



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
612 EAST LAMAR BLVD, SUITE 400
ARLINGTON, TEXAS 76011-4125

December 23, 2008

EA-

Randall K. Edington, Executive
Vice President, Nuclear/CNO
Mail Station 7602
Arizona Public Service Company
P.O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: MEETING SUMMARY FOR PUBLIC MEETING WITH ARIZONA PUBLIC
SERVICE COMPANY

Dear Mr. Edington:

On December 18, 2008, the NRC held a public meeting to discuss the current status of the Palo Verde Nuclear Generating Station performance improvement initiatives at the NRC Region IV Office in Arlington, TX. The meeting attendance list and a copy of the NRC presentation and licensee presentation are included as Enclosures 1, 2, and 3.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the Public Electronic Reading Room page of the NRC's public web site at www.nrc.gov/reading-rm/adams.html.

Should you have any questions concerning this matter, we will be pleased to discuss them with you.

Sincerely,

Michael Hay, Chief
Project Branch D
Division of Reactor Projects

Dockets: 50-528, 50-529, 50-530
Licenses: NPF-41, NPF-51, NPF-74

Enclosures:

1. Meeting Attendance List
2. Nuclear Regulatory Commission Presentation
3. Palo Verde Nuclear Generating Station Presentation

Arizona Public Service Company

- 2 -

Mr. Steve Olea
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, AZ 85007

Mr. Douglas Kent Porter
Senior Counsel
Southern California Edison Company
Law Department, Generation Resources
P.O. Box 800
Rosemead, CA 91770

Chairman
Maricopa County Board of Supervisors
301 W. Jefferson, 10th Floor
Phoenix, AZ 85003

Mr. Aubrey V. Godwin, Director
Arizona Radiation Regulatory Agency
4814 South 40 Street
Phoenix, AZ 85040

Mr. Scott Bauer, Director
Regulatory Affairs
Palo Verde Nuclear Generating Station
Mail Station 7636
P.O. Box 52034
Phoenix, AZ 85072-2034

Mr. Dwight C. Mims
Vice President
Regulatory Affairs and Plant Improvement
Palo Verde Nuclear Generating Station
Mail Station 7605
P.O. Box 52034
Phoenix, AZ 85072-2034

Mr. Jeffrey T. Weikert
Assistant General Counsel
El Paso Electric Company
Mail Location 167
123 W. Mills
El Paso, TX 79901

Mr. Eric Tharp
Los Angeles Department of Water & Power
Southern California Public Power Authority
P.O. Box 51111, Room 1255-C
Los Angeles, CA 90051-0100

Mr. James Ray
Public Service Company of New Mexico
2401 Aztec NE, MS Z110
Albuquerque, NM 87107-4224

Mr. Geoffrey M. Cook
Southern California Edison Company
5000 Pacific Coast Hwy. Bldg. D21
San Clemente, CA 92672

Mr. Robert Henry
Salt River Project
6504 East Thomas Road
Scottsdale, AZ 85251

Mr. Brian Almon
Public Utility Commission
William B. Travis Building
P.O. Box 13326
1701 North Congress Avenue
Austin, TX 78701-3326

Mr. Phil McNeely
Environmental Program Manager
City of Phoenix
Office of Environmental Programs
200 West Washington Street
Phoenix, AZ 85003

Mr. John C. Taylor
Director, Nuclear Generation
El Paso Electric Company
340 East Palm Lane, Suite 310
Phoenix, AZ 85004

Chief, Radiological Emergency Preparedness Section
National Preparedness Directorate
Technological Hazards Division
Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, CA 94607-4052

Electronic distribution by RIV:
 Regional Administrator (Elmo.Collins@nrc.gov)
 Deputy Regional Administrator (Chuck.Casto@nrc.gov)
 DRP Director (Dwight.Chamberlain@nrc.gov)
 DRP Deputy Director (Anton.Vegel@nrc.gov)
 DRS Director (Roy.Caniano@nrc.gov)
 DRS Deputy Director (Troy.Pruett@nrc.gov)
 Senior Resident Inspector (Ryan.Treadway@nrc.gov)
 Resident Inspector (Michelle.Catts@nrc.gov)
 Resident Inspector (Jim.Melfi@nrc.gov)
 Resident Inspector (Joe.Bashore@nrc.gov)
 Branch Chief, DRP/D (Michael.Hay@nrc.gov)
 Senior Project Engineer, DRP/D (Don.Allen@nrc.gov)
 Public Affairs Officer (Victor.Dricks@nrc.gov)
 Team Leader, DRP/TSS (Chuck.Paulk@nrc.gov)
 RITS Coordinator (Marisa.Herrera@nrc.gov)

SUNSI Review Completed: MC ADAMS: Yes No Initials: MC
 Publicly Available Non-Publicly Available Sensitive Non-Sensitive
 R:\Reactors\PV\2008\PV Meeting Summary 121808.doc

C:DRP/D		
MCHay		
<u>MC</u>		
12/23/2008		

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

PUBLIC MEETING
PALO VERDE CAL STATUS
December 17, 2008, 1 p.m.
NRC Region IV, Arlington, TX.

NAME	TITLE	ORGANIZATION
Louis Cortopassi	PLANT MANAGER	APS - PALO VERDE
Dwight Mims	VP - Reg Affairs & PHT Insp	APS - PVNGS
JOHN HESSER	VP NUCLEAR ENGINEERING	APS - PVNGS
Pandy Edington	Exec VP / CNO	APS - PVNGS
MARIA LACAL	DIR. EXECUTIVE PROJ + PLT SUPP	APS - PVNGS
ROBERT BEMENT	VP NUCLEAR OPERATIONS	APS - PVNGS
Balwant Singh	Project Manager, HQ	NRC
David Probst	Senior Project Engineer	NRC
Don Allen	Senior Project Engineer	NRC
Mike Hay	Chief Project Branch D	NRC
Roy Caniano	Director, Division of Reactor Safety	NRC
Dwight Chamberlain	Director, Division of Reactor Projects	NRC
Abin Farrbanks	Project Engineer	NRC
Michelle Catts	Resident Inspector	NRC
ELMO Collins	Regional Administrator	NRC
Greg Werner	Chief, ^{Plant support} Branch 2	NRC
Zach Bailes	Reactor Inspector, NSPDP	NRC
Victor Dricks	NRC Public Affairs	NRC
Scott Bauer	Director, Regulatory Affairs	APS - PVNGS



U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Palo Verde Nuclear Generating Station Performance Improvement Meeting

- Nuclear Regulatory Commission – Region IV
- December 18, 2008



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Protecting People and the Environment

NRC Representatives

Licensee Representatives



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Protecting People and the Environment

Purpose of Today's Meeting

A public forum for discussion of Palo Verde's performance improvement initiatives



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Protecting People and the Environment

Overview

- Confirmatory Action Letter (CAL) issued June 2007 and revised in February 2008
 - 12 Key Performance Areas Identified for Improvement
- NRC Plans to perform five quarterly CAL inspections and has completed four of those inspections
- Continuous inspections performed by regional and resident inspectors



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Protecting People and the Environment

Confirmatory Action Letter

- Actions that need to be satisfactorily implemented to address the fundamental causes for performance problems at Palo Verde

- 12 Key Areas:
 - Yellow finding
 - White finding
 - Problem identification and resolution
 - Human performance
 - Engineering programs
 - Resolution of past problems



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Protecting People and the Environment

Current Status

- NRC has completed reviewing 360 out of 501 CAL items
- 2 key areas and the White finding have been closed
- 3 key areas are currently under review for closure



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Protecting People and the Environment

Confirmatory Action Letter (cont.)

- 12 Key Areas (cont.):
 - Safety culture survey
 - Accountability
 - Change management
 - Emergency Preparedness
 - Longstanding equipment concerns
 - Backlog



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Licensee Presentation



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Protecting People and the Environment

Contacting the NRC

- Report an emergency
 - > (301) 816-5100 (call collect)
- Report a safety concern:
 - > (800) 695-7403
 - > Allegation@nrc.gov
- General information or questions
 - > www.nrc.gov
 - > Select "What We Do" for Public Affairs
- Victor Dricks, Public Affairs Officer, RIV
 - > 817-860-8128
 - > Victor.Dricks@nrc.gov
- Feedback Forms available today



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Protecting People and the Environment

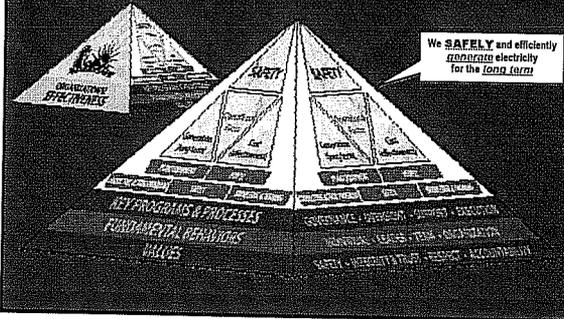
Reference Sources

- Reactor Oversight Process
 - > <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html>
- Public Electronic Reading Room
 - > <http://www.nrc.gov/reading-rm.html>
- Public Document Room
 - > 1-800-397-4209 (Toll Free)

Randy Edington

Executive Vice President and
Chief Nuclear Officer

The Palo Verde Leadership Model



Agenda

- **Confirmatory Action Letter Status**
 - Presenter: Maria Lacal
- **Fundamental Cultural Shift — Standards and Expectations for Performance and Accountability**
 - Presenter: Bob Bement
- **Safety Culture Results / Problem Identification and Resolution Improvements**
 - Presenter: Dwight Mims
- **Plant Equipment / Human Performance**
 - Presenter: Lou Cortopassi
- **Questioning Attitude and Technical Rigor / Engineering Programs**
 - Presenter: John Hesser
- **Closing Remarks**
 - Presenter: Randy Edington

**History + New + Change =
The Palo Verde Way**

**Controlled
at Deliberate Speed!**

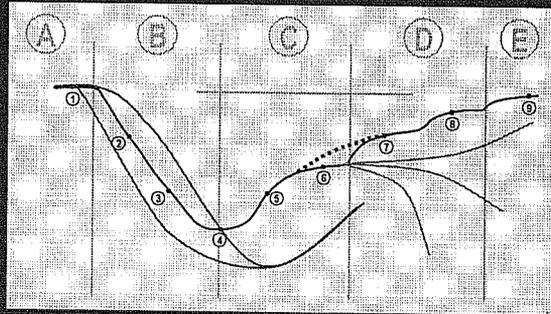


Recognize where we've been...



**Emphasize where we are
and where we are going**

Potential Stages of Power Plants



Transition to Beyond CAL

The Journey to Excellence

- What are the things that will go away automatically or will be phased out?
- What are the things we will transition or modify to ensure continued performance improvement?

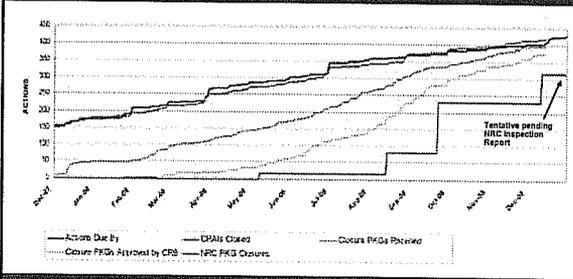
Confirmatory Action Letter Status

Maria Lacal

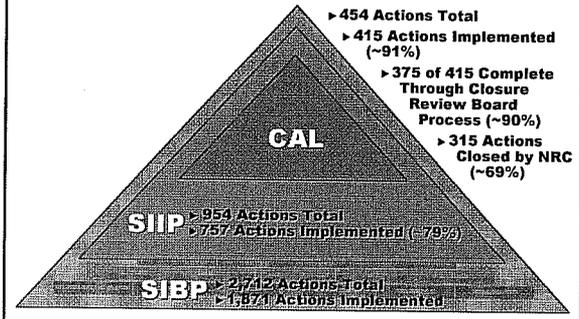
Director
Executive Projects and Plant Support /
Implementation and Monitoring Team



Schedule Adherence CAL Actions, CRB Approved, NRC Closure



SIBP / SIIP / CAL (2008)



CAL Key Performance Areas

- KPA 1: Recirculation Actuation Signal (RAS)
- KPA 2: EDG K-1 Relay
- KPA 3: Problem Identification and Resolution
- KPA 4: Human Performance
- KPA 5: Engineering Programs
- KPA 6: Quality of Equipment Evaluations
- KPA 7: Safety Culture
- KPA 8: Standards and Expectations
- KPA 9: Change Management
- KPA 10: Emergency Preparedness
- KPA 11: Long-standing Equipment Issues
- KPA 12: Backlog Tracking and Prioritization

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Closure Priority Being Completed	Priority Closed by NRC
KPA-1 RAS	172	167	165	141
KPA-1 Focus Area 1 Procedure Requirements	14	14	14	14
KPA-1 Focus Area 2 Licensing/Design Basis Information	18	15	15	14
KPA-1 Focus Area 3, Part 1 Questioning Attitude/Technical Rigor	21	20	20	19
KPA-1 Focus Area 3, Part 2 Operability Determinations	23	23	23	23
KPA-1 Focus Area 4 Communication of Design Information	33	32	32	18

