FENOC
FirstEnergy Nuclear Operating Company

5501 North State Route 2
Oak Harbor, Ohio 43449

Mark B. Bezilla
Vice President - Nuclear

419-321-7676
Fax: 419-321-7582

Docket Number 50-346
License Number NPF-3
Serial Number 1-1451

February 6, 2006

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

Subject: Submittal of the 2005 Engineering Programs Effectiveness Independent Assessment Report for the Davis-Besse Nuclear Power Station

Dear Mr. Caldwell:

The purpose of this letter is to submit the assessment report for the 2005 Engineering Programs Effectiveness independent assessment of the Davis-Besse Nuclear Power Station (DBNPS). This submittal is in accordance with the Nuclear Regulatory Commission (NRC) letter dated March 8, 2004, "Approval to Restart the Davis-Besse Nuclear Power Station, Closure of Confirmatory Action Letter, and Issuance of Confirmatory Order," which requires submittal of the assessment results within forty-five (45) days of the completion of the assessment.

The on-site activities of the Engineering Programs Effectiveness Independent Assessment were conducted from November 28 to December 9, 2005, in accordance with the Assessment Plan, Rev. 1, submitted via letter Serial Number 1-1440, dated October 14, 2005. The results were presented to the DBNPS management on December 23, 2005, marking the end of the assessment. The enclosed report contains the results of the Independent Assessment. No issues rising to the level of an area for improvement were identified in the Independent Assessment; therefore, no action plans are included to address areas for improvement.

If you have any questions or require additional information, please contact Mr. Clark A. Price, Manager - Regulatory Compliance at (419) 321-8585.

Sincerely yours,

Barry S. Allen
for Mark B. Bezilla

LJS

Attachment 1 - Commitment List

Enclosure 1 - 2005 Independent Assessment, Engineering Programs Effectiveness, Davis-Besse Nuclear Power Station

cc: USNRC Document Control Desk
DB-1 NRC/NRR Project Manager
DB-1 Senior Resident Inspector
Utility Radiological Safety Board

COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station (DBNPS) in this document. Any other actions discussed in the submittal represent intended or planned actions by the DBNPS. They are described only for information and are not regulatory commitments. Please notify the Manager - Regulatory Compliance at (419) 321-8585 at the DBNPS with any questions regarding this document or associated regulatory commitments.

COMMITMENTS	DUE DATE
None	N/A

Docket Number 50-346
License Number NPF-3
Serial Number 1-1451
Enclosure 1

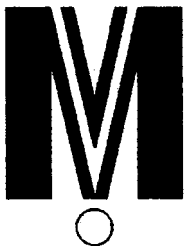
2005 INDEPENDENT ASSESSMENT OF THE ENGINEERING PROGRAMS EFFECTIVENESS AT THE DAVIS-BESSE NUCLEAR POWER STATION

(66 pages follow)

Independent Assessment
Engineering Programs Effectiveness
Davis-Besse Nuclear Power Station

COIA-ENG-2005
November 28 – December 9, 2005

Prepared by:



THE MARATHON CONSULTING GROUP

1000 Abbey Court
Alpharetta, GA 30004
Phone 678-879-8700
WWW.MARATHONINC.COM

Team members:

John Garrity	President and CEO, The Marathon Consulting Group, Team Leader
Paul Borer	Vice President, The Marathon Consulting Group
Harold Baumberger	Vice President, The Marathon Consulting Group
Gene Kelly	Manager - Engineering Programs, Limerick Station, Exelon Nuclear
John Meyer	Technical Support Manager, Comanche Peak Station, TXU
Glenn Perkins	General Supervisor, Corporate Engineering – Fleet Programs, Constellation Energy Group

Submitted by:

John H. Garrity 12/9/05
Team Leader

Reviewed and Accepted by:

1/4/06
DBNPS Vice President - Nuclear

1/5/06
FENOC Vice President - Oversight

Table of contents

Section 1

1.1 Executive Summary

The Engineering Programs Independent Assessment Team found the engineering programs at Davis-Besse to be effective overall, and found performance in each of the six areas designated for assessment to be effective.

The team reviewed engineering work products in a number of areas in depth, and did not find any discrepancies that were considered to be either significant in terms of the validity of the work product, or indicative of a systematic deficiency in engineering work performance or quality management.

Findings were categorized into three types, defined as an Area of Strength (AS), an Area for Improvement (AFI), or an Area in Need of Attention (ANA):

An Area of Strength is an identified performance, program, or process element within an area of assessment that is significant in obtaining desired results.

An Area for Improvement is an identified performance, program, or process element within an assessed area that requires improvement to obtain the desired results with consistency and effectiveness. All Areas for Improvement identified in the Assessment Report will be addressed by the Action Plan(s) submitted to the NRC.

An Area in Need of Attention is an identified performance, program, or process element within an area of assessment that, although sufficient to meet its basic intent, management attention is required to achieve full effectiveness and consistency. Areas in Need of Attention are not addressed by Action Plan(s) submitted to the NRC, but are considered for entry into the Corrective Action Program.

The Team's findings in 2005 consisted of:

1	Area of Strength (AS)
0	Areas For Improvement (AFI)
6	Areas in Need of Attention (ANA)

In addition, the Team made two comments (CMT).

The 2005 Findings are designated as:

Area of Strength

1 AS	Improved Engineering Performance and Environment

Areas in Need of Attention:

1 ANA	Containment Copper Oxide
2 ANA	Additional Corrective Actions to Address Vendor Product Quality Concerns
3 ANA	Transmittal of Engineering Requirements for Operation and Maintenance
4 ANA	Program Status – PRA and Equipment Reliability
5 ANA	System Engineering Attention to Detail
6 ANA	Design Engineering Backlog Reduction

Comments

1 CMT	Future of Engineering Assessment Board (EAB)
2 CMT	Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,

These findings are described in more detail in section 1.5 of this report.

By comparison, the team's findings in 2004 consisted of:

3	Areas of Strength
3	Areas for Improvement (AFIs)
12	Noteworthy Items (NIs) (equivalent to Areas in Need of Attention in 2005)

The Independent Assessment Team made several overall conclusions:

- Quality of Engineering work products and Engineering support work has improved.
- Favorable influences have included stable effective leadership, deployment of fleet standards and methods, fleet support, extensive self-checking and performance monitoring, reduction of post-restart backlogs.
- Focus has been on standards, processes, backlog reduction, post-restart commitments. Challenge will be to transition focus and techniques to maintaining and improving performance of organization and plant.

One CR was written during the assessment: "Documentation of EAB observation of a trend indicating vendor engineering product quality has not

improved to a level consistent with engineering products produced by site staff, and to track actions to improve vendor work quality". (CR 05-05828, no immediate actions required).

1.2 Introduction

The Confirmatory Order Modifying License dated March 8, 2004, required FENOC to conduct independent assessments of the effectiveness of the engineering program annually for a period of five years. The assessment conducted by the Independent Assessment Team and reported in this document is the second annual independent assessment of the engineering program.

The plan for this Independent Assessment was formulated in accordance with the guidance of FENOC's procedure DBBP-VP-0009 Management Plan for Confirmatory Order Assessments Rev 3, and also with benefit of the guidance of FENOC's procedure NOBP-LP-2001 Focused Self-Assessment. The Assessment Plan was submitted via serial letter 1-1440 Rev 1 dated October 14, 2005 (see appendix 1)

The members of the Independent Assessment Team were drawn from the nuclear power industry. There were three team members from operating US nuclear plants and three from the Marathon Consulting Group. The Curricula Vitae of the team members are included in the Assessment Plan. The Team members were:

John Garrity	The Marathon Consulting Group, Team Leader
Paul Borer	The Marathon Consulting Group
Harold Baumberger	The Marathon Consulting Group
Gene Kelly	Limerick Generating Station, Exelon Nuclear
John Meyer	Comanche Peak Station, TXU
Glenn Perkins	Constellation Energy Group

(Curriculum Vitae are provided in section 1.7)

The Independent Assessment Team commenced work on the Davis-Besse (DB) independent assessment on September 21, 2005, with information gathering and activities and discussions with FENOC management. The team gathered information from FENOC relevant to the DB assessment and posted this information to an internet FTP site established for this purpose over a period of several months. The three weeks of October 10 and 17 and November 7 were devoted to intensive review of FENOC documents and formulation of interview strategies, questions, and interview lists. The Team spent the weeks of November 28 and December 5 at the Davis-Besse site conducting initial and follow-up interviews and reviewing additional FENOC supplied material.

1.3 Scope of Assessment

The scope of the Engineering program assessment included primarily activities and performance since the 2004 Independent Assessment

Assessment information was drawn from a variety of sources, including:

- Documents supplied by FENOC, including procedures, performance data and reports, program descriptions, engineering work products such as modification packages, calculations, etc., Corrective Action Program (CAP) work items and records, and assessments (partial list of documents provided in Appendix 3)
- Assessments performed by others such as NRC, INPO, and independent assessors and reviewers
- FENOC task, project, program, and business plans and status reports
- Interviews with FENOC personnel (interview list provided in section 1.6.1)

The assessment concentrated on engineering performance in six areas of interest:

1. Modifications
2. Calculations
3. System Engineering
4. Implementation of the Corrective Action Program by Engineering
5. Effectiveness of Assessment Activities
6. Corrective Acton Taken in Response to AFI's Identified in the 2004 Independent Assessment

Within each of these areas, sub-areas were identified for review. These sub-areas are shown below:

1. Plant Modification Process

The team will perform a review of activities to assess the effectiveness of the plant modification process:

a. Selection and prioritization of potential modifications (2004 AFI DB 1.2) including assessment of delayed modifications on plant and operating personnel
b. Owner acceptance sub-process (review of contracted work)
c. Quality of modification packages since the 2004 assessment
d. Closeout of modification packages and supporting document updates (2004 AFI DB 1.2)
e. Effectiveness of modifications
f. Interaction and support from parallel processes
g. Workload management

2. Calculation Process

The team will assess the following attributes of the plant calculation process:

a. Workload management, including appropriateness of work priorities
b. Acceptance criteria
c. Margin management and allocation, propagation of engineering requirements for operation and maintenance
d. Linkages and consistency with other calculations
e. Preservation of design bases
f. Documentation/traceability/attribution
g. Calculation health and improvement program (2004 AFI DB 2.2)
h. Interaction and support from parallel processes
i. System descriptions design information
j. Engineering rigor and attention to detail
k. Fleet counterpart interactions

3. System Engineering

The team will assess the following items:

a. System Engineering alignment and plant support
b. System Health evaluation and reporting
c. Process for prioritizing, communicating, and resolving system health deficiencies and program deficiencies
d. Equipment Reliability Improvement Program
e. Maintenance Rule system monitoring and trending
f. Experience and expertise, including use of operating experience
g. Margin awareness and margin allocation
h. Interaction and support from parallel processes
i. Access to knowledge of Engineering information in calculations
j. Workload management

4. Implementation of the Corrective Action Program by Engineering

The team will assess the following:

a. Promptness in initiating condition reports for identified conditions adverse to quality
b. Condition Report ownership and appropriate initiator involvement
c. Quality of root and apparent causes produced by Engineering and associated management behavior and guidance
d. Prompt acceptance of corrective actions
e. Corrective action quality and implementation timeliness
f. Effectiveness of corrective actions to prevent recurrence
g. Support of corrective actions assigned to others
h. Workload management and backlog management
i. Response to Davis-Besse CR 05-02585 which documents the findings from the NRC Safety System Design and Performance Capability (SSDPC) Inspection

5. Effectiveness of Assessment Activities

The team will evaluate the effectiveness of the Davis-Besse Nuclear Power Station's assessment activities associated with the implementation of Engineering programs as follows:

a. Review the results of the Davis-Besse Quarterly Quality Assessments that evaluated Engineering. Determine if the assessments were comprehensive and if effective actions were taken to correct problems or weaknesses identified.

b. Evaluate the effectiveness of self-assessment capability by reviewing corrective actions associated with self-assessment reports, audits (including audits of the offsite safety committee activities), and evaluations conducted of Engineering program implementation.

c. Determine if the Engineering staff is aggressive in correcting self-assessment and assessment findings, and determine whether the corrective actions are adequate, timely, properly prioritized, and that effectiveness reviews are ensuring the desired results. (2004 AFI DB 6.2)

d. Determine the receptivity and responsiveness of management and staff to issues raised in self-assessments and assessments.

6. Corrective actions taken in response to the Areas for Improvement identified during the 2004 Independent Assessment

The team will evaluate the responses to the three AFIs identified during the 2004 Independent Assessment within Areas 1 (Modification Process), 2 (Calculation Process), and 6 (Assessment Process) as noted above where an AFI is referenced.

1.4 Methodology

The assessment was performed in accordance with the sequence of steps, summarized below.

1. Develop the assessment scope, including areas to be assessed and assessment topics under each area. This step included consideration of FENOC management's views, FENOC's procedural and business planning guidance for assessments in general, and the need to meet the particular assessment requirements for Davis-Besse.

2. Develop the assessment plan, including the overall objectives and approach, the framework for conducting the assessment, and including review and comments by FENOC engineering and corporate management and staff.

3. Determine the team size and composition requirements

4. Recruit the team, including industry peers.

5. Develop a document library and means to provide access to team members. This included collecting documents from FENOC's corporate offices and the Davis-Besse site such as procedures, performance reports, engineering work products, and organizing them for access by team members through a website established for this purpose.

6. Develop a list of plant personnel to be interviewed and typical interview questions or areas of inquiry. A list of plant personnel to be interviewed was developed by defining the organizational positions to be interviewed for each assessment area and topic, and selecting one or more team members to represent that interview area of interest.

