

**PREDECISIONAL ENFORCEMENT & REGULATORY CONFERENCE ATTENDANCE**

|                            |   |
|----------------------------|---|
| <b>LICENSEE/FACILITY</b>   | Palo Verde Nuclear Generating Station       |
| <b>DATE/TIME</b>           | April 5, 2005 1:00 p.m.                     |
| <b>CONFERENCE LOCATION</b> | USNRC Region IV Offices<br>Arlington, Texas |
| <b>EA NUMBER</b>           | N/A   |

**NRC REPRESENTATIVES**

| <b>NAME (PLEASE PRINT)</b> | <b>ORGANIZATION</b>                                   | <b>TITLE</b>  |
|----------------------------|---|---|
| Bruce Mallett              | USNRC Region IV                                       | Regional Administrator                                |
| Art Howell                 | USNRC Region IV                                       | Director, Division of Reactor Projects (DRP)          |
| Dwight Chamberlain         | USNRC Region IV                                       | Director, Division of Reactor Safety (DRS)            |
| Steve West                 | USNRC Region IV                                       | Deputy Director, DRS                                  |
| Troy Pruett                | USNRC Region IV                                       | Branch Chief, Projects Branch D, DRP                  |
| Greg Warnick               | USNRC Region IV                                       | Senior Resident Inspector, PVNGS                      |
| Greg Werner                | USNRC Region IV                                       | Senior Project Engineer, Projects Branch D, DRP       |
| Nick Taylor                | USNRC Region IV                                       | Project Engineer, Projects Branch D, DRP              |
| Charlie Stancil            | USNRC Region IV                                       | Project Engineer, Projects Branch B, DRP              |
| Bill Maier                 | USNRC Region IV                                       | Regional State Liason Officer                         |
| Mel Fields                 | USNRC Office of Nuclear Reactor Regulation            | Project Manager, Office of Nuclear Reactor Regulation |
| Jennifer Dixon-Herrity     | USNRC Office of the Executive Director for Operations | Region IV Coordinator                                 |
| Rani Franovich             | USNRC Office of Nuclear Reactor Regulation            | Division of Inspection Program Management             |
|                            |   |   |

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**LICENSEE REPRESENTATIVES**

| <b>NAME (PLEASE PRINT)</b> | <b>ORGANIZATION</b>            | <b>TITLE</b>                          |
|----------------------------|--------------------------------|---------------------------------------|
| Gregg Overbeck             | Arizona Public Service Company | Senior Vice President                 |
| David Smith                | Arizona Public Service Company | Plant Manger                          |
| Mike Winsor                | Arizona Public Service Company | Director, Nuclear Engineering         |
| Dwayne Carnes              | Arizona Public Service Company | Director, Nuclear Assurance           |
| Craig Seaman               | Arizona Public Service Company | Director, Regulatory Affairs          |
| Scott Bauer                | Arizona Public Service Company | Department Leader, Regulatory Affairs |
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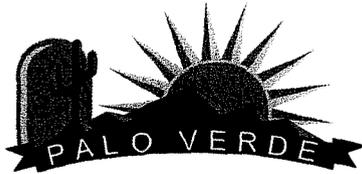
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**PUBLIC PARTICIPANTS**

| NAME (PLEASE PRINT) | ORGANIZATION                          | TITLE                                     |
|---------------------|---------------------------------------|---|
| Eric Salowitz       | El Paso Electric                      |   |
| Silverio Garcia     | Arizona Public Service Company        | Employee                                  |
| Jenny Weil          | McGraw-Hill Publishing Company        | Managing Editor, <i>Platts Inside NRC</i> |
| Elaine Hirou        | McGraw-Hill Publishing Company        | Managing Editor, <i>Platts Inside NRC</i> |
| Cheryl Adams        | Southern California Edison            |   |
| Silverio Garcia     | Arizona Public Service Company        | Employee                                  |
| Dave Axline         | San Onofre Nuclear Generating Station | Compliance Engineer                       |
| John Osborne        | San Onofre Nuclear Generating Station | Nuclear Oversight & Assessment            |
| Ed Scherer          | San Onofre Nuclear Generating Station | Manager, Nuclear Regulatory Affairs       |
|                     |                                       |   |
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|                     |                                       |   |

# **NRC Management Meeting**



**Gregg R. Overbeck  
April 5, 2005**

**Introduction  
Gregg Overbeck  
Sr. Vice President, Nuclear**



## **Agenda**

- ◆ **Introduction**                    **Gregg Overbeck**  
   **Sr. Vice President, Nuclear**
- ◆ **Equipment**                     **Mike Winsor**  
   **Director, Engineering**
- ◆ **Quality**                         **Dwayne Carnes**  
   **Director, Nuclear Assurance**
- ◆ **Organization**                 **Dave Smith**  
   **Plant Manager**
- ◆ **Closing**                        **Gregg Overbeck**



## **Station Equipment Issues**

**Mike Winsor**

**Director, Engineering**



## **Palo Verde System Health**

- ◆ **System Team concept**
  - **Integrated teams by system**
  - **Site-wide membership**
  - **Specific goals developed for each team/system**
- ◆ **Approver of all modifications to their system**
- ◆ **Responsible for action plans for system health**
- ◆ **Quarterly Health Reviews**
- ◆ **Oversight by System Team Steering Committee**



## Palo Verde System Health

◆ **Health determination**

- Risk-significant equipment failures
- Recurring equipment failures
- Longstanding equipment issues
- Performance measures
- Operating experience

◆ **System Team product**

- Red/Yellow windows require action plans to restore health



## System Health Report System Rating Guide

| System Status Rating Definitions |                   |   |
|----------------------------------|-------------------|---|
| Rating Color                     | Performance       | Action  |
| Green                            | Excellent         | Performing well. No Level 1's or major improvement mods planned.  |
| White                            | Acceptable        | Current performance/activities appropriate.   |
| Yellow                           | Needs Improvement | Needs additional attention. Enhanced team activities and/or additional resources required.  |
| Red                              | Not Acceptable    | System/components not meeting goals. Improved corrective action and/or resources and management support required.                                     |
| Trend                            |                   |   |
| Trend                            | Performance       | Description   |
| ↑                                | Improving         | Objective evidence evaluated by the System Engineer indicates that the performance of the system or system group is improving or expected to improve. |
| →                                | Neutral           | Performance is expected to remain essentially unchanged.  |
| ↓                                | Degrading         | Objective evidence evaluated by the System Engineer indicates that the performance of the system or system group is degrading or expected to degrade. |



# System Health Report System Rating Guide

| System Status <i>Minimum Performance Criteria**</i> |                   |  |
|---|-------------------|--|
| Rating Color  | Performance       | Minimum Criteria During Quarter  |
| Green   | Excellent         | No operations concern.<br>No T-Mods due to degraded equipment.<br>No lost MWhr generation.<br>MRule rating of (a)(2).<br>Reliability/availability criteria not exceeded for current and previous 2 qtrs.<br>Must have ≥2 previous consecutive white or green windows.<br>Meets criteria for white. |
| White   | Acceptable        | Does not meet criteria for green.<br>MRule rating of (a)(2) or (a)(1) with all corrective action goals per plan and trending positively.<br>No significant performance deficiencies.<br>No significant physical condition concerns.<br>Meets criteria for yellow.                                  |
| Yellow  | Needs Improvement | Does not meet criteria for white.<br>MRule (a)(1) corrective actions past due.<br>Has caused >500 MWhr unplanned lost generation.<br>Has recurring problems on key components.   |
| Red   | Not Acceptable    | Does not meet criteria for yellow.<br>MRule (a)(1) corrective actions not established.<br>Has been yellow for 3 or more quarters without improvement.<br>Has caused >1000 MWhr of unplanned lost generation.<br>Has chronic recurring problems on key components.                                  |

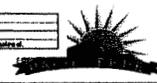
\*\* System must meet minimum criteria to be rated a specific color. A system may meet minimum criteria and be rated lower due to system specific reasons.