As of 12/16/08

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Costs Reported (by \$ mil)	Priority Over 90 Days
KPA-1 Focus Area 5 Problem Identification & Resolution	12	12	12	10
KPA-1 Focus Area 6 Operating Experience Program	24	24	23	21
KPA-1 Focus Area 7 Engineering Experience and Training	17	17	17	14
KPA-1 Focus Area 8 Engineering Resources	10	10	9	8
KPA-1 Focus Area 9 Nuclear Assurance Department Oversight	9	9	9	9
KPA-1 Focus Area 10 DBM Writer's Guide	13	10	10	8

As of 12/16/08

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Costs Reported (by \$ mil)	Priority Over 90 Days
KPA-2 EDG K-1 Relay	17	15	14	17
KPA-3 Problem Identification and Resolution	47	45	39	23
KPA-4 Human Performance	33	25	18	14
KPA-5 Engineering Programs	38	35	35	35
KPA-6 Quality of Equipment Evaluation	9	9	9	9
KPA-7 Safety Culture	46	33	17	12

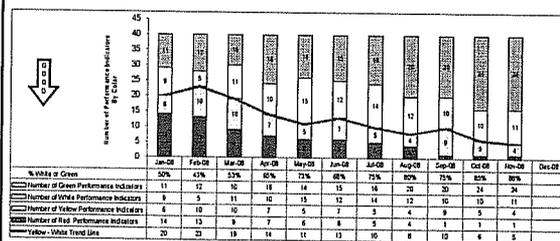
As of 12/16/08

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Costs Reported (by \$ mil)	Priority Over 90 Days
KPA-8 Standards and Expectations	58	54	52	42
KPA-9 Change Management	5	5	5	5
KPA-10 Emergency Preparedness	17	16	16	5
KPA-11 Long-standing Equipment Issues	9	9	9	9
KPA-12 Backlog Tracking and Prioritization	32	31	31	32

As of 12/16/08

Status of Core Performance Indicators



Palo Verde Nuclear Generating Station
SIIP Performance Indicators

Category	Indicator	Target	Actual	Notes
OPERATIONS	Open Work Order Backlog	100%	100%	
	Operating Hours	99.9%	99.9%	
MAINTENANCE	Preventive Maintenance	100%	100%	
	Emergency Maintenance	100%	100%	
TRAINING	Quality of Work	100%	100%	
	Training Hours	100%	100%	
SAFETY PROGRAMS	SRM Incidents	0	0	
	ES&H Violations	0	0	
REGULATORY	Open Work Orders	100%	100%	
	Compliance	100%	100%	

Legend: Target, Actual, In Progress, Not Started

March 2008

Palo Verde Nuclear Generating Station
SIIP Performance Indicators

Category	Indicator	Target	Actual	Notes
OPERATIONS	Open Work Order Backlog	100%	100%	
	Operating Hours	99.9%	99.9%	
MAINTENANCE	Preventive Maintenance	100%	100%	
	Emergency Maintenance	100%	100%	
TRAINING	Quality of Work	100%	100%	
	Training Hours	100%	100%	
SAFETY PROGRAMS	SRM Incidents	0	0	
	ES&H Violations	0	0	
REGULATORY	Open Work Orders	100%	100%	
	Compliance	100%	100%	

Legend: Target, Actual, In Progress, Not Started

November 2008

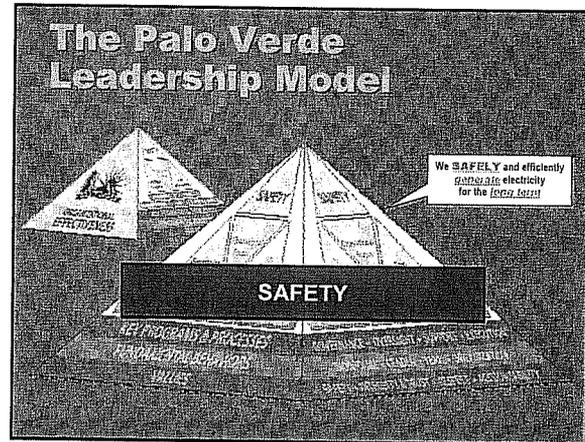
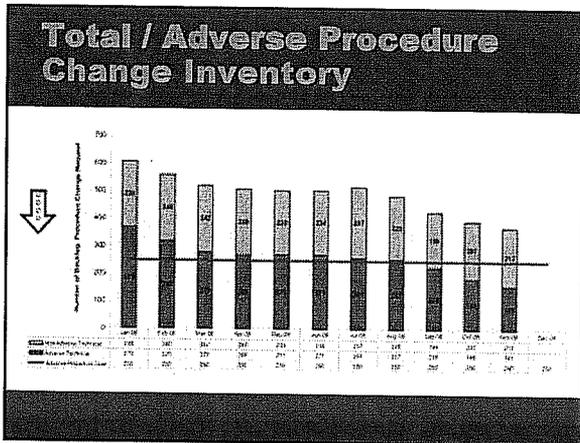
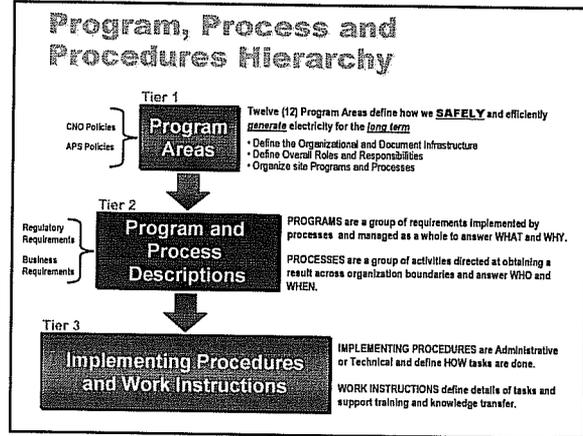
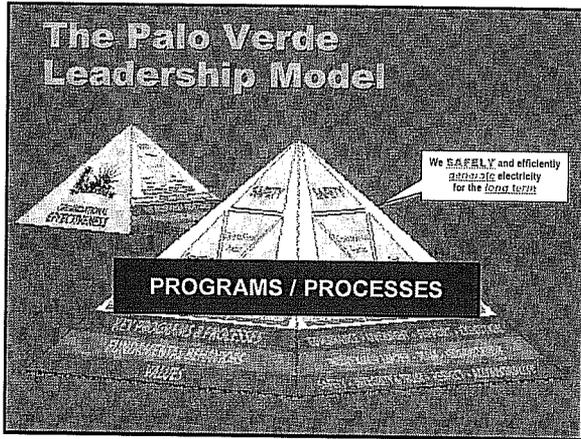
Sustaining Continuous Improvement
Transition to Beyond CAL

- Institutionalize**
 - Programs, Procedures, Policies, Policy Guides (including developmental references)
 - Job Familiarization Guides / Qualification Cards
 - Preventive Maintenance / Work Orders / Modifications
- Training**
 - Initial and Continuing Accredited Training Programs
 - Stakeholder Training (Accredited and Non-Accredited)
 - Leader Training Program
- People**
 - Knowledge Transfer - Individual Skills and Knowledge
 - New Positions / Organizational Changes
 - Staffing Strategies
 - Reliance on non-APS Personnel
- Measures**
 - Performance Indicators with Industry Targets
 - Self-Assessments and Benchmarking
- Oversight**
 - Management Review Meetings
 - Nuclear Assurance, Off-Site Safety Review Committee, Nuclear Oversight Committee
 - Plant Health Committee
 - Executive Challenge Boards

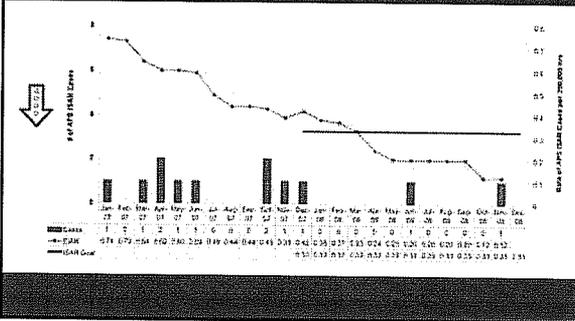
Fundamental Cultural Shift
Standards and Expectations for Performance and Accountability

Bob Bement
Vice President
Nuclear Operations

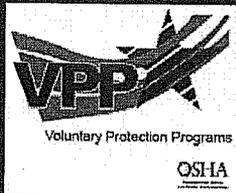
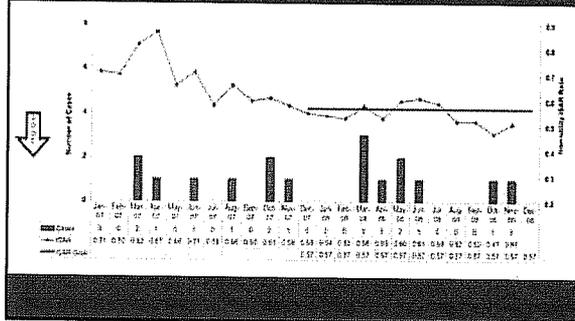


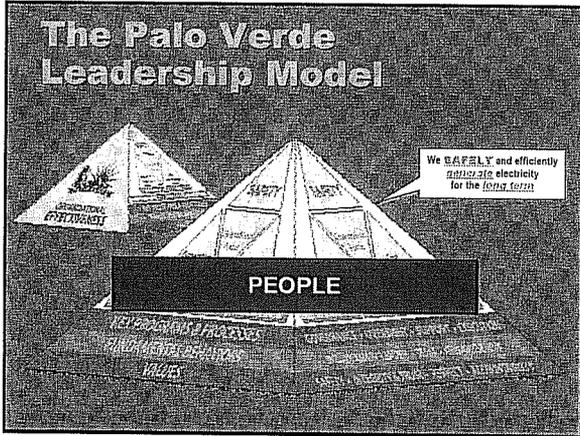


APS/ PVNGS Industrial Safety Accident Rate (ISAR)



Non-Utility Industrial Safety Accident Rate (ISAR)





Hiring Model... Hiring for OUR Future

What do you want the organization to look like in 5 years, 10 years, 15 years?

Planning for OUR future includes:

- Workforce Planning
- Initial and Targeted Hires
- Performance Management
- Development and Retention
- Compensation and Rewards
- Metrics / Effectiveness Reviews

70% - 90%

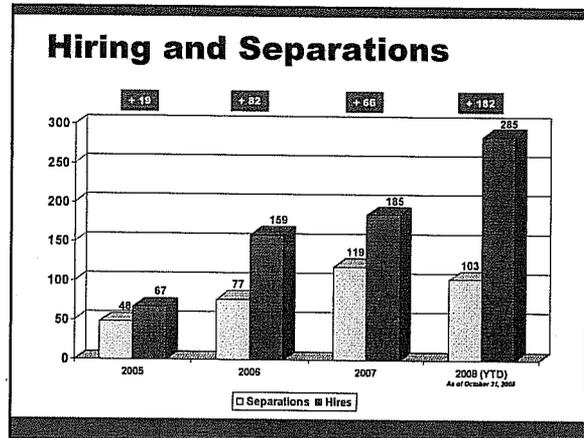
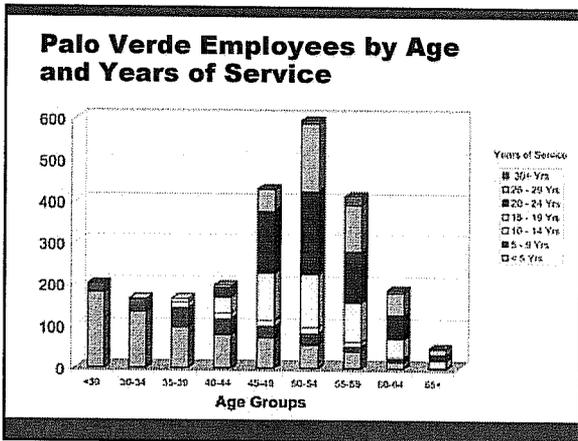
REPLACEMENT

10% - 30%

REPLACEMENT

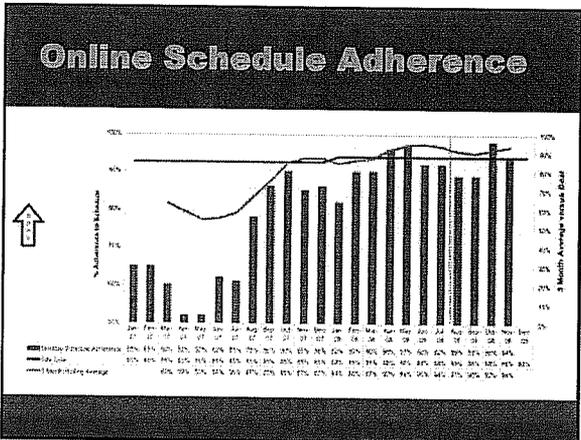
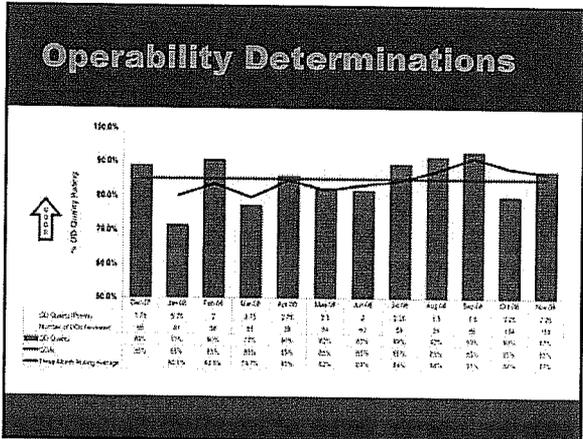
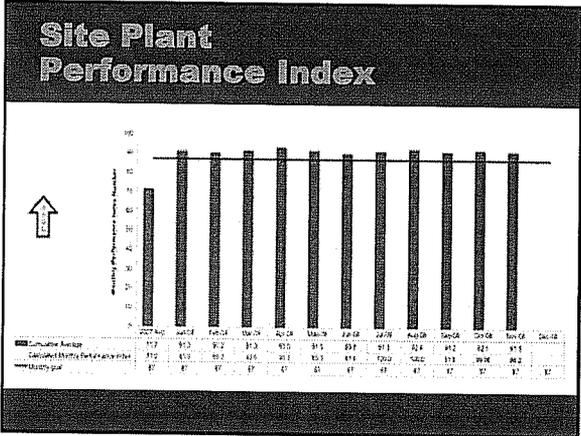
REPLACEMENT