7. Develop the detailed interview schedule. Plant administrative support personnel scheduled interviews and published schedules notifying interviewees and team members of the time, date, location, subject, and participants of each interview. Typically an interview was scheduled for an hour, and interviewees were scheduled to meet with from one or two Team members. Follow-up interviews were scheduled during the assessment as needed. Approximately seventy formal interviews were conducted, with sixty different individuals interviewed, and additional follow-up discussions were held as necessary. The first week on site was dedicated to interviews and assessment of the areas of modifications, calculations, and system engineering, while the second week focused on the areas of implementation of the corrective action program by engineering, effectiveness of assessment activities, and corrective action taken in response to AFIs identified in the 2004 independent assessment

8. Assemble the team and provide orientation. The team assembled for an orientation session the Sunday evening before the assessment. The interview schedules were briefed, any new documents received were noted, and the overall assessment schedule was discussed. The assessment plan and scope, the background for and development of the assessment scope, and the guidance provided for focused self-assessments by the FENOC fleet procedure, were discussed.

9. Obtain badges for unescorted access to the plant (all Independent Assessment Team members were granted unescorted access)

10. Conduct interviews and document reviews. During the assessment period, results of interviews and document reviews were summarized on daily records of facts and observations. Items of interest were those thought to require further follow-up or having the potential for becoming findings. The daily records were collected, consolidated, and distributed to team members on a daily basis.

11. Organize items of interest. Toward the end of each of the assessment weeks, items of interest from daily records were binned to identify evolving issues in the form of potential Strengths, AFIs, and Areas in Need of Attention in each of the assessment areas. Potential findings were documented on a summary form developed for this purpose.

12. Provide regular counterpart briefings. The Team briefed site counterparts on a regular basis to keep the site staff informed of items of interest and potential findings, and also to support generation of Condition Reports when appropriate (two were generated during the assessment)

13. Consolidate items of interest into Areas of Strength, Areas for Improvement (AFIs), and Areas in Need of Attention (ANAs). Near the end of each assessment week, issue summary forms were developed to reflect available information and to support generation of management briefing and exit talking points.

14. Brief plant engineering management at exit. Site management was briefed at a formal exit on Friday of the second week of the assessment. FENOC key corporate executives and engineering managers were included in this briefing by conference telephone connections. The briefings were conversational in style, with a team member for each assessment area discussing the significant findings in his area. For each potential finding, the issue and appropriate examples or other supporting information was presented and questions were answered. The daily counterpart briefings and management pre-exit briefings assured that the site personnel being briefed already knew of all findings and that appropriate CRs had been generated.

15. Provide assessment preliminary findings. Site management briefing talking points and the issue summary forms were provided to the sites in electronic file form after the assessment was complete. (At this stage, the findings were still considered draft, but useful information for the sites).

16. Provide report for Davis-Besse. This report is the report for information and action by Davis-Besse and FENOC.

1.5 Conclusions

The Assessment team's conclusions are summarized in this section. These findings are based on extensive working field notes and Team discussions conducted each day during the assessment period and after.

1.5.1 Overall Rating of Engineering Programs Effectiveness

The Independent Assessment Team rates the effectiveness of Engineering Programs as **Effective**, with no identified Areas for Improvement and several Areas in Need of Attention

- Quality of Engineering work products and Engineering support work has improved.
- Favorable influences have included stable effective leadership, deployment of fleet standards and methods, fleet support, extensive self-checking and performance monitoring, reduction of post-restart backlogs.
- Focus has been on standards, processes, backlog reduction, post-restart commitments. Challenge will be to transition focus and techniques to maintaining and improving performance of organization and plant.

Specific findings in the 2005 independent assessment included
1 Area of Strength
0 Area For Improvement,
6 Area in Need of Attention,
2 Comments

1.5.2 Assessment Ratings by Assessment Areas

Section 1.5.2 presents the Independent Assessment Team's conclusions about the effectiveness of Engineering performance in each of the six assessment areas.

Findings were, with one exception, not uniquely associated with only one assessment area. Therefore, with that one exception, the findings are described in section 1.5.4, and those descriptions are referenced under the heading "cross-cutting findings" in the discussion of each of the six assessment areas.

1.5.2.1 Modifications

Area Effectiveness Rating

Overall, the team rated the modification process **Effective**. The finding from the 2004 COIA was addressed, the backlog of open modifications is decreasing, and the design department continues to produce quality modifications.

Source information

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Section 1.6.2).

The team reviewed selected Engineering Change Packages (ECP), interviewed design and system engineers and managers, fleet oversight staff, Engineering Assessment Board members, as well as operations and maintenance managers.

Documents reviewed:

ECP 05-0285 Replace HPI Flow Indicator
EWR 02-0117 Makeup Tank Level Transmitter Replacement
ECP 04-0345 Non Essential MCC Grounding Change
Engineering Assessment Board Report for July 1-September 30, 2005

Observations

The assessment team reviewed three recent ECPs (one had not yet received Engineering Assessment Board (EAB) review, two were recently issued). In particular, the descriptions, 10CFR50.59 screens, regulatory applicability determinations, and various design interface documents were reviewed. The assessment team concluded the technical content of ECPs and associated documents was of acceptable quality.

The EAB Quarterly Report for the period July 1 through September 30, 2005 was also reviewed. The observations were then discussed with the responsible Engineering managers. EAB review scope includes all ECPs and associated calculations, selected 50.59 evaluations and selected Operability Evaluations. The EAB evaluated 126 products during this period, and have documented an improved trend in FENOC design engineering product quality. Discussions with several design engineers indicate that the real-time feedback (from EAB) on calculation and ECP quality serves to reinforce the *FENOC Engineering Principles and Expectations.*

The engineering change process has improved since the 2004 assessment. The backlog of ECPs to be initially classified has been reduced from about 550 in 2004 to about 45 in 2005. The backlog of modifications that are field-complete but not closed has been reduced from approximately 57 in 2004 to about six currently. The overall number of items in Engineering Change Process has been reduced from about 1200 in 2004 to about 800 in 2005. This reduction is a result of more timely modification closeout and the voiding of modifications or modification requests that are no longer needed.

Specific Issues for this area

During 2004 and early 2005, Design Engineering gave priority to working off the Engineering corrective action backlog. When it was recognized that the June 6, 2005, milestone for issuance of all modification packages required for the original scope of the 14th Refueling Outage (14RFO) would be missed, a recovery plan was put in place. The last of the 16 packages was issued on December 7, 2005, approximately three months before the start of the outage. However, as priority shifted to the modification package production, progress in reducing the corrective action backlog has stalled and is not anticipated to resume until many corrective actions are closed during 14RFO.

Workload management is in a transition from the Engineering Work Management System (EWMS) to SAP. Currently, engineers and managers are managing work with both systems until the transition is completed in 2006. The backlog of engineering change products is slowly decreasing.

Findings for This Area

There were no Findings uniquely associated with the Modification assessment area

Cross Cutting Findings Applicable to This Area

The team made several Findings that relate to or are applicable to more than one Assessment Area. The Findings are documented in Section 1.5.4. Cross-cutting findings which are applicable to the area of Modifications are:

1 AS	Improved Engineering Performance and Environment
2 ANA	Formal Corrective Actions to Address Vendor Product Quality Concerns
3 ANA	Transmittal of Engineering Requirements for Operation and Maintenance
6 ANA	Design Engineering Backlog Reduction
1 CMT	Future of EAB
2 CMT	Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,

1.5.2.2 Calculations

Area Effectiveness Rating

Overall the team rated the calculation area as **Effective** based on the quality of work performed and the progress made. More work remains to clear the backlog of calculations and to achieve better overall calculation health.

Source information

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Section 1.6.2).

In particular, the team reviewed the plant Design Basis Assessment Reports (DBAR), with emphasis on the Calculation Health and Calculation Quality sections, Condition Reports related to calculations, and new and revised staff and vendor calculations issued since the last assessment.

The team used the Calculation Utility and the data entered to assess its accuracy and usefulness.

Interviews were conducted with the owners of the Calculation Improvement Plan and the Calculation Utility. Interviews were conducted with engineers concerning work products reviewed and actions taken with respect to last assessment's findings.

Finally, the team independently reviewed twelve calculations performed since last year for conformance to standards and expectations with respect to technical rigor.

Calculations reviewed include:

C-ME-026.02-003 Rev 01 Addendum 01
C-EE-013.10-001 Rev 3 Addendum A02
C-NSA-36.02-001 Rev 02
C-ISE-026.02-003 Rev 0
034.009 Rev 2 and Rev 3
C-EE-006.01-026 Rev 26
C-NSA-016.04-004 Rev 01 Addendum A01
C-ICE-026.02-003 Rev 01 Addendum 1
C-EE-013.10-001 Rev 3 Addendum A02
C-ME-016.04-036 Rev 3
C-CSS-059.01-014
C-NSA-099.16-086

Specific Condition Reports reviewed included:

05-02322	05-02324	05-02327	05-02356	05-02559
05-02382	05-02585	05-02673	05-02688	05-02732
05-02748	05-02822	05-02869	05-03136	05-02503
05-03245	05-03343	05-04231	05-04041	05-04462

Observations

The quality of the calculations fully met the station's high standards and expectations. This was affirmed by the team's independent review of twelve calculations issued in 2005. One calculation reviewed, 034.009 Revision 2, "Minimum Flow Requirements to Meet TS 3.1.1.1," failed to meet these standards. However, the problems with this calculation had been self-identified prior to the team's arrival, and a revised calculation, 034.009 Revision 3, had already been issued. Revision 3 had found and corrected all issues identified during review of Revision 2 before the time the team arrived. This is attributed to the station's improved ability to find and correct its own problems.

The quality of calculations is also monitored by staff using Engineering Assessment Board (EAB) scores presented in the DBAR Calculation Quality Section. Current EAB scores show an improving trend since last assessment with scores consistently achieving the goal of less than or equal to 0.5. Scores have recently stabilized in the 0.3 to 0.4 range indicating a relatively consistent level of performance is being achieved. The result of our independent review of calculations is consistent with the EAB results.

The Calculation Improvement Plan is essentially complete and is ready to be closed. Based on the actions taken and the observed level of performance in this area, it is our assessment that the Plan has met its intended purpose (to improve the rigor of calculations) and we consider closure at this time to be appropriate.

Calculation Health, as defined in the DBAR, is a combination of the age and margin available in plant calculations. This indicator is "RED" in the DBAR based on the number of calculations with low margin. These calculations include Masonry Block Wall calculations and SW piping stress in containment. Efforts are currently in progress to address these areas with the majority of the work to be complete by the refueling outage next spring (14RFO). Completion of these items will address the current factors driving this indicator to "RED".

Margin management and margin improvement efforts were evident and driven by the Calculation Health indicator. Efforts are ongoing to restore margins in masonry block wall calculations and SW system analyses.

Propagation of Engineering requirements to Operations and Maintenance is accomplished by the Design Interface Evaluation (DIE process). This process is used effectively to identify necessary design inputs to calculations. This process is also generally effective in identifying impacts on operation and maintenance, but these requirements are identified in the conclusions section of the calculations. The requirements can be surmised from a detailed review of the design inputs and review of the use of these inputs in the calculation. This is not always effective in identifying necessary Operations and Maintenance

requirements. For example, Calculation 034.009 Revision 2 failed to identify all requirements related to the operation of the Boric Acid Addition System to ensure the requirements of TS 3.1.1.1 are met. This failure was self-identified soon after the approval of Revision 2 and Revision 3 was issued to address the problem. However, even in Revision 3, the operational impacts are evident only by review of the calculation design inputs, and not specifically identified in the conclusions. See Finding 6 ANA for more details.

Overall, it is concluded that the calculation area has made significant progress since the last assessment. The quality of calculations being prepared and approved is excellent. The Calculation Improvement Plan is ready to be closed. Current calculation health remains an issue, but is improving as older calculations are upgraded in the normal course of work.

Specific Issues for this area:

Calculation Health, as defined in the DBAR, is a combination of the age and margin available in plant calculations. This indicator is "RED" in the DBAR based on the number of calculations with low margin. These calculations include Masonry Block Wall calculations and Service Water piping stress in containment. Efforts are currently in progress to address these areas with the majority of the work to be complete by the refueling outage next spring (14RFO). Completion of these items will address the current factors driving this indicator to "RED".

Findings for This Area

There were no Findings uniquely associated with the Calculation assessment area

Cross Cutting Findings Applicable to This Area

The team made several Findings that relate to or are applicable to more than one Assessment Area. The Findings are documented in Section 1.5.4. Cross-cutting findings which are applicable to the area of Calculations are:

1 AS	Improved Engineering Performance and Environment
2 ANA	Additional Corrective Actions to Address Vendor Product Quality Concerns
3 ANA	Transmittal of Engineering Requirements for Operation and Maintenance
4 ANA	Program Status – PRA and Equipment Reliability
6 ANA	Design Engineering Backlog Reduction
1 CMT	Future of EAB
2 CMT	Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,

1.5.2.3 System Engineering

Area Effectiveness Rating

The Independent Assessment Team rates the System Engineering area as **Effective**

Source information

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the list of documents provided in advance by FENOC (See Section 1.6.2).

In particular, the team reviewed recent and past Plant Health Reports, and interviewed system engineers responsible for the selected plant systems listed below.

In addition, the team selected engineering programs from the Engineering Programs Quarterly Health Report and interviewed the site program owners (AOV, ISI, Alloy 600, Maintenance Rule and FAC Programs)

Plant Engineering supervisors and the Plant Engineering manager were interviewed, as were selected management personnel from the Plant organizations responsible for operations and maintenance.

Observations

System Engineering was generally praised as effective and responsive to problems and support assistance needs of Operations and Maintenance.

System engineers interviewed regarding the status and health of their systems were knowledgeable and engaged in system health monitoring and reporting.

Maintenance rule systems overall health was found to be White for the current quarter (2Q 2005)

The following systems, spanning a range of health levels and histories, were selected for closer review and interviews with the system owners.

System	Health 2Q 2005	Health 2Q 2004
Reactor Coolant System	Yellow	Yellow
Service Water	Yellow	Yellow
Control Room Emergency Ventilation	Yellow	White
Feedwater	Green	Green
480 V AC	Red	Red
Freeze Protection/Heat Trace	Red	Red

During the Independent Assessment Team's time on site, three Condition Reports were filed to identify the problem of untimely return of maintenance rule systems to MR (a)(2) status:

CR 05-05755	480V AC system (discovery date 11/29/05)
CR 05-05761	Freeze protection System(discovery date 11/29/05)
CR 05-05762	Radiation Monitoring System (discovery date 11/29/05)

These CR's document "..an adverse management and organization weakness based on the inability to restore the system in a timely manner. Increased emphasis is required to restore the system....."

