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January 8, 2007
PY-CEI/OIE-0689L

Mr. James L. Caldwell
Nuclear Regulatory Commission
Regional Administrator, Region III
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

Perry Nuclear Power Plant
Docket No. 50-440
License No. NPF-58

Subject: Correction to Perry Nuclear Power Plant Performance Improvement Initiative Summary Report, Submitted January 3, 2007

Dear Mr. Caldwell,

The purpose of this letter is to inform you of an error identified in the attachment to a FirstEnergy Nuclear Operating Company (FENOC) letter to you dated January 3, 2007 and to provide corrected information. In the letter FENOC sent the Perry Nuclear Power Plant Performance Improvement Initiative Summary Report as an attachment. On January 5, 2007, an error was discovered in the data used to compile two of the charts presented on page 6 of the attachment. This data error affected the magnitude of each of the bars depicted on the charts in a similar fashion but the basic trend demonstrated by the chart did not change. The data has been corrected and page 6 of the report has been revised to reflect the correct data.

Additionally data has been included for two of the trend charts that are presented on pages 10 and 11 of the report. This data was not complete when the report was mailed; therefore these two pages of the report have been updated.

The report was also reviewed to ensure that none of the conclusions were affected by the changes to the data. The charts are used to illustrate the performance trends and the trends did not change, therefore the conclusions remain valid.

FENOC is providing, attached, Revision 1 to the previously submitted report which replaces the January 3, 2007, attachment in its entirety. FENOC will refer to the attached Revision 1 of the report in the forthcoming meeting on January 10, 2007.

There are no additional commitments contained in this letter. If you have questions or require additional information, please contact Mr. Jeffrey Lausberg – Manager, Regulatory Compliance at (440) 280-5940.

IE01

Very truly yours,

R.W. Pearce

Attachment
cc: Document Control Desk
NRC Project Manager
NRC Resident Inspector
E. Duncan, NRC RIII

PERRY NUCLEAR POWER PLANT
PERFORMANCE IMPROVEMENT INITIATIVE SUMMARY REPORT
REVISION 1

Purpose

The purpose of this report is to provide a summary of the key results achieved at the Perry Nuclear Power Plant (PNPP) through the implementation of the Performance Improvement Initiative (PII) process. This report also provides a high level assessment of the areas addressed by the PII, the sustained performance achieved and future continuous improvement focus areas. Each individual PII initiative has a detailed closure report documenting the results and conclusions of the improvements, and a more detailed overall closure report for PII Phase 2 (P2) has been prepared and approved.

Introduction

In August of 2003, the NRC increased the oversight of PNPP as required for a Degraded Mitigating Systems Cornerstone resulting from two White Findings. The White Findings resulted from problems encountered with air binding in the Residual Heat Removal and Low Pressure Core Spray (RHR/LPCS) systems following a loss of offsite power, and failure of an Emergency Service Water (ESW) Pump coupling following maintenance. Further, performance deficiencies encountered in the evaluation and untimely execution of corrective actions for these White Findings led the NRC to place PNPP in the Repetitive Degraded Cornerstone of the Reactor Oversight Process Action Matrix (Column IV of the Action Matrix) in August of 2004. This level of performance also led the NRC to identify a substantive cross-cutting issue in the Problem Identification and Resolution area (August of 2004). Based on findings during inspections NRC also identified a substantive cross-cutting issue in the Human Performance area (in March 2005). In accordance with NRC Inspection Manual Chapter (MC) 0305, the NRC conducted supplemental inspections following Inspection Procedure (IP) 95003 during the first half of 2005.

Beginning in 2004, First Energy Nuclear Operating Company (FENOC) undertook extensive actions to determine the root causes of the deficiencies related to PNPP system performance, program performance, and performance of the PNPP organization. These assessments led FENOC to establish the PII in 2004 to improve performance of the station organization and the plant. The pace of improvement in 2004 and the first half of 2005 did not always meet the expectations of FENOC or the NRC. Therefore, FENOC established the PII P2 to respond to the NRC 95003 Inspection findings, to achieve further improvement in performance, to integrate the fleet programs into the process and culture at PNPP, and to ensure that the performance improvement would be sustained. Additionally, the NRC issued a confirmatory action letter (CAL) on September 28, 2005 to confirm the acceptability of commitments made by FENOC to improve performance at PNPP and to complete 13 specific actions in the PII P2 (i.e. CAL Commitments)

PNPP has now completed implementation of all of the actions identified through the CAL Commitments, as well as the actions in the PII P2 (reference FENOC letter dated December 20, 2006.) Through the PII P2 initiatives, PNPP has made substantial improvements in performance, has anchored those improvements in its procedures and processes to ensure that those improvements are sustained in the future, and has established a culture of continuous improvement through the FENOC fleet standard programs. These achievements provide sufficient basis for closure of the PII and allow the normal performance improvement processes, as prescribed in the FENOC Business Plan, to support continuous improvement.

Performance Improvement Initiative

During the development of PII Phase 1 in early 2004, several equipment and organizational root causes and collective significance reviews were completed. Out of these reviews, the PII was developed and was primarily a discovery process for organizational effectiveness. The result of this effort was the identification of performance gaps that fed into the Phase 2 effort. In addition, there were significant improvements made to the plant equipment, including, for example, resolution of long standing technical

issues with the Emergency Diesel Generator Testable Rupture Disc and Emergency Service Water pumps.

In developing the PII P2, FENOC included initiatives in Work Management, Training, Employee Engagement and Operational Focus because PNPP recognized the interrelationship between the cross-cutting areas of Human Performance and Corrective Action Program (CAP) implementation and other processes and performance areas. Issued in August 2005, the PII P2 has been completed over the last 16 months. The goals of the individual initiatives in the PII P2 were to provide substantial, measurable improvement in the Human Performance Program, Corrective Action Program, and work management process implementation supported by initiatives in employee engagement, operational focus, and training. The PII P2 was intended to provide the means to sustain the improved performance through anchoring the improvements in enhanced processes and procedures coupled with performance indicators to monitor results and a robust continuous improvement process and culture. A key learning for the station during PII P2 was the ability to value critical self-assessments. The essence of a viable continuous improvement program is strong performance in the identification of performance gaps, the analysis and planning of actions to close those gaps, and implementation of effective activities to improve plant safety and reliability.

Through the PII P2, PNPP station management team and employees improved performance of the equipment and programs at the PNPP station from less than adequate levels in 2004 to median industry performance levels, or above, at the close of 2006. The PNPP management team has demonstrated its ability to resolve the issues that led to less than adequate past performance and to continuously improve Human Performance and implementation of the Corrective Action Program at PNPP. During the period from August 2004 through December 2006, FENOC made steady progress toward identifying and correcting the specific problems that led to the entry of PNPP into Column IV of the Action Matrix, and designation of the two cross cutting issues, and achieving the goals and objectives of PII P2.

The requisite licensee actions for performance improvement, as defined by the NRC MC 0305 for the Multiple/Repetitive Degraded Cornerstone (i.e. Column IV of the Action Matrix), have been accomplished as follows:

- Corrective action commitments to resolve the root causes and prevent recurrence of the conditions that led to the White Findings in Mitigating Systems and Emergency Preparedness are complete and effective.

- Commitments identified in the CAL are complete and the programmatic and organizational performance issues identified through the NRC 95003 inspection have been addressed through the PII (Phases 1 and 2) and are resolved.

- Corrective actions to resolve the root and contributing causes of the substantive cross-cutting issues in Human Performance and Corrective Action Program implementation are complete and there have been no new plant events or findings, during the past 12 months, that reveal similar significant performance issues in these cross-cutting areas.

- Performance in the following areas has been substantially improved and sustained as demonstrated through the results of specific PII initiatives, the completion of CAL Commitments and key performance indicators for each of the following focus areas:
    - CAP Implementation (CAL and PII Focus Area)
    - Human Performance (CAL and PII Focus Area)
    - Work Management (PII Focus Area)
    - Emergency Preparedness (CAL)
    - Maintenance Procedures (CAL)
    - Operational Focus (PII Focus Area)
    - Training (PII Focus Area)
    - Employee Engagement (PII Focus Area).

- Self and peer-assisted assessments of performance in the six PII focus areas have been completed. In five of the areas, these assessments ascertained that substantial improvements have been achieved together and also identified areas for improvement. In the area of Operational Focus (PII Focus Area), the assessment identified that limited improvements had been achieved, however important areas for improvement remained. These have been carried forward to the Perry and FENOC Fleet Excellence Plans.

- FENOC has the right management team in place at PNPP and Excellence Plans have been developed to ensure continued focus on those areas for improvement that will help ensure that performance improvements are sustained and continuous progress toward excellence is made at a pace prescribed by the FENOC Fleet management through the business plan and performance improvement model.

- NRC and Perry performance indicators do not indicate significant performance weaknesses that have not been adequately addressed.

- FENOC and Perry management has successfully used key performance indicators to track performance coupled with a management review process to assure that Perry station performance goals are achieved. Performance trends will continue to be assessed against FENOC standards and KPIs will continue to be used in achieving FENOC's Excellence Plan goals.

In summary, the PII P2 provided the framework for actions to achieve and sustain the necessary improvements in performance and for the key programs and processes for the six PII focus areas. The performance improvements were confirmed through self- and peer-assisted assessments conducted as part of the formal closure of the PII. This higher level of performance has been sustained and PNPP has now transitioned from the PII P2 to the FENOC Fleet Excellence Plan. Founded on the industry's Performance Improvement Model the FENOC Fleet Excellence Plan provides the framework for the behavioral improvements needed for a robust continuous improvement culture. The combination of the improvements achieved through the PII P2, the FENOC Fleet Business Plan and the implementation of the Excellence Plans provide the foundation for continuous improvement and achieving further improvements in areas such as Operational Focus.

