April 19, 1999

See Ltr.

LICENSEE: Arizona Public Service Company

FACILITY: Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3

SUBJECT: SUMMARY OF MEETING HELD ON APRIL 7, 1999, TO DISCUSS FUTURE ACTIVITIES AND LICENSING ACTIONS

On April 7, 1999, the NRC and the Palo Verde licensee, Arizona Public Service Company, met in Rockville, Maryland to discuss licensing actions and several issues related to future activities planned by the licensee. The four topics discussed during this meeting were (1) a proposed revision to the technical specifications to preclude double sequencing of safety-related loads, (2) the plans to replace the Palo Verde Unit 2 steam generators in 2003, (3) the development of on-site capabilities for conducting fuel reload analyses, and (4) the status of the dry cask storage facility design at the Palo Verde site. Attachments 1 through 4 are the lists of attendees for each of these topics, and Attachments 5 through 8 are the slides used by the licensee in their presentations.

It was agreed at the conclusion of the meeting that the staff and the licensee will maintain communication as developments arise on these issues

ORIG. SIGNED BY
Mel B. Fields, Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529
and STN 50-530

Attachments: 1.-4. Lists of Meeting Attendees
5.-8. Licensee's Meeting Slides

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Document Name: PV4799mts.wpd

OFC	PDIV-2	PDIV-2	PDIV-2
NAME	MFields	CJamerson	SDembek
DATE	4/19/99	4/16/99	4/19/99

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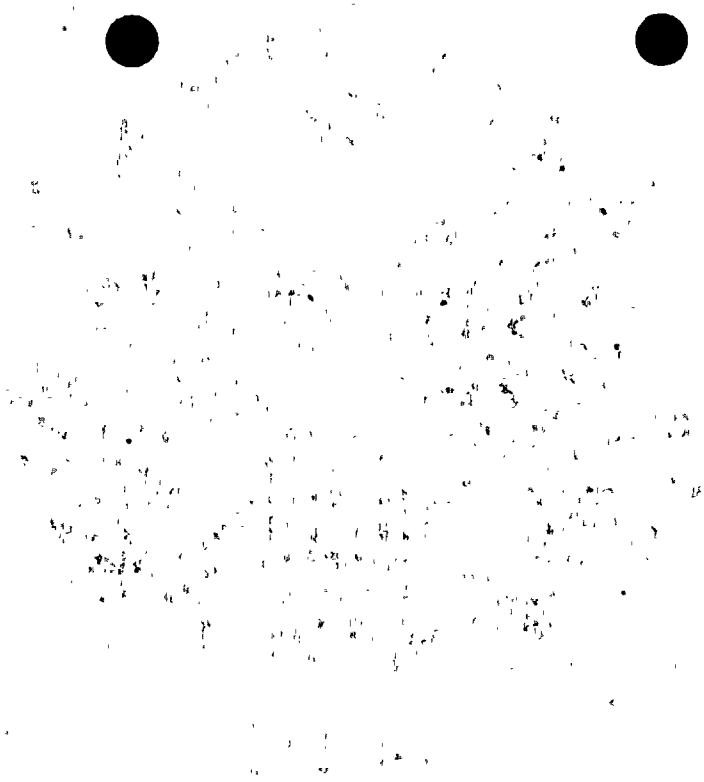

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 19, 1999

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FACILITY: Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3

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DISTRIBUTION FOR APRIL 7, 1999 MEETING WITH ARIZONA PUBLIC SERVICE COMPANY

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ALee (AJL)
LKopp (LJK)
TAttard (ACA)
TMcGinty (TJM1)
SShankman (SFS)
SO'Connor (SCO)
JLazevnick (JJL)
DThatcher (DFT)
DLange (DJL)
PHarrell, RIV (PHH)
KBrockman, RIV

MEETING ATTENDANCE

PALO VERDE NUCLEAR GENERATING STATION

DOUBLE SEQUENCING OF SAFETY-RELATED LOADS

NRC/APS

APRIL 7, 1999

ARIZONA PUBLIC SERVICE COMPANY

Scott Bauer.
Paul Crawley
Scott Burns
Harvey Leake

NRC

Mel Fields
Jim Lazevnick
Dale Thatcher
Stuart Richards
Steve Dembek

ATTACHMENT 1

MEETING ATTENDANCE

PALO VERDE NUCLEAR GENERATING STATION, UNIT 2

STEAM GENERATOR REPLACEMENT

NRC/APS

APRIL 7, 1999

ARIZONA PUBLIC SERVICE COMPANY

Scott Bauer
Paul Crawley
Paul Clifford
Carl Churchman
Richard Bernier
Rosemary Fullner
Ram Prabhakar
Sushil Daffuar
Mohammad Karbassian
Kevin Neese

ABB

Rick Bradshaw
Bill Gardner

NRC

Mel Fields
Cheryl Beardslee
Gene Imbro
Chu-yu Liang
Steve Dembek
Arnold Lee

ATTACHMENT 2

MEETING ATTENDANCE

PALO VERDE NUCLEAR GENERATING STATION

FUEL RELOAD ANALYTICAL CAPABILITY

NRC/APS

APRIL 7, 1999

ARIZONA PUBLIC SERVICE COMPANY

Brian Hansen
Scott Bauer
Paul Crawley
Rosemary Fullner
Ram Prabhakar
Bob Bandera

NAC International

Alton B. Auril

NRC

Mel Fields
Steve Dembek
Larry Kopp
Tony Attard

ATTACHMENT 3

MEETING ATTENDANCE

PALO VERDE NUCLEAR GENERATING STATION

PROPOSED DRY CASK STORAGE FACILITY

NRC/APS

APRIL 7, 1999

ARIZONA PUBLIC SERVICE COMPANY

Bob Bandera
Scott Bauer
Brian Hansen
Paul Crawley

NAC International

Alton B. Auril

NRC

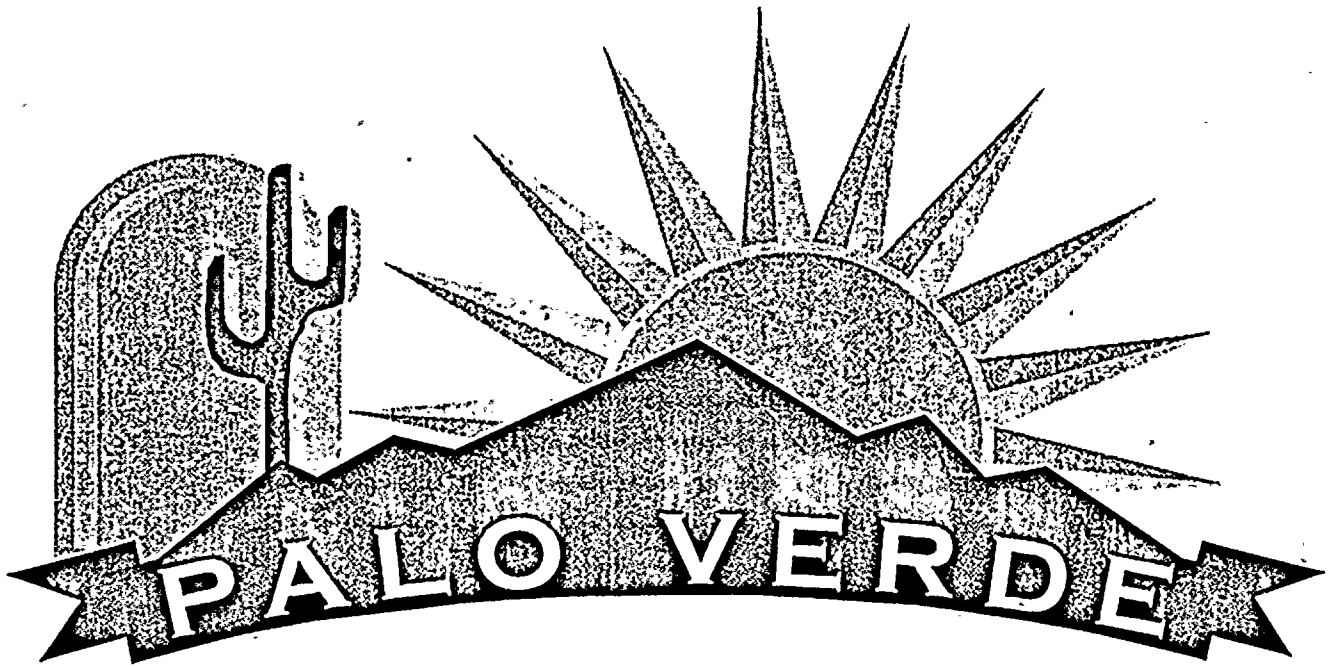
Mel Fields
Steve Dembek
Tim McGinty
Susan F Shankman
Stephen O'Connor

ATTACHMENT 4

ATTACHMENT 5

MEETING SLIDES

Tech Spec Revision for Offsite Circuits

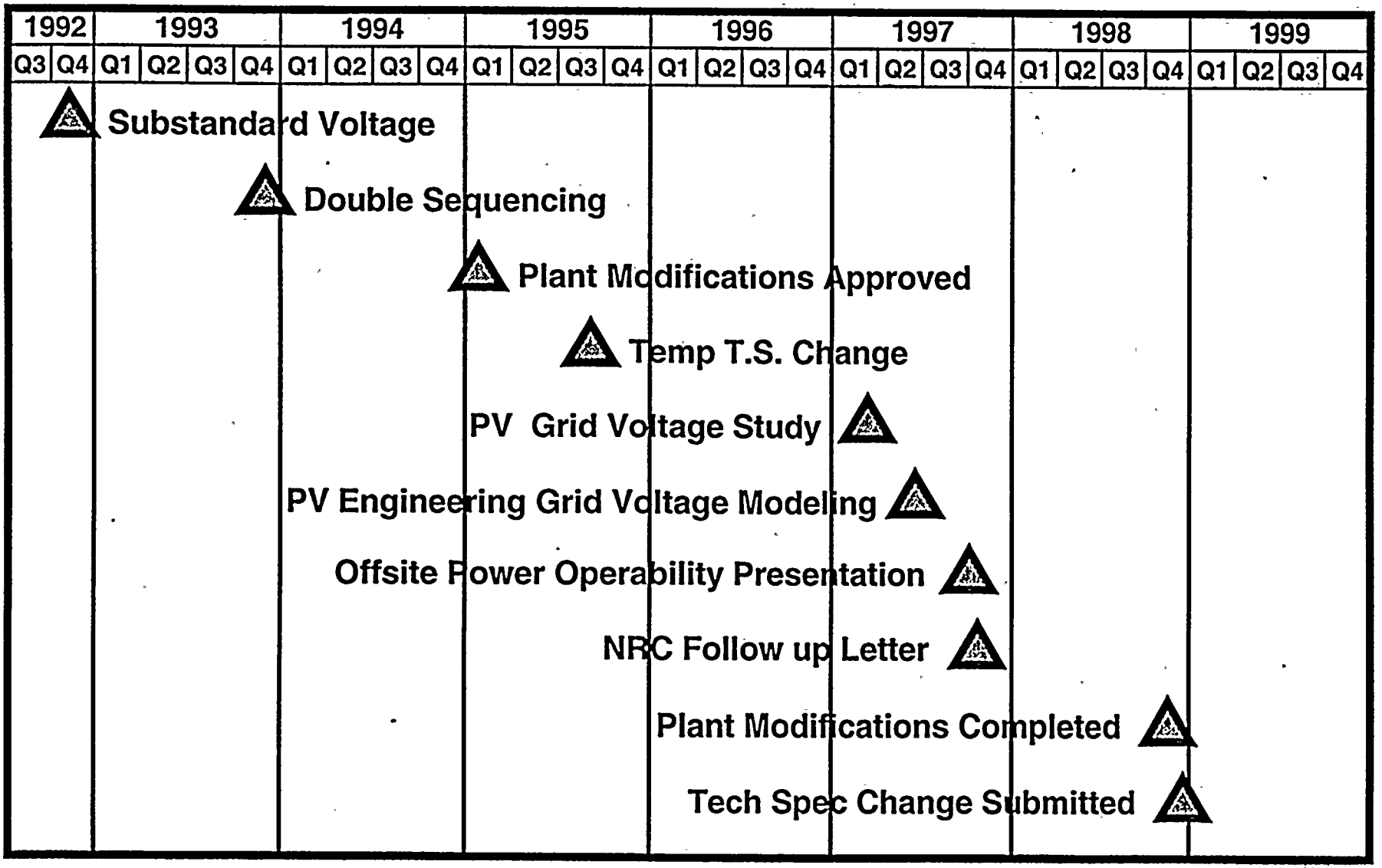


April 7, 1999

Agenda

- Substandard Voltages
- Double Sequencing
- Offsite Power Circuit Operability
- Completed Actions
- Proposed Technical Specification