The implementation of actions listed in health improvement plans was mixed, with an estimated 20% or greater carryover of items listed in the second quarter 2004 report which were scheduled at that time to be completed before the end of second quarter 2005 but were not completed as scheduled and still on the list of items to be completed.

On December 8, 2005, it was reported that the last system engineer had qualified for use of the calculation utility.

Specific Issues for this area

The Plant Health Report for third quarter 2005 was not available during the team's visit. A new report format and method of production had been recently instituted. While the new report protocol holds promise for reducing the reporting burden imposed on the system engineers and to provide more current information, the details of the information flow into the report and the algorithms for calculating values of performance indicators were insufficiently mature to be reliable, and report release was being held up.

A review of a small sample of reports filed by system engineers following their system walkdowns showed some variation in report content and detail, as well as some variability in cycle time for filing the report and obtaining supervisor review.

Findings for This Area

Note: This is the only finding that is applicable to only one assessment area.

5 ANA System Engineering Attention to Detail.

Improvement is needed in attention to detail in some areas of System Engineering. Examples of lack of attention to detail include:

1. System engineer walkdown records / checklists reviewed were disparate in content and formulation. Form DB-0518-0 requests Asset No./Asset

title/Comments/Deficiencies to be noted in one column, and CR/Notification/ECR Number and Corrective Action Recommended in the other. Scope detail varied from a list of each component to the name of the system. . Elapsed time between walkdown date and date report submitted varied from 0 days to 5 days, and elapsed time between date submitted and supervisor signature varied from 0 days to almost two months. One individual reported his most recent walkdown report has been misplaced.

2. The management expectations for System Engineer tasks, activities, and work products are dispersed through several documents
   - Reviewing Engineering Job Familiarization Guidelines DBBP-DBDE-0002
   - Training and Qualifications of Engineering Support Personnel NT-ST-07044
   - FENOC Engineering Principles and Expectations
   - Engineering Program Management NOP-SS-2101
   - Engineering Work Management System DBBP-DBPJ-0001
   - Plant Engineering System Health Reporting DBBP-PES-0003
   - FENOC Plant Health Report Program NOBP-ER-3009
   - Plant Health Committee NOBP-ER-3002
   - Work Management Scheduling Process NOP-WM-2001
3. While training for System Engineers was reported to be essentially current, reports showing this are either difficult to interpret or contain errors.
4. One system engineer, whose system is red and has been for a long time, did not recall ever discussing his system status with the Plant Health Committee.

Cross Cutting Findings Applicable to This Area

The team made several Findings that relate to or are applicable to more than one Assessment Area. The Findings are documented in Section 1.5.4. Cross-cutting findings which are applicable to the area of System Engineering are:

1 AS	Improved Engineering Performance and Environment
1 ANA	Containment Copper Oxide
3 ANA	Transmittal of Engineering Requirements for Operation and Maintenance
4 ANA	Program Status – PRA and Equipment Reliability
2 CMT	Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,

Note:
5 ANA System Engineering Attention to Detail is unique to the System Engineering assessment area.

1.5.2.4 Use of the Corrective Action Program (CAP) by Engineering

Area Effectiveness Rating

The Independent Assessment Team's overall rating for the Corrective Action area is **Effective**. Progress is being made on corrective action backlogs, although some setbacks are occurring due to higher priority outage work. Actions taken to transfer lower value ("enhancement") actions to SAP should have positive effect on the backlog.

Source Information

The Independent Assessment Team members reviewed a number of applicable Condition Reports in their assessment of the areas of Modifications, Calculations, and System Engineering. In addition to the insights provided with respect to the areas under review, this also provided insight into Engineering's use of the Corrective Action Program.

The team also reviewed the DBAR section related to Design Engineering Condition Report (CR) Backlog Reduction to determine progress being made with respect to Backlog Reduction of investigations and corrective actions completion/resolution. Similar statistics were obtained for Plant Engineering from the available management reports

The engineering assessment avoided duplication of the work performed under the independent assessment of the Corrective Action Program that was completed during the weeks of September 13 and September 27 before the engineering assessment took place.

Observations

The team reviewed the results of this earlier Confirmatory Order Independent Assessment of the Corrective Action Program performed in September 2005, and generally concluded that those findings were also applicable to the Engineering area. In particular, issues with the timeliness of corrective action and the impact of large backlogs are also applicable to engineering. Because these issues are already being addressed, no new findings were appropriate.

Considerable progress has been made at reducing Corrective Action backlogs in Engineering. Plant Engineering has remained below the "work down" curve. Design Engineering was able to remain below the "work down" curve until April 2005. At that time Design Engineering priorities were adjusted away from Backlog reduction to 14RFO design packages and support. Since April 2005, the Design Engineering backlog has leveled out, with approximately the same number of completions as incoming items. Although, this has been somewhat of a setback to Design Engineering backlog reduction efforts, the change in

priorities to outage-related work was necessary to complete a number of commitments due the first refueling after restart.

In general, the team found that Engineering was promptly initiating Condition Reports when appropriate. One instance was noted where EAB noted a negative trend in the quality of vendor products reviewed did not result in a Condition Report. When the failure to capture this in the Corrective Action Program was questioned by the team, engineering management acknowledged this was an oversight and initiated a CR.

Condition reports appeared to be appropriately classified as SCAQ, CAQ or NCAQ. The type of actions included requiring root cause evaluations, apparent cause evaluations, or fix (no evaluation required). The items chosen for root cause, apparent cause and fix (no evaluation) appeared appropriate. The one root cause evaluation reviewed was well done (CR 05-05999). No apparent cause evaluations were reviewed. The corrective actions for "FIX" items appeared appropriate for the specific item identified in the condition report. But some opportunities to address more generic issues may have been missed.

Corrective actions considered "enhancements" are being converted to SAP Tracking Items and closed in the corrective action system as they come due. This appears to be satisfactory as long as items are truly "enhancements". Corrective actions classified as enhancements in Condition Reports reviewed by the team did appear to be appropriately classified. This action should have a positive effect on the Corrective Action resolution backlog, but were not yet reflected in the backlog numbers.

Specific Issues for this area

Some of the issues listed in the Confirmatory Order Independent Assessment of the Effectiveness of the Corrective Program were also observed in the Engineering area. Since these are being addressed by the findings from that assessment, the team did not cover the same ground and no effort was expended to reexamine these areas or develop separate Engineering findings.

Findings for This Area

There were no Findings uniquely associated with the Use of the CAP by Engineering assessment area.

Cross Cutting Findings Applicable to This Area

The team made several Findings that relate to or are applicable to more than one Assessment Area. The Findings are documented in Section 1.5.4. Cross-cutting findings which are applicable to the area of Use of the Corrective Action Program are:

1 AS	Improved Engineering Performance and Environment
1 ANA	Containment Copper Oxide
2 ANA	Formal Corrective Actions to Address Vendor Product Quality Concerns
6 ANA	Design Engineering Backlog Reduction
2 CMT	Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,

1.5.2.5 Effectiveness of Assessment Process

Area Effectiveness Rating

Overall, the team rated the self-assessment process as **Effective**. This is based on the quality of self-assessments, interviews with engineers and managers, and the receptivity and responsiveness management exhibits toward the self-assessment process.

Source information

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Section 1.6.2).

The team reviewed the following self-assessments:

Number	Title
DB-SA-05-04	System Trending/Monitoring
DB-SS-05-05	Fuse List
DB-SA-05-06	Flow Accelerated Corrosion
DB-SA-05-07	Alloy 600
DB-SA 05-08	Equipment Qualification

The team also reviewed six effectiveness reviews associated with the following CRs:.

CR Number	Title
02-07596	Emergency Diesel Generator
02-00891	Boric Acid Corrosion Control
05-01642	DH Suction Piping Voiding
02-08530	Allowable Operating Transient Cycle Program
03-04375	Thermal Overloads – 480 V Motors
01-01687	MS 106 Failure to Open

Observations

In 2005, approximately 11 self-assessments were scheduled. To date, seven have been completed, one cancelled and replaced with an on-going program, one postponed until other prerequisites are met, and two are scheduled for completion by year's end. In addition three (emergent) self-assessments were scheduled and completed in 2005. The 2006 Fleet Plan is under development at this time.

Quarterly Quality Assessment reports for Q1-2005, Q2-2005, and Q3-2005 were reviewed. The assessments were comprehensive, and over a two-year period, several key engineering areas were in turn, assessed. Condition reports were generated as necessary. A spot check indicates the corrective actions were addressed in a timely manner. Many of the engineering issues raised were administrative errors - not following the procedure or being careless in documenting assumptions.

Engineering program self-assessments were found to be consistently executed, intrusive, adding value, and of high quality. Self-Assessment results are challenged at Senior Leadership Team meetings, and associated comments are critical and constructive. The self-assessments reviewed employed subject-matter experts from all three FENOC plants, as well as from other utilities in some instances. INPO, ERPI and other industry references were used as templates to either plan the assessment or to benchmark via gap analyses.

Effectiveness reviews are required by procedure NOP-LP-2001 for conditions requiring a root cause determination and other cases requested by the MRB or the CR owner. A review of a sample of six effectiveness reviews indicated they were complete and the corrective actions were effective. Effectiveness reviews are reviewed by the CARB. One of these six was initially rejected by CARB because it did not make reference to the FME program that has been in place since the CR was initially written, indicating this CARB review was critical.

The receptivity, responsiveness, and aggressiveness of management and staff to resolving issues raised in self-assessments were evaluated by conducting interviews of many engineers, oversight personnel, and managers. Overall, the

results of the interviews indicated management was aggressively correcting self-assessment and assessment issues.

Specific Issues for this area

None

Findings for This Area

There were no Findings uniquely associated with the Effectiveness of Assessment Process assessment area

Cross Cutting Findings Applicable to This Area

The team made several Findings that relate to or are applicable to more than one Assessment Area. The Findings are documented in Section 1.5.4. Cross-cutting findings which are applicable to the area of Assessment Effectiveness are:

1 AS	Improved Engineering Performance and Environment
4 ANA	Program Status – PRA and Equipment Reliability
1 CMT	Future of EAB

1.5.2.6 Follow-up to AFI's from 2004

Area Effectiveness Rating

The Independent Assessment Team rates DB Engineering Performance in this area as **Effective**

Source information

The team reviewed the actions taken on last assessment's Areas for Improvement as documented on Condition Reports initiated following the last assessment.

The team reviewed documentation provided in the library (see section 1.6.2) related to the issues. The team also interviewed individuals responsible for authorizing closure of the CR corrective actions for the Condition Reports issued to resolve the 2004 Findings.

Documents reviewed:

- CR 04-06562 COIA-ENG-2004 Initiation and Closeout of Modification Paperwork (AFI DB 1.2)

- CR 04-06564 COIA-ENG-2004 Calculation Improvement Program Needs Management Focus (AFI DB 2.2)
- CR 04-06563 COIA-ENG-2004 Self-Assessment Process not Fully Utilized to Improve Performance (AFI DB 6.2)
- CR 04-06566 COIA-ENG-2004 Noteworthy Items roll-up
- CR 04-06485 Mechanical Calculation CME-011.01-142 Rev 1"Accumulator Sizing Calculation for SW 142p/1434"

Observations

There were three AFIs identified in the 2004 Independent Assessment.

Area 1 – Modifications AFI DB 1.2

The 2004 AFI indicated:

> ***Initiation and closeout of documentation associated with plant modifications are untimely and inefficient.***
>
> *There are about 550 Engineering Change Requests (ECR) that have not been dispositioned (apparent indecision about the need or type of modification to be used).*
>
> *Planning and document control personnel indicate that there are about 57 modifications, some believed to be installed in the plant as early as 1998, that remain open because the exact status of the modifications in question is unknown; thus the documentation closeout has not been performed.*
>
> *The closeout process is unique at each FENOC site. At Perry, closeout is performed by Document Control; at Beaver Valley, the process is handled by Engineering; at D-B, Work Planners are responsible.*
>
> Recommendation
>
> 1. *Review the modification closeout processes across the fleet and adopt a common process. Consider process efficiency improvements as well as consistency improvements.*

CR 04-06562 COIA-ENG-2004 Initiation and Closeout of Modification Paperwork addressed this item.

Status is: adequate progress has been observed

Condition is:

- In 2004, approximately 550 ECRs needed dispositioning. Now the number is about 45.
- All but one of the ECPs identified in the 2004 assessment (approximately 56) have been closed out. At this time that backlog is small (<6).

- The backlog of open modification and modification requests has declined from 1200 in Oct. 2004 to about 800 today (2005 year end goal is 681).
- Common Fleet closeout process due date deferred to December 2006.

Area 2 – Calculations AFI DB 2.2

The 2004 AFI indicated:

The Calculation Improvement Program is not receiving sufficient management focus to ensure timely completion.

Although the Calculation Improvement Program status report in the DBAR is provided to engineering management, there is no discussion or assessment of progress provided, only item-by-item status. Low management visibility and lack of a summary level discussion could result in overlooking information showing lack of progress .

Relatively few items have been addressed since restart. Most items due in the March - June 2004 time frame have been extended through the end of the year. Many of these items are reporting 0% complete.

Several due dates indicate "Under Review" or "TBD" without indication (in notes or otherwise) of the reasons for not having a required due date.

The goal established for the Calculation Quality Indicator is an average score of 1.0 or less. Actual performance has been better than this goal since February 2004. A more challenging goal has not been established.