## Palo Verde System Semi-Annual Health Report July 1, 2004 – December 31, 2004

|   |  |  |  |  |   |
|---|--|--|--|--|---|
| AR<br>Condenser<br>Air Removal                    | CB<br>Circuit<br>Breakers                            | CD<br>Condensate<br>(see CS for<br>Condensate)<br>(a)(1) | CE<br>Main<br>Generator<br>Stator<br>Cooling | CH<br>Chemical<br>Volume<br>Control                | CO<br>Main Turbine<br>Oil<br>Control          |
| CC<br>CPC/CAC<br>Core<br>Protection<br>Calculator | CS<br>Condensate<br>(see CD for<br>Condensate)       | CG<br>Diesel<br>Generator                                | EC<br>Essential<br>Cooling                   | ED<br>Extraction<br>Drains                         | EW<br>Essential<br>Cooling<br>Water           |
| FP<br>Fire<br>Protection                          | FT<br>Feed Pump<br>Turbine                           | FW<br>Main<br>Feedwater                                  | GT<br>Gas<br>Turbine                         | HA<br>Aux Bldg<br>HVAC                             | HC<br>Containment<br>HVAC                     |
| HP<br>Fuel Bldg.<br>HVAC                          | HJ<br>Control<br>Bldg.<br>HVAC                       | HP<br>Containment<br>Hydrogen<br>Control                 | IA<br>Instrument<br>Air                      | LO<br>Main<br>Turbine<br>Lube Oil                  | LT<br>Large<br>Transformers                   |
| MA<br>Main<br>Generator<br>(a)(1)                 | MC<br>MOTORS   | MRULE<br>Structures<br>(a)(1)                            | MT<br>Main<br>Turbine                        | MX<br>Plant<br>Multiplexer                         | NA<br>Non-Class<br>12.8 kV<br>Power<br>(a)(1) |
| NC<br>Nuclear<br>Cooling<br>Water                 | NK<br>Non-Class<br>Battery                           | NO<br>Nuclear<br>Cooling<br>Water                        | NQ<br>Nuclear<br>Cooling<br>Water            | PK<br>Class<br>Batteries                           | PH<br>Class 1F<br>Instrument<br>AC            |
| QB<br>Essential<br>Lighting<br>(a)(2)             | QC<br>Essential<br>Lighting<br>(a)(2)                | RC<br>Reactor<br>Coolant<br>(a)(1)                       | RJ<br>Plant<br>Monitoring                    | SA<br>Engineered<br>Safety<br>Feature<br>Actuation | SB<br>Reactor<br>Protection                   |
| SC<br>Radiation<br>Monitoring                     | SE<br>Excore<br>Nuclear<br>Instrumentation<br>(a)(2) | SO<br>Main<br>Generator<br>Seal Oil                      | SP<br>Safety<br>Spray<br>Pond                | SS<br>Safety<br>Spray<br>Pond                      | ST<br>Safety<br>Spray<br>Pond                 |
| TC<br>Turbine<br>Cooling                          | WC<br>Normal<br>Cool<br>Water                        |  |  |  |   |

|                   |   |
|-------------------|---|
| Legend            | 1 - Q 2004    2 - Q 2004    3 - Q 2004<br>Current Quarter 4th 2004<br>System Designer (D)    System Name<br>Maintenance Rule Status (M) (T) |
| EXCELLENT         | Performance well. No Level 1's or higher improvement needs planned. Oversight may be reduced.   |
| ACCEPTABLE        | Current performance / activities appropriate.   |
| NEEDS IMPROVEMENT | Needs additional attention. Enhanced team activities and / or additional resources required.  |
| NOT ACCEPTABLE    | System performance not meeting goals. Increased corrective action and/or resources and management support required.                         |



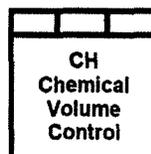
## Auxiliary Feedwater

- ◆ Maintenance Rule a(1) category
- ◆ Control power dropping resistor issue
  - 2 failures in 2004
  - 3<sup>rd</sup> failure in 2005
  - No failures at Palo Verde (since 1990)
- ◆ Target rock steam admission valve reliability
  - Fuse modification
  - Future governor or admission valve modifications being considered



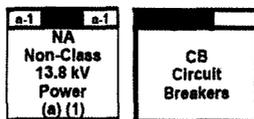
## Charging / Letdown

- ◆ Long-standing design issues with letdown/pressurizer level control
- ◆ Configuration control issue with Unit 1 letdown nuclear cooling water low-flow switch T-mod
- ◆ Recent charging pump trips under certain configurations



## Circuit Breaker / Non-class Power

- ◆ **Fast bus transfer failure in 2003**
  - Beckwith relay design
    - Modification of relay to remove UV contact
    - Unit 1 and 3 modification complete, Unit 2 in U2R12
- ◆ **S05 and S06 13.8kv breaker failure to close**
  - Root cause determined to be anti-pump relay design
    - Sealed relay modification being implemented in all units
    - Air conditioning of switchgear enclosures to improve cleanliness and conditions
- ◆ **Recent Unit 1 S06 switchgear failure**
  - Root cause as of yet indeterminate
    - Inspect and clean all S05 and S06 switchgear in upcoming outages



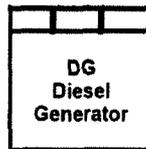
## Circulating Water

- ◆ **Cooling tower material condition**
  - Long-term plan to monitor and repair/replace degraded concrete components
  - Recent cooling tower distribution deck failure
- ◆ **Tower overspray/spill issues resolved**



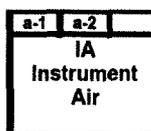
## Emergency Diesel Generator

- ◆ **Historically very high reliability and availability**
- ◆ **Recent increase in functional failures**
  - Unit 1 A fuel line fretting, 6/02
  - Unit 3 A output breaker, 12/03
  - Unit 2 A diode failure, 6/04
  - Unit 2 A jacket cooling water leak, 12/04
  - Unit 1 A mechanical governor, 3/05



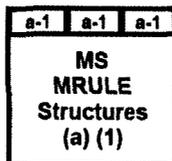
## Instrument Air

- ◆ **Instrument air reliability problems**
  - Dryer replacements
  - Breaker maintenance improvements
  - Unloader valve replacements
  - Air compressor replacements scheduled beginning 2005



## Maintenance Rule Structures

- ◆ Mrule structure monitoring progress behind schedule
- ◆ Manhole water intrusion plan not fully implemented



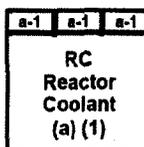
## Emergency Lighting

- ◆ QD in MRule a(1) status
- ◆ Recent investigation by new system engineer determined that lamp failures were not being trended appropriately
  - Worst case 90 lamps failed in 2003
  - All lamps have been replaced
- ◆ Emergency lighting batteries approaching 80% capacity