Closure Assessment for PII Focus Areas

This section of this report summarizes the more important achievements and the related areas for continued improvement identified through a series of critical self-assessments performed in each of the six PII focus areas.

Corrective Action Program

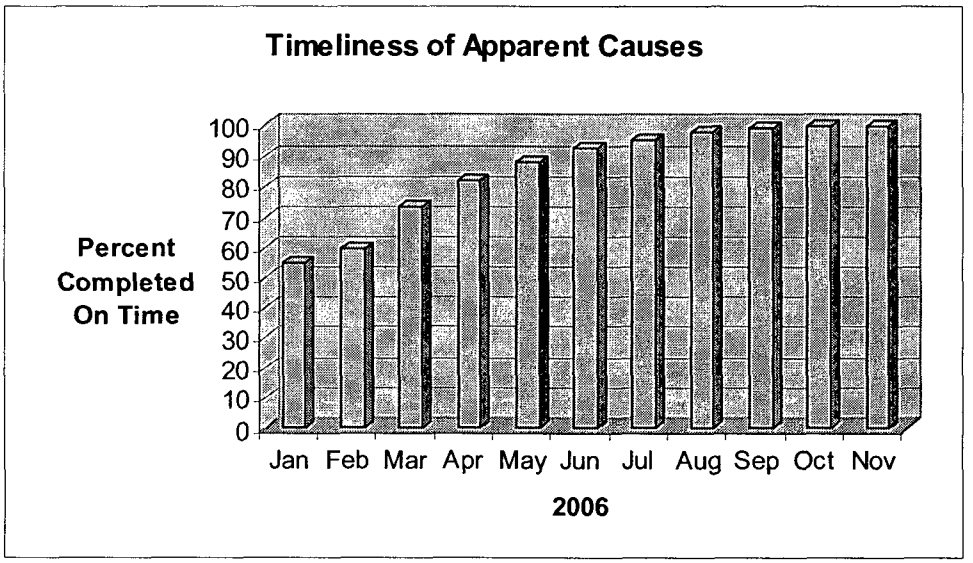
The PII P2 initiative for the Corrective Action Program (CAP) has been completed. The targeted areas of cause evaluation and implementation of corrective actions have improved.

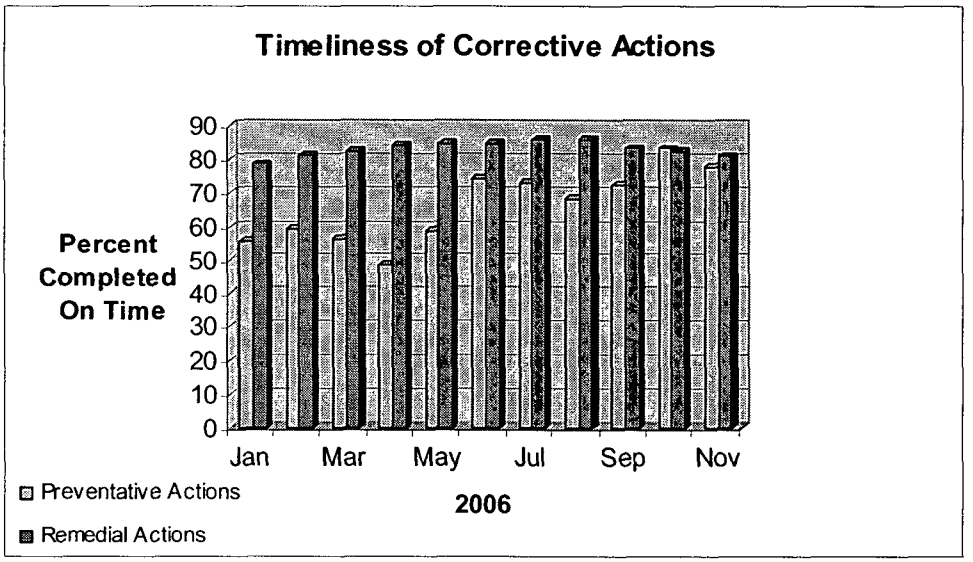
Focus Areas for Improvement: The initiative actions were organized to align with the structure of a corrective action program. The actions ensured the foundational elements existed and built performance skills to strengthen the overall performance. The areas for improvement include:

- Ownership: Ownership and station focus on CAP
- Identification: Self-identification of problems and trending of issues for early detection
- Analysis: Cause Analysis quality and timeliness and corrective action planning
- Documentation: Quality of closure documentation
- Program monitoring: Management oversight of the Corrective Action Program

Performance Results

Corrective Action Program performance during 2006 has shown substantial improvement in the timeliness and quality of the cause evaluations. In particular, the timeliness of completing the evaluations and the implementation of corrective actions has improved demonstrating improved ownership by the line personnel. The controlling procedures and business practices contain expectations and goals commensurate with industry standards for timeliness. Active participation in the Corrective Action Program Owners Group (CAPOG) by the Fleet Corrective Action Group assures that the program is current with industry standards. The CAPOG is extremely active and FENOC is hosting the 2007 biannual conference. The graphs below show the improvement in the 6-month rolling averages in the timeliness of apparent cause evaluations and corrective actions.

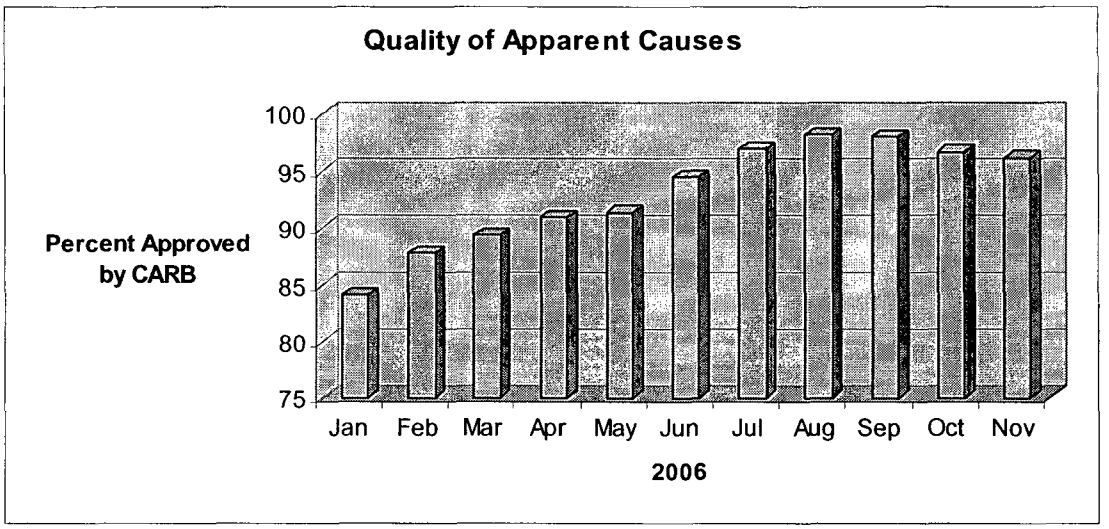




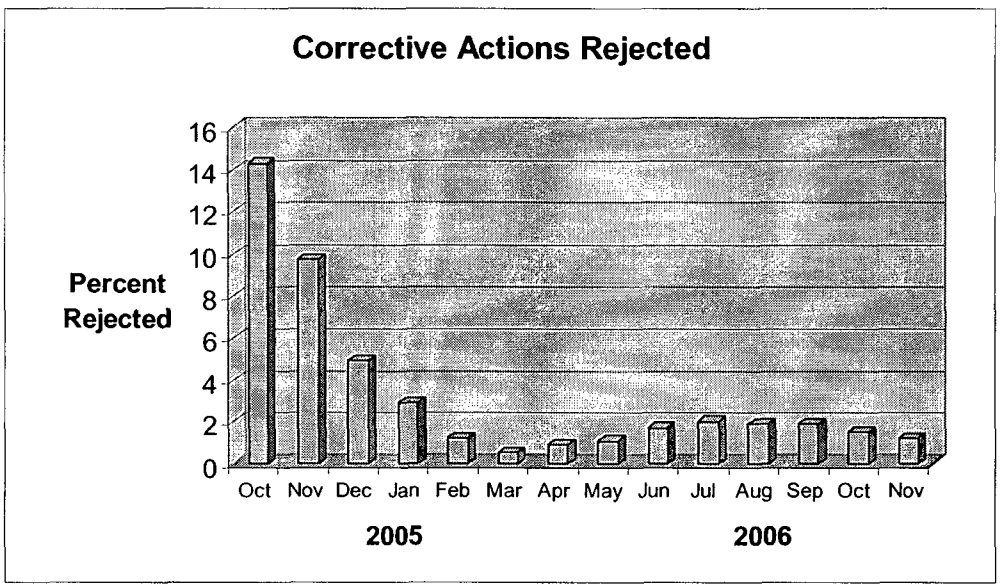
Timeliness for root cause evaluations and overall Condition report (CR) closures have likewise demonstrated sustained improvement over the period.

The quality of the products from the Corrective Action Program has improved. The indicator showing the Corrective Action Review Board (CARB) approval of Apparent Cause evaluations is depicted below. The improvement in the quality of Apparent Cause evaluations demonstrated on the indicator is a product of the PII actions that increased the level of performance of CARB and the training given to the

CR evaluators and the CR Analysts. This further demonstrates improvement even while the standards and expectations were being raised. This is an important indicator because it demonstrates improving management ownership and leadership.