Timeline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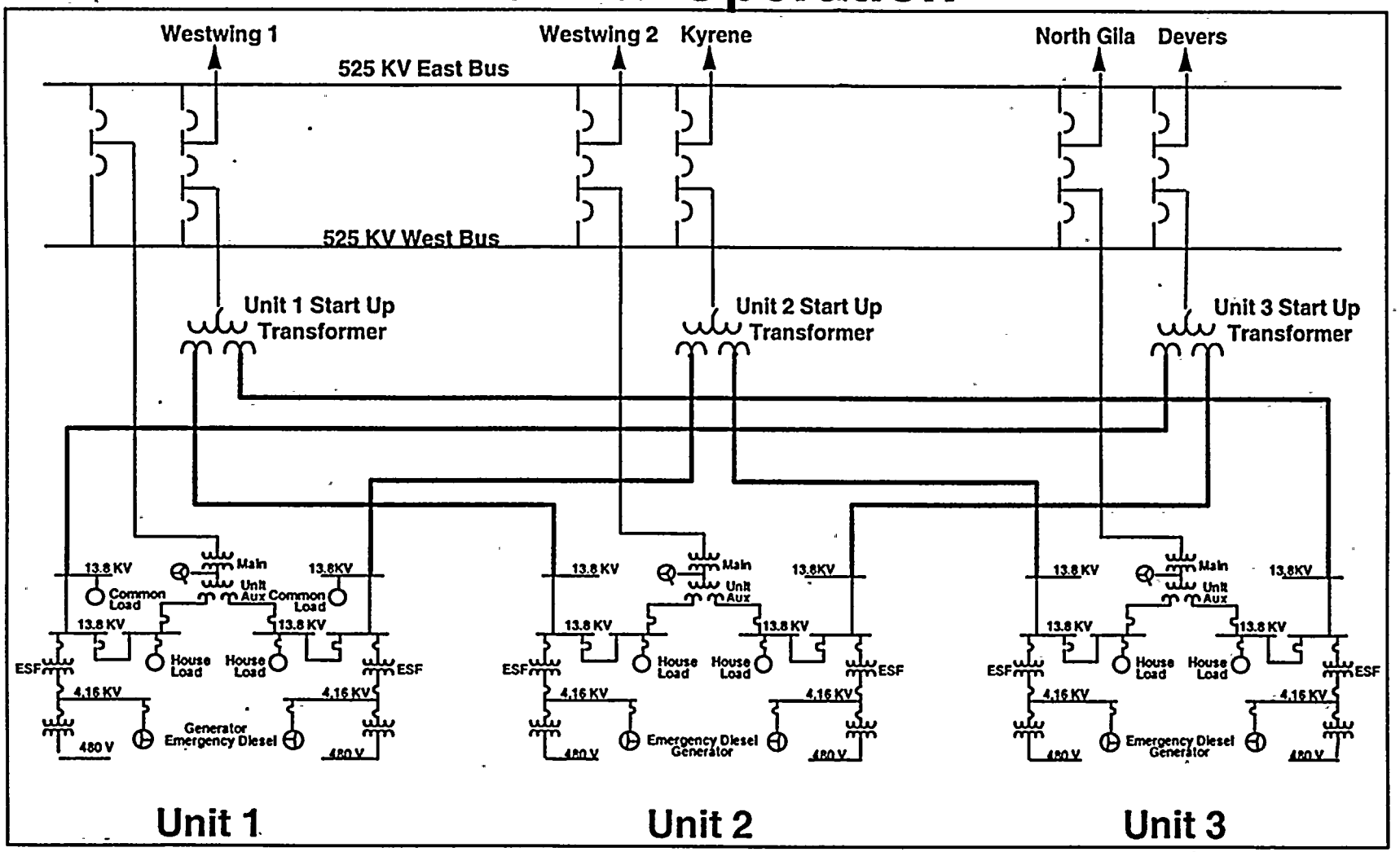
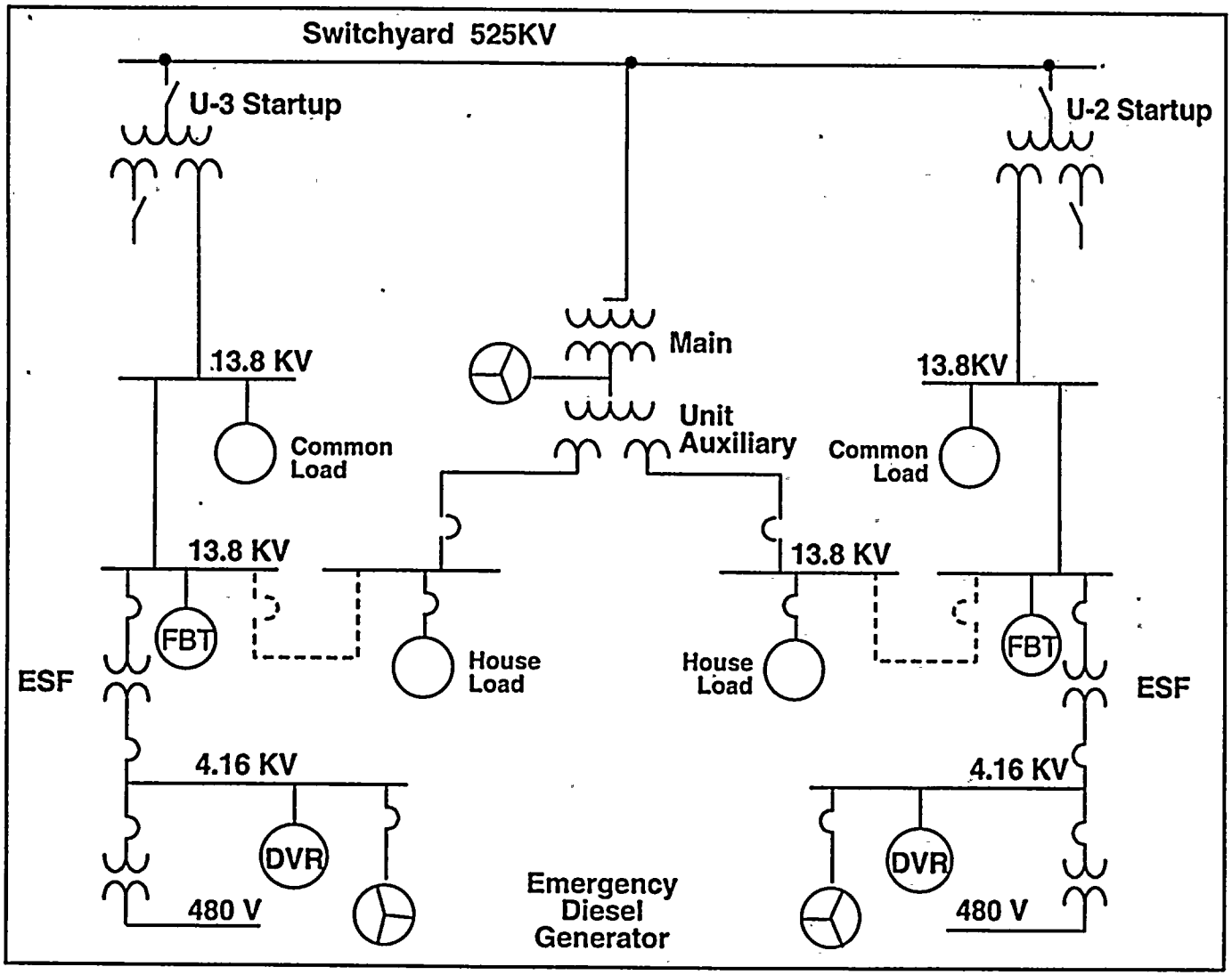
Substandard Voltage
Double Sequencing
Plant Modifications Approved
Temp T.S. Change
PV Grid Voltage Study
PV Engineering Grid Voltage Modeling
Offsite Power Operability Presentation
NRC Follow up Letter
Plant Modifications Completed
Tech Spec Change Submitted

Palo Verde Offsite Power

Normal Operation



Simplified U1 Single Line Diagram

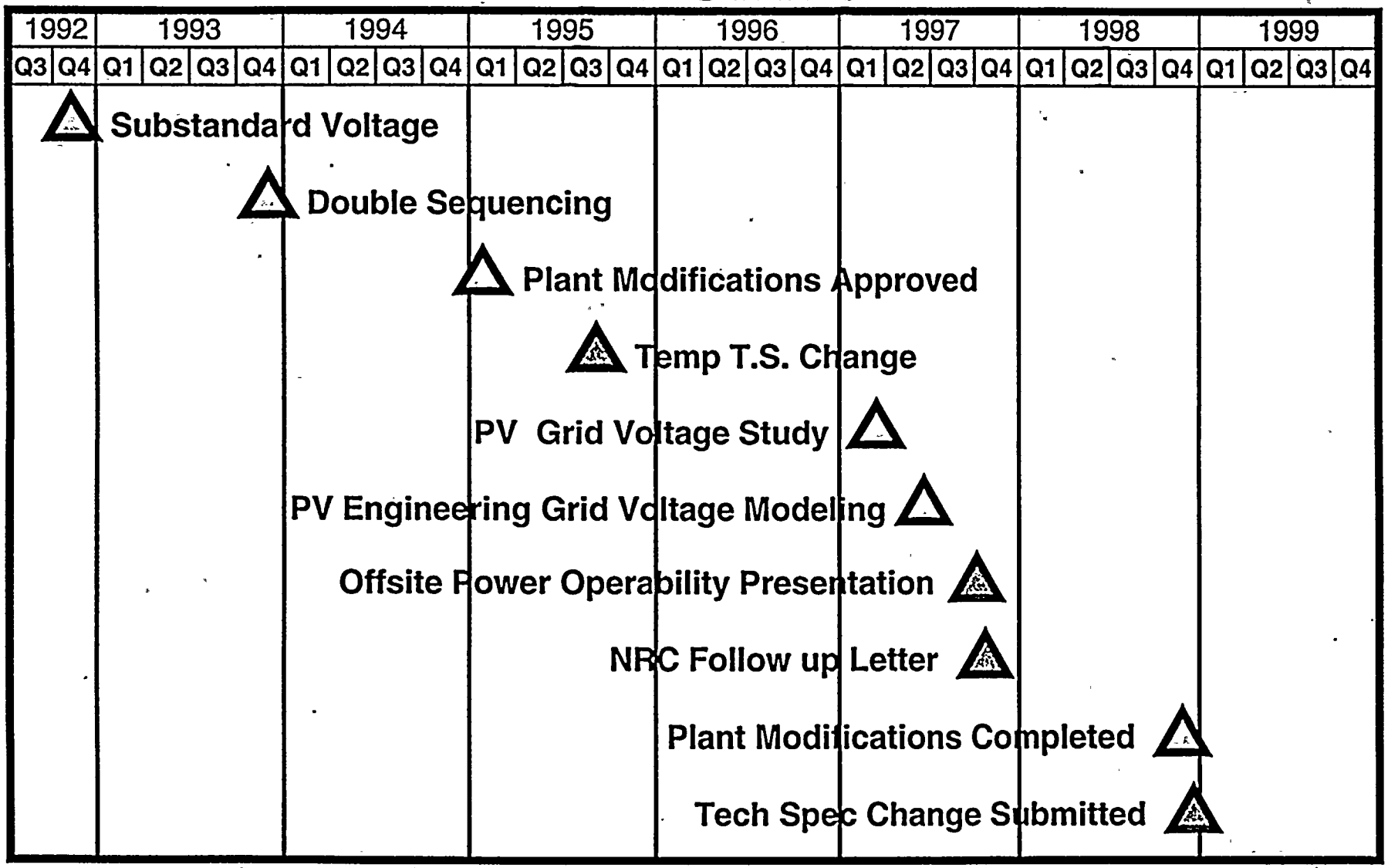


Actions Taken

- Restrict switchyard normal operating range
- Implemented LCO/Admin Controls
- Replaced DVR's with more accurate relays
- Revised Class 1E transformer tap settings
- Upgraded Unit 1 switchyard voltage meter
- Unit 1 control room low voltage alarm
- Trip of WRF load on SIAS and low voltage
- Replaced Class 1E control power transformers
- Relocated CEDM fan sequence step

PALO VERDE

Timeline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Tech Spec Change Submitted

NRC Letter
October 8, 1997

❶ Provide the basis for concluding that PVNGS will be operated in accordance with the regulations

❷ Provide an analysis of the risk impact of the proposed administrative controls

❸ Review the Final Safety Analysis Report to verify that it adequately describes the plant as it relates to degraded switchyard voltage and double sequencing

Compliance With Regulations

- 10CFR50 Appendix A: General Design Criteria

  "*Provisions shall be included to minimize the probability of losing electric power... as a result of... the loss of power generated by the nuclear power unit*" (GDC 17)