Recommendations

1. *Since implementation of this program represents a regulatory commitment, either complete scheduled actions in a timely manner or justify and request a change to the commitment.*
2. *Evaluate whether the remaining actions under Section 2 "Re-Affirmation and Alignment of DB DES Supervision and Staff" are warranted/add value and work with the regulators to adjust the plan, if appropriate.*
3. *Establish a more challenging goal for the Calculation Quality PI.*
4. *Consider factoring progress on Calculation Improvement Program items when assigning a Calculation Quality "window" color. (e.g. 90% or above achievement of scheduled items - Green).*

Additional note: The team found information relating to the overall quality of calculations in two different sections of the DBAR: "calculations" under the Design Basis Health tab, and "calculation quality" under the Engineering Programs tab. Different individuals are named as owners. Overall calculation health might be better indicated by taking into account both the quality of current production calculations and also the condition of legacy calculations, with one owner responsible overall.

Recommendation

1. *The team recommends taking a more integrated view of calculation health and reporting the result in one section of the DBAR.*

CR 04-06564 COIA-ENG-2004 Calculation Improvement Program Needs Management Focus addressed this item.

Status is: All issues from the AFI have been satisfactorily resolved.

Condition is:

- This finding is closed.
- Changes have been made to the Calculation Improvement Plan to address the issues.
- Management attention is evident. The status of the Calculation Improvement Plan presented in the DBAR accurately reflects progress made and actions taken.
- The Calculation Improvement Plan is essentially complete and this commitment is ready for closure.
- All issues from the AFI have been satisfactorily resolved.

Area 6 Self-Assessment AFI 6.2 Utilization of the Self-Assessment Process

The 2004 AFI indicated:

The Self Assessment Process is not being fully utilized to improve Engineering Performance.

To date, of the 34 engineering self assessments scheduled for 2004, seven have been completed, ten are pending completion, and 17 have been canceled.

Twelve fleet-wide focused self assessments were originally scheduled for 2004. Ten of these scheduled assessments have been canceled.

The team reviewed 16 self assessments, including focused assessments, ongoing departmental assessments, and collective significance reviews. The quality was variable. 50% (8) of the assessments were judged to be critical and had appropriate CAs to address the issues. The remaining 50% were judged average (3) or below average (5), particularly in the area of CAs.

In general, the focus of most self assessments has been backwards looking for compliance instead of forward looking toward improvements and higher standards. Therefore, there were few assessments where opportunities for process efficiencies/improvements or higher standards were identified.

The change management associated with the implementation of corporate procedures NOBP-LP-2001 and NOBP-LP- 2004 was inadequate. Currently, no owner for the self-assessment process exists onsite. Discussions with site personnel indicate that the owner is now a corporate individual. This individual was interviewed and he recognized the change management issues and indicated that he is actively working to address them in the future.

Recommendation(s)

1. *Establish site and corporate ownership for the self assessment program.*

2. *Plan self assessments well in advance to identify which SAs will be performed, who will perform them (identify direct and support requirements), and to coordinate them.*
3. *Develop a strategy for SAs taking into account factors and considerations such as the following:*
   - *Demonstrating compliance with corporate, site, and external requirements and commitments*
   - *Identifying needs and opportunities for process change to improve quality and business results*
   - *Identifying areas where enhanced standards would benefit FENOC*
   - *Integration of self assessment activities*
4. *Consider CARB review of self assessment plans and results to provide a management perspective (as an interim measure)*

CR 04-06563 COIA-ENG-2004 Self-Assessment Process not Fully Utilized to Improve Performance addressed this item

Status is: adequate progress has been observed

Condition is:

- In 2005, approximately 11 self-assessments were scheduled. To date, seven have been completed, one cancelled and replaced with an on-going program, one postponed until other prerequisites are met, and two are scheduled for completion by year's end. In addition three (emergent) self-assessments were scheduled and completed in 2005.
- The program self-assessments were of high quality.
- Self-Assessment results are reviewed at Senior Leadership Team meetings.
- 2006 Fleet Plan is under development

No AFIs were identified in the 2004 Engineering Programs Independent Assessment in the following assessment areas

Area 3 – System Engineering
Area 4 – Use of the CAP Program
Area 5 – Management

Additional Observations

The Team also followed up on two CRs from the 2004 Independent Assessment which, while not the subject of AFIs, were deemed of sufficient interest to review:

1) CR 04-06372 Dry Fuel Storage Pad Control of Transient Combustibles

In this CR, the principle the Team wished to convey was the need to reliably control the configuration and operation of the plant to be in conformance with the inputs, assumptions, and acceptance criteria use in engineering evaluations for predicting plant performance and determining acceptable outcomes. This is a

general process concern. The CR illustrated an example in which the control of plant configuration and operation was not instituted, i.e. no instructions for limiting the combustible loading of the dry fuel cask pad were instituted or recognized as needed by the plant.

The response to the CR was to impose temporary controls for dry fuel cask pad combustibles, and to schedule a more durable control in the form of a procedure revision, again to control the dry cask pad combustible loading.

The DIE process had been instituted after the dry cask storage pad construction was complete, and DB believed the DIE process would in the future suffice for translation of engineering requirements for operation and maintenance into plant controls.

However, the Team believes the DIE process poses a likelihood of error in achieving the desired imposition of controls implementing engineering requirements because it requires each DIE process participant to become familiar with the details of all the engineering evaluation material to be sure no engineering requirements have been implicitly imposed in his or her area of responsibility which the participant would then have to implement by imposing controls.

The Team suggests that engineering requirements for operation and maintenance of the facility should be explicitly identified and highlighted in engineering evaluations, then summarized and presented in such a way that the likelihood of overlooking them in the DIE process is reduced.

A second example of this issue was identified during the 2005 Independent Assessment, and documented in CR 05-05559 which addressed use of non-conservative assumptions in calc 034.009 "Minimum Boric Acid Flow for Technical Specification 3.1.1.1" In that case, a calculation was performed to demonstrate adequate performance of the boric acid transfer pump, and it was determined that certain parameter values in the calculation might be more limiting than actual conditions in the field might be found to be. Alternatively stated, the assumptions in the calculation were not imposed on the plant as engineering requirements for system operation and maintenance.

The probable cause write-up for this CR indicates the parameters which need to be controlled by the plant to preserve the integrity of the engineering evaluation showing acceptable performance and recommends that '...additional administrative controls associated with the BA pumps be implemented..."

2) CR04-06566 Collector for Noteworthy Items

Summary – 12 NIs from 2004 assessment were collected under this CR. 7 were reviewed in 2005 assessment. Of these, 4 were completed, 1 is ongoing, 1 was extended, and 1 was closed without action taken.

DB 1.3, CA 9, CR item #1 Selection, Prioritization, and communication of Modifications
Corrective action was completed 5/26/05.
Procedure changes were implemented to enhance FVR scoring of industrial safety and ALARA projects and also to provide a prioritization category for management sponsorship of projects regardless of FVR scoring. Funds are allocated in the budget to fund such projects.

DB 2.6, CA 4, CR item #3 Fleet Counterpart Interactions
Corrective action was completed 9/8/2005.
NOP-SS-2101 calls for fleet program peer group meetings. Face to face meetings are held quarterly, telephone conferences are held monthly, with records of participation maintained.
System owners...
Functional supervisors and managers.....
NOBP-SS-2101

DB 5.4 CA 3 CR item # 12 Human Resource development
Corrective action is complete as of 8/17/05
A training needs analysis for use of SAP by Engineering personnel was completed, found training was needed, and raining was enhanced in content and extended to additional personnel. ESPC_200502_DB-03 SAP Engineering Restraints was provided to all engineering personnel in 2005. All site personnel were trained to MISC-SAP0501_FEN SAP Activity Tracking Training in 2005. In addition, ESC-AO-SAP is being offered to personnel next week (week beginning 12/12/05) to about 20 engineering personnel desiring advanced training.
Nevertheless, training is reactive to recognized deficiencies in performance and skills and has a long cycle time, whereas training for new technology rollouts needs to be anticipatory and adjusted on a short cycle time as needs are anticipated.

DB 3.2 CA 5 CR item #5 System health rating – may not provide early indication
Corrective action completed 11/15/05
A new system health report generation process and report design has been implemented (although the first revised edition has not been published for the 3rd quarter of 2005). The new reporting process does include some anticipatory elements (e.g. overdue PMs) and is reported to be a little more challenging in the health scoring algorithm. However, problems with the data acquisition, sub score calculation, and even the philosophy inherent in some scoring inputs remain to be finalized. (For example, MWOs are only counted against a system if they are scheduled to be worked in within three months, but not counted if they aren't scheduled to be worked until later). The new reporting system is a significant initiative with considerable promise.

DB 3.4 CA 2 CR item #7 Access to knowledge of Engineering information in Calculations
Corrective action completed 12/9/05
The calc utility is now available to everyone on a read only basis through the engineering toolbox. Training on use of the calc utility, qualifying the user for all uses, has been provided to all DED personnel and some Plant Engineering personnel. The training of ESI-CU Rev 0 Using the Calc Utility Database has been added to the requirements for maintaining ESI-100 qualification. Individual training for all engineering personnel required was completed by during the time the Team was on site..

DB 3.3 CA 7 CR item #6 System Health Improvement Activities and Plan Implementation
CA was closed to SAP Activity Tracking under item 15021 (notification 600262930). Status in SAP – due date is 12/29/05

**This CA does not address the central theme of the finding, and implements a corrective action which may not be the best way to address the one example it relates to.*

DB 3.2 CA 6 CR item #5 System Health Rating – may not provide early indication

**CA response was that no change was needed, 8/19/05*

3) CR 04-06485 Mechanical Calculation CME-011.01-142 Rev 1"Accumulator Sizing Calculation for SW 142p/1434"

This calculation contained administrative errors (not marked safety-related and a typographical error in a number, not affecting the calculation result) and several questions were raised about the methodology used. The CR resulted in update of the calculation to correct the administrative errors and resolve the methodology issues (no change in the methodology was required). The CR is closed. The team concluded that this CR was appropriately resolved.

Specific Issues for this area

None

Findings for This Area

There were no Findings uniquely associated with the Follow-up to AFI's from 2004 assessment area

Cross Cutting Findings Applicable to This Area

None

1.5.3 CR summary

This section summarizes CRs written during the assessment related to assessment reviews, discussions, and findings

One CR was written during the Independent Assessment, by the Design Engineering Department.

> **CR 05-05828** Documentation of EAB observation of a trend indicating vendor engineering product quality has not improved to a level consistent with engineering products produced by site staff, and to track actions to improve vendor work quality. (no immediate actions required).

1.5.4 Findings

This section presents the Findings of the Independent Assessment Team and shows the relationship between findings and the six assessment areas. With only one exception, the findings arose from and are applicable to more than one area of assessment.

The table below shows a list of findings and relates them to the assessment areas.

Findings	Areas of Assessment					
	Modifications	Calculations	System Engineering	Use of CAP	Self Assessment Effectiveness	2004 AFIs
1AS Improved Engineering Performance and Environment	X	X	X	X	X	
1ANA Containment Copper Oxide			X	X		
2ANA Additional Corrective Actions to Address Vendor Product Quality Concerns	X	X		X		
3ANA Transmittal of Engineering Requirements for Operation and Maintenance	X	X	X			
4ANA Program Status – PRA and Equipment Reliability		X	X		X	
5ANA *System Engineering Attention to Detail*			X			
6ANA Design Engineering Backlog Reduction	X	X		X		
1CMT Future use of EAB	X	X			X	
2CMT Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,	X	X	X	X		

Findings statements

The following section contains the findings statements and their bases.

1 AS Improved Engineering Performance and Environment

Engineering performance and environment have improved since the previous Independent Assessment.

1. Engineering programs are robust.
   a. Each program is managed by knowledgeable expert.
   b. The program self-assessments are critical.
2. The Calculation program has improved.
   a. The Calculation Utility is fully functional.
   b. The Calculation Improvement plan is complete.
   c. Calculation quality has improved.
3. Operability Evaluations are few in number and of high quality.
4. Davis Besse Condition Reports are screened for applicability to Perry and Beaver Valley.
5. An effective management team is in place.
   a. Solid management and teamwork skills are displayed.
   b. Steady progress has been made since the last Independent Assessment.
   c. The management team has continuity from last year.
   d. The staff has high morale and confidence in the management team.

1 ANA Containment Copper Oxide

The presence of copper dust in the containment has been the subject of vigorous investigation and evaluation, using the Station's Problem Solving/Decision Making process. Evaluation based on current knowledge indicates the copper dust is not harmful. Some additional information will be received in the future, in particular a formal evaluation by Areva.

Shortcomings identified included:

- The currently intended ultimate closure state of this issue has not been defined.
- A decision tree, or similar tool, displaying potential contingencies, action levels, and response concepts has not been prepared to guide the ongoing effort.
- Readiness assessments to indicate what, if any, preparations for dealing with contingencies should be undertaken have not been performed.
- Reinspection of the containment to confirm the rates and locations of copper dust accumulations had not been included on the unscheduled outage work list.

2 ANA Additional Corrective Actions to Address Vendor Product Quality are Needed.

Although individual actions have been taken with respect to vendor product quality issues, additional corrective actions are needed to address a declining trend in vendor product quality, as identified by the EAB.

- The EAB identified a declining trend with vendor product quality in June 2005. CR 05-03244 was generated to address vendor quality issues but no corrective actions were taken other than a memorandum to the FENOC masonry wall project personnel. Measures such as locating vendor engineers onsite, providing vendor representatives with EAB training and feedback, and instituting contractual incentives based on quality have not been implemented. This issue deserves a more formal causal analysis, and more substantive interventions, as it directly affects the quality of engineering products, the effectiveness of Owner Acceptance, and the ability to work down backlogs and effectively manage work.

- The assessment team's review of the most recent EAB Quarterly report indicates a continued need to improve the methods of giving feedback to selected vendors concerning product quality.

- The design engineering staff issued CR 05-05828 to resolve this issue.

3 ANA Transmittal of Engineering Requirements for Operation and Maintenance

Engineering documents do not always clearly convey the values of parameters under the control of Operations and Maintenance which must be maintained to provide adequate assurance that required system or component performance will be achieved. There is thus the chance that controls for these parameters might not be established to the correct values or even at all.