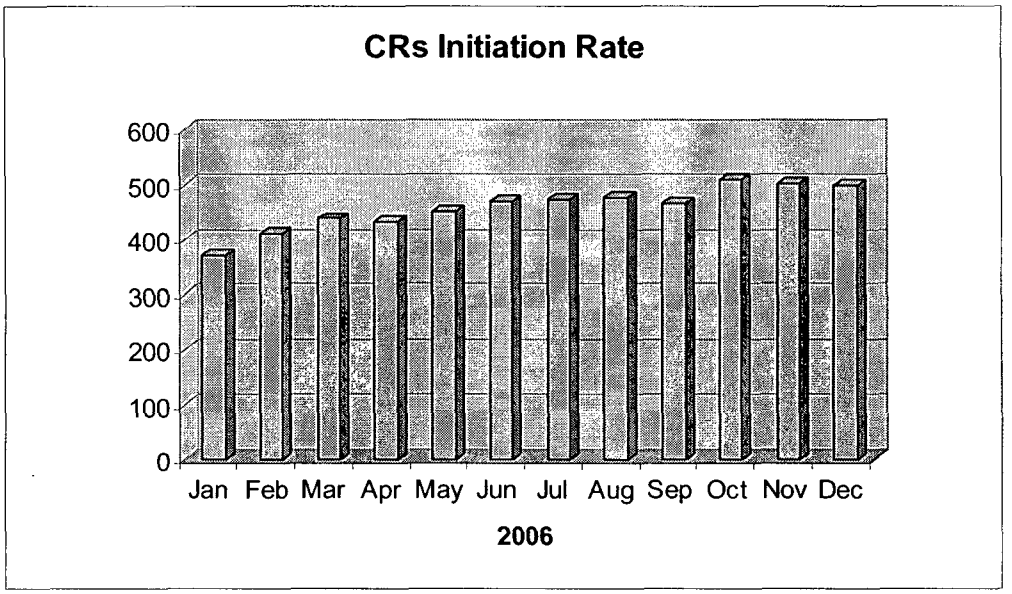


A similar sustained improvement has been achieved for root causes. This is demonstrated through the CARB approval rate and the grade given to each root cause evaluation after review by CARB. Additionally, this same improvement trend can be demonstrated for corrective actions. The graph below shows the improvement in the quality of the corrective actions over the period. A reject is counted if any of the reviews after completion find the corrective action to be deficient, whether the review is a CARB, Oversight, CR Analyst or other review.

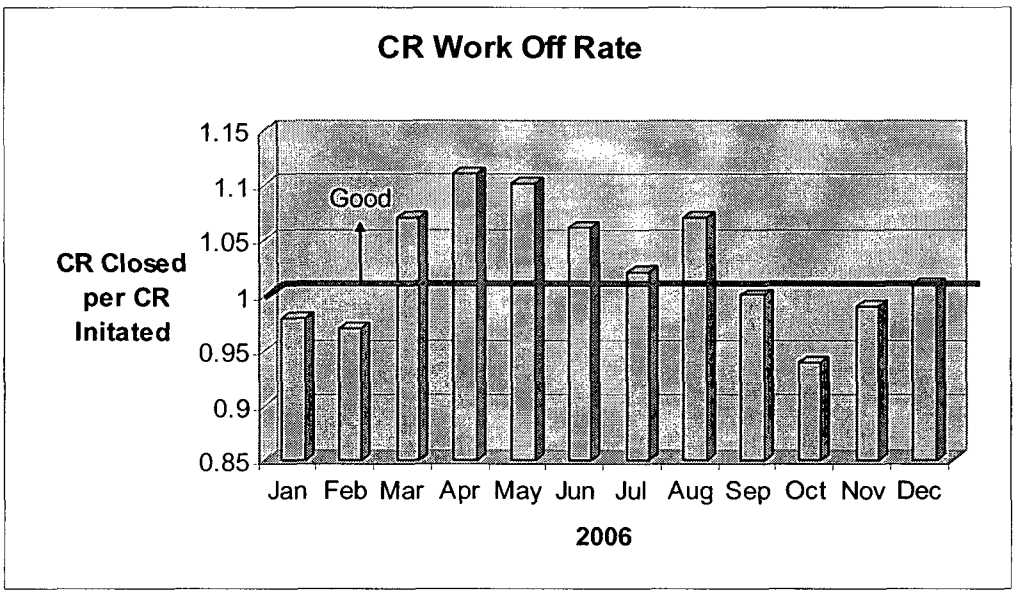


The 6-month rolling averages for initiation rate and work-off rate of CRs depicts a healthy program as shown on the following graphs. The threshold for identification is continuing to lower causing a higher initiation rate. The staff is able to maintain a work off rate of greater than 1.0, demonstrating the ability to keep up with the higher influx. These graphs demonstrate the result of effective actions taken to improve the self-identification and prioritization of problems and the site's priority for assuring the timely

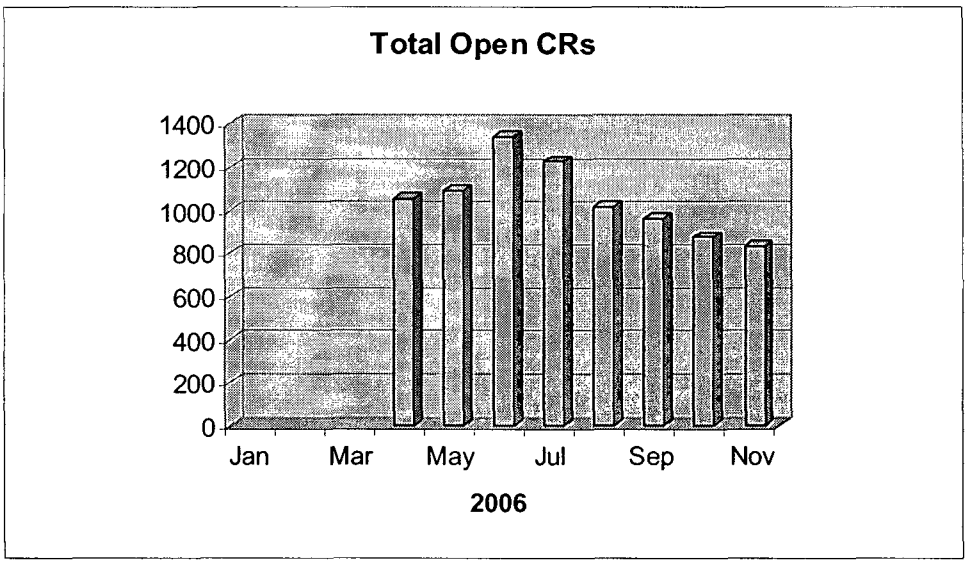
implementation of CAP. The improved focus of the PNPP staff on "working today's issues today" is also evident below.



The work-off rate is a ratio of the closed CRs to influx of new CRs. Anything greater than 1.0 indicates that more CRs were closed than were initiated.



Finally, a true measure of the improvement of Corrective Action Program is, when looking at the graphs in aggregate, the throughput of the program is healthy and the total inventory is decreasing to industry excellence standards. A single unit plant inventory should be approximately 500 open condition reports based on industry benchmarking. PNPP, with a healthy input and good attention to evaluating and resolving problems, shows a good trend towards this standard of excellence. Note that the Total Open CRs graph below is relatively new and no industry comparable data is available for the first three months of this year.



Performance Monitoring

Eighteen Key Performance Indicators (KPIs) are used to monitor the performance of the main elements of the Corrective Action Program. These indicators are published and reviewed on a monthly basis. Each KPI graph shows the performance of the PNPP organization in implementation of each of the key CAP elements for each month over the past 12 months. These KPIs are produced for the PNPP site as a whole and for each section of the PNPP organization.

An aggregate score card for 2005/2006 was produced to show the trend of these indicators on the following table over an extended period of time. Each row of the score card represents one of the 18 KPIs. It shows that performance of the Corrective Action Program is improving by a shifting of predominantly red or yellow windows in 2005 to predominantly white and green in the most recent months of 2006. KPI 15, Median Age of CRs has not shown dramatic improvement. The reason for only slight improvement is that as more emphasis is placed on working today's problems, some of the older, less significant CRs are not being worked. Hence, the increased age masks the real improvement in culture being realized by the PNPP staff. KPI 16, % Effectiveness Reviews That Conclude Ineffective Corrective Actions to Prevent Recurrence (CAPRs), has shown relatively poor performance primarily due to the low number of data points.