- 10CFR50.36(c)(2): Limiting Conditions for Operation

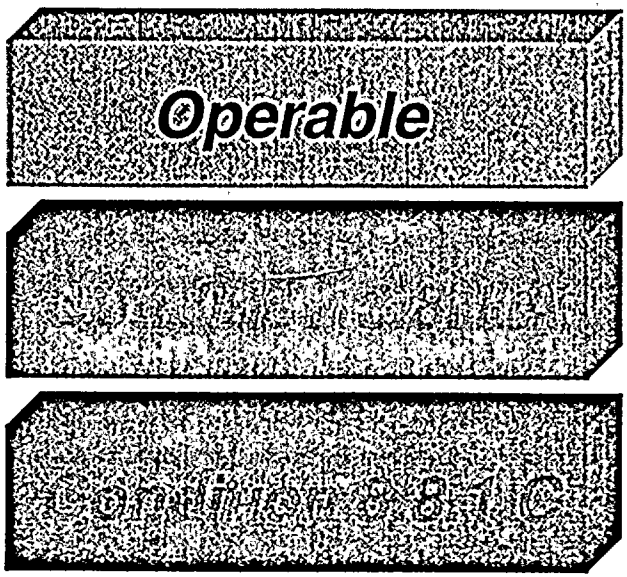
  Offsite power source is Inoperable when it "*does not have the capability to effect a safe shutdown and to mitigate the effects of an accident*" (RG 1.93)

Proposed Tech Spec Revision

- Enhances compliance with RG 1.93
- Establishes LCO
  - Involves monitoring of key parameters
- Establishes required actions
  - "Administrative controls"
- Establishes required completion times

PALO VERDE

Conventional TS Approach



Both offsite circuits available

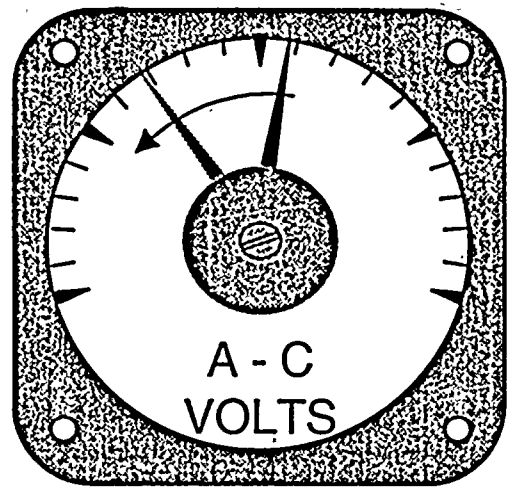
One offsite circuit unavailable

Both offsite circuits unavailable

LOCA / Consequential LOOP

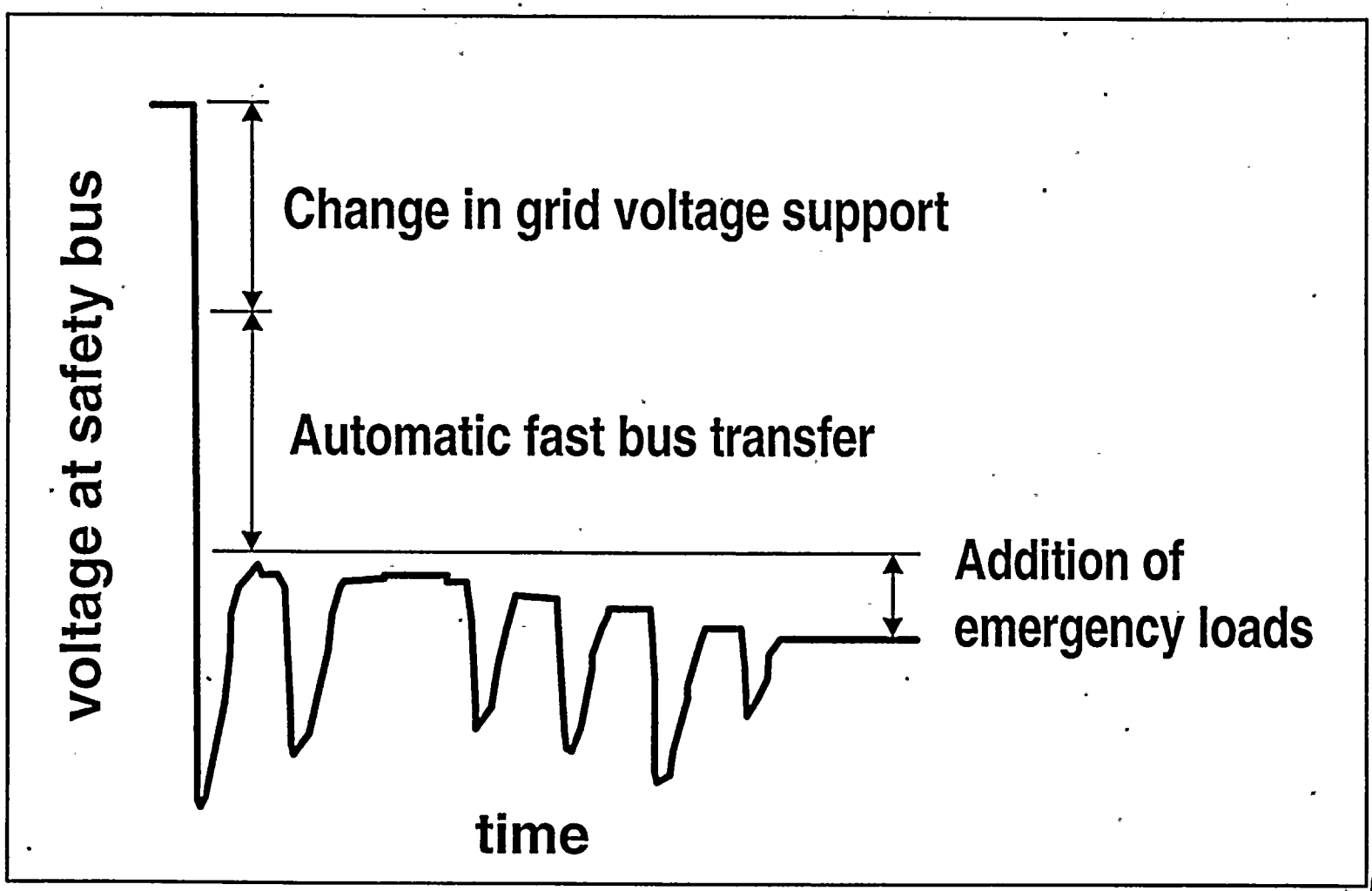
- LOCA effects cause tripping of the degraded voltage relays (DVRs)
- Causes transfer of safety bus from offsite circuit to diesel generator
- When this vulnerability exists, the offsite circuit...
  - lacks the capability to mitigate the effects of an accident
  - is therefore inoperable per RG 1.93 definition

Voltage Effect of LOCA

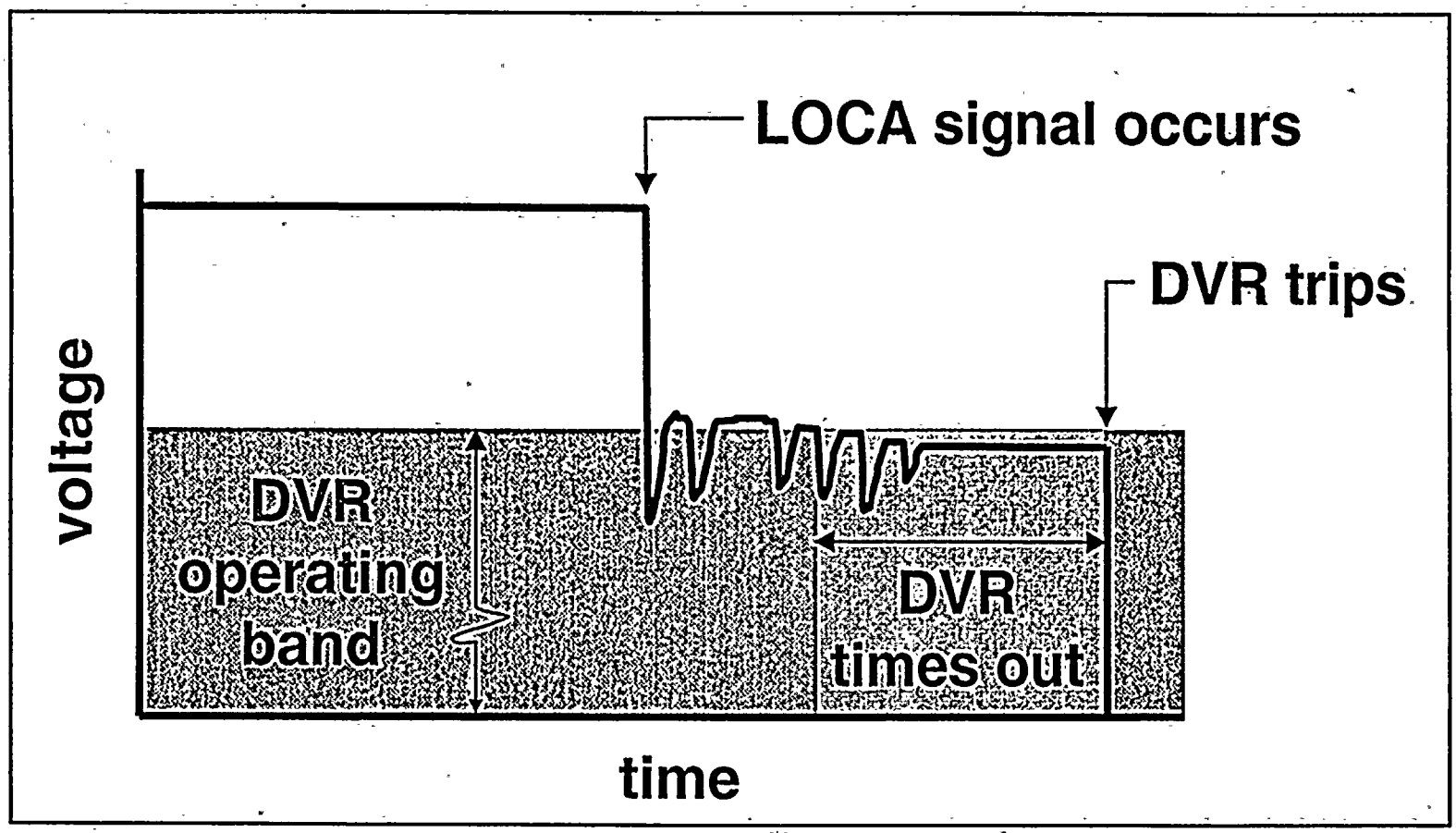


- Voltage changes at safety buses
- Voltage could drop into DVR trip range

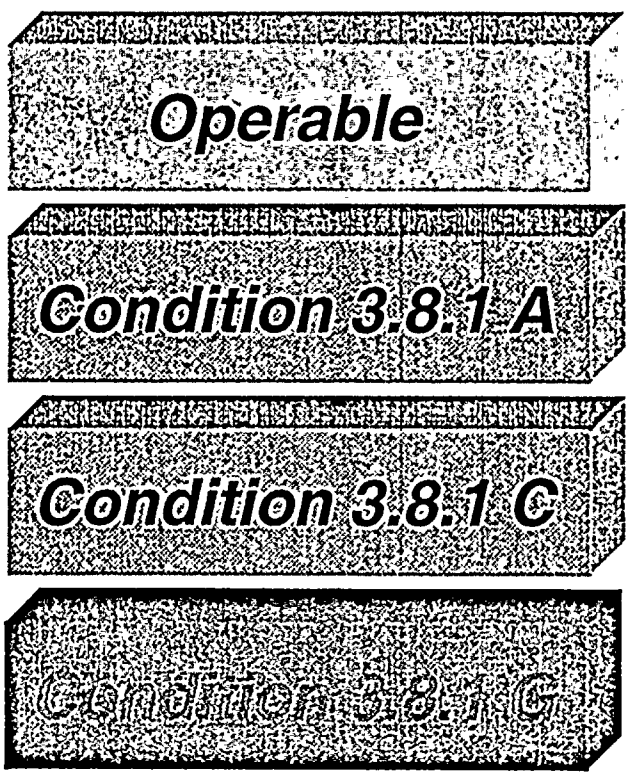
Voltage Is Affected By...