## Reactor Coolant System

- ◆ **Reactor coolant pump equipment reliability issues**
  - Instrumentation failures
  - Thrust bearing and motor oil leaks
- ◆ **Aggressive Alloy 600 replacements**
  - Steam generator replacements
  - All A600 penetrations at T-hot or greater, except for CEDM nozzles, will have been replaced by Unit 1 Fall 2005 refueling outage, per unit:
    - 7 pressurizer instrument nozzles
    - 9 hot leg instrument/sampling nozzles
    - 8 hot leg spare RTD nozzles
    - 10 hot leg RTD nozzles
    - 36 pressurizer heater sleeves
- ◆ **Dissimilar metal welds**



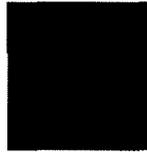
## Reactor Protection

- ◆ **System in Yellow due to unexpected end of cycle VOPT pre-trips**
  - Unit 3, 68 VOPT pre-trips in Spring 2003 and Fall 2004
  - Unit 2 experienced pre-trips at end of last cycle
  - Multi-disciplined team formed
    - Increased monitoring of plant parameters
    - Power changes appear related to small local flow changes
    - Condition observable at end-of-life due to MTC affects



## Secondary Chemistry

- ◆ **Material condition and equipment reliability issues**
- ◆ **Major improvement in material condition made due to improved maintenance practices (Fix It Now team) and design modifications**
- ◆ **Additional design modifications planned to address reliability issues**



## Main Steam

- ◆ **Red rating resulting from lost generation due to UFM issues:**
  - CALDON used non-conservative calibration factor for PVNGS clamp-on UFM's, removed from service in June 2004
  - Extensive testing and evaluation program to re-qualify UFM's
  - UFM planned return to service in April 2005
- ◆ **Main steam feedwater isolation system reliability issues**
  - Modifications issued and planned for R12 outages



## **Main Steam (continued)**

- ◆ **Target rock solenoid-operated valve reliability issues**
  - **Modifications to be installed in R12 outages**
    - **Replace steam trap isolation valves with air-operated valves**



## **Safety Injection System**

- ◆ **System placed in Maintenance rule a(1) for variety of reliability and unavailability issues**
  - **9 subsystems/trains rolled up under SI system. With 3 Units, 27 opportunities to require a(1) placement**
  - **Stringent requirements for reliability and availability**
- ◆ **Complex technical issues**
  - **Unit 1 shutdown cooling line flow-induced acoustic vibration**
  - **HPSI pump structural resonance**
  - **Recent RAS sump and gas accumulation issues**



**Station Quality Issues**  
**Dwayne Carnes**  
**Director, Nuclear Assurance**



**Station Quality Issues**

- ◆ **Station key quality issues**
- ◆ **Station noteworthy quality issues**
- ◆ **Problem Identification and Resolution**  
**cross-cutting issue**
- ◆ **Human performance cross-cutting issue**
- ◆ **Emergency planning**



## New Nuclear Assurance Process Summary

### ◆ Quality program key elements

- Audit reports
- Performance trending (CRDRs)
- Evaluation reports
- Vendor audits

### ◆ Station quality issues program

- Increased flexibility and visibility
- Direct link to the corrective action program
- Formal monthly exit
- Senior management commitment and accountability



## Performance Criteria

### Criteria:

|  | Rating | Color Code |
|--|--------|------------|
| Issue Resolved & Monitoring for Sustainability                           |        |            |
| Progressing Per Program & Monitoring Effectiveness                       |        | White      |
| Not Progressing Per Program- Additional Management Attention Required    |        | Yellow     |
| <i>Issue Escalated</i> , Resolution Ineffective & Requires Re-Evaluation |        |            |

### Status Trends From Last Report

No Change in performance ►; Improving performance ↗; Declining performance ↘



## Station Key Quality Issues (Feb. 2005)

| Issue Date | Issue  | Owner                      | Status Trend | Rating |
|------------|--|----------------------------|--------------|--------|
| 7/04       | <b>Regulatory Performance</b><br><small>(2743299) (2734661) - CRAI 2759037)</small>            | Carnes/<br>Seaman          | ⬇            | White  |
| 10/04      | <b>CRDR Backlog &amp; Timeliness</b><br><small>(2734661) - CRAI 2759065)</small>               | Carnes/<br>Seaman          | ▶            | White  |
| 1/04       | <b>Emergency Planning</b><br><small>(2715749, 2687557, 2774125, 2774106)</small>               | Hesser                     | ⬇            | Yellow |
| 5/04       | <b>Maintenance Configuration Control</b><br><small>(2715123)</small>                           | Shea                       | ▶            | White  |
| 11/02      | <b>System Integrity of Underground Services</b><br><small>(2497009)</small>                    | Winsor                     | ⬇            | Yellow |
| 6/04       | <b>50.59 Process Compliance</b><br><small>(2726522)</small>                                    | Carnes<br>Winsor           | ▶            | White  |
| 6/04       | <b>RP Change Management</b><br><small>(2697384)</small>  | Gaffney                    | ⬇            | Yellow |
| 9/04       | <b>"Reference Use" Procedure Use and Adherence</b><br><small>(2734661) - CRAI 2759062)</small> | Riedel<br>Lotts<br>Gaffney | ⬇            | White  |
| 5/04       | <b>Maintenance Engineering DF Process Adherence</b><br><small>(2693192, 2741947)</small>       | Winsor                     | ▶            | Yellow |
| 1/05       | <b>Operability Determinations</b><br><small>(2729600)</small>                                  | Radtke                     | ⬇            | White  |



## Station Noteworthy Quality Issues (Feb. 2005)

|       |   |                |   |        |
|-------|---|----------------|---|--------|
| 12/03 | <b>Westinghouse</b><br><small>(1R 03-026 W001)</small>                                  | NUPIC          | ⬇ |        |
| 1/05  | <b>Non-Conformance Program Interface &amp; Ownership</b><br><small>(2779012)</small>    | Shea           | ⬇ | Yellow |
| 12/03 | <b>Non-process SQA</b><br><small>(2612327)</small>                                      | Webb           | ▶ | White  |
| 6/04  | <b>Permit and Tagging</b><br><small>(2742173)</small>                                   | Radtke         | ▶ |        |
| 7/04  | <b>SI Configuration Control (RAS/LPSI Venting)</b><br><small>(2716209, 2729600)</small> | Churchman      | ▶ | White  |
| 12/02 | <b>Self Assessments</b><br><small>(2773031)</small>                                     | Carnes         | ⬇ | White  |
| 9/03  | <b>Material Storage Outside Warehouse</b><br><small>(2629618)</small>                   | Shea<br>Riedel | ▶ | White  |



## **Problem Identification and Resolution**

**“The adverse trend in problem identification and resolution issues indicates that you have not effectively addressed the underlying causes associated with this substantive crosscutting area.”**

**-- NRC, Annual Assessment Letter, March 2, 2005**



## **Problem Identification and Resolution**

### **◆ 18 PI&R aspects include:**

- 4 instances of failure to adequately identify problems and enter them into Palo Verde's corrective action program**
- 7 instances of failure to adequately evaluate conditions – four of which involved failure to promptly evaluate operability of equipment**
- 7 instances of failing to make effective corrective actions**



## **Problem Identification and Resolution**

### **Common Cause Evaluation for PI&R Cross-cutting issue**

- ◆ **CRDR threshold not consistently applied**
- ◆ **Reference use procedures used without full knowledge**
- ◆ **Some CRDR evaluations lacked depth**
  - Missed opportunities to identify material and procedural deficiencies
- ◆ **The impact to station safety or performance is not consistently included in problem identification, resolution and/or ensuring timeliness of corrective action implementation.**



## **Problem Identification and Resolution**

- ◆ **Other issues**
  - Corrective action backlog and timeliness
  - Root cause investigation improvements
  - Process implementation improvements