Perry		2005												2006										
PI Number	PI Title	Jan-2005	Feb-2005	Mar-2005	Apr-2005	May-2005	Jun-2005	Jul-2005	Aug-2005	Sep-2005	Oct-2005	Nov-2005	Dec-2005	Jan-2006	Feb-2006	Mar-2006	Apr-2006	May-2006	Jun-2006	Jul-2006	Aug-2006	Sep-2006	Oct-2006	Nov-2006
KPI-01	Adverse to Quality CRs Initiated per Month.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
KPI-02	% Root Causes Completed on time.	R	R	R	R	R	R	R	R	R	W	R	R	Y	R	Y	Y	W	W	W	G	G	G	W
KPI-03	% Root Causes Approved by CARB.	Y	Y	R	R	R	Y	G	Y	W	Y	W	Y	G	G	G	G	G	G	G	G	G	G	G
KPI-04	CR Workoff Rate.	R	R	R	R	R	Y	W	W	G	W	W	Y	W	Y	W		W	W	W	W	W	W	W
KPI-05	% Apparent Causes Completed on time.	R	R	R	R	R	R	R	R	R	R	R	R	R	R	Y	W	W	G	G	G	G	G	G
KPI-06	% Apparent Causes Approved by CARB.	Y	W	R	R	R	R	R	R	W	W	W	W	W	W	W	W	W	G	G	G	G	G	G
KPI-07	% Preventive Actions Completed on time.	R	Y	Y	W	Y	W	W	Y	Y	Y	W	R	R	R	R	R	R	Y	Y	Y	Y	W	W
KPI-08	% Remedial Actions Completed on time.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
KPI-09	Corrective Action Workoff Rate.	W	R	R	R	R	R	R	R	Y	W	W	R	R	R	G	G	R	Y	W	Y	G	G	G
KPI-10	% Repeat Root Cause Events (Using Event Descriptor 9450).	R	R	R	R	R	R	R	R	R	R	R	R	W	W	W	W	W	W	W	W	W	W	W
KPI-11	% Timeliness: Total Open CRs versus Total of All Condition Reports Initiated in Past 12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
KPI-12	CRs Self-Identified by an Individual or Supervision/Management, not	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
KPI-13	% Corrective Actions Rejected.	R	R	R	R	R	R	R	R	R	R	R	R	W	G	G	G	G	W	W	W	W	G	G
KPI-14	% Cause Evaluation Rework.	Y	Y	W	W	W	W	W	W	W	W	R	R	R	R	R	G	R	R	R	Y	W	W	W
KPI-15	Median Age of CRs.	R	R	R	Y	Y	Y	Y	Y	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R
KPI-16	% Effectiveness Reviews that conclude ineffective CAPRs.	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	R	G	G	Y	G	R	R
KPI-17	% Fix CRs completed on Time.	G	G	G	G	G	G	W	W	W	W	G	G	G	G	G	G	G	G	G	G	G	G	G
KPI-18	Total Open Non-outage and Outage Related Corrective Actions.	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W

Closure Assessment Conclusion

Through the conduct of self-assessments, review of performance indicators, and the review of the CAP PII actions by the Closure Validation and Review Board (CVRB), FENOC has concluded that there has been substantial improvement in the implementation of the CAP. Self-assessments have confirmed that ownership for implementing the CAP has improved as indicated by a clear understanding of roles and responsibilities among all levels within the organization. Interviews conducted with workers during self-assessments indicated a good understanding of management's expectations with respect to CAP among both workers and supervisors. A low threshold for problem reporting and improvement in the classification and prioritization of actions to resolve identified problems has been observed. Active management oversight has lead to improved quality in root and apparent cause evaluations and more effective corrective actions. Thus the effectiveness of corrective actions has also improved. The areas for improvement identified through self-assessments are captured in the corrective action program.

As noted above, the root and contributing causes have been addressed by implementing the corrective actions through the CAP PII P2. Site personnel, including supervisors and managers, have been trained to expectations and accountability methods used to measure the implementation of the CAP. Part of the training included the role of a Corrective Action Program in a "learning organization" and how CAP must be used to drive station improvement. New employees receive introductory training of CAP during the Plant Access Training (PAT) and receive an orientation manual that contains key aspects of a successful CAP.

In July 2005, an improved set of CAP KPIs were developed and are periodically reviewed by management. Various levels of management review processes have been instituted to ensure adequate oversight of the health of CAP going forward. These include the Corrective Action Review Board (CARB), Management Review Board (MRB), Senior Leadership Team (SLT) and Management Performance Review (MPR) meetings. Intervention actions are implemented if declining or unsatisfactory performance / trends are identified.

Continuous improvement in CAP implementation is assured through: FENOC Fleet governance of the process, site ownership of the CAP implementation, management oversight, sound procedures and policies, monitoring of Key Performance Indicators, and the use of critical self-assessments and

benchmarking. Fleet oversight is exercised through management observations of CARB and participation in monthly performance review meetings.

Fleet ownership of the procedures and business practices enhance the level of assurance that improvements will be sustained because FENOC business practices are benchmarked to industry accepted practices and changes require concurrence from all sites involved. This coordination helps ensure accuracy and consistency while at the same time standards compare favorably to industry accepted practices.

The self-assessment and benchmarking processes continue to be used to evaluate the implementation of CAP and to ensure that subsequent analysis of adverse trends promote continuous improvement by designing actions based on the industry's top performers.

Comparing current performance to the success measures and the metrics described in the CAP PII, which includes site personnel routinely meeting CAP expectations, the incorporation of CAP into performance management plans, collegial reviews of CAP performance, and quality of corrective actions, indicates these measures have been achieved. However, additional actions to sustain continued improvement are planned.

It is therefore concluded that the FENOC Fleet business practices, in conjunction with the use of responsive performance indicators and effective CAP oversight, provide sufficient framework to promote continuous improvement in the implementation of CAP at PNPP and support closure of this initiative.

Conclusion

In summary, the threshold for capturing problems in the Corrective Action Program has been lowered to levels that ensure issues of low significance are being identified. The review and prioritization process for CRs provides confidence that problems are visible for management's attention. PNPP performance demonstrates that the staff is able to focus on evaluating and solving the problems with improved timeliness and improved quality. Additionally, the PNPP staff has demonstrated that it can sustain these improvements in timeliness and cause evaluation quality while also improving closure quality and handling an increased number of CRs. The ultimate benefit of good CAP performance is more reliable equipment, improved organizational performance, and enhanced safety. The improvements evidenced by CAP performance indicators, coupled with improved safety system unavailability, illustrate that the disciplined execution of the Corrective Action Program has become an integral and effective component of the day-to-day business at PNPP .

Human Performance

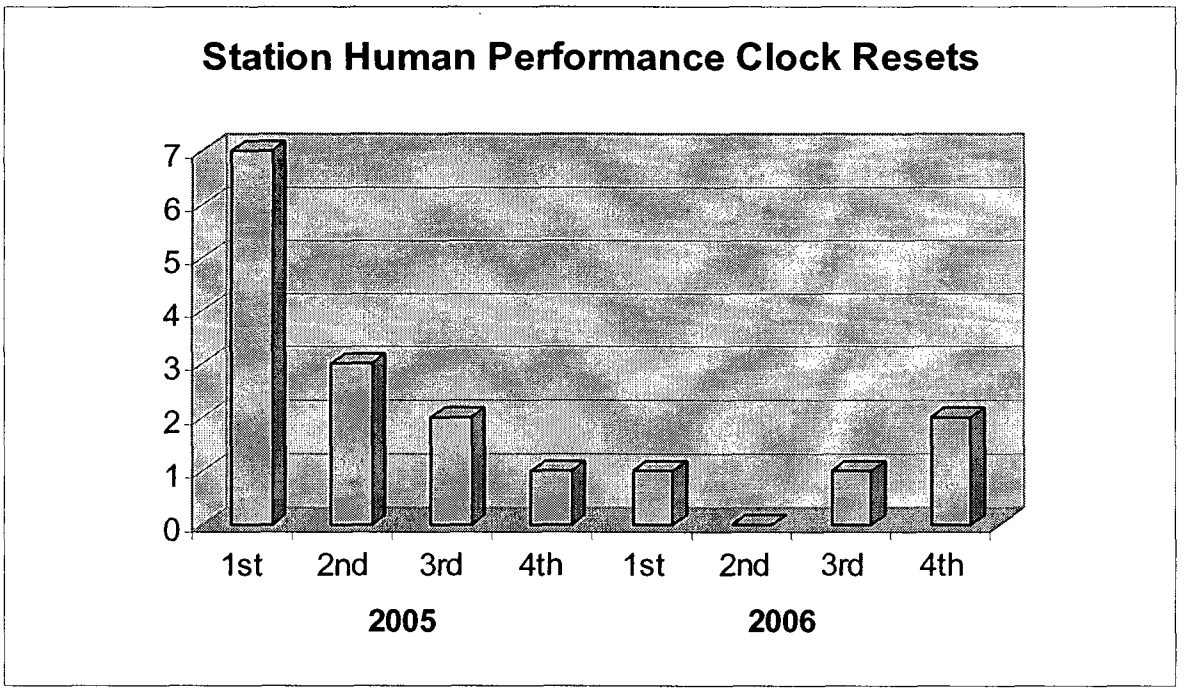
The PII P2 initiative for Human Performance has been completed. The improved use of human error reductions tools along with strengthened barriers have proven to be effective in limiting human performance errors that result in plant events or challenges to the operations staff.