Two examples are cited:

- Control of loading of combustibles on dry fuel storage pad to be in accordance with design and licensing bases not established

  a) This issue was identified during the 2004 assessment, but the corrective action only established control of combustibles on the dry fuel storage pad. It did not address the larger issue of lack of a process for establishing controls in the plant to keep the design assumptions valid.

  b) The design and licensing analyses for the dry fuel storage cask pad assumed that combustible loading on the pad was negligible, and

demonstrated that when that is true, the effects of fires postulated as design requirements are acceptable. To maintain the risk associated with fires, therefore, the combustible loading must be controlled to the values assumed in the analyses.

c) The requirement to impose and maintain combustible loading control was not recognized and implemented by the responsible plant organization. This issue was documented in CR 04-06372. Interim instructions were issued to control combustible loading, and a procedure change is imminent to institute more durable controls.

d) However, *the larger issue* identified in the CR, i.e. that the process for ensuring compliance with design and licensing bases by identifying parameter values and configuration conditions under operational purview and instituting controls of those values and conditions, *was not addressed.*

- Review of Root Cause for CR05-05559; Inability to meet TS 3.1.1.1 , Boron Addition Pump capacity of 25 gpm @7875 ppm boron or equivalent.

a) In this case, an engineering calculation was performed to demonstrate that the boric acid transfer pumps were capable of performing their intended function as required by Technical Specifications. The plant was found to be potentially operating outside the configuration s and parameter values assumed in the calculation, thus potentially invalidating the assurance that the pumps would perform.

b) The root cause analysis recognized the inadequacy of measures to translate assumed parameter values and configuration conditions from the calculation into operational controls to ensure compliance and functional performance:

"Based on a preliminary iterative process it has been determined that Boric Acid Pump 1 can meet the technical specification minimum flowrate.

MU Tank Maximum Pressure during boration: 45 GPM
BAAT Minimum Boron Concentration: 11,000 PPM
Makeup Filter F12-1 (F12-2) Maximum Differential Pressure: 6 PSID
Letdown Maximum Flowrate: 70 GPM

Outside these parameters there is less than adequate assurance that BA Pump 1 can meet the technical specification flowrate".

And later..."It is recommended that these additional administrative controls associated with the BA pumps be implemented upon the need to borate the RCS...."

c) This excerpt from the CR provides a good example of one form of language that could be included in a summary section of a calculation to identify the parameter values and configuration conditions required to stay within the bounds of the calculation and assure adequate performance can be summarized and made available to operations and maintenance.

d) The DIE process can provide some support for the process of identifying and implementing engineering requirements for operation and maintenance, but use of the DIE process for this purpose creates an error prone situation.

The example of the presentation of the engineering requirements in the root cause analysis indicates a need to better identify engineering requirements for operation and maintenance of plant structures, systems, and components and translate them into controls.

4 ANA Program Status – PRA and Equipment Reliability

Program reviews indicated management attention is needed to bring the Probabilistic Risk Assessment (PRA) and Equipment Reliability Programs up to industry standards

- PRA program

  a) The PRA model has not been updated since 2001.

  b) There is no Fire PRA, DB has not pursued any risk-informed applications, e.g. risk-informed ISI/IST program revisions.

  c) A makeup pump seal water modification was not pursued to reduce Core Damage Frequency.

  d) There is no corporate PRA infrastructure

- Equipment reliability engineering program

  a) Component criticality categorization first pass has been completed, but 2nd pass (validation) is not complete. Many plants have completed categorization of components.
  b) PM Templates are being developed at fleet level. 25 are due to be available by the end of 2005, and the remainder (another 25 or so) are due to be completed by YE 2006. PM conformance to templates will follow. Many plants have completed template development and are well along in implementing them.
  c) PM feedback reviews and results implementation are backlogged.

5 ANA System Engineering Attention to Detail

The Team identified several instances where attention to detail was lacking:

Examples include

1) SD-037A, Chemical Additional System, is potentially affected by changes to Calculation 034.039, "Minimum Required Flow to Meet TS 3.1.1.1". Inability to meet TS 3.1.1.1 requirements under certain conditions without operator intervention identified and evaluated in CR 05-05559. After discussion with the root cause evaluator for CR 05-05559, he stated he would initiate a SAP action to evaluate the need for update to SD-037A The information potentially missing from SD-037A is:

- SD-037A did not list TS 3.1.1.1 in the applicable Technical Specifications section of the System Description (SD). TS 3.1.1.1 requires a minimum shutdown margin of 1% delta k/k in Modes 5 and 6. The action statement of TS 3.1.1.1 requires immediate boration (initiation of the boric acid addition pumps) at 25 gpm flow rate of 7875 ppm boron concentration, or equivalent, if TS 3.1.1.1 is not met. Therefore, TS 3.1.1.1 would be applicable.
- SD did not list the action statement of TS 3.1.1.1 as the design basis for boric acid addition pump capacity. The design basis was listed as pumping a volume of boric acid in a 24 hour period. It appears that the action statement of TS 3.1.1.1 is also a design basis requirement for the boric acid addition pump capacity and is more limiting than the design basis requirement cited.
- Calculation 034.009 provides the verification that the requirements of TS 3.1.1.1 are met. This calculation is not referenced in the SD.
- CR 05-05559 resolves issues related to the inability of the boric acid addition pumps to meet the TS action statement specified flow rate under all conditions, by identifying additional operating restrictions during emergency boration to meet the TS requirement. Evaluations related to the design basis are usually included in the SD. Therefore, a discussion and reference to CR 05-05559 should be considered for addition to the system description.

2) The system engineer walkdown records / checklists reviewed were disparate in content and formulation. Scope detail varied from a list of each component to be included in the walkdown to the name of the system. Time elapsed between walkdown date and date report submitted varied from 0 days to 5 days, and elapsed time between date submitted and supervisor signature varied from 0 days to almost two months. One recent walkdown report had been misplaced.

3) The management expectations for System Engineer tasks, activities, and work products are dispersed through several documents, including:

- Reviewing Engineering Job Familiarization Guidelines DBBP-DBDE-0002
- Training and Qualifications of Engineering Support Personnel NT-ST-07044
- FENOC Engineering Principles and Expectations
- Engineering Program Management NOP-SS-2101
- Engineering Work Management System DBBP-DBPJ-0001
- Plant Engineering System Health Reporting DBBP-PES-0003
- FENOC Plant Health Report Program NOBP-ER-3009
- Plant Health Committee NOBP-ER-3002
- Work Management Scheduling Process NOP-WM-2001

4) While training for System Engineers was reported to be essentially current, reports showing this are either difficult to interpret or contain errors

5) One system engineer, whose system is red and has been for a long time, did not recall ever discussing his system status with the Plant Health Committee.

6 ANA Design Engineering Backlog Reduction Efforts Need Attention.

Although excellent progress was made through April of 2005, priorities shifted away from backlog reduction to Fourteenth Refueling Outage (14RFO) projects and support. Since then Design Engineering has not been able to further reduce the backlog and is in jeopardy of missing the current June 2006 target for completion. Although this was necessary and unavoidable, management attention is needed in the following areas:

- Develop a "Recovery Plan" to either establish a new work down curve or get back on the original curve
- Assess the impact of the transfer of work items to SAP with respect to the backlog and its positive impact to backlog reduction
- Analyze the impact of possible competing priorities in the next operating cycle and incorporate into the work down curve.
- Analyze the backlog to determine if there is low value work that should be either cancelled or moved to SAP. (Currently this determination is not being made until the item comes due).

1 CMT Future Use of Engineering Assessment Board

Although the EAB has had a positive impact on the quality of engineering products, the impact may be diminishing. Quality scores for product reviews have reached the stated goals, stabilized, and further improvement is considered unlikely. Further, by performing "in-line" reviews, the EAB alters the very process it is attempting to assess.

Some consideration could be given to removing EAB from an "in-line" function and making it an after-the-fact sampling process, This will provide an opportunity to either verify that the process can stand on its own without EAB's involvement or to identify areas where process improvement is needed. Additionally, EAB may want to select new "targets of opportunity" and scale back from 100% reviews.

It is recognized that the Fleet is working toward a standardized EAB function and charter to be implemented at all FENOC sites, but that a consensus has not been reached.

2 CMT Change Management for Technology Initiatives – SAP, Plant Health Report, Program Health Report,

Change management for major technology initiatives is not fully effective. Some significant technology initiatives have been deployed with problems known or soon becoming evident. Since technology development and rollout will continue, capturing and using lessons learned could improve performance in the future.

Based on reviews of several technology initiatives (SAP AITS, Calc Utility, Plant Health Reporting system) Lessons Learned are available in the following areas

- Advance evaluation of the changes made possible in process design and performance by new technology being introduced and the advantages that can be sought. (Don't use SAP to continue to do work the same way, use it to find better ways to do, and manage, the work)
- Advance evaluation of the changes made possible in process design by technology and the advantages that can be sought
- Estimating the level and type of development and support resources required, and arranging to have them available
- Determining the types and timing of interactions with users during development of data flows, screens, etc., and coordinating those interactions
- Piloting or beta testing new modules and applications to reveal and correct problems prior to large scale deployment
- Planning and management of transition to new applications, data sets, and procedures
- Developing training for users with varying experience levels and job responsibilities
- Human engineering the interface to reduce the number of screens, eliminate transcription of information, and avoid error prone situations.

1.6 References

1.6.1 List of persons interviewed

Charles	Ackerman	Staff Nuclear Specialist
Douglas	Andrews	Staff Nuclear Specialist
Nate	Barron	Adv Nuclear Engineer
Mike	Beier	Staff Nuclear Specialist
Eric	Bennett	Sr. Nuclear Engineer
Richard	Blair	Staff Nuclear Engineer
Clair	Bleau	Supervisor, Electrical/I&C Engineering
Brian	Boles	Manager, Plant Engineering
Edward	Chimahusky	Staff Nuclear Specialist
Chuck	Daft	Staff Nuclear Engineer
Bill	Dejong	Staff Nuclear Engineer
Dale	Duquette	Sr. Nuclear Engineer
Richard	Farrell	Director, Site Maintenance
John	Fehl	Staff Nuclear Engineer
Ken	Filar	Staff Engineer, Chemistry; RCA Evaluator
Becky	Gonzales	Staff Nuclear Engineer
John	Grabnar	Manager, Design Engineering
Pete	Grondin	Staff Nuclear Specialist
Dan	Haley	Staff Nuclear Engineer
Doug	Hart	Staff Nuclear Engineer
Jon	Hook	Supervisor, Structural Mechanical Engineering
Robert	Hovland	Manager, Technical Services
Raymond	Hruby	Manager, Fleet Oversight
Dave	Isherwood	Staff Nuclear Specialist
Paul	Jacobsen	Sr. Nuclear Engineer
John	Johnson	Staff Nuclear Specialist
Joe	Kendall	Sr. Nuclear Engineer
Gary	Kendrick	Manager, Site Maintenance
Bill	Kline	Fleet Engineering Programs Manager
Mark	Koziel	Staff Nuclear Specialist
Guy	LeBlanc	Supervisor, Electrical/I&C Engineering
Steven	Loehlein	Director, Site Engineering
Peter	Mainhardt	Staff Nuclear Engineer
Alan	McAllister	Supervisor, Nuclear Engineering Programs
Gary	Melssen	Staff Nuclear Engineer
Greg	Michael	Sr. Nuclear Engineer
Andy	Migas	EAB Chairman
Connie	Moore	Supervisor, Nuclear configuration Control
John	Mueller	Adv Nuclear Engineer
Bill	Mugge	Manager, Site Work management
Matt	Murtha	Staff Nuclear Engineer
Steve	Osting	Staff Nuclear Engineer

Kevin	Ostrowski	Manager, Site Operations
Jim	Pierson	Staff Nuclear Specialist
Clark	Price	Manager, Site Regulatory Compliance
John	Reddington	Principal Consultant Fleet Programs
Brad	Reineck	Staff Nuclear Engineer
Jeannie	Rinckel	Vice President, Fleet Oversight
Mark	Roelant	Supervisor, Nuclear Work Planning
Scott	Saunders	Staff Nuclear Engineer
Dennis	Schreiner	Sr. Consultant
Keith	Slauterbeck	Sr. Nuclear Engineer
Steve	Slosnerick	Staff Nuclear Engineer
Tim	Tackett	Adv Nuclear Specialist
David	Wahlers	Supervisor, Nuclear Support Oversight
Reed	Wiegle	Member, Engineering Assessment Board
Brian	Young	Sr. Nuclear Engineer
Kevin	Zellers	Supervisor, Nuclear Engineering Analysis
Frank	Zurvalec	Staff Nuclear Engineer

1.6.2 Reference Documents

The information listed below was provided in advance by FENOC for the use of the Independent Assessment Team Additional information was provided by FENOC while the Team was on site at Davis Besse. Additional documents that the Team found significant are listed in the report sections for the relevant assessment areas.

Some document titles were changed to support organization of the documents within the ftp site library, or to make the titles more indicative of the contents.

A number of INPO documents were reviewed at the site. These documents remained in the control of FENOC personnel and were obtained under non-disclosure agreements. These documents are not individually listed.