## **Problem Identification and Resolution**

### **◆ Corrective actions:**

- **Increase organizational accountability**
  - **Promptly identifying and communicating issues**
  - **Completing thorough evaluations**
  - **Implementing timely & effective corrective actions**
- **As an interim action, NAD is reviewing 100% of Adverse/Significant CRDR evaluations**
- **Procedure and software changes for electronic CRDR process**



## **Problem Identification and Resolution**

### **◆ Corrective actions:**

- **Revising program screening process to establish formal apparent cause classification level**
- **Dedicated root cause team**
- **Leader training on corrective action program**
- **Frontline training on corrective action program**
- **Process simplification team**



## **Human Performance Cross-cutting Issue**

**“The adverse trend in human performance issues indicates that you have not effectively addressed the underlying causes associated with this substantive cross-cutting area.”**

**-- NRC, Annual Assessment Letter, March 2, 2005**

- ◆ 16 green findings include:**
  - 9 instances of failure to follow procedure**
  - 4 instances of inadequate work instructions**



## **Human Performance Cross-cutting Issue**

### **Common-cause analysis for human performance cross-cutting issue**

- ◆ Users did not meet expectations for procedure use**
- ◆ Reference use procedures used without full knowledge**
- ◆ Inadequate procedural guidance**



## **Human Performance Cross-cutting Issue**

### **◆ Corrective actions:**

- Business plan strategic priority to improve human performance through standards and expectations**
- Procedure use and adherence stand down**
- Procedure use and adherence training**



## **Emergency Planning Issues**



## **Emergency Planning Issues**

- ◆ **Accuracy and technical review rigor on control of emergency action levels**
- ◆ **Siren vandalism**
- ◆ **Repeat program deficiencies**
- ◆ **Emergency response organization notification**
  - **Auto-dialer repeat process deficiencies**
- ◆ **Poor organizational infrastructure**



## **Emergency Planning Areas Of Continued Improvement**

- ◆ **Integrated drills; security and E-plan**
- ◆ **Corrective action backlog**
- ◆ **Drill scenario; uncommon emergency action levels seldom practiced**
- ◆ **Accountability by organization and personnel on E-plan responsibilities**



## **Emergency Planning Corrective Actions**

- ◆ **Changed leadership of Emergency Planning**
- ◆ **Added additional Operations resources to Emergency Planning**
- ◆ **Added rigor in program changes and reviews**
- ◆ **Adding additional Radiation Protection resources to Emergency Planning**



## **Emergency Planning Corrective Actions**

- ◆ **Siren upgrade project**
- ◆ **Team to reduce corrective action backlog**
- ◆ **Developing training for uncommon emergency action levels**
- ◆ **Routine auto-dialer testing to ensure effectiveness**



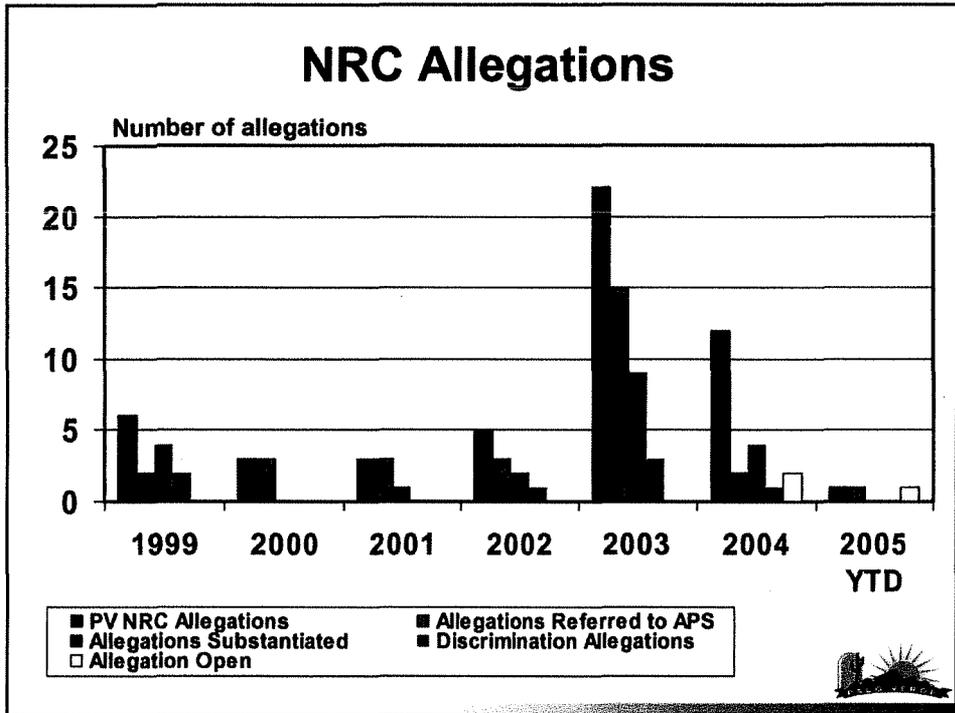
**Station Organizational Issues**  
**Dave Smith**  
**Plant Manager**



**Station Organizational Issues**

- ◆ **Allegations**
  - 2005 SCWE assessment
- ◆ **Self assessments**
  - Leader effectiveness
  - USA safety culture
  - INPO mid-cycle
- ◆ **Business plan**
  - Performance assessment
    - Organizational accountability





## 2005 Safety Culture Assessment

- ◆ **Assessment completed by Synergy Consulting Services Corp.**
- ◆ **Scope and methodology included:**
  - Nuclear safety culture
  - General culture and work environment
  - Palo Verde requested special topics
    - Leadership and management
    - Issues resolution process effectiveness
    - Industrial health and safety program effectiveness
- ◆ **Scoring on a scale of 1 – 5, with a 3.0 being “adequate” or “generally agree”**
- ◆ **Number of respondents, 1861 employees (86.6%)**

## 2005 Safety Culture Assessment

- ◆ **Relative weaknesses identified, nuclear safety and general culture:**
  - Confidence that management is making well-thought-out decisions in allocation of resources to assure nuclear safety is maintained (3.42, 19.4% negative)
  - Confidence in the CRDR process ensuring potential nuclear safety problems are addressed in a timely manner (3.50, 11.5% negative)
  - Effectiveness in planning and implementing changes in the business (3.38, 16.6% negative)



## 2005 Safety Culture Assessment

- ◆ **Relative weaknesses identified, special topics:**
  - Leaders attaining appropriate staffing levels (3.24, 24.9% negative)
  - Senior leaders:
    - Open and honest in communications (3.34, 20.2% negative)
    - Setting a positive example (3.32, 21.9% negative)
    - Provides leadership during change (3.31, 20.1% negative)
    - Being visible and accessible (3.30, 22.6% negative)



## **2005 Safety Culture Assessment**

### **◆ Relative strengths:**

- **Nuclear safety first and overriding priority (4.26, 97.3% positive)**
- **High standards during conduct of business (4.10, 95.7% positive)**
- **Personal satisfaction in current work assignment (4.01, 93.4% positive)**
- **Questioning attitude (4.09, 96.5% positive)**
- **Conservative decision making (4.02, 96.5% positive)**



## **2005 Safety Culture Assessment**

### **◆ Conclusion**

**“Palo Verde culture is ranked in the top industry quartile across all key metrics”**

- ◆ Will provide final results of the in depth review upon completion**



## **Self Assessments**

- ◆ **Leader effectiveness**
- ◆ **USA safety culture**
- ◆ **INPO mid-cycle**



## **Self Assessment Recommendations**

- ◆ **Develop one set of site-wide standards and expectations**
- ◆ **Review current strategies and ensure continued support of vision and mission**
- ◆ **Develop strategies that challenge improper behavior, consider accountability and methods for measuring performance**
- ◆ **Simplify cumbersome site programs**
- ◆ **Improve leader communications, mentoring and oversight**