Focus Areas for Improvement: The initiative actions were organized in three distinct stages which include:

- Program Structure: Setting performance expectations and communication of roles and responsibilities
- Behavior Modification: Enhancement of and training on Error Prevention Tools and line ownership, alignment, and integration
- Discipline in Execution: Monitoring and line accountability for results, procedure adherence, and confirmation of effectiveness of actions

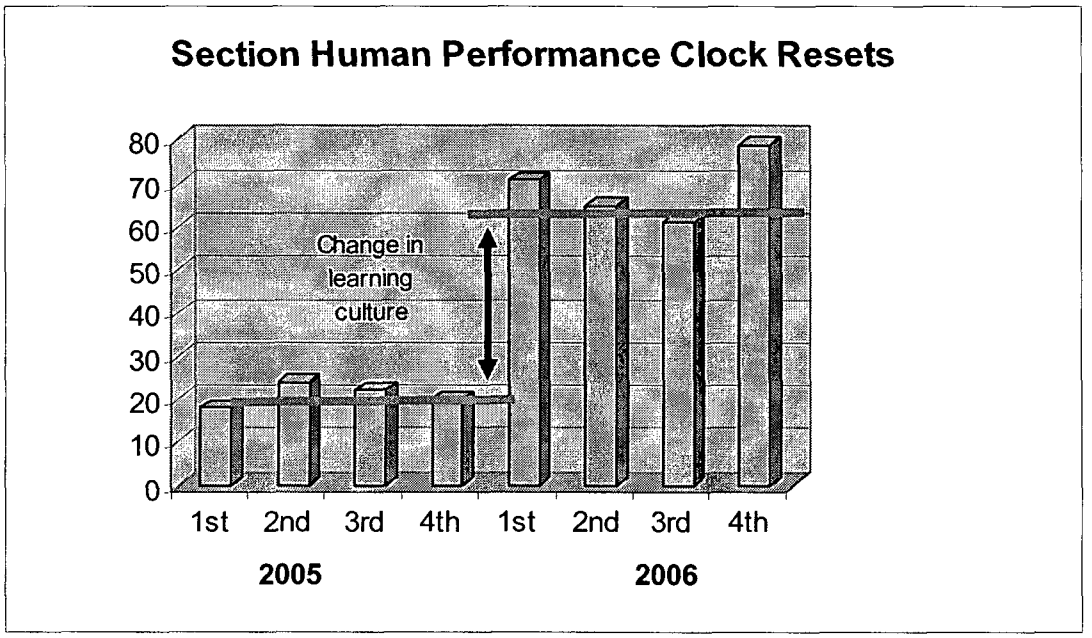
Performance Results

The Human Performance program promotes the prevention of plant events due to human error by focusing on sustaining error-prevention behaviors. The Perry PII for Human Performance drove improvement in the behaviors which produced a decrease in consequential events that "reset" the Station Clock. The graph below shows this improving trend starting in the second quarter of 2005. This was accomplished in three distinct stages. First, the program structure was established to provide enhanced roles and responsibilities, management expectations, and improved processes. Once the program structure was in place, training on expected behaviors and error-prevention tools was conducted for all site personnel. Serving both to increase the skills and behaviors of the workers, the new level of awareness on human performance resulted in a reduction in station events attributable to human errors. Finally, the disciplined execution of the processes and behaviors continued this improving trend to a low number of station events. This level of performance has now been sustained for four quarters.



Section Clock resets are events of lower significance than the Station Clock resets, but each event is considered a learning opportunity. The station's ability to prevent consequential events caused by human error is enhanced by the study and learning from the precursor events of low significance. The indicator below shows an increased use of this learning tool demonstrating a greater focus on learning from precursor events. The 2005 horizontal line indicates an approximate steady state number of resets or learning opportunities. The 2006 line indicates a new steady state number of learning opportunities

each quarter beginning in 2006. This step change coincides with completion of key PII actions and confirms the effectiveness of this initiative.



Closure Assessment Conclusion:

Following a review of the self-assessment results, performance indicators, and the effectiveness of HU PII, FENOC concluded that there had been substantial improvement in Human Performance at PNPP and that these improvements are sustainable. Self-assessments have confirmed that expectations for human performance have been established, communicated and reinforced with all station personnel. Management field observations and supervisory oversight ensure that human performance fundamentals are being demonstrated at all levels of the organization. Line accountability is being demonstrated through daily interactions, increased emphasis on monitoring and analysis of human performance errors, and support of the observation program. The root causes of procedure use and adherence issues including procedure upgrades are being addressed and are continuing to have a positive impact on Human Performance improvement efforts.

Sustained improvement in Human Performance is being assured through four primary mechanisms. These mechanisms include efficiently and effectively implementing human performance processes, monitoring performance through responsive performance indicators, continuing an active management observation program, and conducting critical self-assessments.

The actions and improvements noted in this HU PII have been anchored within Fleet business practices which provide reasonable assurance of continuous improvement due to the fact that all FENOC business practices are coordinated through the FENOC Fleet and require concurrence from all sites involved. This coordination helps ensure accuracy and consistency while at the same time being compared to industry accepted practices. The PNPP organization continues to utilize these business practices in the evaluation and improvement of human performance at all levels — thus ensuring that performance expectations are achieved.

Performance indicators for monitoring human performance are used to monitor and improve performance across the PNPP site. These indicators have been adapted from top performing organizations and are used by management to provide reasonable assurance that adverse trends will be promptly identified to station management. The self-assessment and benchmarking processes will continue to be used to ensure these indicators and subsequent analysis of adverse trends promote continuous improvement.

The PNPP station performance, described above, clearly demonstrates that the Human Performance Initiative has been successful in achieving and sustaining improved levels of performance. The success measures and metrics set forth in the HU PII (i.e. the site success clock goal of greater than 45 days for a 12-month rolling average between resets and sustaining greater than 120 field observations per month for a 3-month period) have been achieved.

Conclusion

The Human Performance Effectiveness Self-Assessment performed in September, 2006, confirmed that the desired behaviors have been instilled in the organization at all levels. Benefits of increased attention to human error prevention have also been observed in the industrial safety statistics for the PNPP site. In this area of industrial safety, PNPP has achieved zero OSHA recordable for all of 2006. In addition, plant personnel continue to achieve an Industrial Safety Accident Rate of 0.00 against an industry top quartile of 0.16 OSHA recordables per 200,000 man-hours. The PNPP staff has recently achieved the notable milestone of over 2 million person-hours without a lost time accident.

Additionally, overall plant reliability has improved with a Capability Factor of approximately 97% for 2006 up from a 2 year average of 82% in January of 2006, and Forced Loss Rate of approximately 1.1%, improved from a 2 year average of 7.8% in January of 2006. These high level indicators of safe and reliable plant performance demonstrate the roll-up affect of improved Human Performance.

Work Management

Effective Work Management is a direct contributor to performance in the cross-cutting area of Human Performance and also contributes to improved implementation of CAP. As such, effective Work Management is a key attribute of a growing and improving safety culture at PNPP. The PII P2 initiative for Work Management has achieved performance levels that are comparable to the other nuclear stations in the FENOC fleet and meets or exceeds industry standards. The Work Management process provides the fundamental structure for efficient use of station resources as well as overall improvement of equipment condition. The work management process is one of an integrated set of processes for the operation and support of nuclear plants.

The principles of the Effective Work Management improvement actions were organized into four general areas:

- Timely identification: Providing timely identification, selection, planning, coordination, and execution of work necessary to maximize the availability and reliability of station equipment and systems.
- Managed risk: To manage the risk associated with conducting work.
- Discipline in Execution: To identify the impact of work to the station and work groups and to protect the station from unanticipated transients due to the conduct of work
- Efficiency and Effectiveness: To maximize the efficiency and effectiveness of station staff and material resources

An effective work management process should accomplish the following:

1. Promote and improve nuclear, industrial, and radiological safety performance.
2. Improve equipment performance and system health.
3. Increase productivity through the efficient use of resources.
4. Provide for a long-range plan to include major design changes and predictive and periodic maintenance activities. This should include provisions to address equipment obsolescence and asset management.

Each of these is discussed in more detail below.

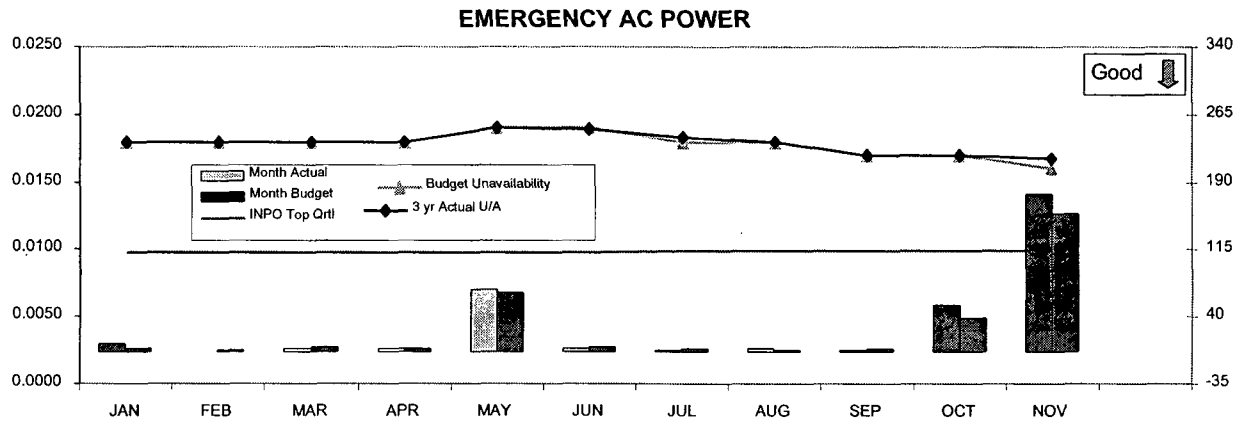
Performance Results

1. Promote and improve nuclear, industrial, and radiological safety performance.

Work Management performance improvement was implemented to ultimately improve overall system health for nuclear safety and reliability. Nuclear safety has improved over the past 10 months as indicated by overall performance and availability of safety systems. For example:

Emergency AC Power

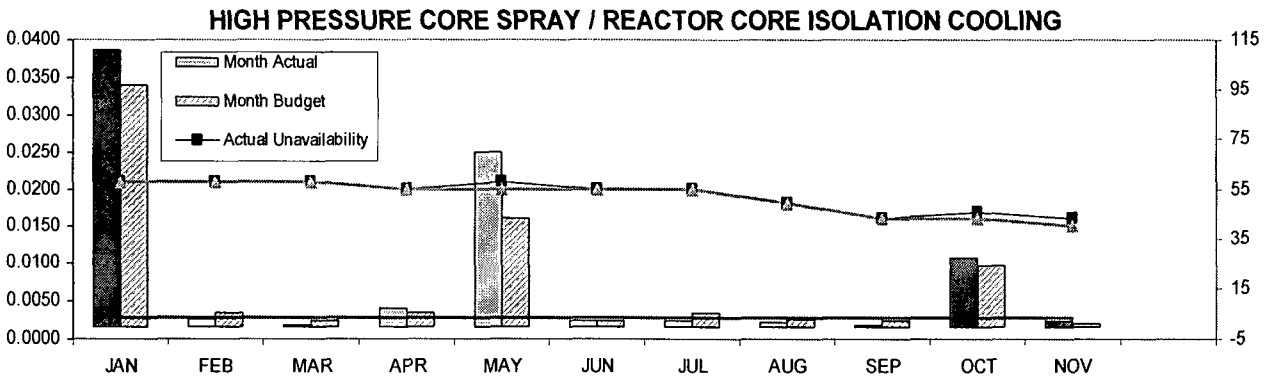
The Emergency AC Power indicator shows an improving trend in unavailability hours. This is a measure of timely and effective maintenance performed on the Emergency Diesel Generators. Past management maintenance strategy served to improve the reliability of the EDGs by performing required maintenance on-line. The consequences of this strategy were an adverse effect on unavailability hours. Present management has implemented a revised strategy that has both improved the reliability of the EDGs and improved the unavailability hours through a balanced approach to divisional outages and refuel outage work.



Note: Left Axis – 3 Year Rolling Average Unavailability Ratio. Right Axis – Unavailability Hours

High Pressure Core Spray/Reactor Core Recirculation

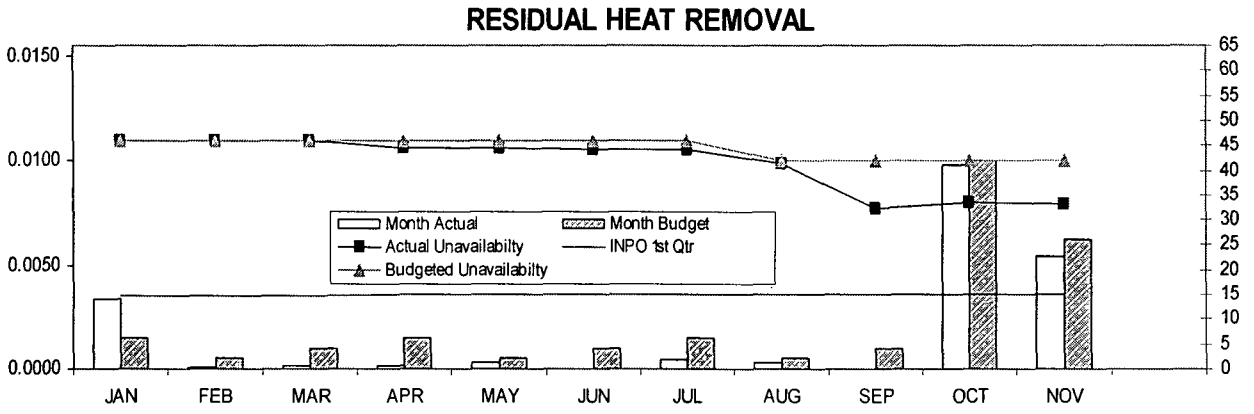
A similar trend is seen on the safety system indicators for HPCS/RCIC systems.



Note: Left Axis – 3 Year Rolling Average Unavailability Ratio. Right Axis – Unavailability Hours

Residual Heat Removal

Residual Heat removal shows a similar improving trend. Present performance supports future top quartile performance levels.



Note: Left Axis – 3 Year Rolling Average Unavailability Ratio. Right Axis – Unavailability Hours

It is clear that top quartile performance has not been achieved, but the actions of the Work Management PII have been successful in improving nuclear safety.

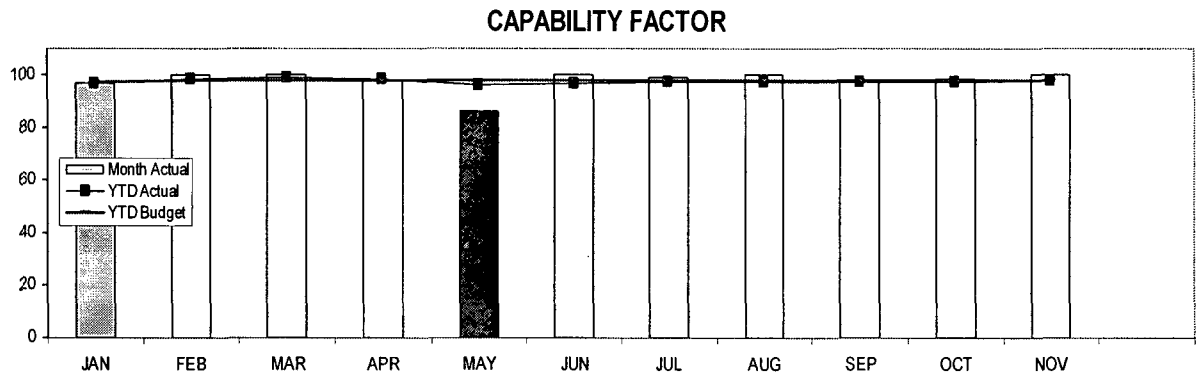
As discussed above in the human performance improvement section above, the PNPP station industrial safety statistics have improved. PNPP has achieved zero OSHA recordable incidents in 2006. In addition, plant personnel continue to achieve an Industrial Safety Accident Rate of 0.00 against an industry top quartile of 0.16 OSHA recordables per 200,000 man-hours.

In the area of radiological safety, challenges continue to exist. PNPP continues to be in the bottom quartile for accumulated dose at nuclear plants in the country. However, a major chemical cleaning effort to reduce the source term will be completed during the next outage. These source term reduction plans for the next refueling outage and other dose reduction plans have been reviewed by several outside agencies and deemed appropriate.

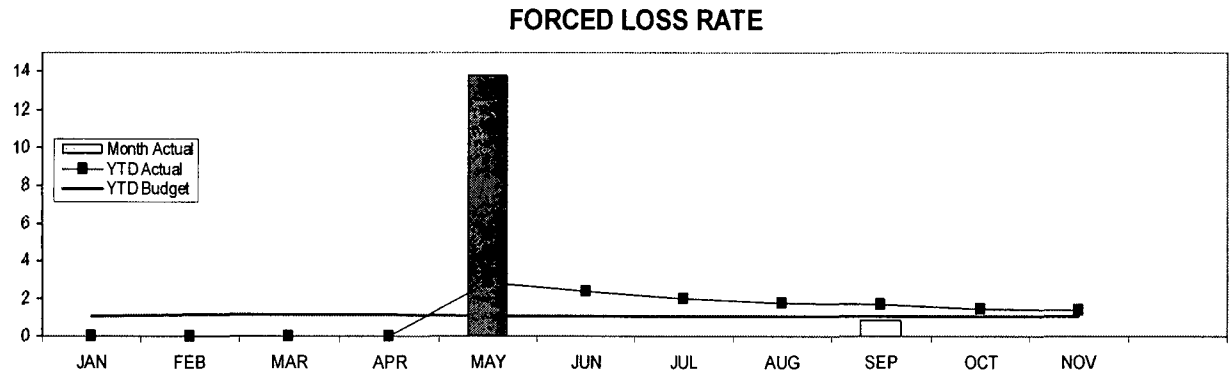
2. Improve equipment performance and system health.

The Work Management process is focused on improving overall system health for reliability. System health reports have shown acceptable and steady system performance throughout the year 2006. Use of system health reports as an input to Plant Health Committee priority decisions and subsequent integration with work management process has provided the methodology of implementing actions needed to improve equipment and system reliability issues. High level indications of reliability are plant Capability Factor and Forced Loss Rate.

The Capability Factor chart shows a high level of performance throughout the year. Although challenges have occurred, the significance of these and the severity have been decreased such that plant management has been able to control the impact on plant operation.



The Forced Loss Rate has been maintained at very low levels. During the month of May, 2006, an unplanned down power was performed to repair a hydraulic oil leak on the Reactor Recirculation Flow Control Valve actuator. In December, operators manually removed the reactor from operation due to degrading instrument air pressure. The plant was restarted 8 days later when the off gas system was returned to operation. Complications with high temperatures in the charcoal beds were the primary reason for the down time. During the period, the Forced Loss Rate has improved, returning to the business plan value. It is recognized that there will be plant issues that affect this indicator, but solid organizational performance will enable an improvement as demonstrated below.



3. Increase productivity through the efficient use of resources.

The Business Plan was developed with assumptions and goals that reflect good performance as benchmarked with the Electric Utility Cost Group. PNPP finished on plan which demonstrates efficient and effective use of resources.

4. Provide for a long-range plan to include major design changes and predictive and periodic maintenance activities. This should include provisions to address equipment obsolescence and asset management.

The Equipment Reliability, Maintenance, Outage, and the Work Management Excellence Plans contain the actions going forward for continuing to improve equipment and plant safety and reliability. The plans also address obsolescence and asset management.

Closure Assessment Conclusion:

Following a review of the self-assessment results, performance indicators, and the effectiveness of the Work Management PII, FENOC concluded that there has been substantial improvement in Work Management at PNPP and that these improvements are sustainable. Self-assessments have confirmed through observations, interviews and performance result reviews that expectations for process performance have been established, communicated and reinforced, with the end result that the basic expectations are understood by all affected station personnel. These assessments also identified areas for improvement in work planning, execution of scheduled work and craft participation in work package walk downs, which are being addressed in the excellence plans.