CPI OTHER ENG

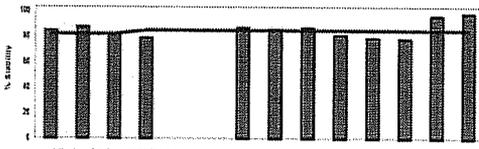


Site Operational Focus Indicator

OPS Aggregate Impact	Owner	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08
Operator Work Hours	X Hours												
Operator Burden	X Hours	20	13	20	15	15	12	21	17	23	13	20	17
Oil Accumulation	6 Hours												
PEEs	6 Hrs												
Long Term Impact	6 Hrs	65	43	65	21	79	73	77	77	75	71	61	71
Fire Treatment (P&ID)	6 Hrs						56	43	41	45	34	42	41
Temporary Modifications (T-Block)	6 Hrs	71	72	71	65	65	65	71	71	27	22	24	26
Unplanned LCOs	6 Hrs	15	11		18	6					19		
Component Maintenance Priority	6 Hrs	26	26	49	47		74	75	58		28	27	27
Plant Startup Maintenance Priority	6 Hrs						134	126		173	141	141	141
Window Color		Yellow	White	Yellow	Yellow	White	White	Yellow	White	Green	Green	Green	Green



Online Scope Stability



Monthly Scope Stability	85	86	82	79	87	86	81	81	79	78	90	95
Site Goal	82	82	82	85	85	83	83	85	83	85	85	85

Sustaining Continuous Improvement

Internal Oversight

- Metrics
- Management Review Meetings
 - Department Review Meetings
- Knowledge / Training
- Corrective Action Program Oversight
- Plant Health Committee
- Human Performance Steering Committee
- Human Performance Event Review Boards
- Effectiveness Reviews / Self Assessments

Sustaining Continuous Improvement

External Oversight

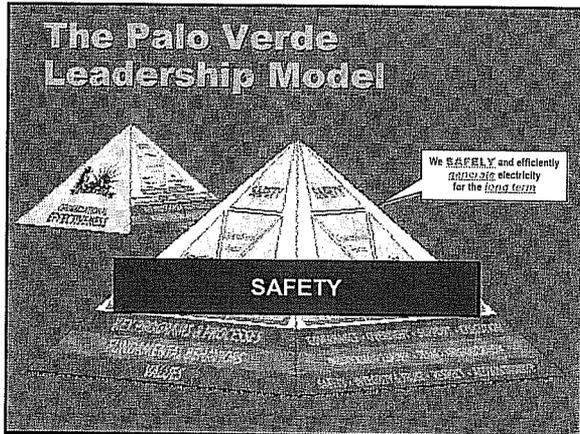
- Nuclear Assurance Department
- Nuclear Oversight Committee
- Off-site Safety Review Committee
- Management Review Meetings

Safety Culture Results / Problem Identification and Resolution Improvements

Dwight Mims

Vice President
Regulatory Affairs and Plant Improvement





2008 SYNERGY Nuclear Safety Culture Results

- 81.5% participation (industry average ~78%)
- Nuclear Safety Culture has improved notably
 - Became an "Area of Strength"
 - 2007 to 2008 trends have moved notably upward
 - Areas of strength have increased from 23 to 64
 - Areas of weakness have decreased from 64 to 3
- Site-Wide and Organizational Specific Initiatives have resulted in notable improvements in addressing Outlier (Priority) Groups
- Confidence in the Corrective Action Program indicated notable improvement

*SYNERGY classifies improvement as: Nominal < 5%; Notable > 5%; Significant > 10%

2008 SYNERGY Top Tier Results

Safety Culture Area	Measured Status	Trend	Industry Quartile
Nuclear Safety Culture	Strength	+5.9%	1st
Nuclear Safety Values, Behaviors and Practices	Strength	+7.4%	1st
Safety Conscious Work Environment	Strength	+2.7%	1st
Employee Concerns Program	Strength	+3.9%	Low 1st
General Culture and Work Environment	Strength	+3.9%	1st

2008 SYNERGY Top Tier Results

- Nuclear Safety Culture – Areas for Improvement
 - Addressing Staffing Resource Issues
 - Improving Process and Procedure Quality
- General Culture & Work Environment – Areas in Need of Attention
 - Performance Recognition
 - Change Management
 - Performance Appraisals
 - Teamwork

2008 ISCPE Top Tier Results

- **Improvements in Palo Verde Safety Culture**
 - Strong, consistent safety message with operational focus
 - Progress is apparent in each of the six identified driver areas
 - Overall confidence/trust in new management team
 - Personnel generally understand need to improve and overall strategy to achieve improvements
 - Significantly improved performance in key areas
 - Basis for continued improvement has been established

2008 ISCPE Top Tier Results

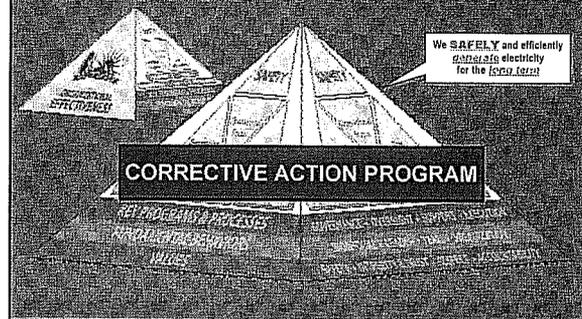
- **Areas for Improvement**
 - Programs/processes outside core structure remain cumbersome and ineffectively implemented or in midst of change
 - Some priority groups have made only limited progress
 - Engineering action plans should have been more broadly applied
- **No Significant New Safety Culture Issues Identified**

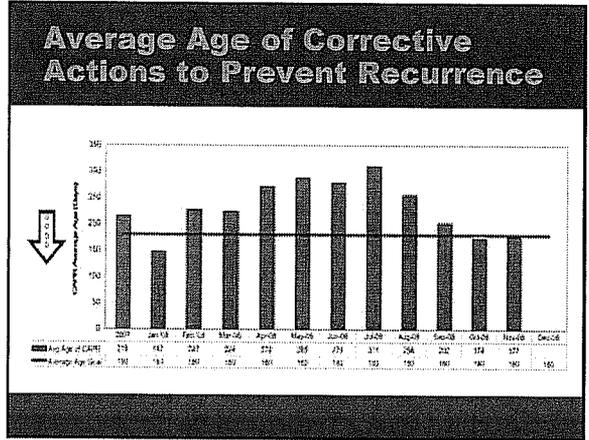
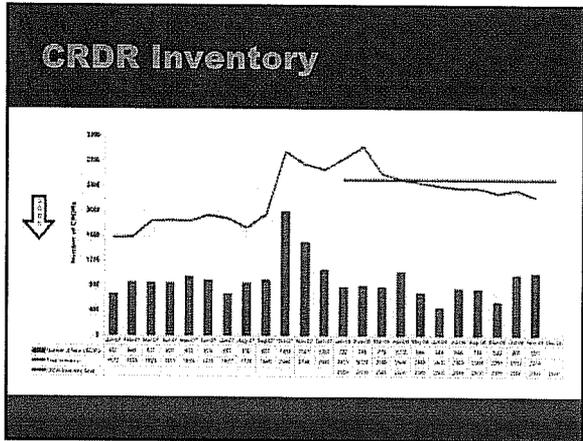
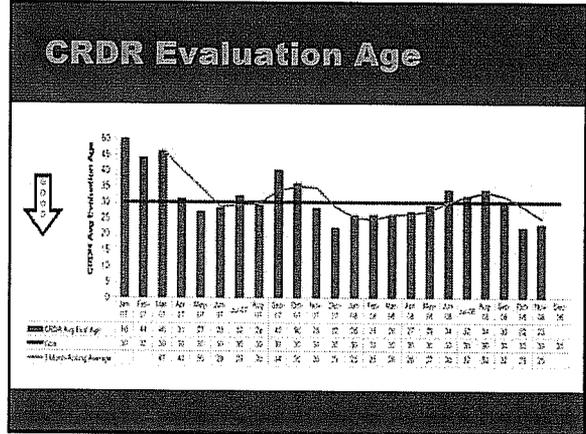
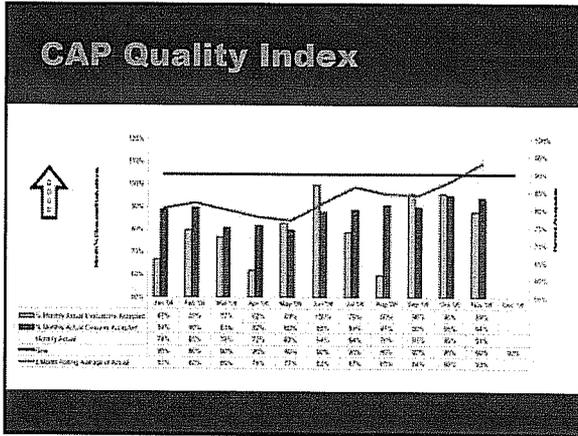
SYNERGY Priority Group Comparison

Priority Group	# Priority Groups 2007	# Priority Groups 2008
Level 1*	2	0
Level 2*	9	0
Level 3**	12	5
Level 4**	4	2
TOTAL	27	7

*Level 1 & 2 Priority Groups are "Areas for Improvement" and "Areas in Need of Attention"
 **Level 3 & 4 Priority Groups are "Opportunities for Improvement"

The Palo Verde Leadership Model





CAP Process / Structure

- **Infrastructure**
 - Action Request Review Committee, Condition Review Group, Corrective Action Review Board
 - Performance Advocates
- **Performance Indicators**
 - Site and Department level
- **Visibility / Awareness**
 - Multiple discussion venues
 - Reports specific to venue
 - Quarterly Report
- **Processes / Procedures**
- **Training**

Department CAP Scorecard

Operations Scorecard	
Compliance Window Color: White	
Section: 22	
Key Performance Indicators 1. Safety 2. Quality 3. Cost 4. Customer Satisfaction	Key CAPOR Indicators 1. CAPOR Score 2. CAPOR Rate 3. CAPOR Time 4. CAPOR Cost
Customer Quality CAPOR Score: 8 CAPOR Rate: 100% CAPOR Time: 100% CAPOR Cost: 100%	Customer Quality CAPOR Score: 8 CAPOR Rate: 100% CAPOR Time: 100% CAPOR Cost: 100%
Customer Quality & Risk CAPOR Score: 8 CAPOR Rate: 100% CAPOR Time: 100% CAPOR Cost: 100%	Customer Quality & Risk CAPOR Score: 8 CAPOR Rate: 100% CAPOR Time: 100% CAPOR Cost: 100%
Customer Quality & Risk CAPOR Score: 8 CAPOR Rate: 100% CAPOR Time: 100% CAPOR Cost: 100%	Customer Quality & Risk CAPOR Score: 8 CAPOR Rate: 100% CAPOR Time: 100% CAPOR Cost: 100%

CAP Behaviors / Culture

- Department-level Engagement and Alignment
- Leader Behaviors
- Ownership and Accountability
- Performance Advocates
- Formal and Cognitive Trending of Issues
- Oversight
- Peer Interaction

PI&R Cross-Cutting Aspects	January 2008	November 2008
Corrective Action Program		
Identification	6	0
Trending	0	0
Evaluation	7	1
Timeliness	4	1
Operating Experience		
Evaluation	0	0
Implementation	4	1
Self and Independent Assessments		
Assessment	2	0
Metrics	0	0
Communicate	0	0

Site Operational Focus Indicator

OFS Aggregate Impact	Owner	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08
Operator Work Absences	V. Adams												
Operator Shortages	K. Adams	20	18	20	15	15	15	21	15	12	13	17	
All Absences	K. Adams												
CPDs	G. Hays							32	31				
Long-Term Absents	K. Adams	65	62	65	61	70	71	77	76	75	71	67	71
Fire Alarms (FSC/FM)	J. Adams						55	43	41	45	51	42	41
Temporary Modifications (T-Mod)	M. Adams	10	10	10	10	10	10	10	10	10	10	10	10
Unplanned LCOs	J. Adams	15	13		11								
Corrective Maintenance Inventory	G. Hays	20	20	49	47	20	24	25	33	21	20	20	20
Plant Section Maintenance Priority	G. Hays					124	124				113	114	111
Window Color		Yellow	White	Yellow	Yellow	White	White	Yellow	White	Green	Green	Green	Green

Recent Equipment Issues

- **Diesel Generator Injector Pumps**
 - Fuel oil leakage identified due to O-ring degradation.
 - All (120) fuel oil injector pumps replaced; coordinated between on-line and outage.
 - NAD oversight of vendor performance.
- **Main Steam Line Hangers**
 - History of component failures identified following plant shutdown.
 - Main steam line hanger hardware upgrade completed on Unit 1 and Unit 2, including component re-positioning.
 - Extensive data gathering instrumentation installed to facilitate long-term resolution.
 - No main steam line hanger issues identified during recent Unit 2 shutdown.