## **Self Assessment Recommendations**

- ◆ **Address concerns for aging workforce**
- ◆ **Refocus site resources to resolve issues and prioritize work**
- ◆ **Provide clear and effective communications**
- ◆ **Improve corrective action timeliness**



## **Palo Verde Business Plan**



## **Business Plan Development**

- ◆ **January 2004, senior management team realignment**
  - **Planned 360-degree feedback and intervention mid-2004**
- ◆ **Plant events**
  - **Extended Unit 3 Fall refueling outage, pressurizer heater sleeves**
  - **8 reactor shutdowns totaling 58 additional days of unit down time**
- ◆ **NRC feedback**



## **Business Plan Development**

- ◆ **Self-assessments**
  - **USA safety culture**
  - **Leader effectiveness**
  - **INPO mid-cycle**
- ◆ **Business planning**
  - **360-degree feedback**
  - **Self assessments**
  - **Plant performance**
- ◆ **Performance assessment team independently assessed Palo Verde**



# Palo Verde Business Plan

## Nuclear Safety

Nuclear safety is our overriding priority. We strengthen safety through conservative decision-making, questioning attitude, operational focus, procedure use, security, training and self-assessment.

## Cost

We reduce cost through optimizing staffing, reducing overtime, leveraging procurement contracts and performing the right modifications at the right time.

## PV MISSION

We will be the industry leader in the safe and efficient production of electricity through the values of:

- Trust
- Execution
- Clarity
- Simplicity
- Teamwork
- Positive Attitude

## Behaviors

We create success by creating clear goals and expectations, effectively interacting, taking ownership, treating each other with respect and being accountable. We use simple processes and always use training, Prevent Events tools and PPE to perform safe, error-free work.

## Generation & Reliability

We maximize generation through equipment replacements and effective maintenance, equipment reliability programs and outage execution. We train and share knowledge to maximize effectiveness and evaluate risk to ensure nuclear safety.

# Leader Development Strategy

## ◆ Purpose

- Improve effectiveness of leaders at all levels of the organization and open the lines of communications

## ◆ Major activities

- Conduct a 360 evaluation and training on Crucial Conversations.
- Re-establish standards and expectations.
- Conduct a leadership effectiveness survey.



## **Equipment Reliability Strategy**

### **◆ Purpose**

- Enhance reliability of permanent plant equipment to reduce operational challenges and support generation goals

### **◆ Major activities**

- Refocus System Team Steering Committee
- Effectively prioritize plant modifications
- Monitor system health performance through regular system team meetings
- Complete reliability-centered maintenance initiative



## **Human Performance Strategy**

### **◆ Purpose**

- Improve human performance by establishing and anchoring consistent behaviors, standards and expectations

### **◆ Major activities**

- Anchor procedure use and adherence
- Ensure Prevent Event tools are used consistently
- Establish common set of standards and expectations
- Complete evaluation of substantive cross-cutting issues and incorporate appropriate corrective actions



## **Program Simplification Strategy**

- ◆ **Purpose**
  - Reduce complexity in key processes at Palo Verde
- ◆ **Major activities**
  - Plant modifications
  - Corrective action program
  - Work management
- ◆ **Dedicated team**



## **Improve Regulatory Performance Strategy**

- ◆ **Purpose**
  - To improve working relationships with NRC through focused communications and modification of our behaviors
- ◆ **Major activities**
  - Improve Palo Verde team behaviors
  - Improve communications with NRC
  - Improve 50.59 evaluations
  - Improve trending capabilities
  - Improve operability determinations



## **Efficient Outages Strategy**

### **◆ Purpose**

- **Improve the efficiency of outages to produce reliable operating cycles following breaker closure**

### **◆ Major activities**

- **Complete steam generator replacements in Units 1 and 3**
- **Develop quantitative shutdown risk model**
- **Obtain Technical Specification changes for emergency diesel generator out of service time**
- **Major modifications**
  - **Refueling equipment**
  - **Reactor head replacement**
  - **Polar cranes**



## **Staffing Strategy**

### **◆ Purpose**

- **Determine future staffing needs to preserve the safe, reliable operations of Palo Verde**

### **◆ Major activities**

- **Develop viable staffing plans that support planned attrition**
- **Maintain critical job knowledge and skills**



## **Industrial Safety Strategy**

### **◆ Purpose**

- **Change industrial safety behaviors to produce a safer work environment**

### **◆ Major activities**

- **Job hazards analysis**
  - **Hazards identification and recognition prior to work**
- **Implement accident prevention checklist**
- **Leaders reinforce and coach to support behavior changes**



## **Communications Strategy**

### **◆ Purpose**

- **Communicate clearly to:**
  - **Employees**
  - **Public**
  - **Regulators**
  - **Owners**

### **◆ Major activities**

- **Improve leader-to-frontline communications**
- **Communicate strategic priorities**
- **Communicate assessments/evaluations and results**



## **Performance Assessment Team**

- ◆ **Provide an independent assessment of overall performance of PV for 2003 and 2004 and determine if current business plan strategies are comprehensive or if other areas need to be reviewed**
- ◆ **Committee**
  - Jim O'Hanlon, Chairman
  - Frank Miraglia
  - Otto Maynard
  - Jay Gutierrez
  - Barry Letts



## **Performance Assessment Team Conclusions**

- ◆ **Business Plan implementation will improve station performance**
- ◆ **Integrate Business Plan strategies**
  - Clearly define accountability for leaders in human performance strategy
  - Refocus regulatory performance strategy
  - Consider short-term actions for program simplification
- ◆ **Emphasize accountability as a core value**
- ◆ **Evaluate senior management team performance**
- ◆ **Clarify senior management roles**
- ◆ **Resolve staffing issue**



***PALO VERDE - WHERE PEOPLE ARE THE POWER***



**2005  
Business  
Plan**

## ***PALO VERDE - WHERE PEOPLE ARE THE POWER***

# **To the Palo Verde Team**

Looking back on 2004, we made progress. You were recognized by the Institute of Nuclear Power Operations for "10 years" of excellence. We achieved all GREEN windows on the NRC plant performance indicator and we successfully inspected our Unit 1 and 3 steam generators, reactor heads and turbines.

As a prudent measure we replaced Unit 3 pressurizer heater sleeves. We installed security modifications and implemented the NRC security orders. You demonstrated our expertise in security force-on-force exercises by winning every scenario and eliminating the adversary.

You set a new station record for days without a significant human performance event. You responded to several challenging plant events and we can say that the plant responded the way it was designed because of the quality of our engineering and maintenance. I could go on but you get the point.

We also must face reality that not all things went well in 2004. A number of equipment-related plant events and integrated self-assessments told us that our station performance had reached a plateau.

Mid-year, the senior management team performed 360-degree feedback to improve internal communication and break down barriers that were holding back performance improvement.

We also tossed out the old business plan and started with a blank white board and, as a team, met to identify what was most important to improving station performance. With input from you during self-assessments, leader workshops with Dave Smith and direct feedback, we developed a clearer vision and mission and then updated our core values.