LOCA / Consequential LOOP Sequence of Events



Enhanced TS Approach



Both offsite circuits available

One offsite circuit unavailable

Both offsite circuits unavailable

LOCA could cause LOOP

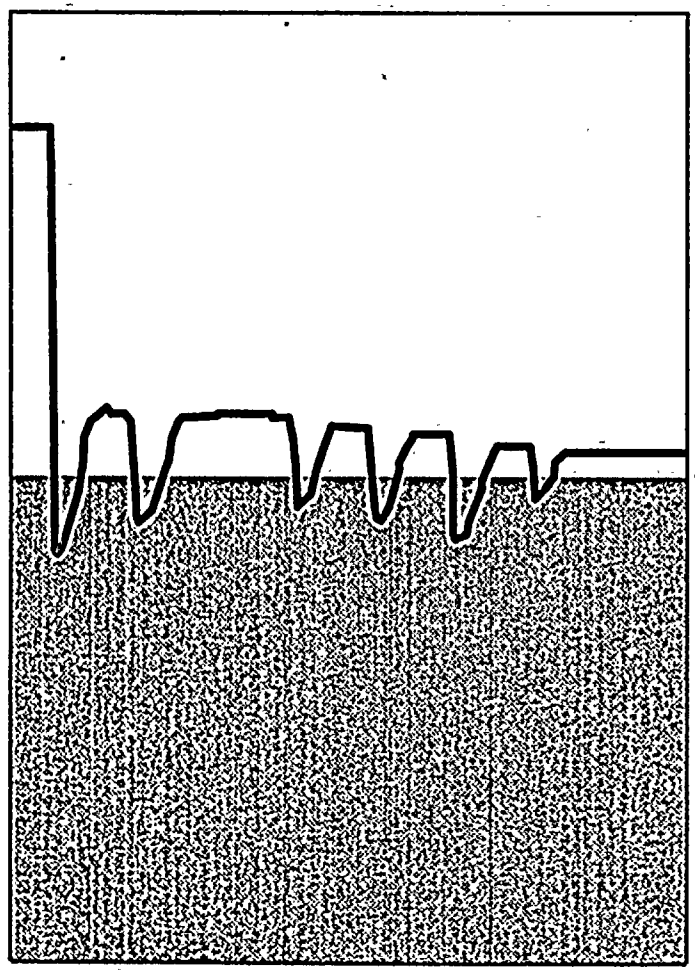
3.8.1G Completion Time

- LOCA / Consequential LOOP results in double sequencing
- Could have adverse effects on both trains
- 1 hour action is appropriate

Alternative 3.8.1G Actions

- Restore operability
  - Reduce post-trip loading
    - Remove loads
    - Block fast bus transfer
  - Increase post-trip switchyard voltage
    - Modify grid parameters
- Or reduce level of degradation
  - Transfer to DG
- Or shut down

Operability Criterion



$$V_e > V_t$$

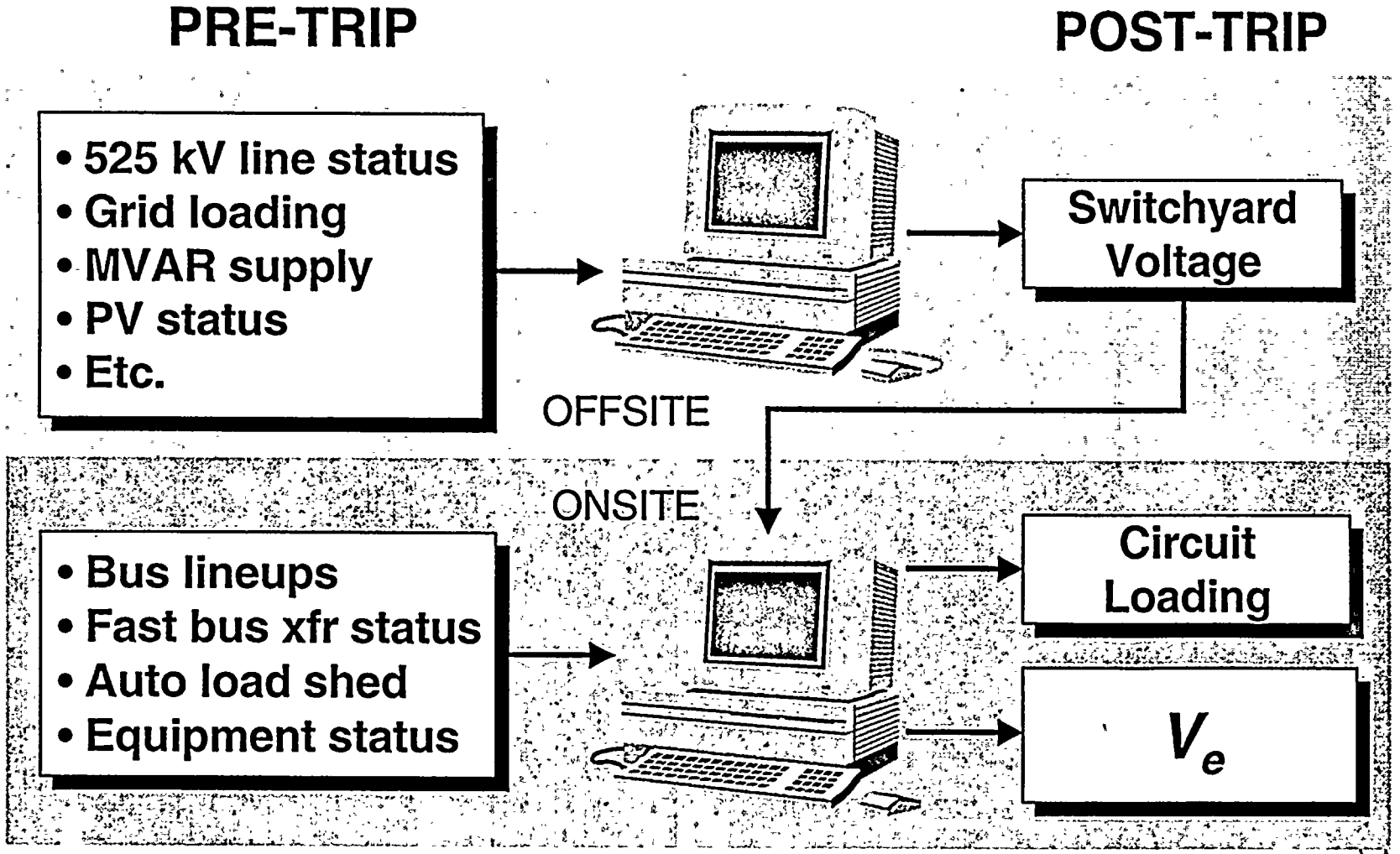
V_e = steady-state voltage during event

V_t = DVR trip voltage

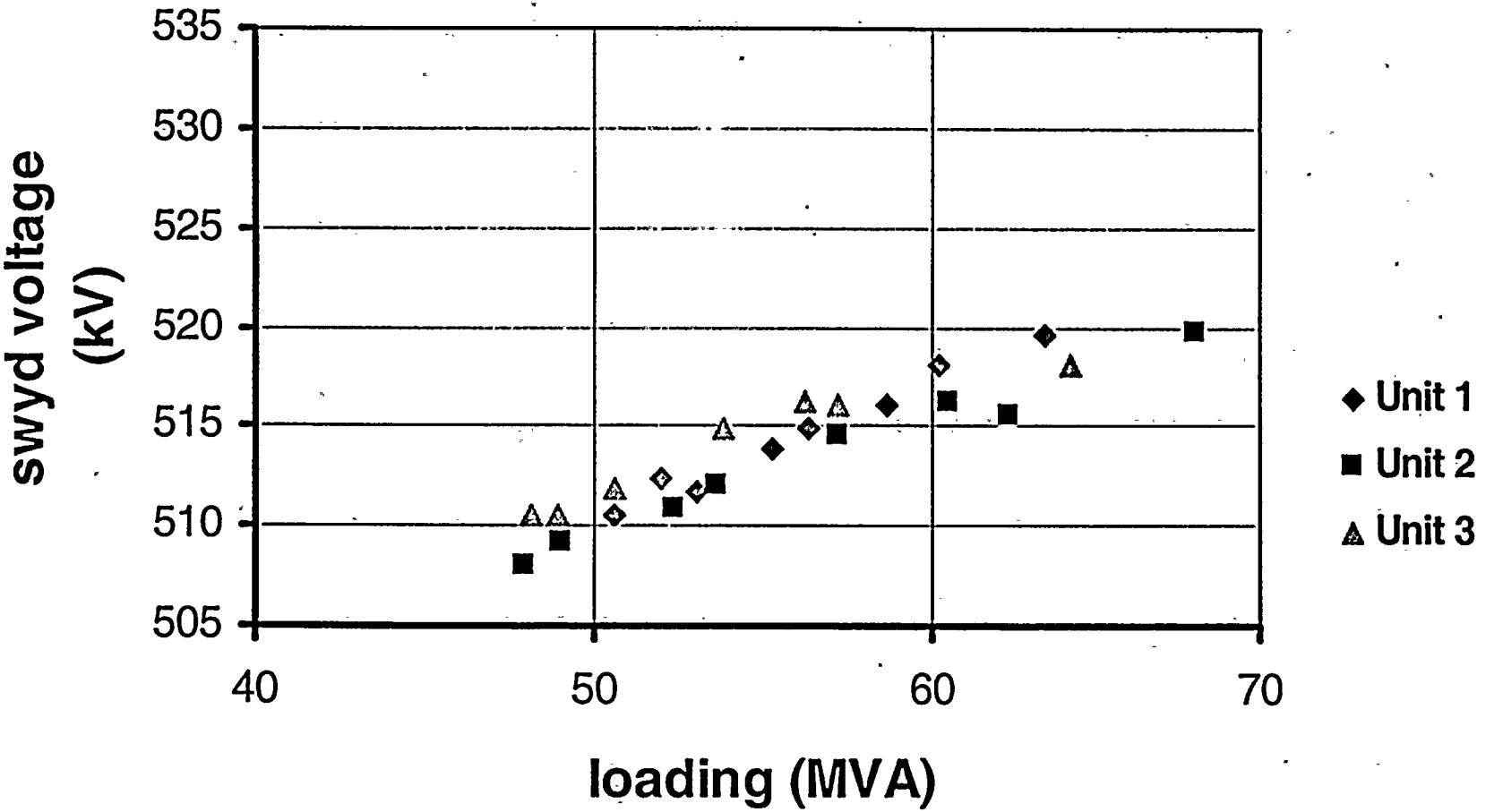
Critical Parameters

- V_t (DVR trip voltage)
  - Nominal DVR setting = 3744 V (90% of 4160 V)
  - Loop uncertainty taken into account
  - Reset characteristics taken into account
- V_e (steady-state voltage during event)
  - Is not observable before-hand
  - Cannot be predicted by conventional relay scheme
  - Can be calculated