Line organization accountability is being demonstrated through daily interactions, increased emphasis on monitoring and analysis of work management performance, and support of the observation program both in Work Management meetings and field observations. The causal factors of poor execution (poor preparation, failure to meet key process milestones, lack of rigor in preparation activities, poor communication and hand-offs between work groups, and a lack of accountability for the success of the process) have been effectively addressed and the emphasis on continued improvement of work preparation is apparent.

The deeper causes of inadequately managed changes and staffing reductions are now historical, and improvements not related to the Work Management PII have been implemented at the fleet level to prevent future change management issues. Management turnover in the outage manager and work management manager positions remains a challenge that the PNPP senior management will monitor and address until resolved.

Continued improvement in Work Management is assured through three primary mechanisms. These mechanisms include efficient and effective procedures, responsive performance indicators, and an active management observation program. Evidence of this can be seen in the Work Management performance indicators showing steady improvement that has been sustained over an extended period of one year at acceptable and/or improving levels. Where there have been negative trends, management has taken action to recover and improve specific functions or performance gaps.

The actions and improvements noted in this Work Management PII have been anchored within Fleet business practices. This provides reasonable assurance of continuous improvement due to the fact that all FENOC business practices are coordinated through the Fleet and require concurrence from all sites involved. This fleet/peer ownership and oversight ensures consistency while at the same time incorporating industry accepted practices. The PNPP organization continues to utilize these business practices in the implementation and improvement of work management at all levels.

Conclusion

Overall, the Effective Work Management PII was effective in improving plant safety, plant reliability, industrial safety, and radiological safety. Challenges exist in ensuring the radiological improvement plans continue to receive attention. The radiological plans are solidly based on fundamental dose reduction and source term elimination. The outage related actions of the performance initiative were moved to the Outage Excellence Plan earlier in 2006 and continue to be implemented by plant management. Through practicing team building skills and Outage Control Center protocols during Divisional outages, the staff has improved their overall performance in dealing with periods of high workload. The last two Divisional outages were effectively implemented and provided for meeting or exceeding unavailability goals. Perry, through effective use of the work management process, has achieved performance numbers commensurate with the other FENOC plants, yet progress needs to continue to reduce backlogs of Elective Maintenance. Preventive Maintenance performance and percentage deep in grace is a key focus for the FENOC fleet. Work Management performance indicators are reported at each Monthly Performance Review and are highly scrutinized by FENOC executives.

Training

Training programs directly affect performance of the personnel at the plant. Hence, training was integral to the improvements realized in Human Performance and Corrective Action. The PII P2 was meant to strengthen and improve the training programs to further continuous improvements.

The National Nuclear Accrediting Board met in May 2005 and placed the maintenance and technical training programs on probation. Specifically the Board stated:

- The station has not been effective in using training to improve plant and personnel performance. (ACAD Objective 1)
- Although recent improvements have been noted, the ability of the station to sustain these improvements remains to be demonstrated. (ACAD Objective: ALL)
- Training effectiveness evaluation has been ineffective, with noted weaknesses in self-assessment and the corrective action program. (ACAD Objective: 6)

The weaknesses identified by the Accrediting Board formed the bases for the Training PII. Although the Training PII was focused on the maintenance and technical programs, actions were also taken in parallel to strengthen the Operations training programs. The approach of the initiative was to specifically cover ACAD Objectives 1 and 6 in detail and to provide for improvement in the remaining ACAD Objective areas to ensure the training programs were commensurate with industry practices and standards.

Performance Results

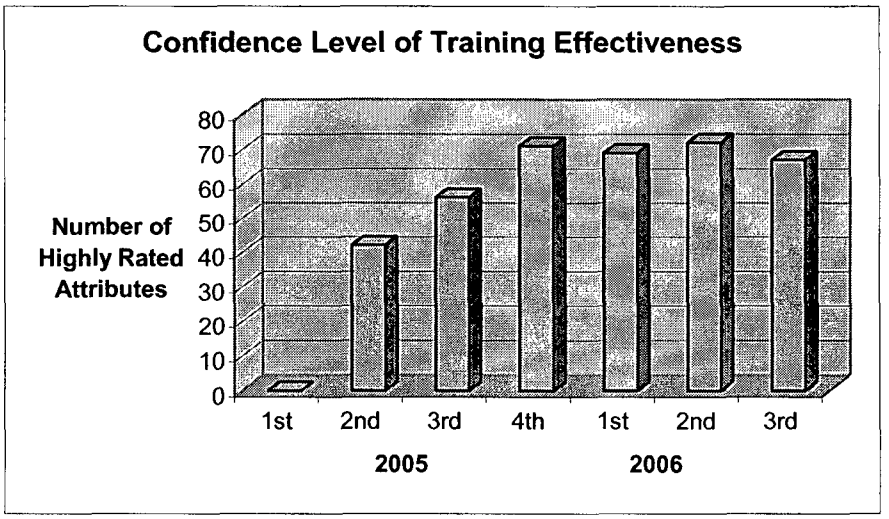
The Training to Improve Performance PII resulted in the program being removed from probation in the fall of 2005 after the November 16, 2005 National Academy for Nuclear Training board meeting. The PNPP training program now conforms to accepted industry standards. The organization has demonstrated self-critical behaviors that assess for gaps and establishes action plans to drive for excellence.

The final effectiveness review for the Training PII was conducted by a team of line and training personnel. The team concluded there has been substantial improvement in the PNPP training programs since implementing this initiative. Line ownership has been instilled through improved use of training coordinators and line manager observations. Early in the timeline of improvements, training committees were inconsistent and poorly attended. Presently, improved ownership by the line and embedding a protocol that focuses the committees on using training to improve performance has resulted in training committees that are standardized, consistent, and showing a strong emphasis on improving performance. For example, line managers acted as subject matter experts during training sessions. For example, the Maintenance Manager led Human Performance Training in the dynamic flow loop simulator to ensure his expectations were clear and understood.

One of the key mechanisms for enabling line ownership and driving improvements through training is a healthy training committee structure and protocol. Actions taken to strengthen the committee structure were effective in that the committees are much more focused on performance related topics. Additionally, committee's discussions centering on how training can be used to resolve issues in the plant occur frequently and are documented in the meeting minutes for future reference. Further, the hierarchy of committees has been effective in engaging all levels in the organization. Cognitive Trending Reports and Condition Reports are central themes throughout the meetings. The sustained improvements in these programs compliment the effectiveness of the Curriculum Review Committee (CRC) and Training Review Committees (TRCs).

Training performance indicators monitor attributes under each ACAD Objective. The attributes are scored based on survey and other objective data and provide a traditional color code corresponding to the level of performance. A program rated all Green would indicate high confidence in the programs and training process. This graph provides an overall indication of the improvement in the confidence of the

training programs. A high confidence in training results from improved ownership by the line, which translates into realizing, more value out of training. This is a measure of the effective use of training committees and improved ownership by the line organization. It is clear that the overall health and training performance has increased. There are 100 attributes total.



There are 100 attributes scored. There was no data in 1st quarter 2005 due to refueling outage

As described above, the line organization and training staff has sustained an acceptable level of confidence and ownership in training effectiveness.

ACAD Objective 2 is Management of Training Processes and Resources. This objective contains the highest vulnerability based on the analysis of the indicators. The dominate reason for poor performance was the effective and efficient use of training resources. This issue has been discussed with the Senior Training Advisory Committee (STAC) and SLT and is being resolved for the coming year in the Training Excellence Plan.

Conclusion

The Training to Improve Performance PII resulted in the Technical Training program being removed from probation in the fall of 2005 after the November 16, 2005 National Academy of Nuclear Training board meeting. The training program now is in line with industry standards and a self-critical organization is continuing to assess gaps and develop action plans to continue to strive for excellence.

Employee Engagement and Communication (EECI)

The purpose of this initiative is to have employees actively engaged in recognizing, understanding and improving PNPP's performance through the Perry Improvement Initiative and other key activities, such as, effective communications, the Plant Safety Committee, ALARA Committee, Consistent Supervision Committee and the FENOC Transformation Team.

Several factors contributed to a sense of historical frustration and dissatisfaction by the workforce at PNPP. It was important to reverse this trend to ensure the plant improves its overall performance and can sustain excellence in the long run.

These initiative actions were organized to address the main areas affecting employee engagement:

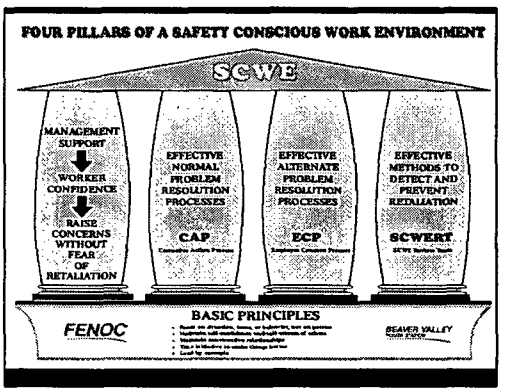
- Employee engagement: Active involvement of employees in key improvement initiatives

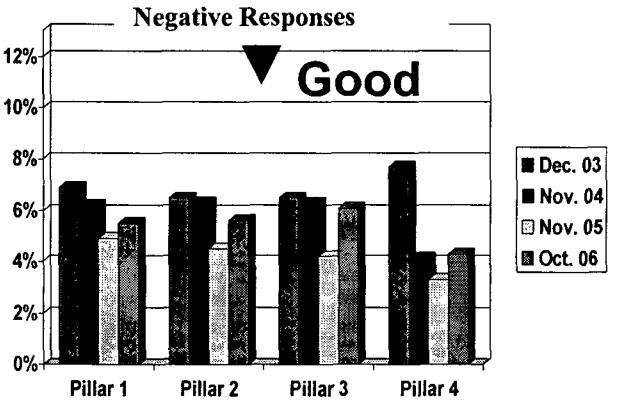
- Performance Management and Standards: Standards and accountability built into the way of doing business and driven through the performance management process.
- Communications: Keeping employees informed

Performance Results

When the results of the actions completed by this and other key performance improvement initiatives are viewed in the aggregate, employee engagement and communications at PNPP appear to be better than 18 months ago.