We identified four major focus areas — Nuclear Safety, Behaviors, Generation Reliability and Cost — all necessary to improving our performance. We brainstormed strategies in each. Finally we prioritized them down to the nine key strategic priorities. These strategic priorities will be tracked by Level 1s and, when implemented, will take Palo Verde to the next level of performance and continue us on the road to excellence. We also reviewed our principles and values and changed several to place a greater emphasis on attributes we believe we need to focus on to get back to basics and move forward. The nine strategic priorities and owners are provided later in this plan.

I am excited about our opportunities for 2005.

Although challenging, everything we plan to do in 2005, we did successfully in 2003. We have the dollars necessary to do what we need to do and we have a direction and a plan.

And, we have each of you, the Palo Verde team. Our slogan, "Palo Verde – Where People Are the Power" recognizes the contribution each of you makes to the organization every day. You are an awesome group of people whose experience, ownership and professionalism are unmatched.

(continued next page)

# ***PALO VERDE - WHERE PEOPLE ARE THE POWER***

2005 will be a success when we achieve the following:

- Make significant progress on our nine strategic priorities.
- All GREEN windows on NRC plant performance indicator.
- Obtain an 86% capacity factor for the station.
- Meet our O&M budget of \$386M.
- Meet our Capital budget for non-steam generator replacement projects of \$79.8M.
- Complete 2R12 safely and on schedule.
- Complete accreditation renewal of our Operations, STA and Engineering training programs.
- Learn as much as we can to improve performance from our July INPO/WANO peer review.
- Place 12 additional dry casks on the pad.
- Replace Unit 1 steam generators and complete 1R12 safely and on schedule.
- Incur no significant human performance events.
- Incur no more than two station automatic or manual reactor trips.

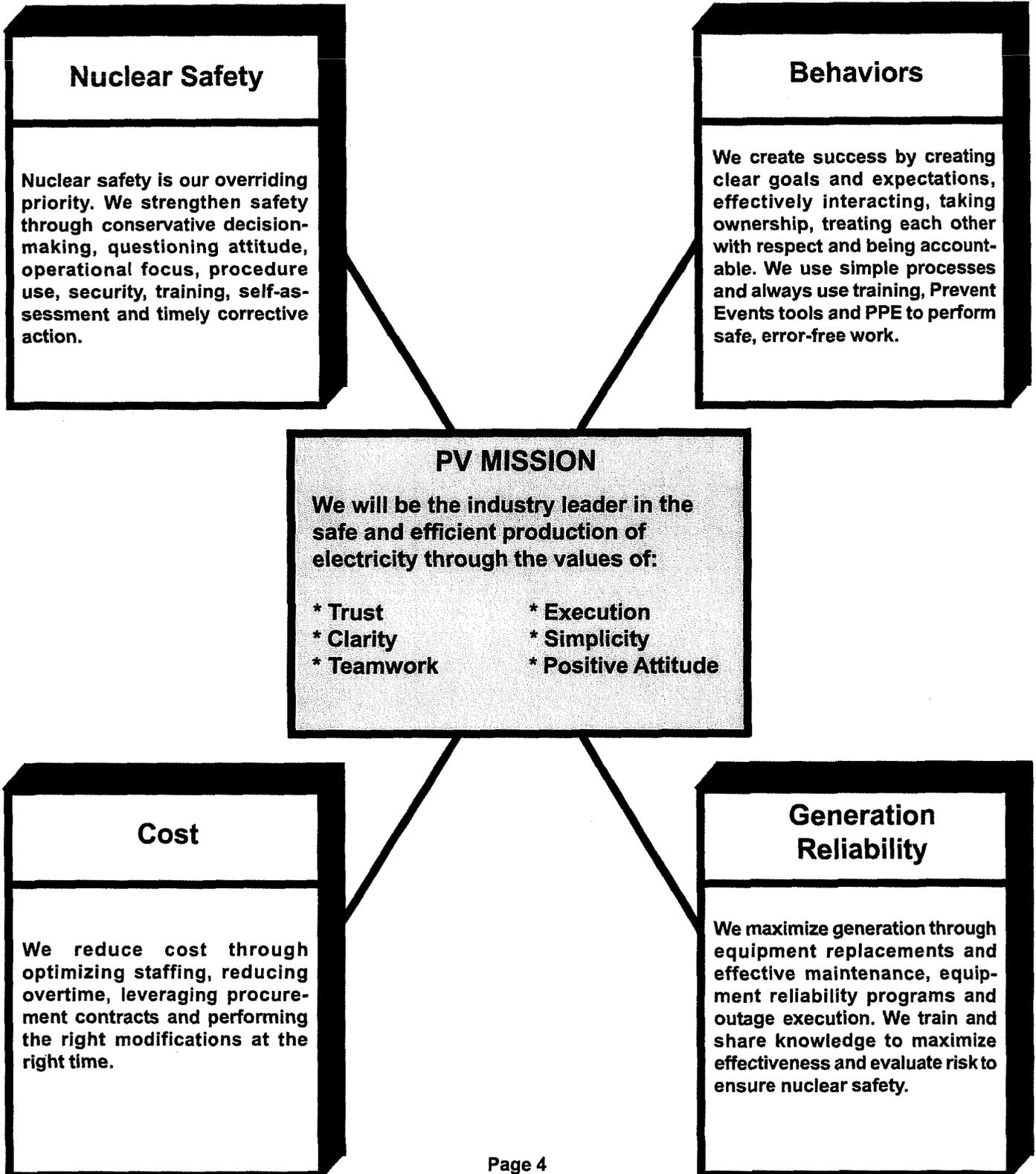
We accomplished a great deal in 2004 and finished on a strong note. Now it's time to look forward. Our direction is described in this plan. Please read the following pages carefully and ask your leader to review the business plan with you and use it to guide you in your individual performance management efforts.

I look forward to our future. Please join me in accomplishing this plan.

Gregg

# **Palo Verde Vision**

***We focus on the basics to lead the Nuclear Industry today and tomorrow.***



# **Principles - Values**

**Clarity** – We are specific about what we want to accomplish, by when and why it is important. We appreciate those who question to ensure safety, to understand or to challenge for improvement.

**Trust** – Integrity is the cornerstone of trust. We act with integrity and trust one another to take action in the best interest of Palo Verde. We feel free to challenge each other to achieve the best result.

**Simplicity** – We develop plans and processes that are effective and seek efficient solutions to problems.

**Teamwork** – We work in multi-discipline teams to develop plans and share resources to create the best opportunity to meet our goals.

**Execution** – We create and work according to efficient plans and employ discipline to perform our work right the first time. We train to ensure quality and proper action and we remain open to creative solutions to ensure maximum effectiveness.

**Positive Attitude** – We control our destiny and create our own success. We seek common ground to achieve our goals, take accountability for our actions and seek not to be a victim and blame, but to do it better the next time.

# Strategic Priorities

## **Regulatory Interface Improvements:**

We improve our day-to-day interfaces and working relationships with the NRC, including Palo Verde's Residents, and NRC Regional and other personnel through focused communications and response efforts.

- Conduct periodic Palo Verde Management and NRC Region IV meetings.
- Assign Licensing Engineers to project manage regulatory issues.
- Conduct weekly NRC Residents' meetings on their issues.
- Brief senior management quarterly on regulatory issues.
- Add NRC Codes to CRDR trending.
- Add NRC Codes to equipment failure trending.
- Improve 50.59 evaluations.
- Enhance NRR/Commissioner interfaces.

**Level 1 Owners:**        *Dwayne Carnes, director, Regulatory Affairs/Nuclear Assurance*  
                                  *Craig Seaman, director, Nuclear Fuels Management*

## **Equipment Reliability Improvements:**

We enhance reliability of permanent plant equipment to reduce operational challenges, optimizing our maintenance and engineering resources, and support high plant generation goals.