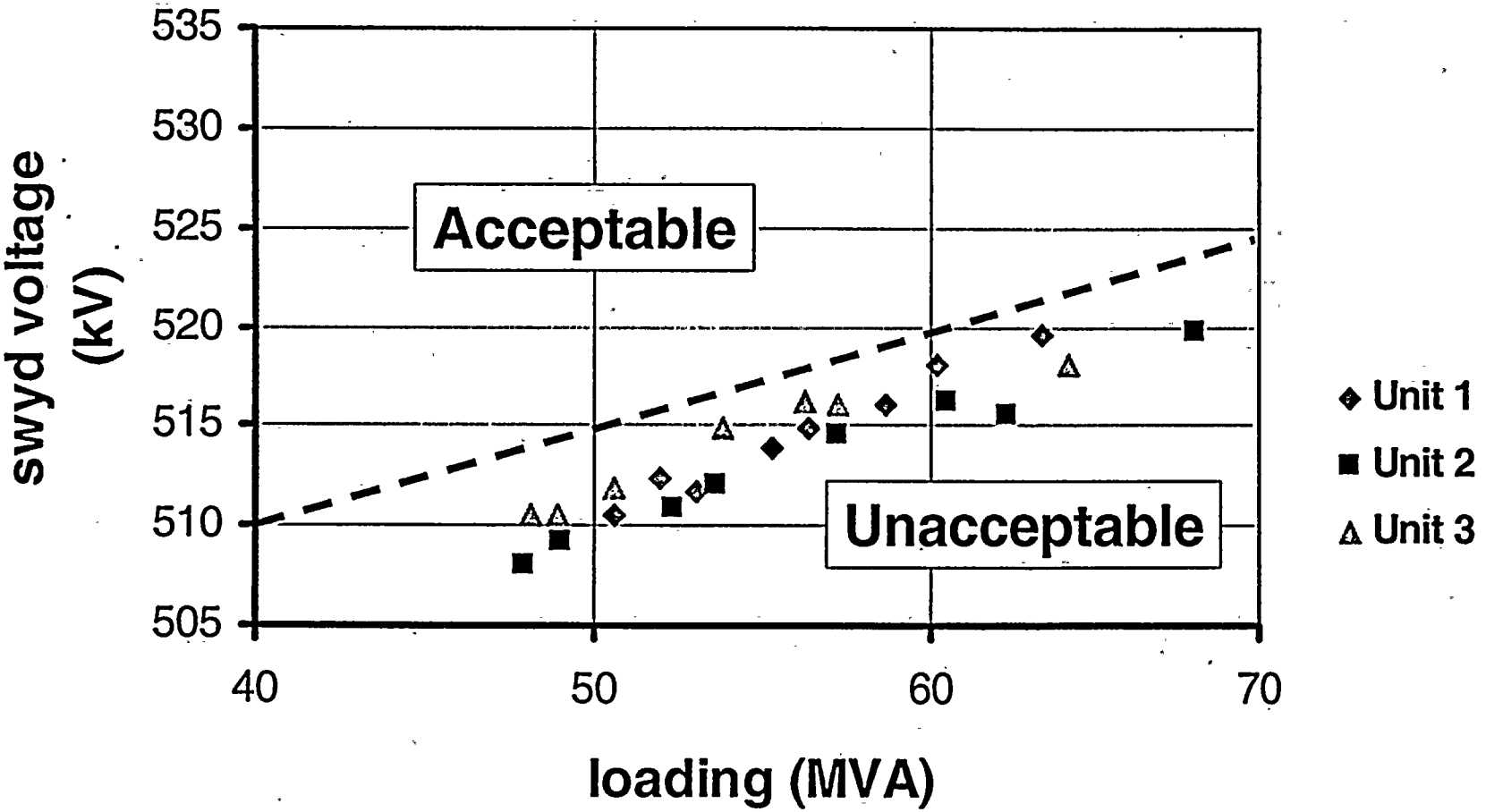
Calculation of V_e



Calculation Results for $V_e = V_t$



Proposed LCO Limit



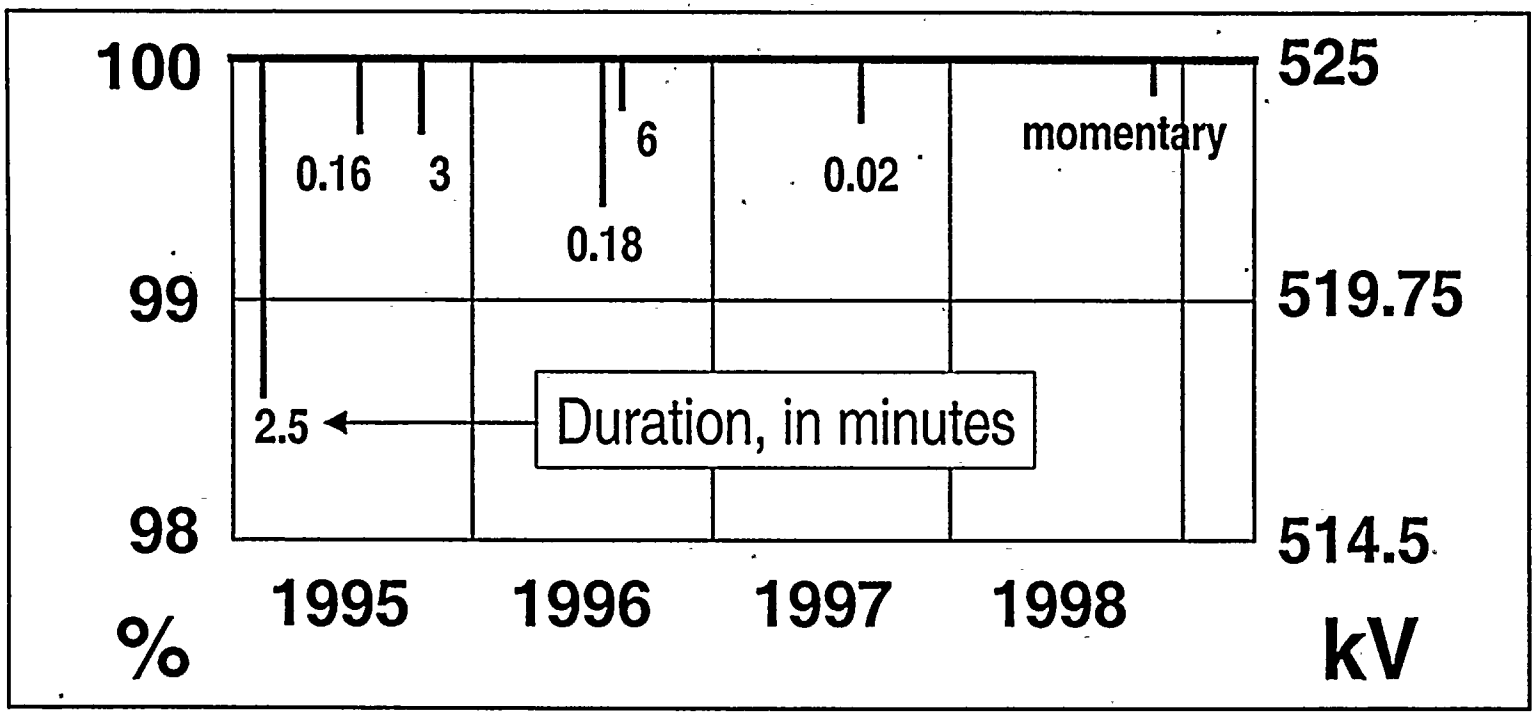
Simplified Method

- Post-trip switchyard voltage (kV)
  - Consider pre-trip grid / PV conditions
  - Select appropriate value from TS B3.8.1
- Post-trip loading (MVA)
  - Consider bus alignments and auto switching
  - Total applicable values from TS B3.8.1
- Acceptance criteria: $MVA \leq 2 \times (kV - 490)$

Risk Impact

- Implementation of LCO 3.8.1G reduces risk
  - Monitors operability status of offsite circuits
  - Minimizes vulnerability to LOCA / consequential LOOP scenario (i.e., double sequencing)
- Automatic actions are not warranted
  - Stability of plant and systems not an issue
  - Vulnerability time usually short
  - Automatic actuations would create additional risks

Low Switchyard Voltage Events



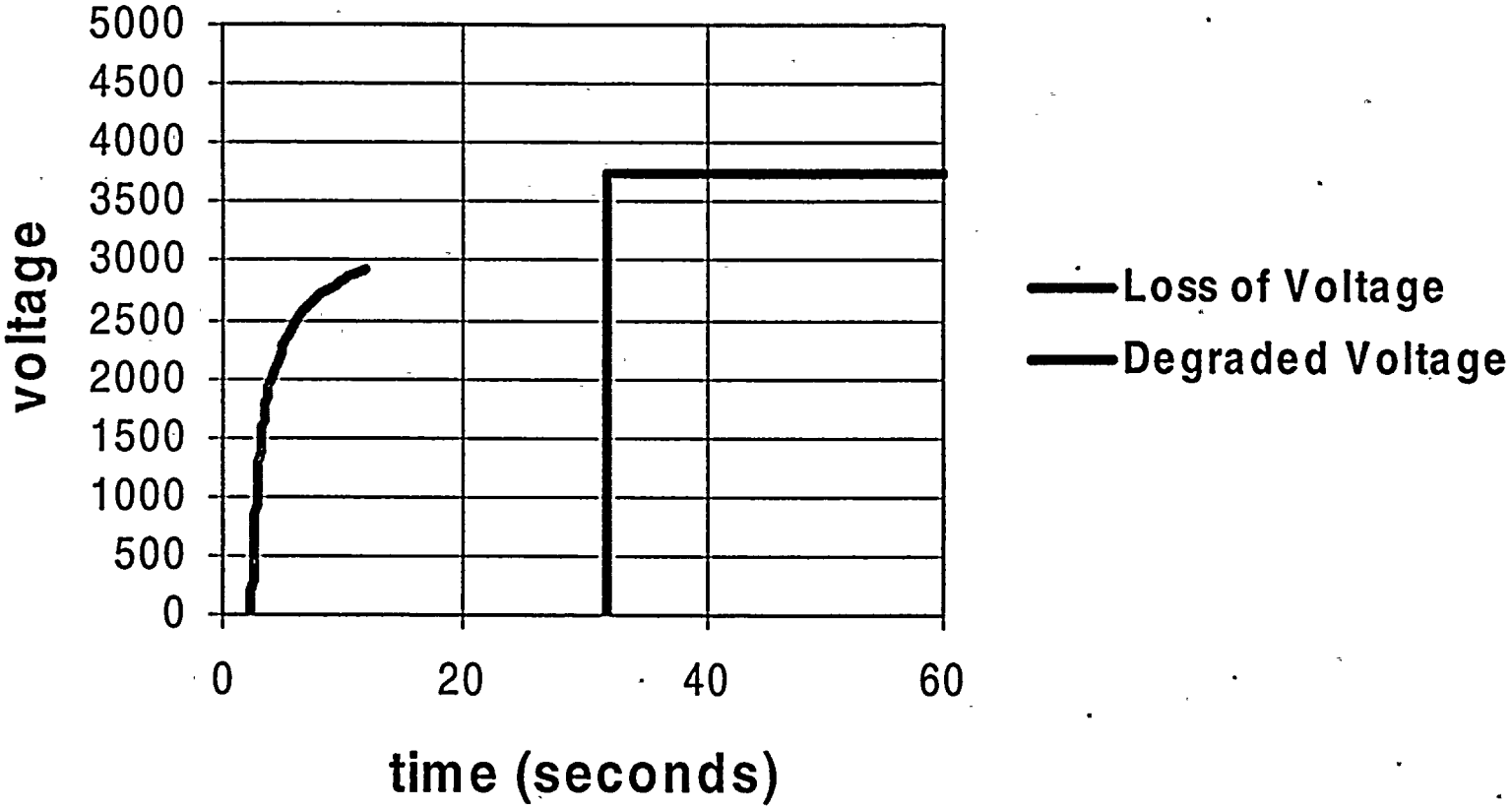
- Probability < 525 kV ≅ 12 min./4.25 years = 5E-6
- X accident frequency (≅ 1.5E-2/year) = 7.5E-8/year

UFSAR

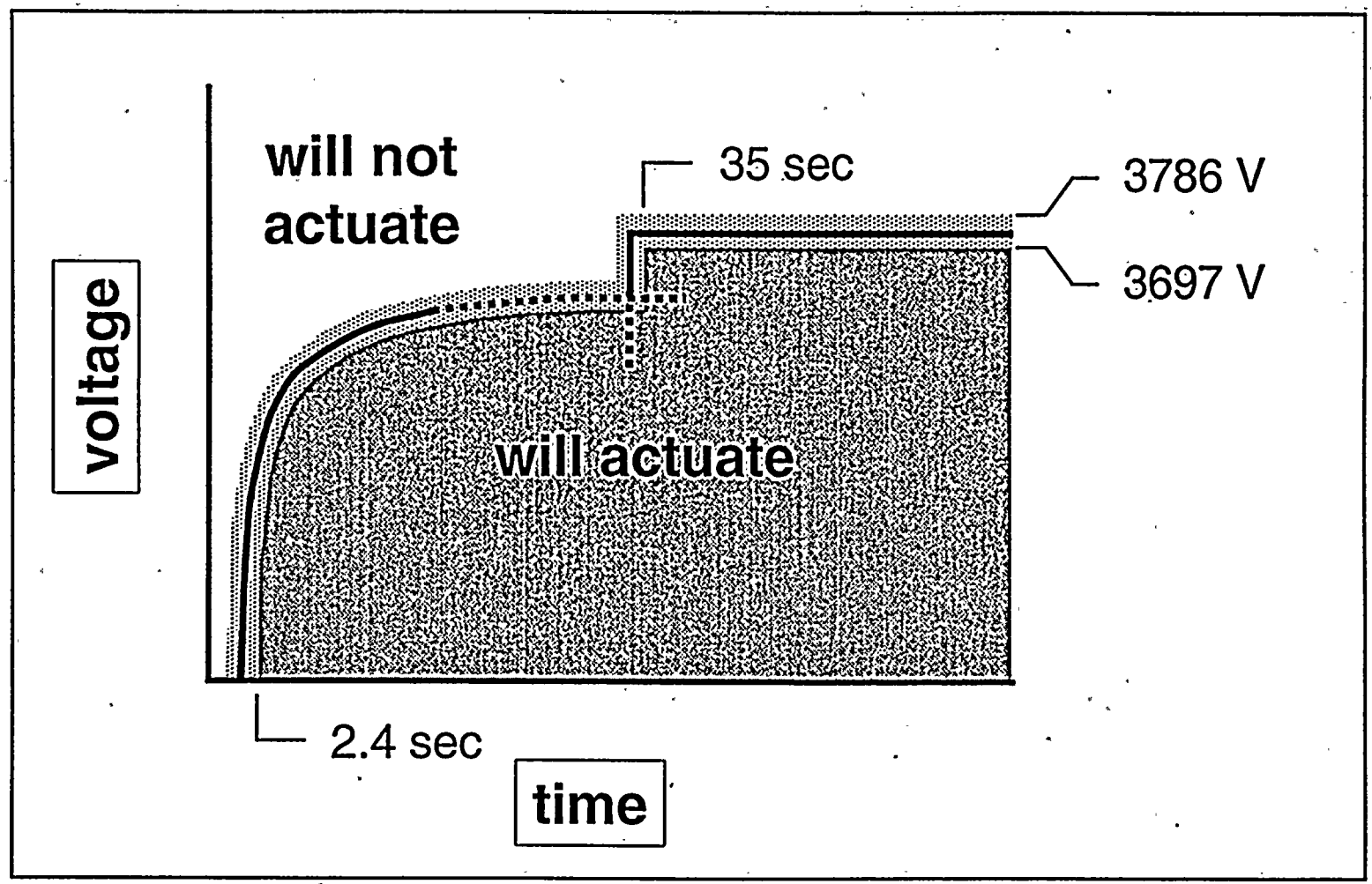
- Time delay of DVRs (31.8± seconds)
  - Design criteria based on 12/12/77 NRC letter
  - Prevents spurious actuation during RCP starting
  - UFSAR statement deleted:

    The allowable time delay, including margin, does not exceed the maximum time delay that is assumed in accident analyses.