Library file # document or file name (Library working name)

10 FENOC engineering assessment planning information

10.001 2005 eng programs assessment plan submitted to NRC Serial1-1432
10.011 FENOC-SA-04-01 2004 Self-Assessment Report (PDF)
10.013 2005 Eng Prog Assessment Plan (PDF)

11 INPO reference material

11.001 SOER02-4.doc

12 Assessment plans, reports, and CRs

12.001 AFI CR 04-06564.pdf
12.002 AFI CR 04-06562.pdf
12.003 AFI CR 04-06563.pdf
12.004 Misc CR 04-06485.pdf
12.005 Misc CR 04-06372.pdf
12.006 NI CR 05-01415.pdf
12.007 NI CR 04-06566.pdf

Library file # document or file name (Library working name)

12.008 Nov 04 plant engineering and technical services rev1.pdf
12.009 2005 ProblemSolvingDecisionMakingProcessOngoingSelf-assessment.pdf
12.010 May,02005DesignEngrgIPA.pdf
12.011 Nov 04 des eng coll sig SA rev1.pdf
12.012 Nov 04 des eng coll sig SA.pdf
12.013 DB-C-04-04 Final Report.doc
12.014 DB-C-05-01.pdf
12.015 DB-C-05-02.pdf
12.016 DB CNRB Mtg Minutes 11-18-04 R0.doc
12.017 DB CNRB Minutes 4_7_05.pdf
12.018 DB Mtg Minutes 7-14-05.doc
12.019 CA 03-10642-1 make a calc list.pdf
12.020 CR 03-10642 Att1 calc list.pdf
12.020a CR 03-10642 Att1 Calc list.xls
12.021 Plant and TechSvcs IPA April 2005.pdf
12.022 DB-SA-05-02 CAP Self Assessment.pdf
12.023 CAP Independent Assessment-2005.pdf
12.024 2Q05 Calc CRs.pdf
12.025 3Q2005 Calc CRs.pdf
12.026 CR 04-06564 Calc improvement program not recveiving mgt attention.pdf
12.027 DB-Oversight 3d Qtr Audit Report.pdf
12.028 CR 05-01849 cont pen prot for pnl L49E1 not evaluated calc EC-118B.zip
12.029 CR 05-02761 Reportability of Pot'l Overcurrent Cond of Penetration PBP5D .zip
12.030 CRs in 2005 requiring RC Analysis.pdf
12.031 2003 S&L Assessment of Davis-Besse Calc Program SL-008171.pdf
12.032 2003 Calculation Collective Significance Review.pdf
12.033 DB-SA-05-04 FSA Sys Trending & Monitoring.pdf
12.034 DB-SA-05-05 FSA Fuse Control.pdf
12.035 DB-SA-05-06 FSA FAC.pdf
12.036 DB-SA-05-07 FSA Alloy 600 Focused.pdf
12.037 DB-SA-05-08 FSA EQ.pdf
12.037a 12.037a DB-SA-05-08 Plan.jpg
12.038 DB-SS-05-04 SnapShot Assessment Vendor Manual Ctrl.pdf
12.039 DB-SS-05-05 SnapShot Assessment Vendor Corresp.pdf
12.040 DB-SS-05-12 SnapShot Assessment Allowable Transient Op Cycles.pdf
12.041 DB-SS-05-16 Alloy 600 Snapshot Plan.pdf
12.042 DB-SS-05-17 BACC Snapshot Plan.pdf
12.043 Design Engineering CSSA may-oct 04 rev1.pdf
12.044 IPA Nov 04-Apr 05 Design Engineering May 2005.pdf
12.045 Focused Self Assessment Log.pdf
12.046 2005 Snap-Shot Self-Assessment Log.xls
12.047 IPA Nov 04-Apr 05 Plt & Tech Serv May 2005.pdf
12.048 IPA May 04 to Oct 04 Plt & Tech Serv November 2004 rev1.pdf

14 Engineering procedures

14.000 ENGINEERING PROCEDURES comparison 2005 to 2004.xls
14.001 DBBP-VP-0009 Approved 042505 Management Plan for Confirmatory Order Independent Assessments
14.002 NOP-LP-2001 rev11 Engineering Changes.pdf
14.003 NOP-CC-2003 rev6 Calculations.pdf
14.004 NOBP-SS-4001-R1 Change Management Guide.pdf
14.005 DBBP-NED-0002-R1 Eng Assessment Board.pdf
14.006 NOBP-CC-2003A-R1 Prelim Cost Est.PDF
14.007 NOBP-CC-2003B-R1 Conceptual design Package.PDF
14.008 NOBP-CC-2003C-R1 Project Team.PDF
14.009 NOBP-CC-2003D-R1 Walkdowns.PDF
14.010 NOBP-CC-2003-R2 Config Mgt Database Control.PDF

Library file # document or file name (Library working name)

14.011 NOBP-CC-3002-R2 Processing Calcs.PDF
14.012 NOBP-CC-7001-R8 Procurement Packages.PDF
14.013 NOBP-CC-7002-R1 Enhanced Procurement.PDF
14.014 NOBP-ER-1002-R3 Proj Apprvl and Resource Allocation.PDF
14.015 NOBP-ER-1004-R2 Fleet Value Rating Methodolog.PDF
14.015a Form NOBP-ER-1004-01 Rev0 FVR worksheet.doc
14.016 NOBP-ER-3002-R1 Plant Health Committee.PDF
14.017 NOBP-LP-2001-R8 Self-Assessment-Benchmarking.PDF
14.018 NOBP-LP-2007-R2 CR Process Effectiveness Review.PDF
14.019 NOBP-LP-2008-R4 CARB.PDF
14.020 NOBP-LP-2010-R2 CREST Trendng Codes.PDF
14.021 NOBP-LP-2011-R3 Cause Analysis.PDF
14.022 NOBP-LP-4003A-R1 50.59 User Guidelines.PDF
14.023 NOBP-LP-4003B-R1 50.59 Mentoring Review Committee.PDF
14.024 NOBP-SS-2101-R1 Peer Groups.PDF
14.025 NOBP-SS-3401-R5 Document Hierarchy.PDF
14.026 NOP-WM-2001-R4 Work Management Scheduling Process.pdf
14.027 NOP-CC-2001-R4 Design Verification.pdf
14.028 NOP-CC-2002-R2 Design Input.pdf
14.029 NOP-CC-2003-R8 Engineering Changes.pdf
14.030 NOP-CC-2004-R4 Design Interface Reviews and Evaluations.pdf
14.031 NOP-CC-3002-R2 Calculations.pdf
14.032 NOP-CC-7002-R5 Procurement Engineering.pdf
14.033 NOP-ER-1001-R0 Cont quip Perf Improvement.pdf
14.034 NOP-ER-3001-R0 Problem Solving and Decision Making.pdf
14.035 NOP-LP-2001-R12 CAP.pdf
14.036 NOP-LP-2006-R0 CNRB.pdf
14.037 NOP-LP-4003-R2 Eval of Changes, Tests, Experiments.pdf
14.038 NOPL-SS-3201-R1 Document Hierarchy.pdf
14.039 NOPL-CC-0001-R1 Eng Principles and Expectations.pdf
14.040 NOPL-ER-0001-R0 Equipment Reliability Policy Statement.pdf
14.041 NOPL-LP-2003-R1 SCWE Policy.pdf
14.042 NOBP-CC-2004-R0 Engineering Change Risk Analysis.pdf
14.043 NOPL-CC-0002R1 Policy for Eng Roles and Responsibilities.pdf
14.044 ESI-001 system engineer qual card.pdf
14.045 Eng suppt personnel training sylabus Rev02.doc
14.046 NOBP-CC-1004 Calc Utility.PDF
14.047 System Description Procedure.PDF
14.048 Design Interface Summary.doc
14.049 Design Interface Evaluation.doc
14.050 Design Interface Review Checklist.doc

16 Engineering work products

16.001 Mods list Report EPE.pdf
16.002 ModsReport EPE download 051025.xls
16.003 Mods Assigned to Maintenance as of 9-12-05.xls
16.004 Long Range Plan - Project Listing Cycle Report.pdf
16.005 FVRs of Open Engineering Projects.pdf
16.006 Calc 034.009 Rev 02 Minimum boric acid flow for TS 3.1.1.1.PDF
16.007 Calc 0083B rev 5 CCW Pipe Stress.PDF
16.008 Calc C-EE-013.10-001 Rev 03 A02.PDF
16.009 Calc C-ICE-026.02-003.pdf
16.010 Calc C-ME-024.02-002 Rev 01.PDF
16.011 Calc C-ME-026.02-002 Rev 01 A01.PDF
16.012 Calc C-NSA-016.04-004 Rev 01 A01.PDF
16.013 Calc C-NSA-036.02-001 Rev 01.PDF
16.014 Calc C-NSA-036.02-001 Rev 02.PDF

Library file # document or file name (Library working name)

16.015 Calc IEB 80-11 Masonry Block Wall 3237 VBW15 B001-081.PDF

17 NRC reports

17.001 NRC Restart Confirmatory Order
17.002 Mid-Cycle Inspection 003 Log1-4658.pdf
17.003 Safety Syst Design and Perf Inspection 004 Log1-4684.pdf
17.004 Integrated Inspection 006 Log1-4685.pdf
17.005 Integrated Insp Rept 007 and OI report 03--029 Log1-4706.pdf
17.006 3Q-2005 Inspection Findings - Davis-Besse.doc
17.007 NRC DB Performance Review and Inspection Plan Q2 2005.pdf
17.008 NRC DB special insp report 005 of April 30 and inspection schedule.pdf
17.009 NRC DB NOV and Civil Penalty insp rept 2002-08 of April 21 2005.pdf
17.010 NRC IN 2005-29 SG tube and support configuration.pdf
17.011 IN 05-30 Safe Shutdown Potentially Challenged by Unanalyzed Internal Flooding Events 051107.pdf

19 General procedures

19.001 NOP-CC-3002 rev2 Condition Report Process.pdf

20 Organizational Charts and contact lists

20.001 Draft DB Org Chart Rev 52
20.002 Org Charts and Primary Duties.pdf

21 Performance Indicators

21.001 IRR A-01 Focused SAs of Programs.pdf
21.002 MPR Aug 05.pdf
21.003 OIP 6.1b Safety Margin - electrical coordination.pdf
21.004 OIP 6.1c Block Walls.pdf
21.005 OIP 6.1d Safety Margin - Service Water.pdf
21.006 OIP 6.2 Latent Issues Reviews.pdf
21.007 OIP 6.3 Design Calc Improvement.pdf
21.008 OIP 6.4 Equipment Reliability.pdf
21.009 OIP 6.8 SAs for Problem Solving Process.pdf
21.010 OIP booklet-Aug 2005 M-01 Engineering Quality.pdf
21.011 OIP booklet-Aug 2005 M-01 pg 2 Engineering Quality pG 2.pdf
21.012 OIP booklet-Aug 2005 P-04 MR safety Significant Reiability.pdf
21.013 OIP booklet-Aug 2005 P-05 Repeat MR a(1) SYSTEMS.pdf
21.014 DRAFT - 1 Calculation Quality Text for Q3 of 2005.pdf
21.015 3rd QTR Prog Health.zip
21.016 MPR Sept 05.pdf
21.017 DBAR 2nd Q 2005.pdf
21.018 DBAR - 3Q Section 230 Calculations.pdf
21.019 DBAR - 3Q Section 420 Calc quality.pdf
21.020 DBAR 1stQ 2005.pdf
21.021 DBAR 3rdQ 2005.pdf
21.022 Program Health Report 2005-02.pdf
21.023 Program Health Report 2005-03.pdf

22 Business and performance improvement/action plans

22.001 FENOC Business Plan.pdf

24 Information provided by industry peers

Constellation information

24.001 Setpoint Control Rev 0.doc
24.002 ASME Section XI Inspection Att B Rev 0.doc
24.003 ASME Section XI Inspection Rev 0.doc
24.004 Check Valve Program Att B Rev 0.doc
24.005 Check Valve Program Rev 0.doc
24.006 Eng svcs trng qual manual Calver Cliffs.doc
24.007 FP App R Rev 0.doc
24.008 Implementing and Managing Engineering Programs Rev 0.doc
24.009 Inservice Testing Att B Rev 0.doc

Library file # document or file name (Library working name)

24.010 Inservice Testing Rev 0.doc
24.011 License Renewal Guideline.doc
24.012 MOV Rev 0.doc
24.013 NMP trng for eng suppt NTP-TQS-404-R21.pdf
24.014 Peg10.doc
24.015 Principal eng expectations 04-0004.doc
24.016 Programs Self-Assessment Guidance Rev 0.doc
24.017 Service Water Reliability (GL 89-13) Rev 0.doc
24.018 NMP EAI-REL-01 System engineers.pdf
24.019 NIP-ECA-05 Constellation NMP Self Assessments.PDF

TXU information

24.020 CP Calc TXU 05.pdf
24.021 CP CAP Initiation TXU 05.doc
24.022 CP CAP Proccessing TXu 05.pdf
24.023 CP Mods TXU 05.pdf
24.024 CP SE Handbook R13 TXU 05.doc

1.7 Team Members' Biographies

The following biographies are included

John Garrity, Marathon Consulting Group
Paul Borer, Marathon Consulting Group
Harold "Rusty" Baumberger, Marathon Consulting Group
Gene Kelly, Exelon Nuclear, Limerick Station
John Meyer, TXU, Comanche Peak
Glenn Perkins, Constellation Nuclear

John H. Garrity
President and Chief Executive Officer (CEO)
Marathon Consulting Group

- 1994-present: *Marathon Consulting Group*; President and CEO - Responsible for Marathon client service operations, and selected personal consulting engagements. Engaged in expert consulting in the area of process performance monitoring and improvement, management mentoring, process centered team formation and compensation, configuration management, business plan and corporate strategy development, process improvement training, and project management training. Also conducted root cause and collective significance analyses of client situations, and participated or lead high impact teams to resolve problems.
- 1993-1994: *New York Power Authority*; Resident Manager - Placed in charge after unit was shut down under NRC confirmatory action letter and on problem plant list. Responsible for developing and executing plan to resolve problems in context of intense political pressure and company senior management turnover. Numerous escalated enforcement actions from actions of earlier periods mitigated by effective, aggressive management investigations and corrective actions.
- 1992: *TVA Bellefonte*; Site Vice President - Responsible for all ongoing activities necessary to reactivate the project from deferred status.
- 1990-1992: *TVA, Watts Bar*; Site Vice President - Responsible for all activities necessary to progress completion of the Watt's Bar units, including engineering, construction, startup, operational readiness, and commissioning. Formulated management objectives for restart of construction following stand down and significant regulatory involvement. Reengineering of design engineering and construction processes, restart of construction, outsourcing construction labor, engineering, and management. Instituted management performance accountability through site wide self-monitoring program, based on principles of TQM. Significant improvement of site nuclear performance, left site positioned for successful completion. Credibility with NRC restored. Significant process performance improvement results in engineering design, engineering analysis, construction engineering, construction, and corrective action.
- 1990: *Maine Yankee Atomic Power Co*; Assistant to President - Special projects assignment, including work on low level waste disposal options available to company and state.
- 1989-1990: *Maine Yankee Atomic Power Co*; Vice President Engineering and Licensing - Responsible for nuclear engineering, plant engineering, licensing, and operations support.
- 1988-1989: *Maine Yankee Atomic Power Co*; Assistant Vice President Engineering and Quality Programs - Responsible for quality assurance, nuclear engineering, licensing and plant engineering.
- 1984-1988: *Maine Yankee Atomic Power Co*; Plant Manager/Senior Site Manager - Responsible for site operations.