- Refocus the System Team Steering Committee.
- Monitor equipment reliability trends and take necessary corrective actions.
- Be responsible for on-line modifications. Prioritize effectively and monitor installation and implementation.
- Take responsibility for prioritization and sponsorship of planned plant modifications and projects.
- Monitor system health performance through regular system team meetings.

**Level 1 Owner:**        *System Team Steering Committee*

## **Leader Development:**

We will improve leader effectiveness by recognizing our blind spots and leader weaknesses through 360 degree evaluations and develop tailored training to remediate these. We will teach improved leader skills in mentoring, motivating and coaching.

- Improve visibility.
- Teach how to coach change.
- Promote the vision.
- Improve issues resolution and response.
- Employ effective cost management.
- Improve procedure use and adherence.
- Support Prevent Events tools use.
- Reinforce industrial safety through job hazard analysis.

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## **Strategic Priorities (continued)**

- Prepare the workforce for changes.
- Plan for succession.

**Level 1 Owners:**        *Rose Majors, director, Procurement/Finance*  
                                 *Mike Shea, director, Maintenance*  
                                 *Gayle Schiavone, manager, HR Client Services*

### **Improve Human Performance through Behaviors, Standards, and Expectations:**

We improve human performance to consistently high levels by establishing an expectation that appropriate tools are used consistently during work at Palo Verde.

- Ensure Prevent Events tool use is consistent across the station.
- Insist on consistent procedure use and adherence across station.

**Level 1 Owners:**        *Fred Riedel, director, Nuclear Training*  
                                 *John Gaffney, director, Radiation Protection*  
                                 *Bob Lotts, plant manager, Water Reclamation Facility*

### **Efficient Outages:**

We improve the efficiency of outages to maximize generation by ensuring that work completed is well planned and executed to produce reliable operational cycles following breaker closure.

- Perform more on-line maintenance consistent with low safety risk.
- Develop quantitative shutdown risk model.
- Obtain Technical Specification change for EDG OOS time/maintenance on line.
- Complete SGR/PUR outages on schedule.

**Level 1 Owners:**        *Terry Radtke, director, Operations*  
                                 *Pete Borchert, director, Work Management*

### **Program Simplification:**

We reduce the complexity both in use and execution of some key processes at Palo Verde by benchmarking, using industrial engineering expert inputs and eliminating unnecessary steps while maintaining top-quality products and outputs from those processes. We will simplify:

- Corrective Action Program
- Work Management
- Plant Modifications

**Level 1 Owners:**        *Shabbir Pittalwala, director, Nuclear Projects Engineering*  
                                 *Carl Churchman, director, Steam Generator Replacement*  
                                 *Randy Sorensen, department leader, Chemistry*  
                                 *Ray Webb, group manager, Information Services*

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# **Strategic Priorities (continued)**

## **Industrial Safety:**

We change our industrial safety behaviors at Palo Verde to produce a safer work environment for all our employees. Focus areas include:

- Hazards identification and recognition prior to working.
- Examination of the functional areas of our organization that most impact our safety efforts.
- Revised statistical analyses that help us solve problem areas.
- Use of accident prevention checklists as part of our work mechanisms.
- Leaders reinforce and coach to support behavior changes.

Level 1 Owners:        *John Hesser, director, Emergency Services*  
                              *Shabbir Pittalwala, director, Nuclear Projects Engineering*  
                              *Peter Rail, department leader, Employee Concerns*

## **Staffing:**

We attain the appropriate staffing and expertise base in each organization to enable Palo Verde to function as a highly effective and efficient organization.

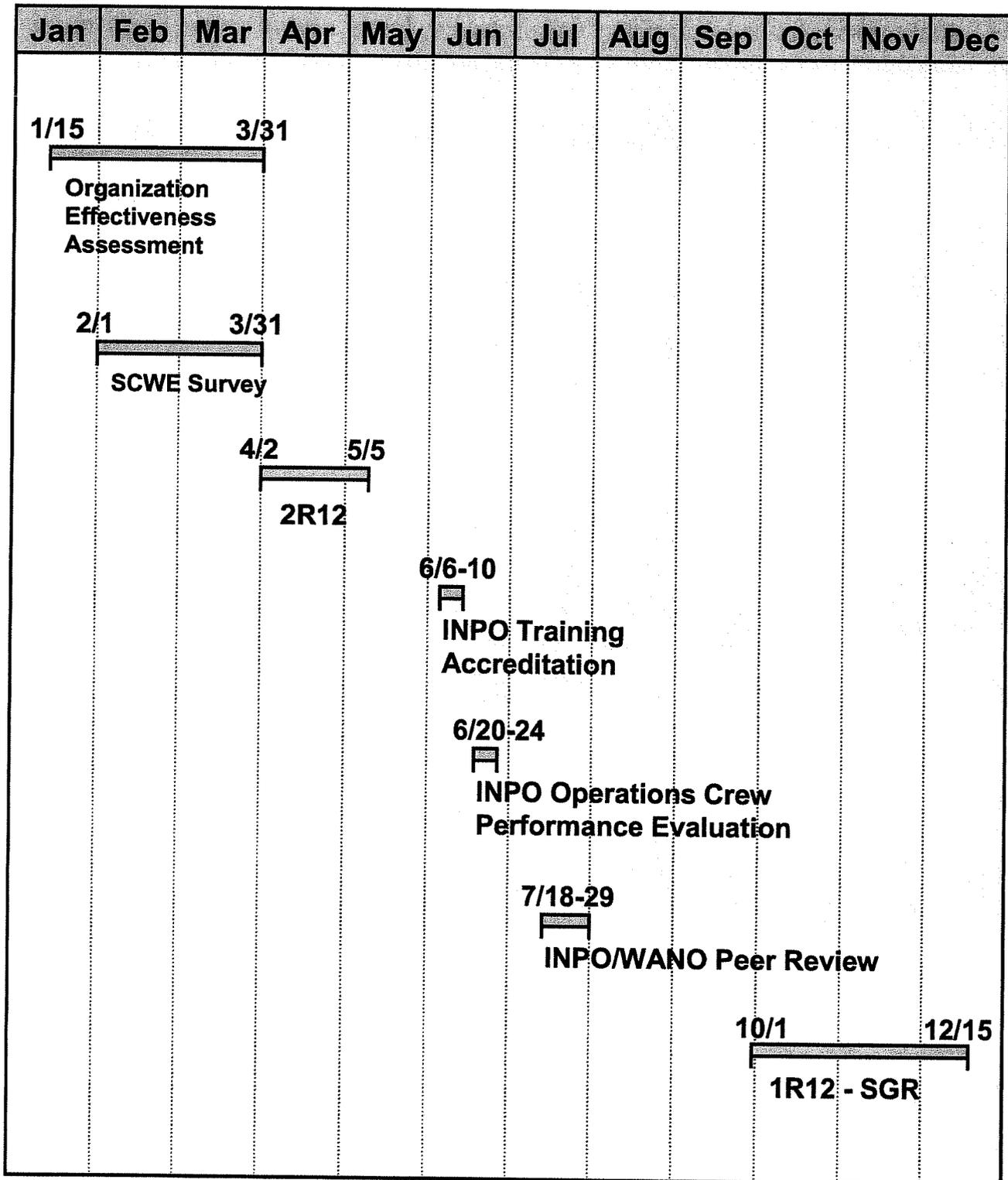
Level 1 Owner:        *Senior Management Team*

## **Communications:**

We clearly communicate to the appropriate organizations and individuals to re-establish excellent performance throughout the station. Communications are accurate, clear and concise, and tell why we are taking specific actions as we progress through strategic changes.