Undervoltage Relay Characteristics



Key Parameters



Integrated Solution

- Plant Modifications - Upgrades complete
- Implementation of TS 3.8.1 G
  - LCO based on calculation results
    - In-plant electrical distribution system
    - Grid voltage response
  - Low switchyard voltage - Infrequent event
  - LCO Actions - Balanced mitigation of risk
- Maximum Offsite Power Operability - Availability

ATTACHMENT 6

MEETING SLIDES

Palo Verde
Steam Generator Replacement
And Power Uprate Project

Presentation
To The
Nuclear Regulatory Commission

April 7, 1999

Palo Verde Steam Generator
Replacement And Power Uprate Project

Project Status

Carl Churchman
SGR Project Director

Meeting Objectives

- Update of activities since October 1998 meeting
- Provide integrated schedule
- Provide status of fabrication activities
- Discuss project oversight
- Discuss transportation plans

Meeting Objectives

- Provide status of installation plans
- Discuss status of safety analyses
- Discuss structural evaluations
- Review future activities

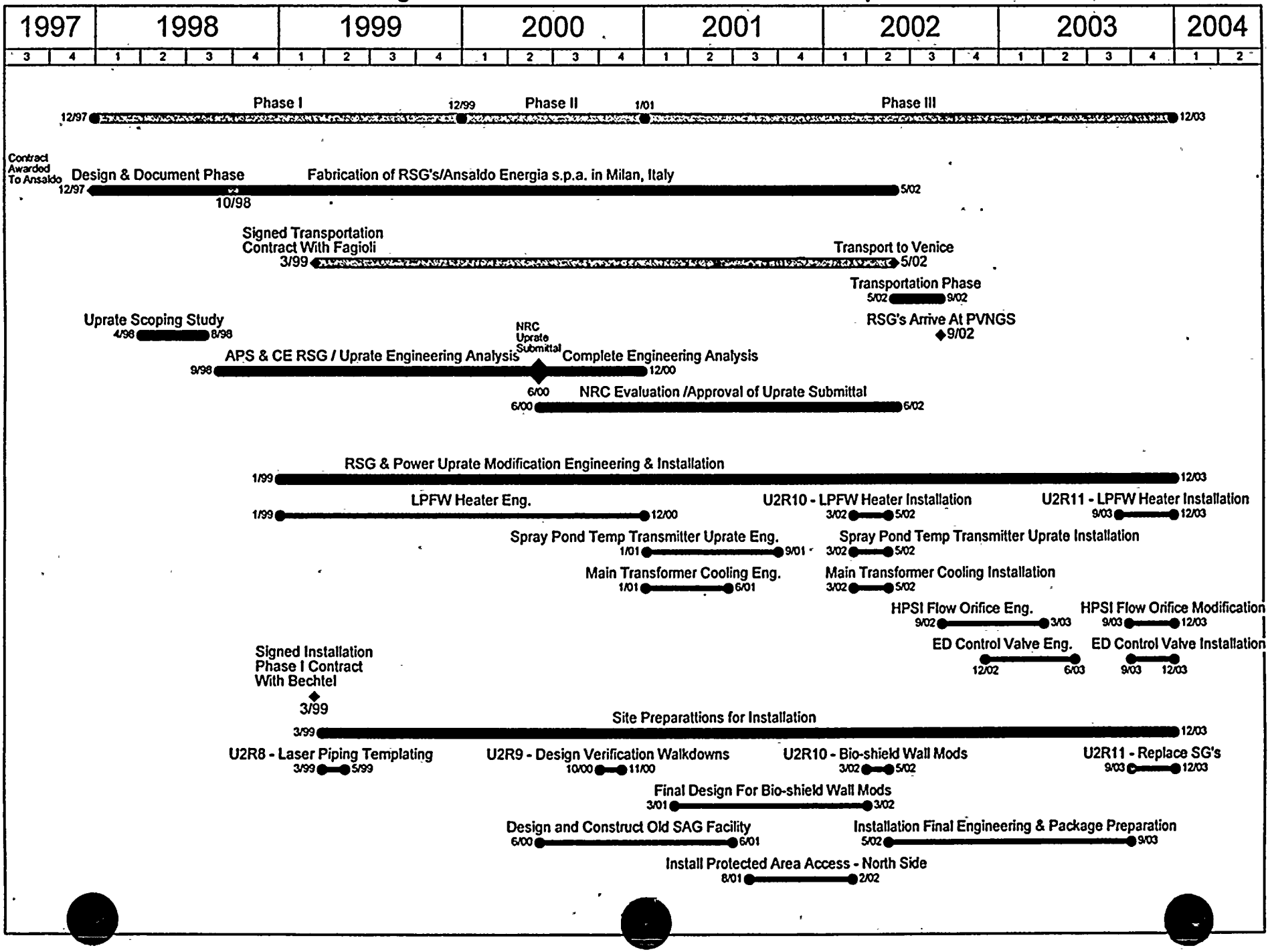
Recent Activities

- RSG fabrication started
- CENTS benchmarking
- Transportation route survey completed
- Installation contractor chosen

Visits To Other Utilities

- Braidwood - October 1998
  - Observed SG replacement activities
- South Texas - October 1998
  - Discussed SG replacement project organization and engineering programs
- Korea - January 1999
  - Discussed operating experiences of recent ABB-designed steam generators

PVNGS Unit 2 Steam Generator Replacement Project
Integrated Level One Schedule for RSG & Power Uprate



RSG Fabrication Status

- Tubing
  - Sandvik of Sweden chosen to supply tubing
  - Procedure preparation to be complete in May 1999
  - Fabrication to start in July 1999 and will complete in April 2000

RSG Fabrication Status

- Tubesheet #1
  - I-600 cladding (two passes) and UT testing of horizontal surface complete
  - Next step is stainless cladding of vertical portions
- Tubesheet #2
  - I-600 cladding (first pass) of horizontal surface complete
- Tubesheet drilling to start Sept/Oct 1999

RSG Fabrication Status

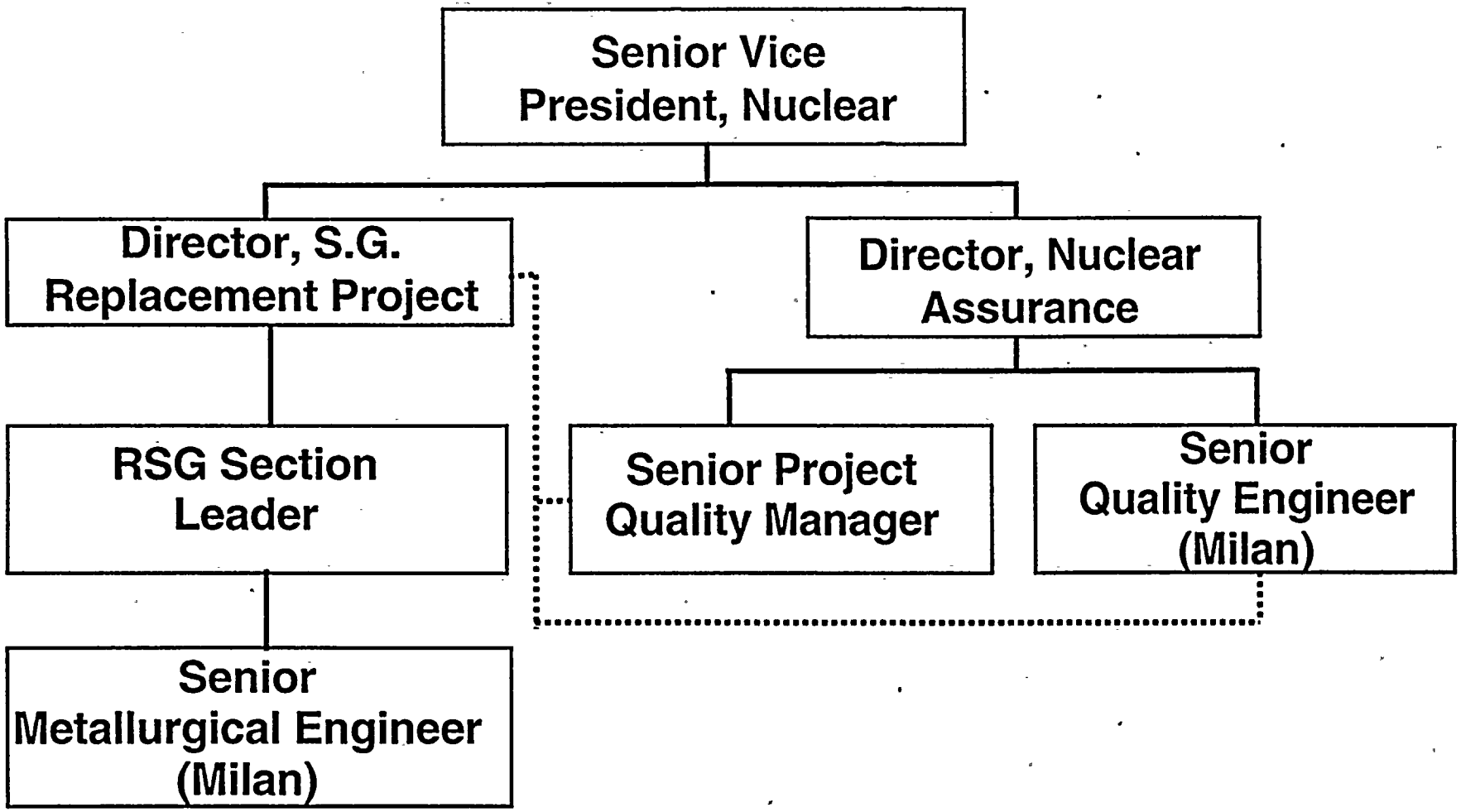
- Transition cone
  - All six pieces have been cut to size
  - Four of six bent into shape
  - Third cone sector being machined for welding
- Stub barrel
  - Stub barrel rolled
  - Vertical weld complete
  - Weld buildup for nozzles/handholes (10) in progress - three complete

RSG Fabrication Status

- Lower Shell
  - Several plates have been received
  - Will be prepped and rolled in next few months
- Primary channel heads
  - Ordered from Japan Steel Works
- Four feedwater nozzles received at Ansaldo

PALO VERDE

Oversight Organization



Oversight Activities

- Oversight organization
- Residents in Milan
  - Filing daily and monthly reports
  - Discovered several non-conformance items
- Conducted assessment of Ansaldo
  - Ansaldo working to strengthen:
    - Continuing training program
    - Design control/design interface issues
    - Computer software control issues

PALO VERDE

Oversight Activities

- Ansaldo also working to strengthen process for self-identification of problems
- Other QA activities
  - Visited Braidwood in June and October 1998
  - Audit of ABB engineering (Chattanooga) in May 1999
  - Audit of ABB engineering (Windsor) in August 1999
  - Audit of Ansaldo in June 1999
    - Wisconsin Public Service Corp. will participate

RSG Transportation

- Completed detailed route survey from Puerto Penasco, Mexico
- Held meetings with various environmental and transportation officials in both countries

RSG Installation

- Bechtel chosen as contractor for the following RSG installation work:
  - Prepare mods and 50.59 for installation
  - Onsite RSG transportation

Safety Analyses

- CENTS Code
- ECCS performance analysis
- Containment subcompartments

CENTS Code

- CENTS will be the primary tool for Chapter 15 non-LOCA transient analysis at PVNGS
- Currently running benchmark cases for LOCV, MSLB, SGTR
- Benchmarking shows that CENTS is correctly modeling the events
- On schedule for June 2000 CENTS topical report submittal

ECCS Performance Analysis

- PVNGS Analyses of Record (AOR) is based on core power level of 4070 MWt (3990 x 1.02)
- No explicit analyses are scheduled for this project
- ABB will demonstrate that the RSGs result in increased margin of safety compared to the AOR
- The LBLOCA, SBLOCA and long-term cooling analyses in the AOR remain applicable

Containment Subcompartments

- Leak Before Break (LBB) considerations
  - Original subcompartment pressurization analysis was based on double ended break in RCS pipe
  - APS subsequently received SERs to allow LBB for RCS piping
  - Reactor cavity and SG compartments do not provide a containment related function
  - NRC LBB guidance eliminates the need to consider double-ended break of RCS piping to evaluate reactor cavity and SG subcompartment structural design

Containment Subcompartments

- Reactor cavity
  - There are no branch lines connected to RCS
  - Further analysis not needed

- SG subcompartment
  - Largest branch line will be analyzed
  - Analysis is expected to demonstrate that original calculation remains bounding

Containment Subcompartments

- Pressurizer subcompartment
  - The pressurizer surge line has not been excluded from the design basis as a result of relief granted due to LBB considerations of RCS piping
  - Effect of power uprate on pressurizer subcompartment analysis will be assessed

Structural Evaluations

- Entire reactor coolant system (RCS)
- RCS branch lines
- Secondary piping affected by replacement steam generators (RSGs) and power uprate
- Sampling and instrumentation nozzles