John H. Garrity (continued)

- 1984: *Maine Yankee Atomic Power Co*; Assistant Refueling Manager - Special assignment, monitored several dozen engineering projects and coordinated activity with overall refueling effort.
- 1980-1984: *Maine Yankee Atomic Power Co;* Director, Nuclear Engineering and Licensing - Responsible for overall coordination of reload design, plant safety analysis and nuclear engineering analysis of plant systems, emergency planning, and radiological monitoring.
- 1975-1980: *Central Maine Power Co.;* Principal Nuclear Engineer for Central Maine Power Co. (1976 –1980), project engineer for two new reactor sites (1975)
- 1970-1974: *Maine Yankee Atomic Power Co.*; performed primary/reactor and secondary plant systems performance monitoring (1973-1974), Reactor Engineer & Startup Test Supervisor for commissioning of the Maine Yankee reactor (1970-1972)

Paul J. Borer
Vice President
Marathon Consulting Group

- 2002-present: *Marathon Consulting Group* - Performed Safety Culture and Engineering Effectiveness Assessments.
- 1986-2002: *Institute of Nuclear Power Operations (INPO)*-Held the following positions:
- Senior Representative for Assistance - Management consulting role. Responsible for formulating performance improvement plans for several nuclear stations. Provided direct feedback to senior station management on performance issues. Prioritized deployment of INPO assistance resources.
- Division Director, Plant Operations Division - a technical INPO division responsible for evaluation of Operations, Chemistry, and Radiation Protection areas. Involved in setting standards for evaluations, responsible for the evaluator training program, and assisting the industry in attaining standards of excellence.
- Detroit Edison Vice President - Nuclear Generation (On - loan from INPO 1997-1998) Responsible for all aspects of Operation, Maintenance, and Engineering of a large scale BWR. Led a plant staff of approximately 500.
- Vice President, Nuclear Engineering - New York Power Authority (On - loan from INPO 1993-1994). Responsible for Design Engineering at two nuclear generating stations. Developed and implemented a plan to deploy corporate design engineering resources to the stations in order to be more responsive to station needs.
- Department Manager - Managed four INPO departments (Emergency Preparedness, Operating Experience Applications, Technical Support, and Operations) - Responsible for the evaluation of their respective areas of plant performance and various assistance programs. Also functioned as a Team Manager and lead teams of 15-20 INPO and industry professionals during performance-based nuclear plant and corporate evaluations.
- Held a Senior Reactor Operator's License - Boiling Water Reactor and Licensed Professional Engineer - Mechanical.
- 1985: *Engineering, Planning, and Management, Inc.*; Project Manager - Responsible for the overall conduct of work, sales, budget, schedule, client relationship, and quality of products for EPM clients in the Southeastern U.S.
- 1983-1984: *Smith Barney, Harris Upham, and Company*; Account Executive - Responsible for retail securities sales, client development, securities research, financial planning advice.
- 1976-1983: *Cooper Nuclear Station*; Served in various management positions, all reporting to the site manager. (Operations Manager, Engineering Manager, Chemistry and Radiation Protection Manager)
- 1970-1976: *U. S. Navy;* Completed the Naval Nuclear Power Training Program and served aboard a nuclear submarine.

Harold E. "Rusty" Baumberger
Vice President
Marathon Consulting Group

- 1996-present: *Marathon Consulting Group*; Responsibilities include the following:
- Vice President and Director, Performance Assessment - Responsible for business areas of independent assessment, INPO evaluation and NRC inspection support, Design Basis assessments, and Maintenance Rule implementation. Also serve as Marathon's Quality Assurance Manager.
- Team Member - Davis-Besse Independent Assessment of the Engineering Program Effectiveness in 2004.
- Project Lead of the Master Equipment List (MEL) Update Project at Millstone - Managed the validation and update of the MEL database.
- Executive Lead, Transition for the Vermont Yankee Nuclear Power Corporation - Managed the implementation of the sale agreement and transition of the Vermont Yankee station to new ownership. Reported directly to the President & CEO.
- Quality Assurance Manager - Developed and implemented Quality Assurance Program, obtained NUPIC certification, trained and certified lead auditors. Provided interface with client QA Managers.
- Configuration Management Supervisor at Cooper Nuclear Station - Worked in environment of high regulatory scrutiny to improve Engineering performance and develop recovery strategies. Responsible for maintaining Design Basis and resolving Design Basis and Configuration Control issues. Managed Modification Process, Design Criteria Program, Equipment Classification Program, Equipment Data File, and Drawing Control Program.
- Served as a Safety System Functional Evaluation team member in the area of Operations at Beaver Valley - Reviewed the 4kV Electrical Distribution and Emergency Diesel Generator systems for Unit 2.
- Provided expert consulting related to INPO-related issues at River Bend - Participated in major assessment covering the new INPO Performance Objectives, existing INPO findings, and items from the Long Term Performance Improvement Program.
- Participated in a component-level design basis review of non safety-related systems and outage work at Dresden - Documented review of over 7000 components against Design Basis, FSAR requirements, original system and component specifications, and vendor-supplied data.
- Performed assessment of Design Basis programs at Vermont Yankee including Design Basis document program development.

Harold E. "Rusty" Baumberger (continued)

- Participated on corporate Engineering Independent Safety Assessment Response Team at Maine Yankee.
- 1990-1996: *Independent Consultant;* Provided services to nuclear utilities and Department of Energy (DOE) contractors in management, safety review, quality assurance and performance areas. Performed audits and independent assessments of overall performance, outage management, maintenance and configuration management programs.
- 1988-1990: *Liberty Consulting Group*; Senior Consultant - Led evaluations of management capability at nuclear power plants in all areas of facility operation. Conducted assessment of plant performance against INPO standards.
- 1980-1988: *Institute of Nuclear Power Operations (INPO)*; Evaluator/Senior Evaluator - Performed evaluations of more than 50 commercial nuclear power stations in areas of maintenance, Engineering Support, and Organization and Administration. Participated in accreditation reviews of utility training programs. Program Manager, Plant Performance Database – Principal author and editor, "Performance Indicators for the US Nuclear Industry", INPO, 1984, 1985, 1986
- 1977-1980: *Nuclear Power Consultants,* Senior Consulting, Engineering and Quality Assurance, Certified Lead Auditor at Fort St. Vrain
- 1963-1977: *U. S. Navy,* Nuclear Power Trained Submarine Officer; certified Engineering Officer by Naval Reactors; Nuclear Weapons Officer; Department Director, Submarine Training Center; trained on Navy Training Systems.

Eugene M. Kelly
Manager – Engineering Programs
Exelon Nuclear, Limerick Generating Station

- 2001-present: *Manager, Engineering Programs, Exelon Nuclear, Limerick Station* - Oversee 12 engineering programs including risk management, maintenance rule, fire protection, ISI and IST, reactor vessel internals, Flow Accelerating Corrosion (FAC) and heat exchangers, thermal performance, leak rate testing, and valve reliability (MOV, AOV, Check Valve, MSIV). Chairman of INPO Working Group on Engineering Programs Excellence. Project manager for two risk-informed industry pilot initiatives on PRA model quality and technical specification surveillance frequency extension.
- 1999–2001: *Manager, Electrical Plant Systems, Exelon Nuclear, Limerick Station* - Responsible for the performance of electrical systems including eight emergency diesel generators, 220 and 500 kV switchyards, a large DC battery distribution network, ventilation and fire protection, security systems and reactor protection instrumentation. Coordinated preventive maintenance, special testing, failure casual analysis, vendor interface and modification improvements. Instituted process improvements in engineering work management. Chairman of Maintenance Rule Expert Panel and member of Plant Operating Review Committee.
- 1994-1998: *Manager, Systems Engineering Branch, U.S. Nuclear Regulatory Commission (NRC), Division of Reactor Safety, King of Prussia, PA* - Responsible for assessment of engineering programs at 20 nuclear reactor sites throughout the Northeast. Manage engineering projects and specialist inspectors in areas including motor operated valves, service water, in-service testing, core physics and mechanical systems. Special projects include complex team inspections (e.g. SSFI), event follow up, design basis investigations and the Millstone Task Force. Agency spokesperson for inspection program. Developed risk-based approaches for inspection.
- 1991-1994: *Reactor Projects Chief, U.S. Nuclear Regulatory Commission* - Managed field offices and supervised resident inspectors at eight sites including Millstone, Haddam Neck, Rowe, Pilgrim and Vermont Yankee. Project management included coordination of Congressional correspondence, enforcement actions and performance assessment reports. Organized and participated in high visibility public meetings and briefings of elected officials and NRC executive management.
- 1988–1990: *Technical Support Staff Chief, U.S. Nuclear Regulatory Commission* - Developed nationwide Master Inspection Planning System and new core inspection program, including institution of budget analysis and new technical initiatives. Managed diagnostic teams, generic issue follow-up and integration of risk assessment techniques.
- 1985–1988: *Limerick Senior Resident Inspector, USNRC* - Supervised detailed inspections of design, test, maintenance, and event follow-up. Coordinated inspection oversight for startup and power ascension programs on one unit and completion of construction activities at the other. Primary

Eugene M. Kelly (continued)

author of Systematic Assessment Performance (SALP) Report for first commercial year of Limerick operation.

- 1982–1984: *Reactor Engineer, USNRC* - Conducted inspections of construction, pre-operational and startup testing at regional sites. Specialized training and qualification on General Electric, Westinghouse and Combustion Engineering plants. Special projects included engineering evaluations at all Yankee sites, and follow-up of employee concerns at Shoreham. Created unique "NTOL" assessment technique to support operating license decisions for five units.
- 1980–1982: *Systems Engineer, Catalytic, Inc., Philadelphia, PA* - Developed nuclear plant modifications for four clients including design specifications, detailed engineering and calculations, coordination of procurement, testing and field installation.
- 1979–1980: *Nuclear Engineer, GPU Nuclear Corporation, Middletown, PA* - Responsible for radioisotope analysis, shielding calculations, Krypton venting evaluations and containment sump water sampling at Three Mile Island site following the accident.
- 1974–1979: *Safety Analysis Engineer, United Engineers and Constructors, Inc, Advanced Engineering Department, Philadelphia, PA* - Prepared Safety Analysis Reports for six nuclear projects. Performed thermal hydraulic studies, radiological dose and shielding calculations and system performance analyses. Developed a heat transfer model for an ultimate heat sink spray pond. Special assignments included startup test and licensing support.

John W. Meyer
Technical Support Manager
TXU Power – Comanche Peak

- 2004-present: *Comanche Peak Steam Electric Station (CPSES)*; Technical Support Manager - Responsible manager for department consisting of five units: 1) Engineering Programs is responsible for establishing and implementing such programs as Fire Protection Engineering, In-service Testing, In-service Inspection, ASME Repair and Replacement, welding processes and qualification, flow accelerated corrosion, RCS materials management, the electrical cable and raceway database, and Environmental Qualification of plant equipment. 2) Design Engineering Analysis has responsibilities delineated below. 3) The Joint Engineering Team serves as the Engineering rapid response team, addressing emergent issues and processing design changes to address documentation issues and minor modifications. 4) Procurement Engineering provides engineering support for procurement activities including development of technical and QA requirements, replacement item evaluations, spare parts management support, and management of TXU interests in the Pooled Inventory Management System. 5) The Computer Aided Design group provides drafting and designer support for the station.
- 2003-2004: *CPSES*; Design Engineering Analysis Manager - Responsibilities included maintenance of the CPSES design and licensing basis, design reviews, adverse condition report engineering resolution, industry operating event research and resolution, emergent operational problem resolution, consultation, engineering human performance, and the CPSES design control program. Provided analytical support for CPSES in such areas as radiation analysis, control room habitability, systems interaction, environmental barriers, thermal/hydraulic analysis, loss of ventilation analysis, tornado venting, electrical calculations, and civil/structural analysis.
- 1998-2003: *CPSES;* Engineering Analysis Manager - Responsible for analytical support of CPSES in such areas as radiation analysis, control room habitability, systems interaction, environmental barriers, thermal/hydraulic analysis, containment analysis, loss of ventilation analysis, and tornado venting. In addition, managed the efforts of the Risk and Reliability Supervisor, responsible for plant PRA and risk assessment activities.
- 1996-1998: *CPSES*; Design Basis Engineering Supervisor - Responsible for maintenance of the CPSES design and licensing basis, Master Equipment List maintenance, design reviews, adverse condition report engineering resolution, industry operating event research and resolution, emergent operational problem resolution, and implementation of reengineered electronic processes for design control and corrective action programs.
- 1992-1996: *CPSES*; NSSS and HVAC Systems Supervisor - Responsible for design engineering support on CPSES NSSS, HVAC, and Fire Protection Systems including design modification engineering, temporary modification engineering review, adverse condition report engineering resolution, industry

John W. Meyer (continued)

operating event research and resolution, and emergent operational problem resolution.

- 1987-1992: *CPSES*; Principal Engineer - Staff Assistant to the Manager, Plant Engineering at CPSES. Founding member of Operations Support Engineering, formed to provide immediate design engineering support to CPSES Operations during transition from construction to Unit 1 operation. Prior to that an NSSS expert assigned to the Primary Plant Systems group of the on-site CPSES corporate engineering department.

- 1974-1987: *Westinghouse Electric Corp.*; As a Senior Project Engineer, served as Nuclear Systems Engineer in the CPSES site office. As a Senior Field Service Engineer, performed field services at operating and construction PWR projects. As an Engineer/Senior Engineer B, responsible for schedule control of a major subcontractor on the Clinch River Breeder Reactor Plant.
- 1969-1973: *U. S. Navy*; Completed Naval officer nuclear power training qualifying for supervision, operation, and maintenance of Naval Pressurized Water Reactors. Assigned to a Sturgeon Class Nuclear Attack Submarine.