Recent Equipment Issues

- **Inverters**
 - Probable Cause attributed to weaknesses in Preventive Maintenance.
 - DC-DC converter cards replaced on all four inverters in Unit 1 and Unit 2. Unit 3 scheduled for 2009 spring outage.
 - Contingent troubleshooting game plan applied on the training inverter (included vendor and external consultant support).
 - Troubleshooting and testing confirm the need for additional data to substantiate the cause of the spurious transfers. (Common alarm displays and clears, with no discrimination on the cause of the alarm.)
 - System recovery team preparing plan for improving inverter reliability.
 - Long-term solution: Preliminary engineering in progress, likely a configuration change that includes a swing inverter.

Recent Equipment Issues

- **Diesel Generator Voltage Regulator Linear Reactors**
 - Unit 2 Diesel Generator 2A Voltage Regulator Linear Reactors failure.
 - Component replaced, circuitry tested satisfactory.
 - Preliminary root cause, component aging and/or manufacturing defect. Failed component disassembly and investigation in-progress.
 - Replacement components on order (1st quarter 2009).
 - Compared industry Operating Experience for additional lessons learned.
 - Long-term solution: Auto Voltage Regulator Modification under review.

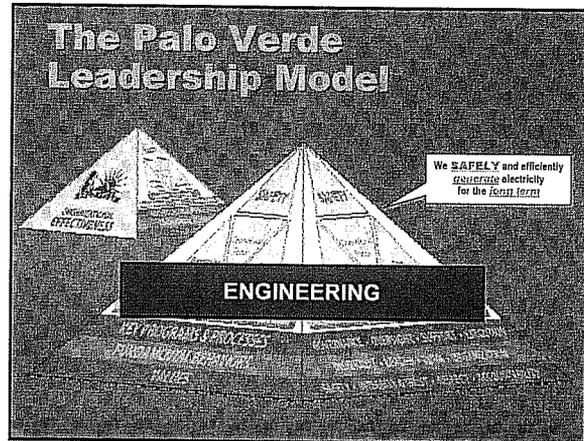
Human Performance Cross-Cutting Aspects	January 2008	November 2008
DECISION MAKING		
Systematic	5	2
Assumptions	8	3
Communication	1	0
RESOURCES		
Margin	2	0
T&Q	0	1
Procedures	0	2
Facilities	1	0
WORK CONTROL		
Planning	2	0
Coordination	2	1
WORK PRACTICES		
Error Prevention	7	4
Procedure Use	1	0
Oversight	3	2



- ## Sustaining Continuous Improvement
- Metrics
 - Management Review Meetings
 - Knowledge / Training
 - Plant Health Committee
 - Site Top 10 Technical Issues Process
 - Corrective Action Review Board
 - Long-range Planning
 - Human Performance Steering Committee
 - Human Performance Event Review Board

Questioning Attitude and Technical Rigor / Engineering Programs

John Hesser
Vice President
Nuclear Engineering

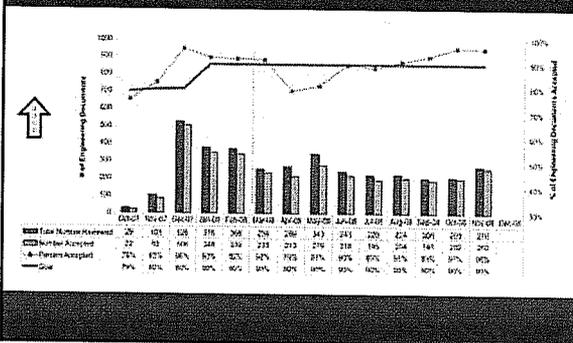
Questioning Attitude and Technical Rigor

- **Engineering Improvements**
 - Implemented Engineering Product Review Board to evaluate and improve Engineering products
 - Improved formal communications of technical information
 - Performed Engineering incumbent analysis and remediated identified gaps
 - Strengthened Design Bases Manual writer's guide
- **Station Improvements**
 - RAS case study training provided and embedded in assessment and evaluation processes
 - Questioning attitude and technical rigor training provided to key plant staff
 - Implemented ARRC/CRG/CARB and supported with job familiarization guides
 - Strengthened reviews of high tier Operating Experience

Questioning Attitude and Technical Rigor

- **Operability Determinations**
 - Training for all STAs / SMs / E-FIN
 - Check list developed to support consistent questioning
 - Organizational changes support daily coverage of operability issues with E-FIN
 - Prompt operability job qualifications
 - Oversight of process, including daily reviews and monthly boards in Operations and monthly reviews in Engineering (EPRB)

Engineering Work Product Quality



Engineering Programs

KPA 5

- **KPA 5 addresses the following:**
 - Equipment Reliability including Long-range Planning and Equipment Root Cause of Failure Analysis Program
 - Engineering Technical Rigor including Engineering Product Quality and Engineering Work Management and Prioritization
 - Design Control / Configuration Management including Configuration Change Processes and Component Design Basis Review
 - Engineering Programs, including program ownership, alignment with industry standards and Program Health Reporting

Key Actions Completed

KPA 5

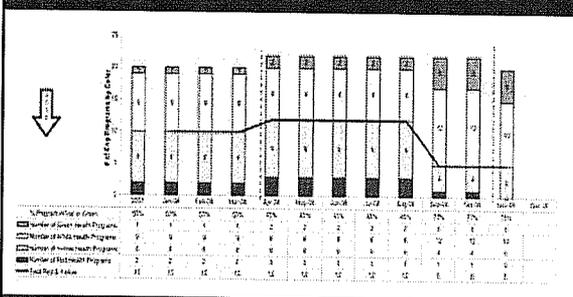
- **Implemented dedicated groups for:**
 - Engineering Programs
 - Fire Protection
 - Minor Modifications
- **Implemented process improvements:**
 - Root and apparent cause process
 - Configuration management
 - Long-range planning
- **Assessed program health and implemented improvements**
- **Completed 62% of Component Design Bases Reviews**
- **Implemented an Engineering Product Review Board**

Key Actions Remaining

KPA 5

- **Perform Assessment on short-term actions taken to improve Long-range Plan** (due 12/19/2008)
- **Complete Component Design Basis Review Project** (due 6/2/2010)
- **Perform remaining Engineering Programs Assessments** (due 8/20/2010)
 - Completed 17 (out of 20) Program Assessments, completed to date ahead of schedule
 - Remaining Program Assessments, accelerated schedule to first half of 2009
 - Steam Generators
 - Welding
 - Flow Accelerated Corrosion (FAC)

Engineering Program Health



KPA 5 Continued Focus Areas

- **Engineering Program Health Report Remaining Yellow Programs**
 - Surveillance Program
 - Motor-operated Valves
 - Heat Exchangers
 - Pressure Testing
 - Maintenance Rule

Engineering Program Improvements

- **Maintenance Rule improvements:**
 - Separate department formed
 - Strengthened expert panel
 - Reviewed all (a) 1 action plans
 - Trained system engineers on performance criteria and revalidated or modified performance criteria
 - Implemented a daily review of MRFF's to ensure timely response to issues
- **Revised the program health criteria to ensure program health reflects conditions of the program**
- **Program changes are reviewed and approved through Plant Health Committee**

KPA 5 Performance Effectiveness

- **Site Comprehensive Self-assessment (Aug 2008): Implementation of Action Plans – ON-TRACK**
- **Year-end Effectiveness Review Challenge Board:**
 - Equipment Reliability – **SATISFACTORY**
 - Engineering Technical Rigor – **SATISFACTORY**
 - Design Control / Configuration Management – **SATISFACTORY**
 - Engineering Programs – **SATISFACTORY**

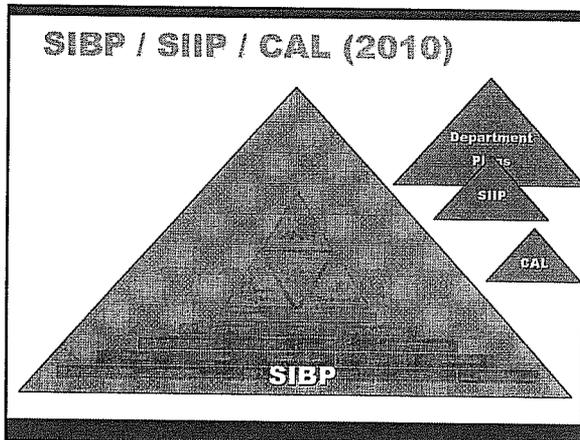
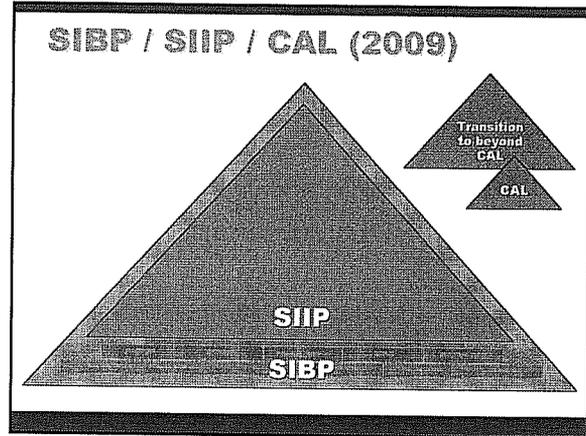
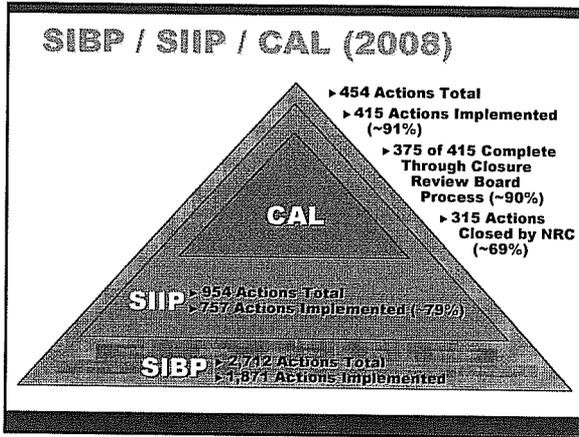
Sustaining Continuous Improvement

- **Metrics**
- **Management Review Meetings**
- **Knowledge / Training**
- **Plant Health Committee**
- **Corrective Action Review Board**
- **Long-range Planning**
- **Engineering Product Review Board**
- **Effectiveness Reviews / Self Assessments**
- **Organizational changes to support dedicated ownership**

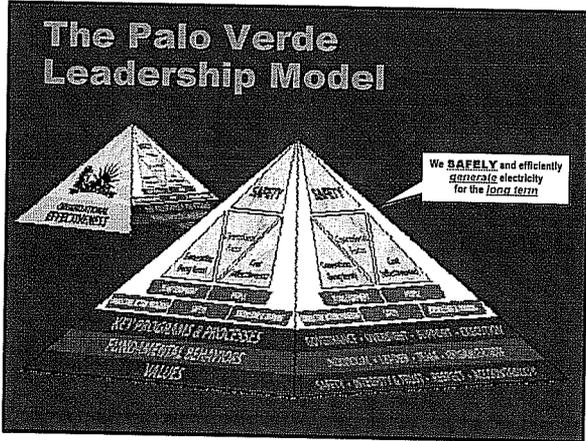
Randy Edington

Executive Vice President and
Chief Nuclear Officer



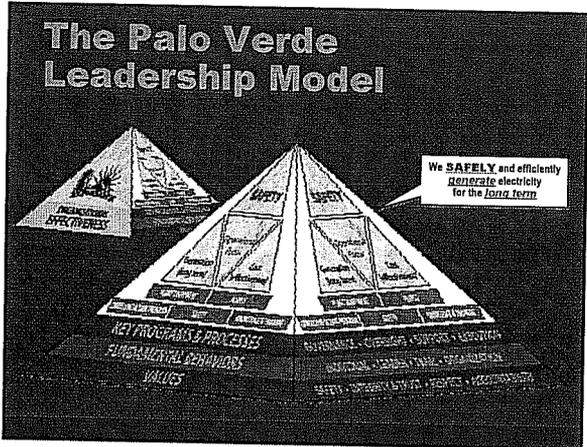


- ### Sustaining Continuous Improvement
- Transition to Beyond CAL*
- Institutionalize**
 - Programs, Procedures, Policies, Policy Guides (including developmental references)
 - Job Familiarization Guides / Qualification Cards
 - Preventive Maintenance / Work Orders / Modifications
 - Training**
 - Initial and Continuing Accredited Training Programs
 - Stakeholder Training (Accredited and Non-Accredited)
 - Leader Training Program
 - People**
 - Knowledge Transfer – Individual Skills and Knowledge
 - New Positions / Organizational Changes
 - Staffing Strategies
 - Reliance on non-APS Personnel
 - Measures**
 - Performance Indicators with Industry Targets
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 - Management Review Meetings
 - Nuclear Assurance, Off-Site Safety Review Committee, Nuclear Oversight Committee
 - Plant Health Committee
 - Executive Challenge Boards