Structural Evaluations

- Re-evaluation of RCS
  - Normal, upset, emergency and faulted operation
  - Impact of affected transients (if any)
  - Impact to seismic analysis due to additional weight of RSG
  - LOCA and jet impingement due to RCS branch line break and secondary high energy line break (HELB) inside of containment

Structural Evaluations

- Re-evaluation of RCS branch lines
  - Deadweight, thermal and seismic anchor motion
  - LOCA anchor motion and dynamic seismic analyses
  - Verification of HELB locations
  - Pipe whip and jet impingement evaluation
  - Fatigue evaluation of Class 1 piping

Structural Evaluations

- Re-evaluation of secondary piping
  - Deadweight, thermal and seismic anchor motion
  - LOCA anchor motion and dynamic seismic analyses
  - Pipe whip and jet impingement evaluation
  - Water hammer/steam hammer as applicable
  - Arbitrary intermediate breaks on the main steam line will be eliminated

Structural Evaluations

- Re-evaluation of instrument and sample lines
  - RSG nozzle adequacy will be assured
    - Limit loads to no greater than existing installation
    - Keep tubing supports similar to existing installation
  - RCS nozzles will be re-evaluated for the total loads from RCS evaluations and LOCA analysis

Licensing Submittals

- June 2000
  - Chapter 15 analyses
  - Most of Chapter 6 analyses
  - CENTS Topical Report
- December 2000
  - Seismic analysis of RCS branch lines
  - EQ evaluations
  - Remainder of Chapter 6 analyses

Potential Technical Specification Changes

- Definition of Rated Thermal Power
- Low SG pressure reactor trip and MSIS setpoint
- Peak containment pressure
- Operating range for cold leg temperature at 100% power

Power Uprate Licensing Reports

- NSSS licensing report outline
- BOP licensing report outline

PALO VERDE

RSG Report And 50.59 Outline

- RSG design
- RSG fabrication
- Safety evaluation

Refueling Outage Activities

- U2R8 - Spring 1999
  - Laser templating of piping in containment
  - UT RCS piping to verify thickness
  - Measure roundness of equipment hatch
  - Optical measurement of SG snubbers
  - General walkdown of containment
- U2R9 - Fall 2000
  - Design verification walkdowns in containment

Refueling Outage Activities

- U2R10 - Spring 2002
  - Replace 2 feedwater heaters
- U2R11 - Fall 2003
  - Replace 4 feedwater heaters
  - Bio/shield wall modifications
  - Replace steam generators

POWER UPRATE BOP LICENSING REPORT

DRAFT

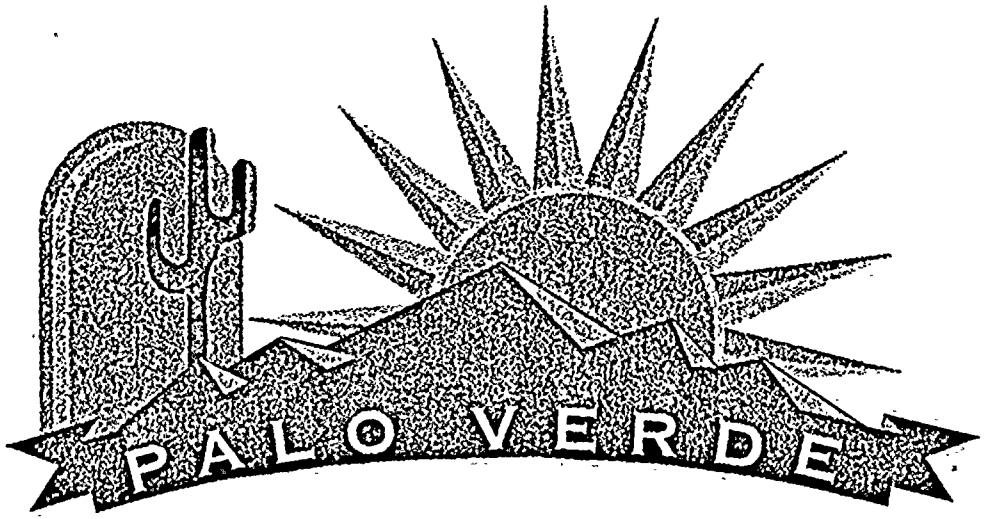
EXECUTIVE SUMMARY

1.0 BOP Program Description
- 1.1 BOP Program Overview
- 1.2 Condensate and Feedwater
- 1.3 Circulating Water
- 1.4 Main Turbine
- 1.5 Main Turbine Auxiliaries
- 1.6 Main Generator and Auxiliaries
- 1.7 Main Steam
- 1.8 Component Cooling Water
- 1.9 Essential Cooling Water
- 1.10 Spent Fuel Pool
- 1.11 LPSI/HPSI
- 1.12 Auxiliary Feedwater System
- 1.13 Containment and Subcompartment Analysis
- 1.14 Post LOCA Hydrogen Generation
- 1.15 Electrical Equipment Qualification
- 1.16 Radiological Assessment
- 1.17 Containment Ventilation
- 1.18 Auxiliary Building Ventilation
- 1.19 Misc. Mechanical Reviews
  - 1.19.1 Turbine Building HVAC Systems
  - 1.19.2 SG Blowdown Processing Systems
  - 1.19.3 CVCS Piping and Supports
  - 1.19.4 Radwaste Systems
  - 1.19.5 Secondary Side Water Chemistry
  - 1.19.6 Secondary System Piping and Valves
  - 1.19.7 PVNGS MOV Program
  - 1.19.8 Low Temperature Overpressure Protection (LTOP)
- 1.20 Misc. Electrical Reviews
  - 1.20.1 Main Power Transformers
  - 1.20.2 Condensate Pump Motors
  - 1.20.3 Diesel Generators
  - 1.20.4 Startup Transformers
  - 1.20.5 Station Blackout
  - 1.20.6 Isophase Bus
  - 1.20.7 Reactor Coolant Pump Motors
  - 1.20.8 Station Service Assessment
  - 1.20.9 Unit Auxiliary Transformer
  - 1.20.10 Grid Stability

ATTACHMENT 7

MEETING SLIDES

PVNGS
Nuclear Fuel Management
Update



April 7, 1999

Purpose

- Progress - 1998
  - In-House Reload Design
  - Clad Testing Program
  - Spent Fuel Storage
  - Unit 2 Steam Generator Replacement/Power Uprate
  - Models and Methods

Purpose

- Current and Future Projects
  - Spent Fuel Storage
    - Boron Credit
  - Models and Methods
    - Simulate
    - CENTS
    - ID TH
  - Fuel Performance
    - PV Fuel Exams
    - Crud/Corrosion
    - Additional Exams Planned

Boron Credit

- Current Pool Capacity
  - Unit 1 - 648 of 1034 Spaces Used
  - Unit 2 - 740 of 1033 Spaces Used
  - Unit 3 - 664 of 1034 Spaces Used
- Unit 2 Lead Unit - Lose Reserve Fall 2000
- Submittal Expected May, 1999
  - 1205 Useable Spaces
  - 4.8 w/o enrichment
- Approval Requested Dec., 1999

Boron Credit

(Continued)

- **Unit Status - w/Boron**
  - 1205 Assembly Capacity
    - 964 Useable Spaces & 241 Spaces for Reserve
  - Unit 3 Spring 2003
    - Estimate 964 Assemblies Exactly
  - Unit 2 Fall 2003
  - Unit 1 Spring 2004

Models & Methods

Palo Verde Nuclear Generating Station

April 7, 1999

Major Projects

- CASMO/SIMULATE Topical
- CENTS Topical
- 1D Thermal Hydraulics

CASMO/SIMULATE

- **Replace**
  - DIT with CASMO-4
  - ROCS/MC with SIMULATE-3
  - Consistent Physics Codes in All Analyses
- **Used Throughout Industry**
- **Extensive Benchmark**
- **Topical in Final Review**

CENTS

- **Replace CESEC**
  - Improved non-LOCA transient model
  - Code Approved By NRC
  - Palo Verde Model Developed
- **UFSAR Chapter 15 Reanalysis**
- **U2 Steam Generator Replacement & Power Uprate Analyses**

1D Thermal Hydraulics

- **Older Bounding TH Calculations**
  - Recent Flatter Core Designs
  - 10CFR21 Defect Reported 1998
- **New 1D Model In Preparation**
  - Current Cycles & U2 SG Replacement/Uprate
- **Same Method, More Adverse Model**
  - New MDNBR Limit
  - Eliminate rework & On-Line Penalties

RECENT FUEL PERFORMANCE

PALO VERDE NUCLEAR GENERATING STATION

Background

- Palo Verde Performance
  - 18 Months - 36 Day Outages
  - 99% Production Factor
- More Efficient Designs
  - Checkerboard Strategy
  - Fresh-against-Fresh Designs
- No AOA & No Failed Fuel

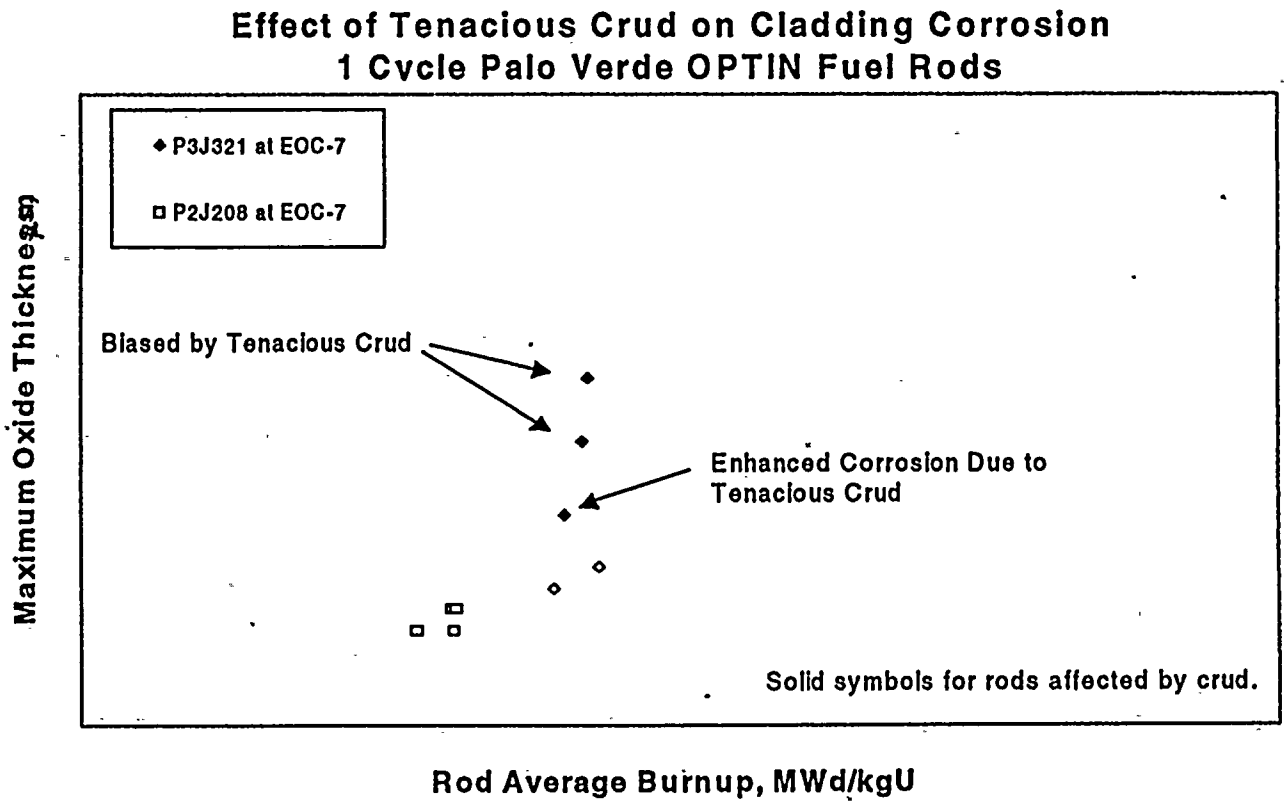
Recent Poolside Observations

- U1C7 - Spring 1998
  - Visual Inspection Only
  - More Crud than "Typical"
- U3C7 - Fall 1998
  - Visuals & Oxide Thickness
  - More Crud/Oxide Than Previous Lower Duty Fuel Rods

Palo Verde Action Plan

- Enhance Core Follow
- Investigate EPRI, Vendor Programs
- Develop Inspection Plan
- Additional Fuel Management Guidelines
  - Decreased Number of Fresh Interfaces
  - Lowered Radial Peaking Targets