Glenn R. Perkins
General Supervisor, Corporate Engineering – Fleet Programs
Constellation Energy Group (CEG)

- August 2005-present: *General Supervisor, Corporate Engineering- Fleet Programs, Constellation Energy Group (CEG)* - Responsible for developing Fleet Programs Excellence Guidelines for program quality and implementation. Developed standardized Program Health Reports and reporting criteria. Other areas of responsibility include development of standardized format for development of Aging Management Programs for License Renewal. Currently developing a Corporate Non-Destructive Examination (NDE) Organization to support CEG nuclear and fossil generating units. Coordinate and provide support to fleet assets in Materials Engineering, NDE and Engineering Programs technical and administrative issues.
- 2003- 2005: *General Supervisor Engineering Programs Group, Nine Mile Point, LLC* - Increased responsibilities to include all ASME Programs, Flow Accelerating Corrosion (FAC), Air-Operated Valves (AOV), Motor-Operated Valves (MOV), Check Valves, Relief Valves, Fire Protection, Maintenance Rule and EPIX Program owners.
- 1999- 2003: *Supervisor ASME Section XI Programs Group, Nine Mile Point Nuclear, LLC* - Oversee the development, maintenance and implementation of ASME Section XI Programs for Nine-Mile Point Units 1 & 2. Specifically, ensure that the ASME XI Programs are in compliance with code and regulatory requirements. Additional responsibilities included oversight of AOV, MOV and Check Valve Programs. Initiated and provided management oversight to many improvement initiatives in programs, such as: development of Containment Programs, use of Risk Informed Methodology for piping exams to reduce exam burden, use of BWRVIP 75 for exam reduction, and several other code improvements.
- 1998-1999: *Sargeant & Lundy, Consultant – In-service Inspection (ISI) Support, Niagara Mohawk - Nine Mile Point Unit 2* - Assigned as the interim Unit 2 ISI Program Manager for the Refueling Outage. Also performed independent assessment of Second Ten-Year Interval ISI & IWF Program Plans.
- 1997-1998: *Sargeant & Lundy, Supervisor - Inspection & Testing Group, Commonwealth Edison - Quad Cities Station* - Responsible for the implementation of all ASME Section XI Programs, including ISI Program, In-service Testing (IST) Program, Snubber Testing, Flow Accelerated Corrosion, RPV-IVVI, IWE Program Development, Pressure Testing Program and the Repair and Replacement Program.
- 1996-1997: *Sargeant & Lundy, Project Engineer, Commonwealth Edison - Quad Cities Station* -Consulting activities, including independent assessment of ISI programs, preparation of new ISI administrative procedures, rewrite of Repair & Replacement Program to include IWE requirements, completed design review for applicability of IWE/IWL requirements, general outage

Glenn R. Perkins (continued)

- support including NIS-2 form completion, and 90-Day Summary Report preparation.
- 1990-1996: *GRP Associates, Inc.*
- Consultant services to *Niagara Mohawk Power Corporation* in ISI activities on Units 1 and 2, including compliance review and new 10-year program plan development and outage support.
- 1991- 1992: *Yankee Atomic Electric Company, Yankee Rowe RPV Project Consultant, Florida Power and Light Company, St. Lucie Unit 2 and Turkey Point Units 3 and 4* - Program reviews for compliance and new 10-year program plan development to 1989 Edition of Section XI.
- *Taiwan Power Company, Maanshan Units 1 and 2*: Program reviews for compliance and new 10-year program plan development to 1989 Edition of Section XI.
- Principal investigator (NDE) on study for *Department of Energy* "State-Of-The-Art Report on Destructive and Nondestructive Evaluation Methodologies and Techniques for Steel Containments and Liners of Reinforced Concrete Containments in Nuclear Power Plants."
- 1981-1990: *NDE Engineering Consultants, Inc.*
- 1989-1990: *Niagara Mohawk NMP Unit 2*: Redevelopment of Unit 2 first interval ISI program plan and 1990 outage coordinator for ISI activities.
- 1988-1989: *Niagara Mohawk Unit 1*: Consultant to the ISI Task Manager; responsible for NDE contractor supervision, coordination of all ISI activities, programmatic and procedure review, and system turnover
- 1985: *Florida Power and Light Company, Turkey Point Units 3 and 4*: Second 10-year interval ISI program development and NRC submittals.
- 1982-1986: *Northeast Utilities Services Company, Millstone Unit 3*: PSI program development and implementation as on-site management.
- 1981-1982: *Florida Power and Light Company, St. Lucie Unit 2*: PSI program development and implementation and on-site management support.
- 1982: *Yankee Atomic Electric, Yankee Rowe*: Engineering support work during outage. Developed and presented ASME Section XI training program.
- 1981-1982: Responsible for the development and implementation of ASME Section XI pre-service examinations of *Southern California Edison Company's SONGS Units 2 and 3 nuclear plants, and Arkansas Power and Light Company's Arkansas Nuclear One Unit 2.*

Section 2 Assessment of Internal Self-Assessment Performance

This topic is an explicit assessment area in the 2005 Independent Assessment plan, and is addressed in section 1.5.2.5

Appendix 1 Action Plans

DBBP-VP-0009 Rev 3 "Management Plan for Confirmatory Order Independent Assessments" requires Action Plans to be developed to address the Independent Assessment Report's Areas for Improvement (AFIs). No AFIs were identified in the 2005 Independent Assessment of Engineering Programs, therefore no action plans are required.

Appendix 2 Independent Assessment Plan submittal

NUMBER:
COIA-ENG-2005

ASSESSMENT AREAS:

Engineering program effectiveness of modifications, calculations, system engineering, and corrective action program utilization.

PURPOSE:

The purpose is to provide an independent and comprehensive assessment of the Engineering program effectiveness at the Davis-Besse Nuclear Power Station.

The purpose of Revision 1 is to replace on (1) of the assessors.

The assessment will be performed in accordance with the requirements of the March 8, 2004, Confirmatory Order Modifying License No. NPF-3, and Davis-Besse Business Practice DBBP-VP-0009, "Management Plan for Confirmatory Order Independent Assessments." The assessment will be used to identify areas for improvement, requiring corrective actions with action plans. The assessment will also be used to assess the rigor, criticality, and overall quality of available Davis-Besse internal self-assessment activities in the Engineering program areas listed above. The final assessment report will provide an overall concluding statement on the Engineering program effectiveness as rated utilizing the assessment categories of DBBP-VP-0009.

SCOPE:

The Independent Assessment Team will assess the following Engineering program areas:

1. Plant Modification process
2. Calculation process
3. System Engineering
4. Implementation of the Corrective Action Program by Engineering
5. Effectiveness of assessment activities
6. Corrective actions taken in response to the Areas for Improvement (AFI) identified during the 2004 Independent Assessment of the Davis-Besse Engineering Program Effectiveness

The Assessment Team will assess conduct of the following activities:

1. Plant Modification Process

The team will perform a review of activities to assess the effectiveness of the plant modification process:

a. Selection and prioritization of potential modifications (2004 AFI DB 1.2), including assessment of delayed modifications on plant and operating personnel
b. Owner acceptance sub-process (review of contracted work)
c. Quality of modification packages since the 2004 assessment
d. Closeout of modification packages and supporting document updates (2004 AFI DB 1.2)
e. Effectiveness of modifications
f. Interaction and support from parallel processes
g. Workload management

1.5.2.7 2. Calculation Process

The team will assess the following attributes of the plant calculation process:

a. Workload management, including appropriateness of work priorities
b. Acceptance criteria
c. Margin management and allocation, propagation of engineering requirements for operation and maintenance
d. Linkages and consistency with other calculations
e. Preservation of design bases
f. Documentation/traceability/attribution
g. Calculation health and improvement program (2004 AFI DB 2.2)
h. Interaction and support from parallel processes
i. System descriptions design information
j. Engineering rigor and attention to detail
k. Fleet counterpart interactions

1.5.2.8 3. System Engineering

The team will assess the following items:

a. System Engineering alignment and plant support
b. System Health evaluation and reporting
c. Process for prioritizing, communicating, and resolving system health deficiencies and program deficiencies
d. Equipment Reliability Improvement Program
e. Maintenance Rule system monitoring and trending
f. Experience and expertise, including use of operating experience
g. Margin awareness and margin allocation
h. Interaction and support from parallel processes
i. Access to knowledge of Engineering information in calculations
j. Workload management

4. Implementation of the Corrective Action Program by Engineering

The Assessment Team will assess the following:

a. Promptness in initiating condition reports for identified conditions adverse to quality
b. Condition Report ownership and appropriate initiator involvement
c. Quality of root and apparent causes produced by Engineering and associated management behavior and guidance
d. Prompt acceptance of corrective actions
e. Corrective action quality and implementation timeliness
f. Effectiveness of corrective actions to prevent recurrence
g. Support of corrective actions assigned to others
h. Workload management and backlog management
i. Response to Davis-Besse CR 05-02585 which documents the findings from the NRC Safety System Design and Performance Capability (SSDPC) Inspection

5. Effectiveness of Assessment Activities

The Assessment Team will evaluate the effectiveness of the Davis-Besse Nuclear Power Station's assessment activities associated with the implementation of Engineering programs as follows:

a. Review the results of the Davis-Besse Quarterly Quality Assessments that evaluated Engineering. Determine if the assessments were comprehensive and if effective actions were taken to correct problems or weaknesses identified.
b. Evaluate the effectiveness of self-assessment capability by reviewing corrective actions associated with self-assessment reports, audits (including audits of the offsite safety committee activities), and evaluations conducted of Engineering program implementation.
c. Determine if the Engineering staff is aggressive in correcting self-assessment and assessment findings, and determine whether the corrective actions are adequate, timely, properly prioritized, and that effectiveness reviews are ensuring the desired results. (2004 AFI DB 6.2)
d. Determine the receptivity and responsiveness of management and staff to issues raised in self-assessments and assessments.

6. Corrective actions taken in response to the Areas for Improvement identified during the 2004 Independent Assessment of the Davis-Besse Engineering Program Effectiveness

The Assessment Team will evaluate the responses to the three AFIs identified during the 2004 Independent Assessment within Areas 1 (Modification Process), 2 (Calculation Process), and 5 (Effectiveness of Self-Assessments) as noted above where an AFI is referenced.

INDEPENDENT ASSESSMENT TEAM:

- John Garrity, Marathon Consulting Group, Team Leader
- Paul Borer, Marathon Consulting Group
- Harold Baumberger, Marathon Consulting Group

- Eugene Kelly, Manager - Engineering Programs, Limerick Generating Station, Exelon Nuclear
- John Meyer, Design Engineering Analysis Manager, Comanche Peak, TXU Energy
- Glenn Perkins, General Supervisor - Corporate Engineering - Fleet Programs, Constellation Energy Group

SCHEDULE:

- October 27, 2005: Send selected documentation to team members to begin off-site preparations.
- October 31, 2005, to November 23, 2005: Offsite (in office) review in preparation for onsite assessment.
- November 27, 2005: Assessment team will assemble at the plant for final assessment preparations.
- November 28, 2005, to December 9, 2005: Conduct onsite assessment and provide Davis-Besse with preliminary results prior to leaving site.
- December 23, 2005: Draft team assessment report and final debrief (marks the completion of the assessment) will be provided to Davis-Besse.
- December 30, 2005: Final team assessment report provided to Davis-Besse.
- February 6, 2006: Final Davis-Besse assessment report and action plans (if required by findings) will be submitted to the NRC within 45 days of the completion of the on-site assessment.

ASSESSMENT METHODS:

The Independent Assessment Team will use DBBP-VP-0009, "Management Plan for Confirmatory Order Independent Assessments."

The assessment methodology may include, but is not limited to, any combination of the following:

- Observing activities
- Interviewing personnel
- Reviewing documentation
- Evaluating or performing trend analysis
- Reviewing procedures, instructions, and programs
- Comparing actual performance levels with pre-established performance indicators

The following general standards will apply to the Assessment of Davis-Besse Engineering program implementation:

- Modifications and Calculations reflect in-depth reviews of problems and resolutions that support a high level of nuclear safety.
- Engineers demonstrate knowledge and understanding of the design basis, including maintenance of design basis documentation.
- System engineers demonstrate intolerance for failures of critical equipment.
- Engineers maintain clear ownership of corrective actions from initiation through resolution.
- A rigorous approach to problem solving and application of engineering procedures and methods is used.

The assessment team will review the referenced procedure/documents during the preparation period prior to site arrival.

The Assessment Team will identify in its final report, as applicable, areas of strength, areas in need of attention, and areas for improvement as defined in Davis-Besse Business Practice DBBP-VP-0009. The Team will provide an overall concluding statement on the Engineering program effectiveness as rated utilizing the assessment categories of DBBP-VP-0009.

REFERENCES:

- Confirmatory Order dated March 8, 2004
- DBBP-VP-0009, "Management Plan for Confirmatory Order Independent Assessments"
- NOP-CC-2003, "Engineering Changes"
- NOP-CC-3002, "Calculations"
- NOP-LP-2001, "Condition Report Process"
- Responses to 2004 Engineering Program Effectiveness Independent Assessment Areas for Improvement
- Action items from NRC inspection reports issued since October 22, 2004, that are applicable to the areas assessed (i.e., condition reports, corrective actions, responses to findings and non-cited violations)
- Applicable self-assessments performed since October 22, 2004
- QA quarterly assessments for past three quarters
- CNRB meeting minutes from last three CNRB intervals
- Applicable Section or area Performance Indicators

ASSESSMENT PLAN APPROVALS:

Prepared by: _____ Date: 10/4/05
John H. Garrity, Assessment Team Lead

Approved by: _____ Date: 10/5/05
Lori J. Strauss, Project Manager

Approved by: _____ Date: 10-11-05
Jeannie M. Rinckel, Executive Sponsor