Randy Edington

Executive Vice President and Chief Nuclear Officer



- ### Agenda
- **Confirmatory Action Letter Status**
– Presenter: Maria Laca
 - **Fundamental Cultural Shift — Standards and Expectations for Performance and Accountability**
– Presenter: Bob Bernant
 - **Safety Culture Results / Problem Identification and Resolution Improvements**
– Presenter: Dwight Mims
 - **Plant Equipment / Human Performance**
– Presenter: Lou Corfopassi
 - **Questioning Attitude and Technical Rigor / Engineering Programs**
– Presenter: John Hesser
 - **Closing Remarks**
– Presenter: Randy Edington

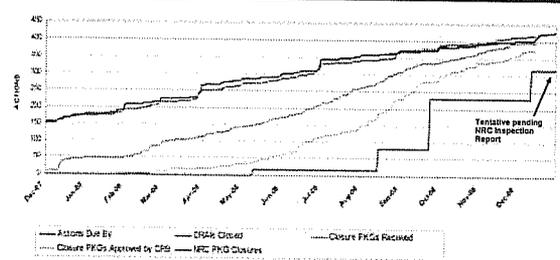
Confirmatory Action Letter Status

Maria Lacal

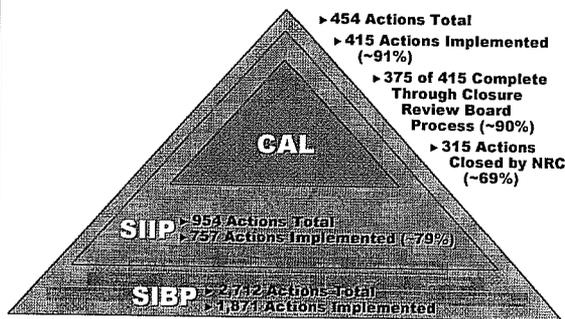
Director
Executive Projects and Plant Support /
Implementation and Monitoring Team



Schedule Adherence CAL Actions, CRB Approved, NRC Closure



SIBP / SIIP / CAL (2008)



CAL Key Performance Areas

- KPA 1: Recirculation Actuation Signal (RAS)
- KPA 2: EDG K-1 Relay
- KPA 3: Problem Identification and Resolution
- KPA 4: Human Performance
- KPA 5: Engineering Programs
- KPA 6: Quality of Equipment Evaluations
- KPA 7: Safety Culture
- KPA 8: Standards and Expectations
- KPA 9: Change Management
- KPA 10: Emergency Preparedness
- KPA 11: Long-standing Equipment Issues
- KPA 12: Backlog Tracking and Prioritization

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Closure Review Score (0-100)	Priority Score (0-100)
KPA-1 RAS	172	167	165	141
KPA-1 Focus Area 1 Procedure Requirements	14	14	14	14
KPA-1 Focus Area 2 Licensing/Design Basis Information	18	15	15	14
KPA-1 Focus Area 3, Part 1 Questioning Attitude/Technical Rigor	21	20	20	19
KPA-1 Focus Area 3, Part 2 Operability Determinations	23	23	23	23
KPA-1 Focus Area 4 Communication of Design Information	33	32	32	18

As of 12/16/08

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Closure Review Score (0-100)	Priority Score (0-100)
KPA-1 Focus Area 5 Problem Identification & Resolution	12	12	12	10
KPA-1 Focus Area 6 Operating Experience Program	24	24	23	21
KPA-1 Focus Area 7 Engineering Experience and Training	17	17	17	14
KPA-1 Focus Area 8 Engineering Resources	10	10	9	8
KPA-1 Focus Area 9 Nuclear Assurance Department Oversight	9	9	9	9
KPA-1 Focus Area 10 DBM Writer's Guide	13	10	10	8

As of 12/16/08

Status of Key Performance Areas

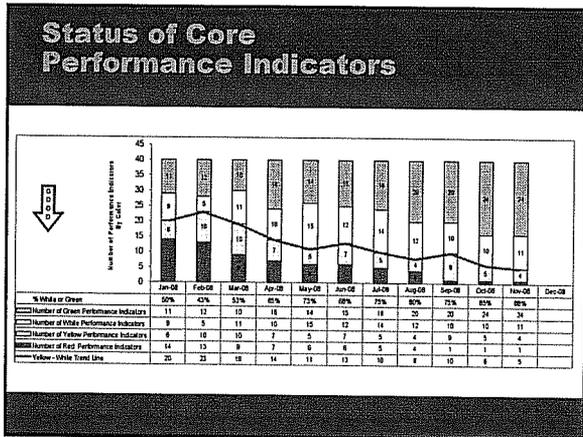
Key Performance Area (KPA)	Total Actions	Implemented Actions	Closure Review Score (0-100)	Priority Score (0-100)
KPA-2 EDG K-1 Relay	17	15	14	17
KPA-3 Problem Identification and Resolution	47	45	39	23
KPA-4 Human Performance	33	25	18	14
KPA-5 Engineering Programs	38	35	35	35
KPA-6 Quality of Equipment Evaluation	9	9	9	9
KPA-7 Safety Culture	46	33	17	12

As of 12/16/08

Status of Key Performance Areas

Key Performance Area (KPA)	Total Actions	Implemented Actions	Closure Review Score (0-100)	Priority Score (0-100)
KPA-8 Standards and Expectations	58	54	52	42
KPA-9 Change Management	5	5	5	5
KPA-10 Emergency Preparedness	17	16	16	5
KPA-11 Long-standing Equipment Issues	9	9	9	9
KPA-12 Backlog Tracking and Prioritization	32	31	31	32

As of 12/16/08



Palo Verde Nuclear Generating Station SIIP Performance Indicators

Category	Indicator	Target	Actual	Status	Notes
Operations	1.01.01.01.01	100%	100%	Green	
	1.01.01.01.02	100%	100%	Green	
	1.01.01.01.03	100%	100%	Green	
Engineering	2.01.01.01.01	100%	100%	Green	
	2.01.01.01.02	100%	100%	Green	
	2.01.01.01.03	100%	100%	Green	
Site Programs and Processes	3.01.01.01.01	100%	100%	Green	
	3.01.01.01.02	100%	100%	Green	
	3.01.01.01.03	100%	100%	Green	
Organization	4.01.01.01.01	100%	100%	Green	
	4.01.01.01.02	100%	100%	Green	
	4.01.01.01.03	100%	100%	Green	

Legend: Green (On Track), Yellow (At Risk), Red (Off Track)

March 2008

Palo Verde Nuclear Generating Station SIIP Performance Indicators

Category	Indicator	Target	Actual	Status	Notes
Operations	1.01.01.01.01	100%	100%	Green	
	1.01.01.01.02	100%	100%	Green	
	1.01.01.01.03	100%	100%	Green	
Engineering	2.01.01.01.01	100%	100%	Green	
	2.01.01.01.02	100%	100%	Green	
	2.01.01.01.03	100%	100%	Green	
Site Programs and Processes	3.01.01.01.01	100%	100%	Green	
	3.01.01.01.02	100%	100%	Green	
	3.01.01.01.03	100%	100%	Green	
Organization	4.01.01.01.01	100%	100%	Green	
	4.01.01.01.02	100%	100%	Green	
	4.01.01.01.03	100%	100%	Green	

Legend: Green (On Track), Yellow (At Risk), Red (Off Track)

November 2008

- ### Sustaining Continuous Improvement Transition to Beyond CAL
- Institutionalize**
 - Programs, Procedures, Policies, Policy Guides (including developmental references)
 - Job Familiarization Guides / Qualification Cards
 - Preventive Maintenance / Work Orders / Modifications
 - Training**
 - Initial and Continuing Accredited Training Programs
 - Stakeholder Training (Accredited and Non-Accredited)
 - Leader Training Program
 - People**
 - Knowledge Transfer – Individual Skills and Knowledge
 - New Positions / Organizational Changes
 - Staffing Strategies
 - Reliance on non-APS Personnel
 - Measures**
 - Performance Indicators with Industry Targets
 - Self-Assessments and Benchmarking
 - Oversight**
 - Management Review Meetings
 - Nuclear Assurance, Off-Site Safety Review Committee, Nuclear Oversight Committee
 - Plant Health Committee
 - Executive Challenge Boards

Fundamental Cultural Shift

Standards and Expectations for Performance and Accountability

Bob Bement
Vice President
Nuclear Operations



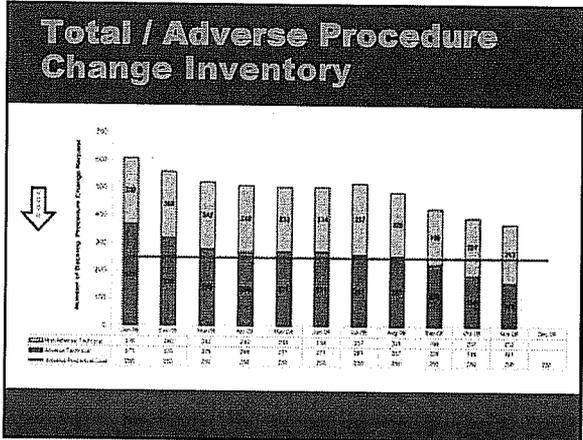
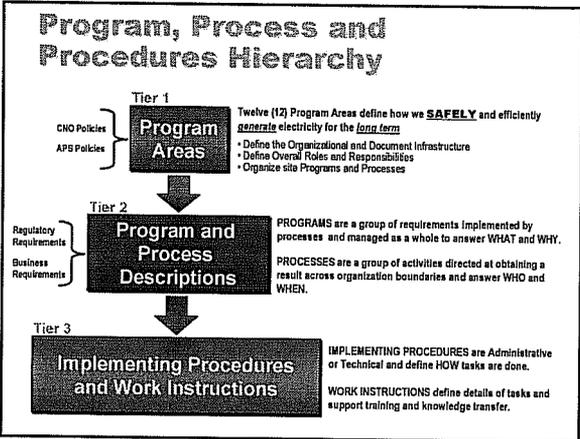
The Palo Verde Leadership Model

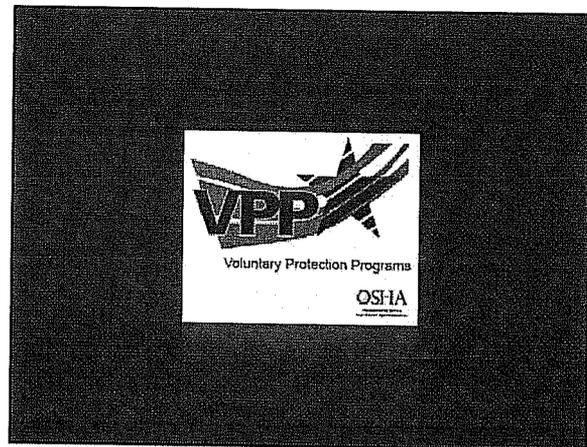
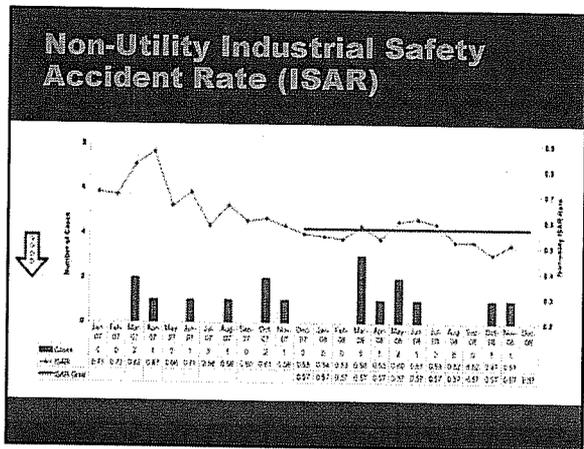
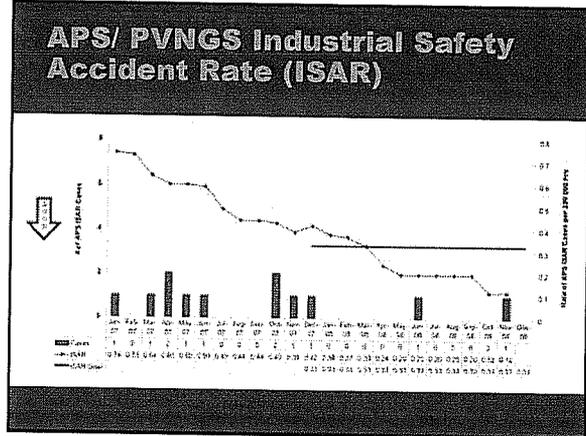
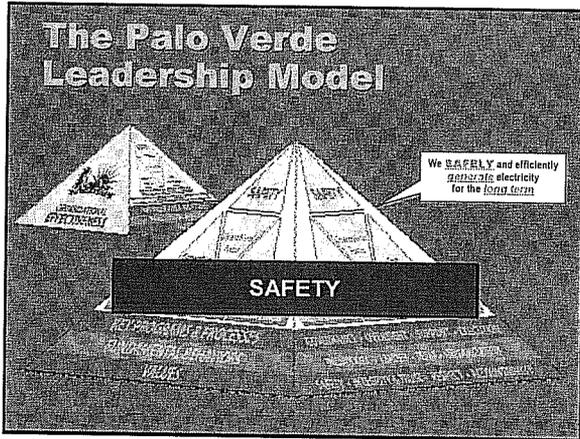
We SAFELY and efficiently generate electricity for the future.