The most recent Safety Conscious Work Environment (SCWE) survey provided some additional insights into the overall employee morale and feelings towards plant processes.





There was a slight increase in negative responses when comparing 2006 to 2005. Additionally, frustration and dissatisfaction remains among some employees regarding Pillar 2, Effective Normal Problem Resolution Process. The increase in negative responses to questions related to this pillar reflects the aggressive efforts to improve CAP and the need for longer term successes to be communicated and leveraged among employees. Additionally, in analyzing the comments and response to survey questions, it is clear that the handling of the mid-year performance management process highly impacted the survey results.

Condition Reports were written for each pillar rated as red as required by the SCWE process. Additionally the condition of SCWE is monitored through a fleet business practice. The process has been in place for over 2 years and has proven to provide a sustainable process for addressing issues raised during the surveys.

The Transformation Team concept is a fleet-wide program to include all levels of employees in participation of FENOC's transformation to top quartile industry performance. This participation comes in the form of initial training on standards and methods of change management coupled with basic skills required for effective change. Then the team is then distributed to areas of management processes to coach and facilitate the groups in proper behaviors to assure progress towards excellence. For example, a Transformation Team member attends all Executive Leadership Team meetings and actively participates in agenda items and post meeting critiques. There have been two graduating classes of the Transformation Team with upwards of 30 people from across all of the sites and corporate.

Finally, PNPP has established several successful employee engagement groups such as the Human Performance Advocates and the CR Analysts. The involvement and ownership demonstrated by these groups can be tied to the Employee Engagement and Communications PII, such as active employee

participation and communications, strong management presence personal accountability and structure to these processes.

Conclusion

Employee engagement has improved through the last 18 months. It is clear that from the Human Performance teams, the Training teams, and the Safety teams that the engagement from employees is occurring and is resulting in improvements.

Operational Focus

The purpose of this initiative is to strengthen the operational focus across the organization. This is accomplished by ensuring common goals and priorities result in excellent materiel condition and equipment reliability that support safe and reliable operations. The purpose of the Operational Focus PII was to establish the appropriate attitudes and behaviors of personnel, along with the framework of policies and procedures, to ensure that nuclear safety is an integral part of every operational decision.

Focus Areas for Improvement: The initiative actions were organized into five general concepts to achieve the Operational Focused Organization:

- Goals and priorities: Creation of an Operationally Focused Organization aligned with common goals and priorities supporting timely resolution of operational challenges while minimizing risk to plant operations.
- Operational Decision Making: Ensure that nuclear safety is an integral part of every operational decision.
- Operations Leadership: Establish Operations leadership in the organization, craft ownership, and a strong engineering presence.
- Long-term Staffing: Develop a long-term staffing plan to ensure that operational knowledge and experience is present throughout the PNPP organization.
- Operator Fundamentals: Develop a focus on the fundamentals of safe plant operation.

Performance Results

There have been several recent indicators that additional work is required to fully achieve an operationally focused organization. Self-assessments have confirmed that while some improvements in focusing on common priorities have been made, further improvements are needed to reach FENOC's top quartile performance objectives. Improvements have been noted in the Morning Turnover, The Management Alignment and Ownership Meeting, Management Review Board, Plant Health Committee, Duty Team Setting Site Priorities and use of System Health Reports. Other improvements in Operations leadership, development of staffing plans, Duty Team updates, and implementation of some performance indicators have also been effective. The operations staff recently has demonstrated strong performance in operating the plant. Several challenges have been expertly handled without incident, including a recent transient involving degrading instrument air pressure. The next level of organizational performance will be achieved through a stronger operationally focused organization lead by the high standards of the operations staff. A self-assessment indicated the operations department has not yet achieved the level of alignment and demanding standards necessary to drive the organization to achieve fleet expectations. Given this level of alignment, operations has not consistently assumed the leadership position normally achieved through consistent demands on the supporting organizations for resolution of organizational shortfalls, and as a result driving organizational accountability.

Implementation of this Operational Focus PII has not achieved the desired overall results of establishing an Operationally Focused Organization. Actions for future improvement are being carried forward to the FENOC Excellence Plan for Operations. For example, the Operations Excellence Plan addresses, in part, reinforcement of Operations standards and expectations, reactivity management, and succession planning and staffing.

Assurance and Continuous Improvement

As the PII P2 initiatives closed, future gap closure actions and initiatives going forward are contained in the Fleet Excellence Plans to assure continuous improvement. The FENOC Management Model depicts the management structure and methods used to implement the processes necessary to meet the Business Plan objectives. A significant portion of the management model is focused on driving and monitoring the continuous performance improvement processes, including critical self assessments. These processes align with the INPO model for Continuous Performance Improvement.

The Excellence Plan is a discrete portion of the Business Plan designed to achieve objectives, measured by key metrics, are used to show Business Plan effectiveness and goals. These plans are maintained by the fleet peer groups, which are led by the Fleet Program Manager. The Excellence Plans and the continuous improvement framework of the fleet processes and programs supply the necessary motive force for continuous improvement such that performance issues are proactively addressed by both the PNPP staff and actively monitored by the FENOC Fleet staff.

The overall strategy for continuous improvement is therefore achieved through three tiers of fleet structure. The first tier provides an umbrella over the entire operation. It includes the Business Plan, Management Model, Independent Oversight, and the Company Nuclear Review Board. Answering to this tier is the second layer which includes the structural programs such as the Peer Groups, Human Performance Program and Training Committees. Finally, providing the foundation of the structure are the functional programs of Corrective Action, Self-Assessment, Benchmarking, and Field Observations. These functional programs provide the traction for the organization to realize gaps and provide solutions to achieve excellence.

FENOC has proven that it is dedicated to improving the performance of its plants and has demonstrated success in doing so. For example, at Davis Besse, FENOC achieved sustained higher levels of performance as indicated by their return to the normal Reactor Oversight Process and continued operation in the Licensee Response Column. Additionally, Beaver Valley has shown continuous improvement and progress towards excellence with a world class steam generator replacement outage and continued high levels of reliability and safety. We believe that by applying the lessons learned from the improvements at Davis Besse and Beaver Valley and with continued focus by both the PNPP organization and FENOC as a whole similar performance results will be achieved at PNPP.

The actions taken and behaviors instilled in the organization will work to lessen the frequency and severity of plant events. FENOC views all events as opportunities to identify additional improvement actions to strive for excellence in performance. Through a robust culture of continuous improvement and placing safety and reliability at the forefront of the Business Plan and Excellence Plans, FENOC will ensure sustained performance improvement.

Since the FENOC reorganization in August of 2004, FENOC has focused on standardization of processes across the three nuclear sites. In accomplishing this, a significant amount of benchmarking and assessment has taken place. The FENOC staff is made up of many senior managers and technical personnel who have diverse industry experience at top fleets across the nation. This facilitates many industry contacts making benchmarking and assessment an ingrained way of doing business. Presently, there is a corporate group dedicated to the assessment program, traversing across site and departmental boundaries. This group not only performs independent assessment, but facilitates the self-assessment program, program metrics, and program oversight.

Finally, there is continuous FENOC oversight of PNPP in the form of:

- Monthly Performance Reviews (implemented in the same week as the other fleet stations with cross-attendance from senior leadership of the other FENOC plants)
- Quarterly Performance Reviews at a Fleet level
- Fleet standard performance indicators with goals based on industry best quartile performance
- Integrated and coordinated Company Nuclear Review Boards
- Assessment by the independent and centralized Fleet Oversight group
- Structured and formal Safety Culture Assessment process facilitated by the Fleet Independent Oversight Department
- INPO corporate evaluation of culture and performance every 4 years. As a mid-cycle activity, FENOC performs a corporate self assessment every four years, staggered with the INPO corporate evaluation. This evaluation is a critical look by industry peers with an in-house team to comprehensively assess the continuous improvement cycle and the performance of the fleet programs.

Overall Conclusion

In summary, PNPP has improved and sustained overall plant performance through both on-site initiatives and, fleet standard programs and oversight. Since the establishment of the PII P2 in the summer of 2005, NRC findings do not indicate any significant performance weaknesses in the areas of Human Performance, Corrective Action Program and Work Management. Likewise, FENOC and NRC performance indicators do not indicate any significant performance weaknesses, and many key performance indicators show substantial performance improvement during 2006. Although, a recent industry evaluation identified some areas where additional focus must be given, particularly in the areas of operational focus and decision making, these areas are being addressed through the Excellence Plan.

Continuous improvement is assured by a fleet standard framework of procedures and processes, a culture of continual assessment against industry excellence, and the people behaving in a manner that shows a bias for improvement. FENOC has focused on developing fleet processes benchmarked against the industry, and now has in place a management team that is imposing the right expectations and standards on a day-to-day basis. The PNPP staff has responded to these challenges and has demonstrated their dedication to improvement and proper execution of the procedures. Finally, identification and resolution of gaps against top levels of industry performance is being addressed through the Excellence Plans and performance improvement processes.