Results

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Overview

- ◆ INPO Identified
- ◆ 2001 Plant Evaluation
 - Reactivity Management AFI
 - REACTOR ENGINEERING
 - OPERATIONS

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Palo Verde Actions

- ◆ NFM/Operations/Training Interface
- ◆ Operations Single Point of Contact
- ◆ Xenon Program
- ◆ Maneuvering Box
- ◆ Procedure Enhancement
- ◆ Training

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Results

- ◆ **NO REACTIVITY EVENTS**
- ◆ **Standardized Game Plans**
- ◆ **Improved Inter-Departmental Relationships**
- ◆ **Improved Tools**

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CENTS, RSG, U2 Uprate

- ◆ **CENTS Implementation Status**
- ◆ **U2 Power Uprate Submittal**

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CENTS Implementation Status

- ◆ **GL 83-11 S1 Process for 3876 MW**
- ◆ **U1, U2 Complete - U3 April 2003**
- ◆ **SABD Revision 20% Complete**
- ◆ **Two Events Await U2 SER**
 - **SGTR + LOP + SF**
 - **Long Term FWLB (PSV Operability)**

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U2 RSG & Power Uprate

- ◆ **Draft SER 3/31 -- Final SER 6/30**
- ◆ **SABD Supplement In Progress**
- ◆ **U2C12 Reload Safety Analyses Begun**
- ◆ **Actively Participating in Development of SG Startup Test Program**

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Fuel Performance

- ◆ **Integrated Fuel Clad Strategy:**
 - Advanced Clad Alloys
 - Primary Chemistry
 - CRUD/Oxide Software
 - Low Duty Core Designs
- ◆ **Long Range Fuel Inspection Plan**

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Advanced Clad Alloys

- ◆ **Westinghouse Decision: Low Tin Zirlo**
 - Alloy A LTA in U3C10 (Spring 2003)
- ◆ **First Batches of Standard Zirlo & Columbia Fuel Rod**
 - U2C11, U1C11 (2002)
 - U3C11 In April 2003
- ◆ **Fuel Handling Accident Rod Pressure**

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Primary Chemistry

- ◆ Additional RCS Cleaning at EOC Shutdown
- ◆ Early Lithium Injection During Startups
- ◆ Elevated-Coordinated Lithium Strategy
 - Currently 7.1 pH
 - Hold Until Inconel Corrosion Issue Resolved

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CRUD/Oxide Software

- ◆ Steaming Rate in Core Design Tools
 - Screen Patterns Against U3C9 Benchmark
- ◆ APS CRUD/Oxide Model
 - Nodal Level/High Duty Ass'y Rod Level
- ◆ Vendor Fuel Duty Model
 - Safety Grade Oxide and FDI Calculations

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Low Duty Core Designs

- ◆ Increase Feed Batch Size
 - 104 vs 96 Assemblies
- ◆ Minimal Feed-Face-Feed
 - U1C10 Visuals of P1M316
- ◆ U2 Uprate Corrosion Strategy
 - Zirlo Clad
 - Re-design Lattice Pattern

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Re-Designed Lattice

- ◆ Current Lattice
 - 2 Enrichments
 - 12 High Enrichment Rods on Each Face
- ◆ New Lattice
 - 3 Enrichments
 - Same Assembly Average Enrichment
 - All Peripheral Rods Low Enrichment
- ◆ Extensive Design Review

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Long Range Fuel Inspection Plan

- ◆ Unit 2, Beginning Fall 2003
- ◆ Zirlo Oxidation (R11, R12, R13)
- ◆ Lithium 3.5 PPM (R11, R12)
- ◆ New Lattice (R12, R13)
- ◆ Assembly Bow (R11)
- ◆ Higher Burnup Leakers

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CPC Replacement

- ◆ Overview of Changes
- ◆ Licensing Schedule

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CPC Replacement Overview

- ◆ Upgrade to Modern Hardware
 - 8 CEA Calculators
- ◆ Concurrent Software Language Change
- ◆ Preserve Original Functionality & Timing
- ◆ First Installation - Fall 2003 Outage

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CPC Replacement Licensing

- ◆ SER on Westinghouse Common-Q
- ◆ Schedule for Formal RAI on PVNGS
- ◆ U2C12 Reload Engineering
 - No Impact to Safety & Uncertainty Analyses
- ◆ PVNGS Supports Joint Meeting

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CEA Replacement

- ◆ Review CEA History
- ◆ Determination of New, Conservative Lifetime
- ◆ Design of New Replacement CEAs
- ◆ Replacement of PLCEAs

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Review of CEA History

- ◆ CEA Finger Failures Observed - 2001
 - Cracks in High Fluence CEA Tips
 - Root Cause - IASCC, Inadequate Testing
 - U2/U3 With Small Pellet Less Severe
- ◆ All Full Length CEAs Replaced
 - Replaced by Design with Smallest Pellet
- ◆ Lifetime Software Abandoned

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Determination of New Lifetime

- ◆ Investigating Various Options
- ◆ Monitoring YGN Inspections
- ◆ Inconel IASCC Threshold
- ◆ Vendor Has Adjusted Software

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Design of New CEAs

- ◆ Now: Unique Feltmetal Design
- ◆ Want: Industry Standard AgInCd Tips
- ◆ Tip Region Extended 4 Inches
- ◆ Hollow AgInCd Slugs

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Replacement of PLCEAs

- ◆ **Original Equipment**
 - Part Length, Part Strength
 - Not Subject to Same Failure Mode
 - Reviewing Design Bases
- ◆ **Replacements**
 - Full Length, Part Strength
 - Transparent to Safety Analysis
 - Tech Spec Change Required

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Dry Cask Storage Update

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Dry Cask Storage Update

- ◆ **Current status Unit 2**
 - Loaded 24 assemblies in first canister March 3
 - Shield lid welded March 6
 - Completed first vacuum drying period March 8
 - March 10 will start 2nd vacuum drying period
- ◆ **Capturing lessons learned from first loading**



Fuel Loading Schedule

- ◆ Complete first canister loading in March, 2003
- ◆ Time out for Unit 3 Refueling outage, ends early May, 2003
- ◆ Complete Unit 2 campaign in June
- ◆ Load 5 casks in Unit 1 later in 2003
- ◆ Plan to load 10 casks per year



UMS Amendment 3

- ◆ Palo Verde benefits
 - Extended vacuum drying times
 - Action statements won't require submersion of Transfer Cask and Canister for cooling
 - Increased seismic limit
 - Increased PWR fuel enrichment limit
- ◆ Anticipate issuance early May 2003