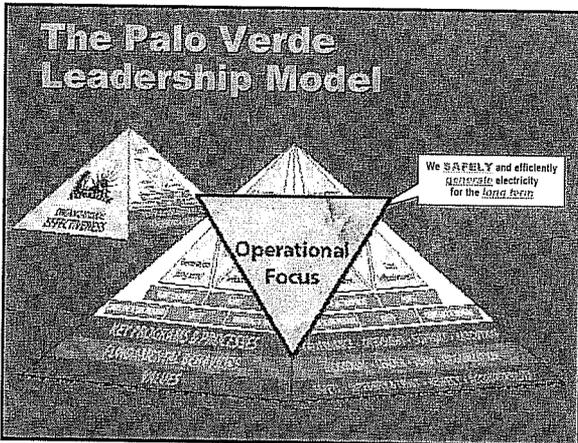
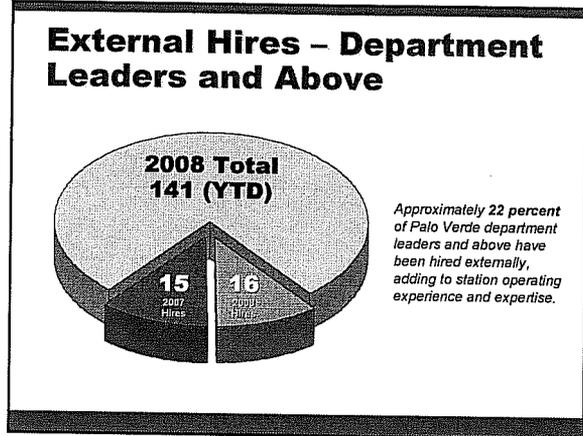
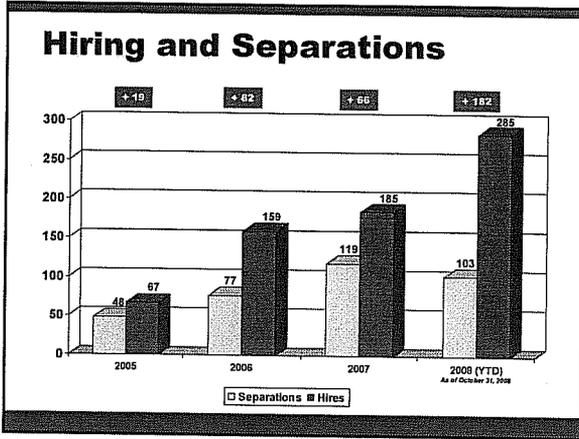
PROGRAMS / PROCESSES

KEY PROGRAMS & PROCESSES
FOR PLANT RESOURCES
PLANS

PLANT MAINTENANCE, OPERATIONS, SAFETY, INSPECTION, TRAINING, SUPPORT, QUALITY, ENVIRONMENTAL, SOCIAL, COMMUNITY







Palo Verde Nuclear Generating Station - MTR

December - 2007

Area	Residual Risk	Operational Process Change	Operational Schedule	EDM & Work Completion	Resource Management	Contract Management	Production Safety	Operational Safety	Cost Management	Regulatory Response
Nuclear Safety	17	17	17	17	17	17	17	17	17	17
Facility Operations	17	17	17	17	17	17	17	17	17	17
Human Performance Leadership	17	17	17	17	17	17	17	17	17	17
Regulatory Interface	17	17	17	17	17	17	17	17	17	17
Financial Leadership	17	17	17	17	17	17	17	17	17	17

Legend:
 [] Planned
 [] Complete
 [] In Progress
 [] Not Started
 [] YTD
 [] 0/0

Note: Blue denotes under development.

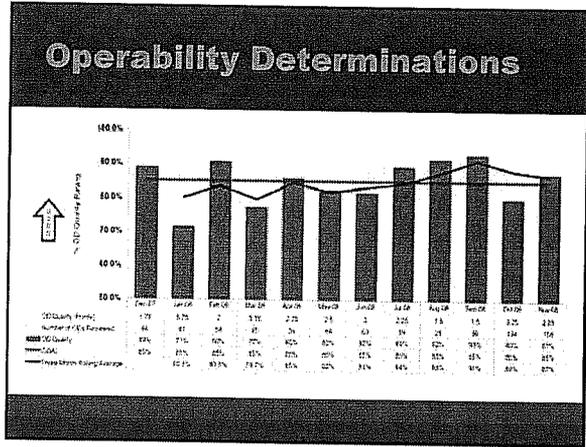
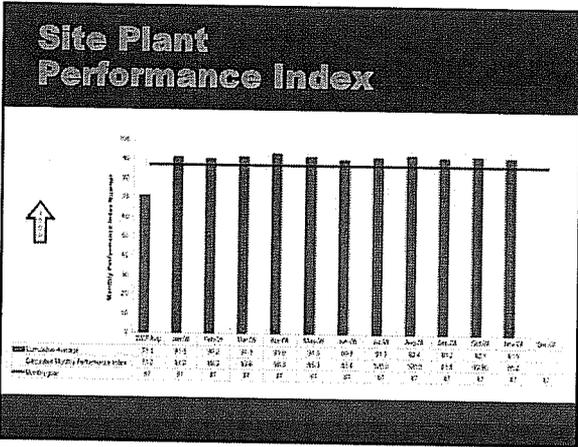
Palo Verde Nuclear Generating Station - MTR

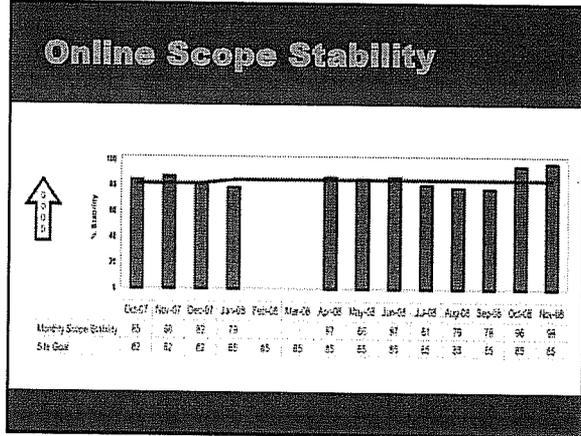
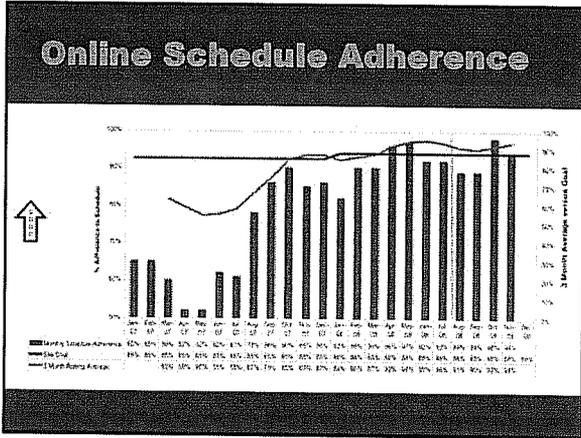
November - 2006

Area	Item	Priority	Start Date	End Date	Status	Responsible Party	Notes
Nuclear Safety	Emergency Preparedness	High	10/15/06	11/15/06	Complete	Plant Manager	
	Fire Protection	High	10/15/06	11/15/06	Complete	Plant Manager	
	Security	High	10/15/06	11/15/06	Complete	Plant Manager	
	Environmental	High	10/15/06	11/15/06	Complete	Plant Manager	
Reliability/Operations	Availability	High	10/15/06	11/15/06	Complete	Plant Manager	
	Performance	High	10/15/06	11/15/06	Complete	Plant Manager	
	Cost	High	10/15/06	11/15/06	Complete	Plant Manager	
	Quality	High	10/15/06	11/15/06	Complete	Plant Manager	
Human Performance/Leadership	Training	High	10/15/06	11/15/06	Complete	Plant Manager	
	Communication	High	10/15/06	11/15/06	Complete	Plant Manager	
	Teamwork	High	10/15/06	11/15/06	Complete	Plant Manager	
	Leadership	High	10/15/06	11/15/06	Complete	Plant Manager	
Regulatory/Inspection	Compliance	High	10/15/06	11/15/06	Complete	Plant Manager	
	Reporting	High	10/15/06	11/15/06	Complete	Plant Manager	
	Inspection	High	10/15/06	11/15/06	Complete	Plant Manager	
	Investigation	High	10/15/06	11/15/06	Complete	Plant Manager	
Financial/Logistics	Budget	High	10/15/06	11/15/06	Complete	Plant Manager	
	Procurement	High	10/15/06	11/15/06	Complete	Plant Manager	
	Inventory	High	10/15/06	11/15/06	Complete	Plant Manager	
	Logistics	High	10/15/06	11/15/06	Complete	Plant Manager	

Site Operational Focus Indicator

Category	Owner	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06
Overall Risk Index	1. Average	18	18	18	18	18	18	18	18	18	18	18	18
Operational Burden	1. Average	20	18	20	18	18	18	18	18	18	18	18	18
SA Availability	1. Average	18	18	18	18	18	18	18	18	18	18	18	18
SAO-1	1. Average	18	18	18	18	18	18	18	18	18	18	18	18
Long-Term Topics	1. Average	18	18	18	18	18	18	18	18	18	18	18	18
Environmental PSCCAI	1. Average	18	18	18	18	18	18	18	18	18	18	18	18
Temporary Workers (T-Aves)	1. Average	18	18	18	18	18	18	18	18	18	18	18	18
Contractor OSA	1. Total	18	18	18	18	18	18	18	18	18	18	18	18
Control of Maintenance Inventory	1. High	18	18	18	18	18	18	18	18	18	18	18	18
Plant Stock Maintenance Inventory	1. High	18	18	18	18	18	18	18	18	18	18	18	18
Window Color	Yellow	White	Yellow	Yellow	White	White	Yellow	White	Green	Green	Green	Green	Green





- ### Sustaining Continuous Improvement
- Internal Oversight*
- Metrics
 - Management Review Meetings
 - Department Review Meetings
 - Knowledge / Training
 - Corrective Action Program Oversight
 - Plant Health Committee
 - Human Performance Steering Committee
 - Human Performance Event Review Boards
 - Effectiveness Reviews / Self Assessments

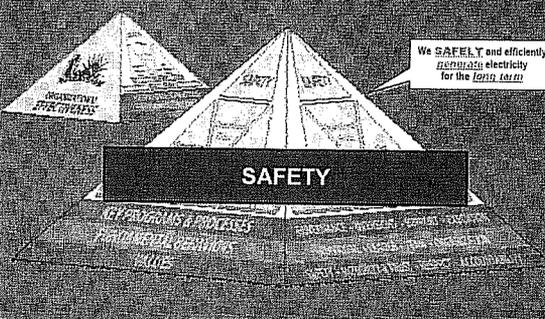
- ### Sustaining Continuous Improvement
- External Oversight*
- Nuclear Assurance Department
 - Nuclear Oversight Committee
 - Off-site Safety Review Committee
 - Management Review Meetings

Safety Culture Results / Problem Identification and Resolution Improvements

Dwight Mims
 Vice President
 Regulatory Affairs and Plant Improvement



The Palo Verde Leadership Model



2008 SYNERGY Nuclear Safety Culture Results

- 81.5% participation (industry average ~78%)
- Nuclear Safety Culture has improved notably
 - Became an "Area of Strength"
 - 2007 to 2008 trends have moved notably upward
 - Areas of strength have increased from 23 to 64
 - Areas of weakness have decreased from 64 to 3
- Site-Wide and Organizational Specific Initiatives have resulted in notable improvements in addressing Outlier (Priority) Groups
- Confidence in the Corrective Action Program indicated notable improvement

*SYNERGY classifies improvement as: Nominal < 5%; Notable > 5%; Significant > 10%

2008 SYNERGY Top Tier Results

Safety Culture Area	Measured Status	Trend	Industry Quartile
Nuclear Safety Culture	Strength	+5.9%	1st
Nuclear Safety Values, Behaviors and Practices	Strength	+7.4%	1st
Safety Conscious Work Environment	Strength	+2.7%	1st
Employee Concerns Program	Strength	+3.9%	Low 1st
General Culture and Work Environment	Strength	+3.9%	1st

2008 SYNERGY Top Tier Results

- **Nuclear Safety Culture – Areas for Improvement**
 - Addressing Staffing Resource Issues
 - Improving Process and Procedure Quality
- **General Culture & Work Environment – Areas in Need of Attention**
 - Performance Recognition
 - Change Management
 - Performance Appraisals
 - Teamwork

2008 ISCPE Top Tier Results

- **Improvements in Palo Verde Safety Culture**
 - Strong, consistent safety message with operational focus
 - Progress is apparent in each of the six identified driver areas
 - Overall confidence/trust in new management team
 - Personnel generally understand need to improve and overall strategy to achieve improvements
 - Significantly improved performance in key areas
 - Basis for continued improvement has been established