Level 1 Owners:        *Judy Melody, department leader, Communications*  
                              *Ken Manne, senior attorney, PNW*  
                              *Janet Burns, department leader, Nuclear Records Management*

# 2005 Tactical Priorities



# How Success Will Be Measured

We measure our success by our performance against goals in the Monthly Trend Report. These are the most critical station indicators:

## Nuclear Safety



### Palo Verde Nuclear Generating Station

|                |               |                              |                              |                       |                                  |                         |
|----------------|---------------|------------------------------|------------------------------|-----------------------|----------------------------------|-------------------------|
| Nuclear Safety | Reactor Trips | Maintenance Rule Performance | Online Equipment Reliability | Reactivity Management | Radiation Exposure               | Contaminated Area       |
|                |               |                              |                              |                       | Timeliness Of Corrective Actions | Self-Assessment Program |

*(Click here to link to the current month's MTR.)*

**Reactor Trips** - The goal for 2005 for planned and unplanned reactor trips is less than or equal to two trips.

*Owner: Terry Radtke, director, Operations*

**Maintenance Rule Performance** - The percentage of Maintenance Rule Systems meeting performance criteria must be at 98 percent or better for the year.

*Owner: Mike Winsor, director, Nuclear Engineering*

**On-line Equipment Reliability** - During calendar 2005, the number of high-risk significant functional failures and failures causing downpowers greater than 10 percent will be 40 or fewer.

*Owner: Mike Winsor, director, Nuclear Engineering*

**Reactivity Management** - A multi-discipline team reviews reactivity management-related CRDRS monthly and rates them for human and equipment performance. The overall color for the month is determined by the combination of these two elements.

*Owner: Craig Seaman, director, Nuclear Fuel Management  
Terry Radtke, director, Operations*

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# ***PALO VERDE - WHERE PEOPLE ARE THE POWER***

**Radiation Exposure** - This goal, expressed in person/REM, reflects the total external and internal whole-body dose received by all personnel, including contractors and visitors, as measured by incremental dosimetry (TLD.) 2005 goal is 254 person/REM.

**Owner:** *John Gaffney, director, Radiation Protection*

**Contaminated Area** - This is the percentage of the radiological-controlled area that is designated contaminated at the end of each month, based on the floor square footage of the RCA. The 2005 goal is 0.4 percent or less contaminated. ( $\% \text{ of RCA contaminated} = \frac{\text{contaminated area (sq. ft.)}}{\text{total RCA (sq. ft.)}} \times 100$ )

**Owner:** *John Gaffney, director, Radiation Protection*

**Timeliness of Corrective Actions** - This reflects the evaluation and closure time for Condition Request - Disposition Requests that are classified as adverse or significant. An adverse CRDR is one on any item or activity that does not conform to requirement. A significant CRDR reports a condition which, if uncorrected, could have a serious effect on safety or operability. The 2005 goal is no more than 50 open CRDR evaluations greater than 30 days and no more than 115 open CRDRs greater than 180 days.

**Owner:** *Dwayne Carnes, director, Regulatory Affairs/Nuclear Assurance*

**Self-Assessment Program** - This is the timeliness of resolving actions from focused self-assessments. The goal for 2005 is 35.

**Owner:** *Dwayne Carnes, director, Regulatory Affairs/Nuclear Assurance*

## **Behaviors**



### **Palo Verde Nuclear Generating Station**

|                  |  |                     |                          |                                |
|------------------|--|---------------------|--------------------------|--------------------------------|
| <b>Behaviors</b> | PV Preventable<br>Recordable<br>Injuries | Significant<br>HPEs | Tagging Permit<br>Events | Timely<br>Issues<br>Resolution |
|------------------|--|---------------------|--------------------------|--------------------------------|

*(Click here to link to the current month's MTR.)*

**Preventable Recordable Injuries** - This is a reflection of how safe we are working. This is the number of OSHA recordable injuries judged to have been preventable. The 2005 goal is 12 or fewer.

**Owner:** *John Hesser, director, Emergency Services*

**Significant HPEs** - Significant human performance events are recorded by CRDRs that identify events attributed to human performance including lost-time injuries. No more than six is the goal for 2005.

**Owner:** *Dwayne Carnes, director, Regulatory Affairs/Nuclear Assurance*

**Tagging Permit Events** - This reflects the number of significant and adverse CRDR events for clearance implementation errors. The goal for 2005 is 18 or fewer.

**Owner:** *Terry Radtke, director, Operations*

**Timely Issues Resolution** - The goal, in days, is the time required to resolve employee issues through the MITR process, or through the Employee Concerns Program. 2005's goal is 30 days or fewer.

**Owner:** *Gayle Schiavone, manager, HR Client Services*

## **Generation Reliability**



### **Palo Verde Nuclear Generating Station**

|                               |                            |                 |                    |
|-------------------------------|----------------------------|-----------------|--------------------|
| <b>Generation Reliability</b> | Palo Verde Capacity Factor | Work Management | Work Order Backlog |
|-------------------------------|----------------------------|-----------------|--------------------|

*(Click here to link to the current month's MTR.)*

**Palo Verde Capacity Factor** - Capacity factor (MDC Net) is the net generation, in MWh, divided by the maximum dependable capacity for the year. Expressed as a percent, it is the gross electrical output less the normal station service loads, as measured at the output terminals of the turbine generator during the most restrictive seasonal conditions (usually the summer.) The 2005 goal is 86 percent.

**Owner:** *Terry Radtke, director, Operations*

**On-Line Work Management** - The 2005 goal is a white or better window based on a compilation of three facets of Work Management: schedule preparation discipline, schedule stability and schedule adherence.

**Owner:** *Pete Borchert, director, Work Management*

**Work Order Backlog** - Unit 1, 2 and 3 Maintenance priority 1, 2, 3 and 7 Work Orders that meet the definitions of Corrective Maintenance and Elective Maintenance whose location code is >150 and <600. The 2005 backlog monthly goal is less than or equal to 740 Elective Maintenance work orders, less than or equal to 60 Corrective Maintenance work orders, with a total average age of 91 days or fewer.

**Owner:** *Mike Shea, director, Maintenance*

## Cost



### Palo Verde Nuclear Generating Station

|      |                 |     |         |      |
|------|-----------------|-----|---------|------|
| Cost | Production Cost | O&M | Capital | Fuel |
|------|-----------------|-----|---------|------|

*(Click here to link to the current month's MTR.)*

**Production Cost** - Production cost is a ratio of the total O&M dollars, plus fuel cost dollars, divided by the net energy produced during the period. O&M includes NRC fees but excludes load dispatch and certain other overhead costs and is expressed in dollars and cents. The 2005 goal is 1.40 cents per kilowatt-hour.

**Owner:** *Rose Majors, director, Procurement/Finance*

**O&M** - Operations and maintenance is the cost of running the plant, excluding fuel and capital improvements. The 2005 goal for Palo Verde is \$386 million.

**Owner:** *Rose Majors, director, Procurement/Finance*

**Capital** - This is the cost of permanent plant and equipment additions to the plant. These dollars are depreciated over a set period of time and are not considered operational dollars. The 2005 goal is \$239 million.

**Owner:** *Rose Majors, director, Procurement/Finance*

**Fuel** - This is the cost associated with Palo Verde nuclear fuel. In addition to the uranium, conversion, enrichment and fabrication, the amount includes fuel disposal fees. The 2005 goal is \$144 million.

**Owner:** *Craig Seaman, director, Nuclear Fuel Management*