One Cycle OPTIN Rods



One Cycle OPTIN Rods

Interior Rod

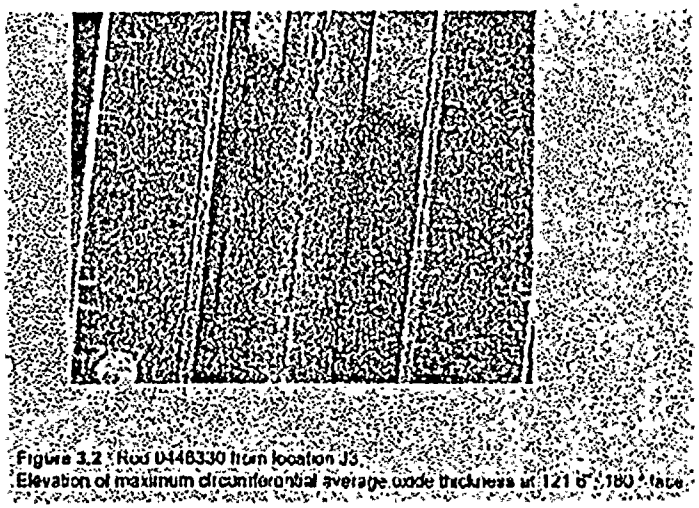


Figure 3.2 : Rod 0448330 from location J3
Elevation of maximum circumferential average oxide thickness at 121.6", 180.1 face

Peripheral Rod

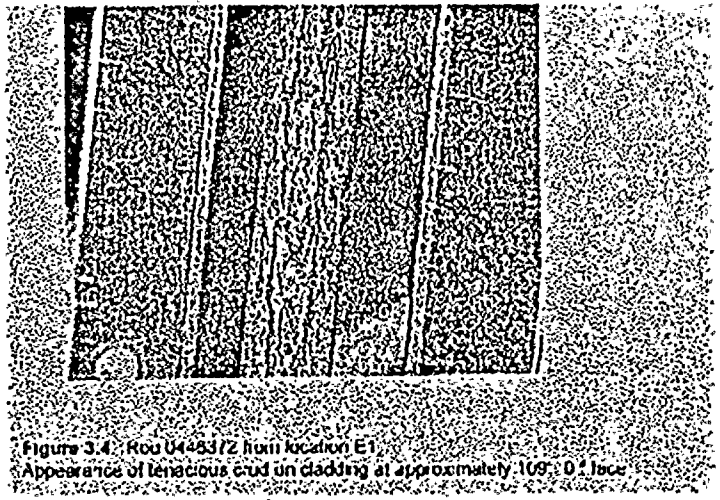
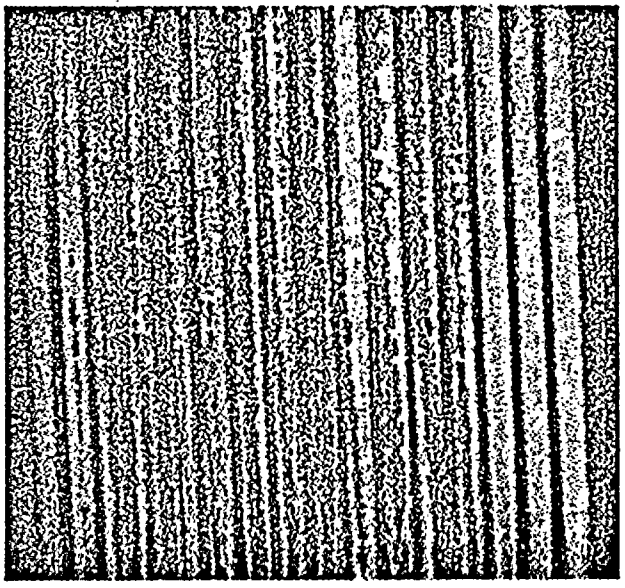


Figure 3.4 : Rod 0448372 from location E1
Appearance of tenacious crud on cladding at approximately 109.0 face

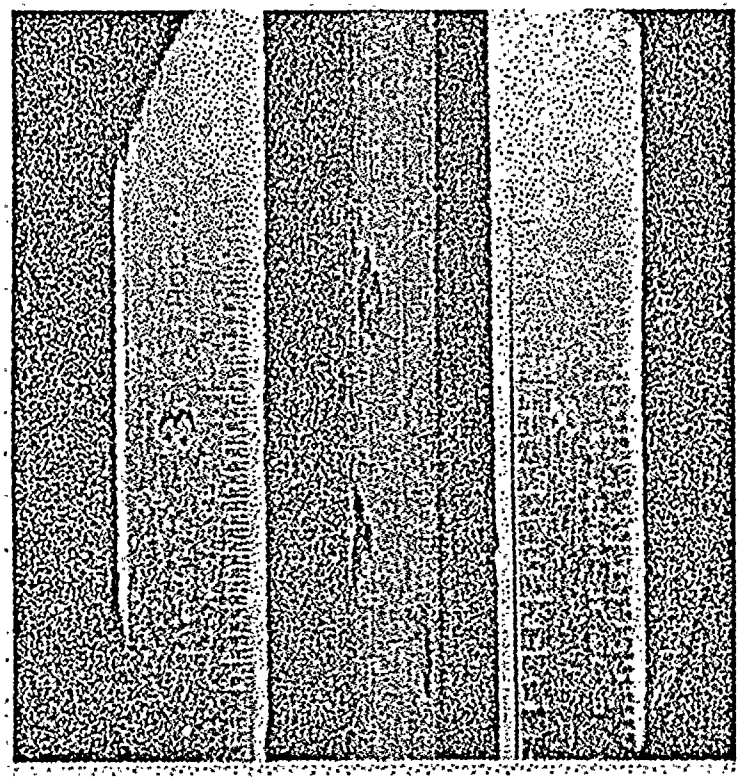
U1C4 - Previous Crud

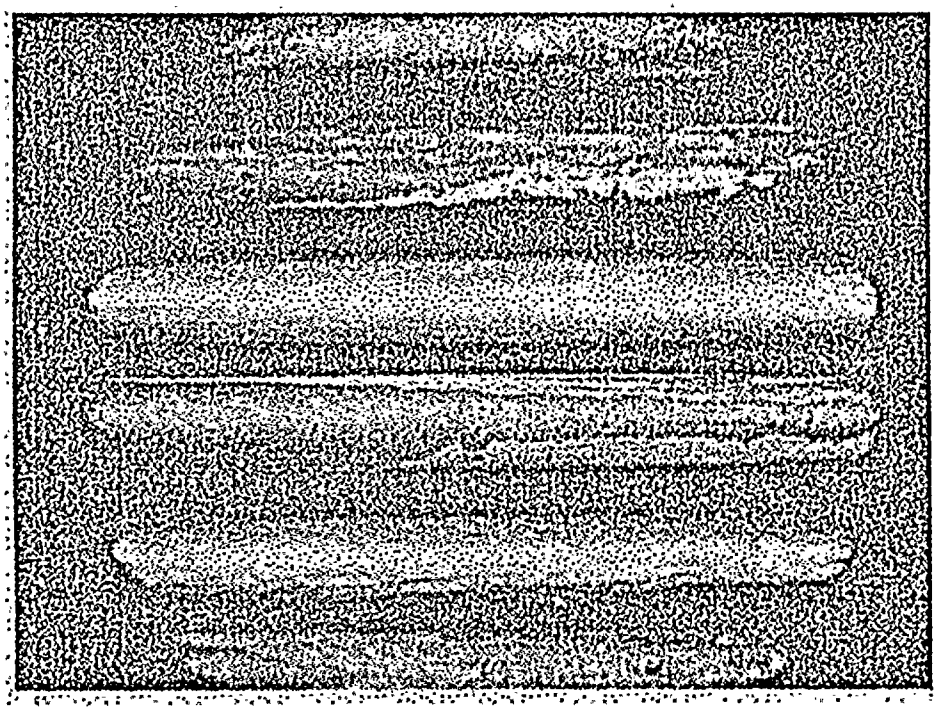
Checkerboard LP, 621ºF T-hot

Standard Zr-4



OPTIN Lead Test Rods





High Burnup Lead Test Rods

- OPTIN Test Rods - High Duty in U3C7
- Oxide Thickness
  - On Prediction, First 3 Cycles
  - Above Prediction, 4th Cycle
- Spallation
- Expecting Final Report from ABB

Plans for 1999

- Retain Current Guidelines
- Explore Advanced Alloys
- Continued Fuel Inspections
  - Oxide Thickness Measurements
  - Crud Sample Analysis
- Model Development
  - Chen Correlation into Reload Assessment
  - Oxide Calculations into Fuel Management

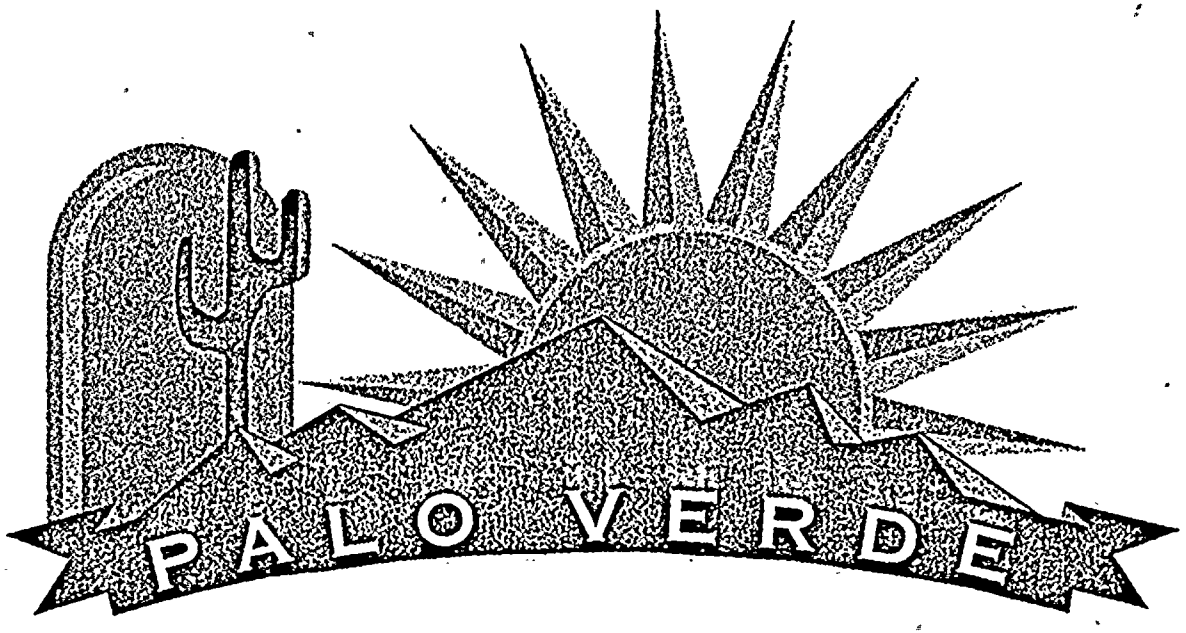
Conclusions

- Palo Verde Is Not Seeing Any Adverse Fuel Performance or Fuel Failure
- We Have Imposed More Restrictive Design Criteria on Fuel Managements
- We Have Questions We Are Continuing To Investigate

ATTACHMENT 8

MEETING SLIDES

PVNGS
Dry Cask Storage



April 7, 1999

Purpose

- Status with NAC
  - Contract
  - NAC Users Group
- Palo Verde Schedule & Major Milestones
  - Boron Credit
  - Site Preparations
  - First UMS Systems

Boron Credit

- Current Pool Capacity
  - Unit 1 - 648 of 1034 Spaces Used
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Boron Credit

(Continued)

- **Unit Status - w/Boron**
  - 1205 Assembly Capacity
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  - Unit 3 Spring 2003
    - Estimate 964 Assemblies Exactly
  - Unit 2 Fall 2003
  - Unit 1 Spring 2004

NAC Status

- Supply Contract With NAC
- Initial Site Review by NAC Complete
- Yankee MPC Draft SER/CoC Issued
- Draft UMS SER/CoC Scheduled Mid 1999
- UMS Fabrication Planning Underway
- NUPIC Audit of NAC and UMS Drop Tests

NAC Users Group

- NUTUG Subcommittees
  - QA
  - Fabrication
  - Operations
- Reviews of 1st RAI Responses
- Preparing for UMS 1/4 Scale Drop Test
- Review RAI Acceptance Letter Response

PVNGS Preparations 1999

- ISFSI Site Being Cleared
- Berms Under Construction
- Cask Load Pit Gate Seal Redesign
- Crane Testing
- Cask Handling Evaluation

Project Milestones

- Facility Siting Completed Dec. 1997
- Site Clearing Begun Fall 1998
- Sign Supply Contract with NAC, Apr. 1999
- Submit Spent Fuel Pool Boron Credit T.S. to NRC, May, 1999
- Draft SER for UMS Storage, Mid 1999
- UMS Procedures, Jan. 2000
- Complete ISFSI Design Work, Dec. 2000

Project Milestones

(Continued)

- Rule Making for UMS, mid-2000
- Ancillary Equip. & Rigging, Jan. 2001
- First Casks Delivered to Palo Verde Apr., 2001
- Facility Construction Completed (initial set of pads) Dec., 2001
- Dry Runs, April 2002
- Load Casks Beginning Sept., 2002

New ISG/Issues

- Fuel Burnup > 45,000 MWd/MTU
- Storage of Fuel Assembly Inserts
- Fuel Rod Buckling
- Compliance with Codes and Standards
- Burnup Credit
- Technical Specifications