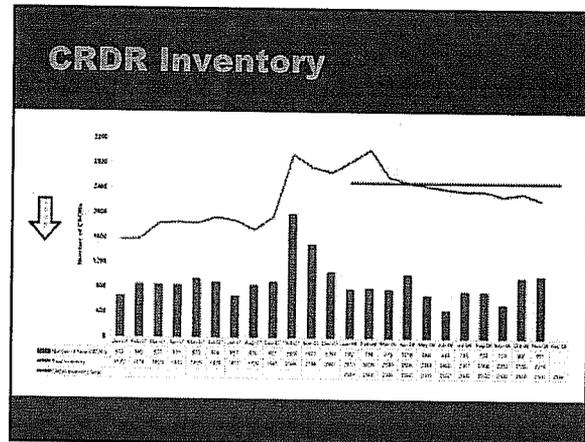
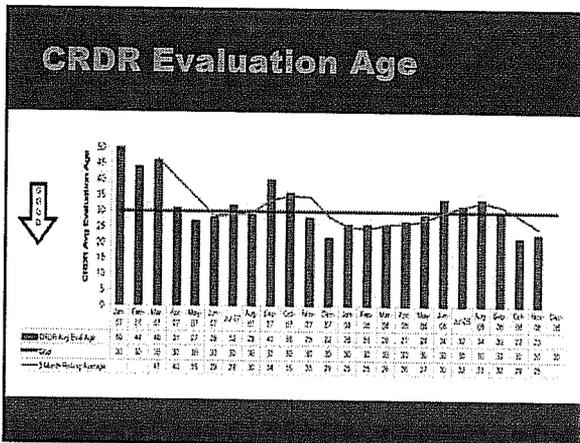
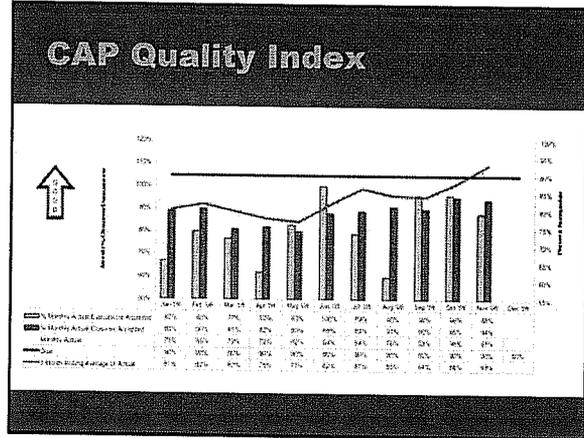
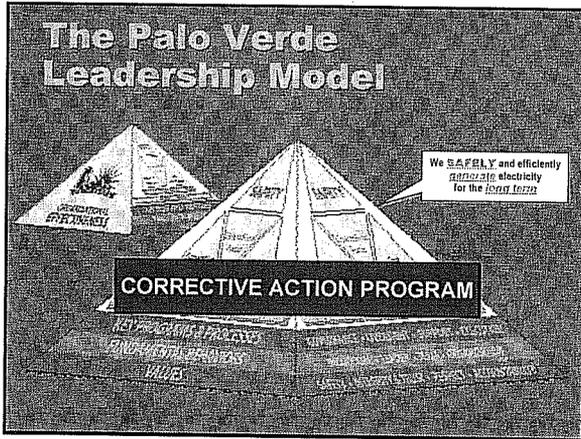
2008 ISCPE Top Tier Results

- **Areas for Improvement**
 - Programs/processes outside core structure remain cumbersome and ineffectively implemented or in midst of change
 - Some priority groups have made only limited progress
 - Engineering action plans should have been more broadly applied
- **No Significant New Safety Culture Issues Identified**

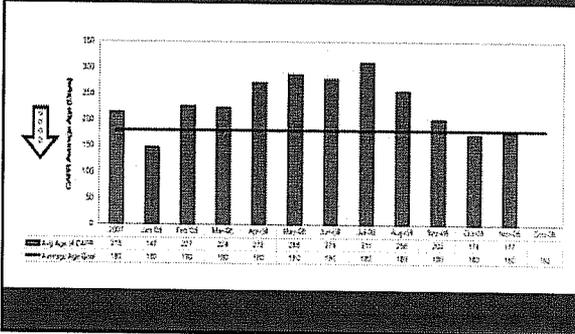
SYNERGY Priority Group Comparison

Priority Group	# Priority Groups 2007	# Priority Groups 2008
Level 1*	2	0
Level 2*	9	0
Level 3**	12	5
Level 4**	4	2
TOTAL	27	7

*Level 1 & 2 Priority Groups are "Areas for Improvement" and "Areas in Need of Attention"
 **Level 3 & 4 Priority Groups are "Opportunities for Improvement"



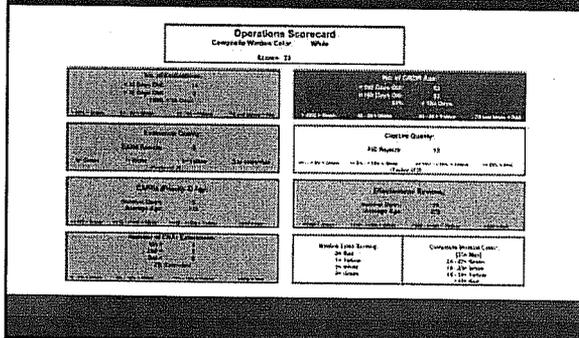
Average Age of Corrective Actions to Prevent Recurrence



CAP Process / Structure

- **Infrastructure**
 - Action Request Review Committee, Condition Review Group, Corrective Action Review Board
 - Performance Advocates
- **Performance Indicators**
 - Site and Department level
- **Visibility / Awareness**
 - Multiple discussion venues
 - Reports specific to venue
 - Quarterly Report
- **Processes / Procedures**
- **Training**

Department CAP Scorecard



CAP Behaviors / Culture

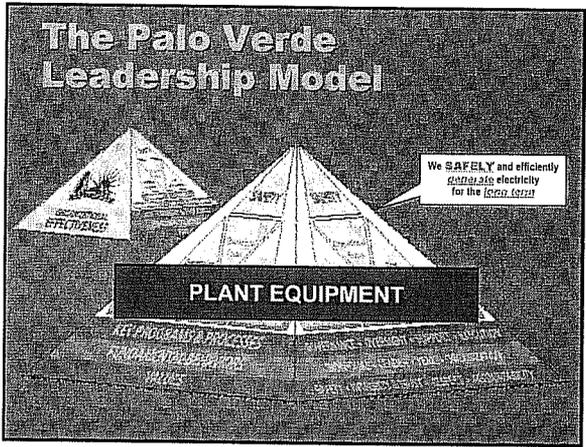
- Department-level Engagement and Alignment
- Leader Behaviors
- Ownership and Accountability
- Performance Advocates
- Formal and Cognitive Trending of Issues
- Oversight
- Peer Interaction

PI&R Cross-Cutting Aspects	January 2008	November 2008
Corrective Action Program		
Identification	6	0
Trending	0	0
Evaluation	7	1
Timeliness	4	1
Operating Experience		
Evaluation	0	0
Implementation	4	1
Self and Independent Assessments		
Assessment	2	0
Metrics	0	0
Communicate	0	0

- ### Sustaining Continuous Improvement
- Metrics
 - Management Review Meetings
 - Knowledge / Training
 - Corrective Action Program Oversight
 - Effectiveness Reviews / Self Assessments
 - Process / Structure
 - Site Ownership of CAP

Plant Equipment / Human Performance

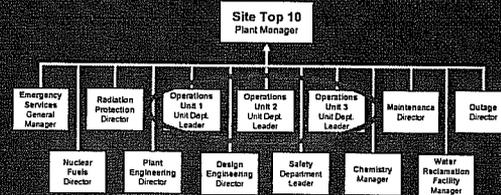
Lou Cortopassi
Plant Manager

Site Top 10 Technical Issues Process

- Identify and resolve equipment issues
- Roll-up process once per year
- Plant Health Committee oversight
 - Approve Site Top 10
 - Approve action plans
 - Approve removal from Site Top 10
- Communication
 - Plant Equipment web site
 - Palo Verde News articles
 - Operational Focus Meeting Report
 - Site-wide posters

Site Top 10 Technical Issues Process



Site Top 10 Technical Issues Process

TOP 10 EQUIPMENT ISSUE	Unit 1	Unit 2	Unit 3
Target Rock SOV SG-134A / 138A	Complete	Complete	2009
EDG Governor / K-1 Relay	Complete	Complete	2009
ECCS Oil Leaks	Complete	Complete	2009
EDG Leaks	Complete	Complete	Complete
MSIV / FWIV Accumulator Margin Recovery	2010	2009	2010
Letdown Control System Instability	2009	2009	2009
Foxboro Chart Recorder Replacement	Complete	Complete	Complete
Borg-Warner Check Valve Reliability	Complete	2009	2009
Main Feedwater Pump Seal Replacement	Complete	Complete	2009
Liquid Radwaste System	Complete	Complete	Complete

SITE TOP 10 TECHNICAL ISSUES				
Site Top 10 Issues	UNIT 1	UNIT 2	UNIT 3	COMMON
Target Rock SOV SG-134A / 138A	Complete	Complete	2009	Complete
EDG Governor / K-1 Relay	Complete	Complete	2009	Complete
ECCS Oil Leaks	Complete	Complete	2009	Complete
EDG Leaks	Complete	Complete	Complete	Complete
MSIV / FWIV Accumulator Margin Recovery	2010	2009	2010	2010
Letdown Control System Instability	2009	2009	2009	2009
Foxboro Chart Recorder Replacement	Complete	Complete	Complete	Complete
Borg-Warner Check Valve Reliability	Complete	2009	2009	2009
Main Feedwater Pump Seal Replacement	Complete	Complete	2009	2009
Liquid Radwaste System	Complete	Complete	Complete	Complete

Site Top 10 Technical Issues Process

Equipment Issues (on deck)

- 120-volt AC system inverter reliability
- Auxiliary Feedwater 'B' MSPI margin improvement
- Control element drive system motor generator set reliability
- Station blackout generator remote start capability
- Atmospheric dump valve reliability
- Steam bypass control valve reliability
- Condenser integrity
- Polar Crane reliability
- Charging pump reliability
- Cooling tower fan reliability
- Main turbine control upgrades

Site Operational Focus Indicator

CPA Aggregate Impact	Owner	Dec 07	Jan 08	Feb 08	Mar 08	Apr 08	May 08	Jun 08	Jul 08	Aug 08	Sep 08	Oct 08	Nov 08
Generator Box Issues	4 Issues	1	1	1	1	1	1	1	1	1	1	1	1
Generator Buses	4 Issues	20	19	20	15	15	15	21	15	12	13	17	17
AV Annunciators	4 Issues	1	1	1	1	1	1	1	1	1	1	1	1
CRDs	3 Issues	1	1	1	1	1	1	1	1	1	1	1	1
Generator Inhibits	4 Issues	15	14	15	13	19	12	17	19	12	11	17	13
Fire Alarms (FSCG)	7 Issues	1	1	1	1	1	1	1	1	1	1	1	1
Generator Motors (GAG)	19 Issues	21	22	23	24	25	26	27	28	29	30	31	32
Generator COs	4 Issues	15	13	14	15	16	17	18	19	20	21	22	23
Generator Maintenance Inventory	4 Issues	1	1	1	1	1	1	1	1	1	1	1	1
Part Stock Maintenance Inventory	4 Issues	1	1	1	1	1	1	1	1	1	1	1	1
Window Color		Yellow	White	Yellow	Yellow	White	White	Yellow	White	Green	Green	Green	Green

Recent Equipment Issues

- **Diesel Generator Injector Pumps**
 - Fuel oil leakage identified due to O-ring degradation.
 - All (120) fuel oil injector pumps replaced, coordinated between on-line and outage.
 - NAD oversight of vendor performance.
- **Main Steam Line Hangers**
 - History of component failures identified following plant shutdown.
 - Main steam line hanger hardware upgrade completed on Unit 1 and Unit 2, including component re-positioning.
 - Extensive data gathering instrumentation installed to facilitate long-term resolution.
 - No main steam line hanger issues identified during recent Unit 2 shutdown.

Recent Equipment Issues

- **Inverters**
 - Probable Cause attributed to weaknesses in Preventive Maintenance.
 - DC-DC converter cards replaced on all four inverters in Unit 1 and Unit 2. Unit 3 scheduled for 2009 spring outage.
 - Contingent troubleshooting game plan applied on the training inverter (included vendor and external consultant support).
 - Troubleshooting and testing confirm the need for additional data to substantiate the cause of the spurious transfers. (Common alarm displays and clears, with no discrimination on the cause of the alarm.)
 - System recovery team preparing plan for improving inverter reliability.
 - Long-term solution: Preliminary engineering in progress, likely a configuration change that includes a swing inverter.

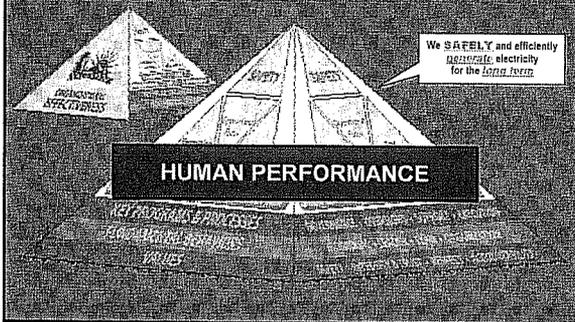
Recent Equipment Issues

- **Diesel Generator Voltage Regulator Linear Reactors**
 - Unit 2 Diesel Generator 2A Voltage Regulator Linear Reactors failure.
 - Component replaced, circuitry tested satisfactory.
 - Preliminary root cause, component aging and/or manufacturing defect. Failed component disassembly and investigation in-progress.
 - Replacement components on order (1st quarter 2009).
 - Compared industry Operating Experience for additional lessons learned.
 - Long-term solution: Auto Voltage Regulator Modification under review.

Long-range Planning



The Palo Verde Leadership Model



Major Actions in 2008

- Revised Standards / Expectations
- Department-specific Observation Program scorecards
- Training to improve Questioning Attitude, Technical Rigor, and Trend Analysis
- Graded approach for Human Performance tools
- Leadership Model

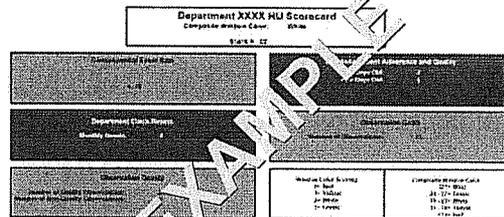


Major Actions in 2009

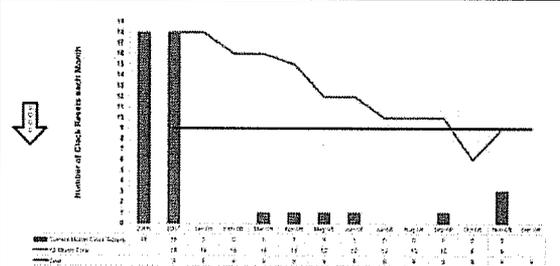
- Training for coach-the-coach, including situational awareness, observations, and how to provide feedback skills.
- Integrated Issues Identification Team (IIIT) to be used in conjunction with coach-the-coach program.
- Increase Performance Improvement Advocates role in mentoring human performance skills.
- Develop site-aligned departmental Human Performance plans
- Departmental Human Performance scorecards

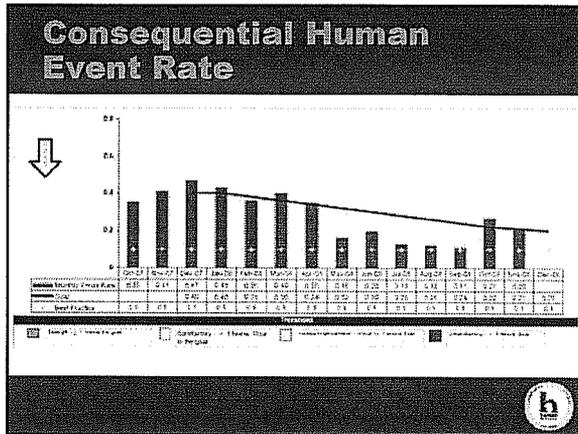


Department Human Performance Scorecard



Site Clock Resets





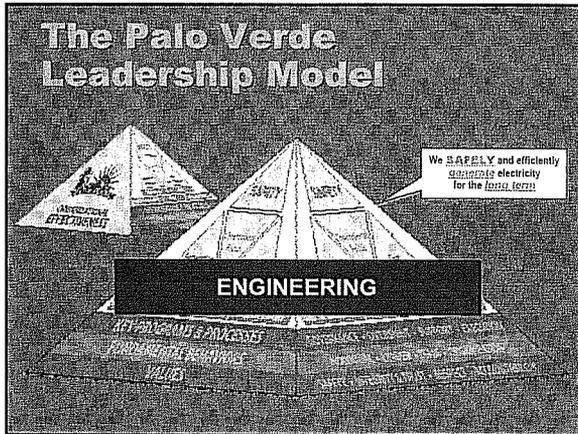
Human Performance Cross-Cutting Aspects	January 2008	November 2008
DECISION MAKING		
Systematic	5	2
Assumptions	8	3
Communication	1	0
RESOURCES		
Margin	2	0
T&Q	0	1
Procedures	0	2
Facilities	1	0
WORK CONTROL		
Planning	2	0
Coordination	2	1
WORK PRACTICES		
Error Prevention	7	4
Procedure Use	1	0
Oversight	3	2

- ### Sustaining Continuous Improvement
- Metrics
 - Management Review Meetings
 - Knowledge / Training
 - Plant Health Committee
 - Site Top 10 Technical Issues Process
 - Corrective Action Review Board
 - Long-range Planning
 - Human Performance Steering Committee
 - Human Performance Event Review Board

Questioning Attitude and Technical Rigor / Engineering Programs

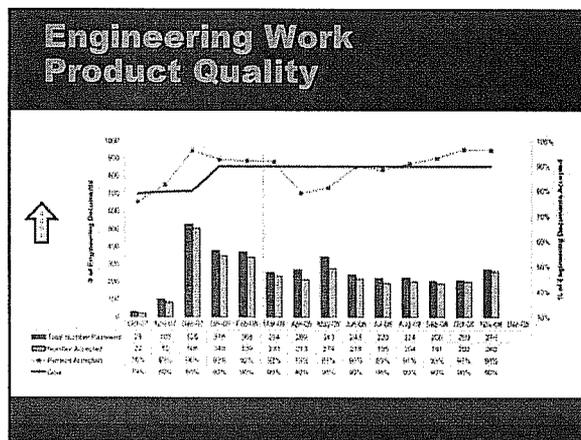
John Hesser
 Vice President
 Nuclear Engineering





- ### Questioning Attitude and Technical Rigor
- **Engineering Improvements**
 - Implemented Engineering Product Review Board to evaluate and improve Engineering products
 - Improved formal communications of technical information
 - Performed Engineering Incumbent analysis and remediated identified gaps
 - Strengthened Design Bases Manual writer's guide
 - **Station Improvements**
 - RAS case study training provided and embedded in assessment and evaluation processes
 - Questioning attitude and technical rigor training provided to key plant staff
 - Implemented ARRC/CRG/CARB and supported with job familiarization guides
 - Strengthened reviews of high tier Operating Experience

- ### Questioning Attitude and Technical Rigor
- **Operability Determinations**
 - Training for all STAs / SMs / E-FIN
 - Check list developed to support consistent questioning
 - Organizational changes support daily coverage of operability issues with E-FIN
 - Prompt operability job qualifications
 - Oversight of process, including daily reviews and monthly boards in Operations and monthly reviews in Engineering (EPRB)



Engineering Programs

KPA 5

- **KPA 5 addresses the following:**
 - Equipment Reliability including Long-range Planning and Equipment Root Cause of Failure Analysis Program
 - Engineering Technical Rigor including Engineering Product Quality and Engineering Work Management and Prioritization
 - Design Control / Configuration Management including Configuration Change Processes and Component Design Basis Review
 - Engineering Programs, including program ownership, alignment with Industry standards and Program Health Reporting

Key Actions Completed

KPA 5

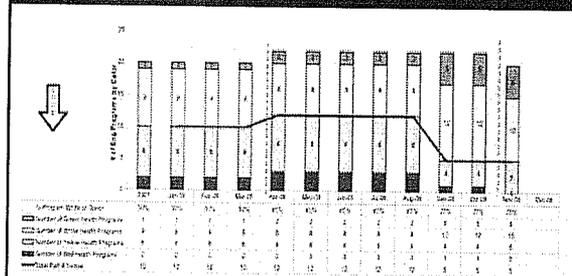
- **Implemented dedicated groups for:**
 - Engineering Programs
 - Fire Protection
 - Minor Modifications
- **Implemented process improvements:**
 - Root and apparent cause process
 - Configuration management
 - Long-range planning
- **Assessed program health and implemented improvements**
- **Completed 62% of Component Design Bases Reviews**
- **Implemented an Engineering Product Review Board**

Key Actions Remaining

KPA 5

- **Perform Assessment on short-term actions taken to improve Long-range Plan (due 12/19/2008)**
- **Complete Component Design Basis Review Project (due 6/2/2010)**
- **Perform remaining Engineering Programs Assessments (due 8/20/2010)**
 - Completed 17 (out of 20) Program Assessments, completed to date ahead of schedule
 - Remaining Program Assessments, accelerated schedule to first half of 2009
 - Steam Generators
 - Welding
 - Flow Accelerated Corrosion (FAC)

Engineering Program Health



KPA 5 Continued Focus Areas

- **Engineering Program Health Report Remaining Yellow Programs**
 - Surveillance Program
 - Motor-operated Valves
 - Heat Exchangers
 - Pressure Testing
 - Maintenance Rule

Engineering Program Improvements

- **Maintenance Rule improvements:**
 - Separate department formed
 - Strengthened expert panel
 - Reviewed all (a) 1 action plans
 - Trained system engineers on performance criteria and revalidated or modified performance criteria
 - Implemented a daily review of MRFF's to ensure timely response to issues
- **Revised the program health criteria to ensure program health reflects conditions of the program**
- **Program changes are reviewed and approved through Plant Health Committee**

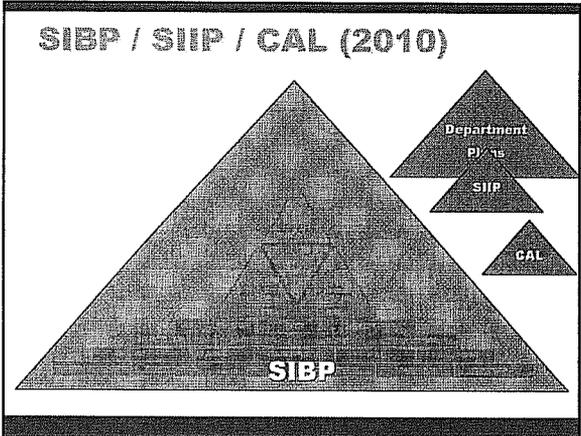
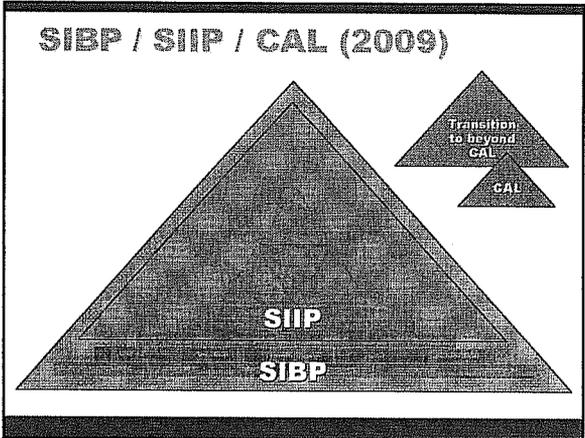
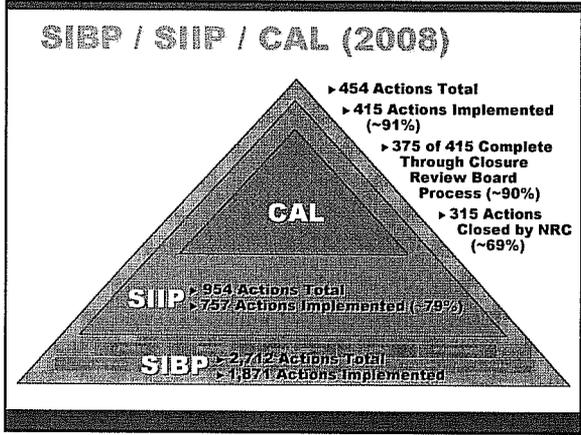
KPA 5 Performance Effectiveness

- **Site Comprehensive Self-assessment (Aug 2008): Implementation of Action Plans – ON-TRACK**
- **Year-end Effectiveness Review Challenge Board:**
 - Equipment Reliability – **SATISFACTORY**
 - Engineering Technical Rigor – **SATISFACTORY**
 - Design Control / Configuration Management – **SATISFACTORY**
 - Engineering Programs – **SATISFACTORY**

Sustaining Continuous Improvement

- **Metrics**
- **Management Review Meetings**
- **Knowledge / Training**
- **Plant Health Committee**
- **Corrective Action Review Board**
- **Long-range Planning**
- **Engineering Product Review Board**
- **Effectiveness Reviews / Self Assessments**
- **Organizational changes to support dedicated ownership**

Randy Edington
 Executive Vice President and
 Chief Nuclear Officer

Sustaining Continuous Improvement

Transition to Beyond CAL

- **Institutionalize**
 - Programs, Procedures, Policies, Policy Guides (Including developmental references)
 - Job Familiarization Guides / Qualification Cards
 - Preventive Maintenance / Work Orders / Modifications
- **Training**
 - Initial and Continuing Accredited Training Programs
 - Stakeholder Training (Accredited and Non-Accredited)
 - Leader Training Program
- **People**
 - Knowledge Transfer - Individual Skills and Knowledge
 - New Positions / Organizational Changes
 - Staffing Strategies
 - Reliance on non-APS Personnel
- **Measures**
 - Performance Indicators with Industry Targets
 - Self-Assessments and Benchmarking
- **Oversight**
 - Management Review Meetings
 - Nuclear Assurance, Off-Site Safety Review Committee, Nuclear Oversight Committee
 - Plant Health Committee
 - Executive Challenge Boards

The Palo Verde Leadership Model

