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November 21, 2008

L-08-357

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

Subject:
Davis-Besse Nuclear Power Station, Unit 1
Docket Number 50-346, License Number NPF-3
Submittal of the 2008 Confirmatory Order Independent Assessment Report of Engineering Programs Effectiveness at the Davis-Besse Nuclear Power Station

The purpose of this letter is to submit the assessment report for the 2008 Independent Assessment of Engineering Programs Effectiveness for 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. This assessment fulfills the requirement of the March 2004 Confirmatory Order and is the final year this assessment is required by that Order.

The on-site activities of the Engineering Programs Effectiveness Independent Assessment were conducted from September 22 through October 3, 2008, in accordance with the Assessment Plan, submitted via letter number L-08-194, dated June 24, 2008. The final debrief of the assessment results was presented to the DBNPS management on October 17, 2008, 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.

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There are no regulatory commitments included in this letter. If there are any questions or if additional information is required, please contact Mr. Dale R. Wuokko, Manager – Site Regulatory Compliance, at (419) 321-7120.

Sincerely,

Barry S. Allen

LJS

Enclosure:
A Assessment Report - 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

Enclosure A
L-08-357

Independent Assessment
Engineering Programs Effectiveness
Davis-Besse Nuclear Power Station

Report Number COIA-ENG-2008

(111 pages follow)

Independent Assessment
Engineering Programs Effectiveness
Davis-Besse Nuclear Power Station

COIA-ENG-2008

September 22 –October 3, 2008

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Section 1 Assessment Results and Conclusions

1.1 Executive Summary

The Engineering Programs Independent Assessment Team found the engineering programs at Davis-Besse (DB) to be effective overall, and found performance in each of the six areas designated for assessment to be effective. However, the effectiveness in assessment area 6, "Corrective actions taken in response to the Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment" could have been greater if some of the issues identified in the 2007 Engineering Programs COIA Report had been addressed in more depth.

A number of improvements have been noted over each of the five annual assessments. Examples include new practices in work management in Design Engineering, system health improvements, the Equipment Apparent Cause Evaluation template, and Engineering modifications milestones for outages.

Current challenges include

- Post Modification Testing definition in Engineering Change Packages
- Quality of engineering work products including human performance and vendor work
- Improvement in known lagging areas (Equipment Reliability, Electrical Calculations)

2008 Findings

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 2008 consisted of:

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

Strengths

1 AS The workload management practices put in place the last 2 years to improve RFO modification preparation, especially the Design Engineering section's face to face work control and scheduling meetings with the staff.

Areas In Need Of Attention (ANA)

The three Areas in Need Of Attention (ANAs) identified in 2008 are designated as:

1 ANA Inadequate Post Modification Test Instructions provided by Engineering in the Installation and Testing section of ECPs.
2 ANA Not Meeting Acceptance Criteria in AC Power System Calc
3 ANA Some Issues From Findings From 2007 COIA Not Resolved

These findings are described in section 1.5.4 of this report.

By comparison, the team's findings in 2007 consisted of:

0 Areas of Strength (AS)
0 Areas For Improvement (AFI)
5 Areas in Need of Attention (ANA)

Condition Reports (CRs) written during the assessment

Seven CRs were written during the assessment:

CR 08-46856 Nonconservative Drift Interval Used in C-ICE-037.01-001 Rev 1

CR 08-46931	COIA-ENG-2008: Clarification of Form NOP-CC-2003-16 R6 Training Expectations
CR 08-47128	Filenet status not updated for 2 calcs after MUR
CR 08-47190	Calcs not using worst case conditions or nonconservatisms justified
CR 08-47303	Disagreement with CR 07-27389 AOV Program Assessment
CR 08-47319	Untimely Vendor Notice Implementation Results in MOV Test Failure
CR 08-47323	Action Plan for Single Point Vulnerability Not Completed by Due Date

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 fifth 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 effective 12/2/2005, and also with benefit of the guidance of FENOC's procedure NOBP-LP-2001 FENOC Self Assessment/Benchmarking Rev 10 effective 3/27/08. The Assessment Plan was submitted to the USNRC via serial letter L-08-194 dated June 24, 2008 (see Appendix 2)

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 resumes of the team members are included in the Assessment Plan and also presented in Section 1.7 Resumes of this report. The Team members were:

John Garrity	The Marathon Consulting Group, Team Leader
Harold Baumberger	The Marathon Consulting Group
Charles Bergeron	The Marathon Consulting Group
Bruce Beuchel	Seabrook Nuclear Station, FPLE
Rod Filipek	St. Lucie Nuclear Power Plant, FPL
Rodney Pickard	DC Cook, AEP

The Independent Assessment Team commenced work on the Davis-Besse (DB) independent assessment during the week of May 26, 2008, with information gathering 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 weeks. The weeks of August 11, September 1, and September 8 were devoted to intensive review of FENOC documents and formulation of interview strategies, questions, and interview lists. The Team spent the weeks of September 22 and September 29 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 2007 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 Section 1.6.2)
- 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 Plant Modification process
2 Calculation process
3 System Engineering Programs and Practices
4 Implementation of the Corrective Action Program (CAP) by Engineering
5 Effectiveness of self-assessments
6 Corrective actions taken in response to the Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment of the Davis-Besse Engineering Program Effectiveness

The Assessment Team assessed 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, 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 2007 assessment (Permanent and Temporary Modifications)
d) Closeout of modification packages and supporting document updates
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 and owner acceptance sub-process (review of contracted work)
c) Margin management and allocation
d) Linkages and consistency with other calculations
e) Preservation of design bases
f) Documentation/traceability/attribution
g) Calculation health and improvement program
h) Interaction and support from parallel processes
i) Systems descriptions design information
j) Engineering rigor and attention to detail

3. System Engineering Programs and Practices

The team will investigate the following items:

a) System Engineering alignment and plant support
b) System Health evaluation and reporting
c) Process for prioritizing, communicating, and resolving health deficiencies and program deficiencies
d) Equipment Reliability Improvement Program as reflected in the First Energy Nuclear Operating Company (FENOC) Excellence Plans
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 Process by Engineering

The Assessment Team will assess the following:

a) Condition Report ownership and appropriate initiator involvement
b) Quality of root and apparent causes produced by Engineering and associated management behavior and guidance
c) The Assessment Team will review selected Condition Reports related to Engineering Section performance initiated since the 2007 Independent Assessment of Engineering Performance and independently assess the corrective actions taken

5. Effectiveness of Davis-Besse 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) Planning of assessments over the short and long term for ongoing assessment of Engineering performance
b) Review the results of the Davis-Besse Nuclear Oversight Reports and Audits that evaluated Engineering. Determine if the assessments were comprehensive and if effective actions were taken to correct problems or weaknesses identified.
c) 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.
d) 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.
e) Determine the receptivity and responsiveness of management and staff to issues raised in self-assessments and assessments.
f) Review progress to date of Davis-Besse's initiative to develop and implement an integrated approach to improving engineering quality, including corrective actions taken in response to the cross-cutting aspects of Human Performance/Resources/Long-Term Plant Safety associated with the Green Non-Cited Violations identified during the 2007 NRC Component Design Basis Inspection. This review will assess the comprehensiveness of the actions identified, progress on implementation of the actions, and an assessment of their effectiveness to date.

6. Corrective actions taken in response to the Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment of the Davis-Besse Engineering Program Effectiveness

The Assessment Team will evaluate the responses to the five (5) Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment:

1 ANA	Waivers of Design Interface Evaluation (DIE) Reviews
2 ANA	Equipment Reliability (ER) Program – Forecast of Preventive Maintenance (PM) Strategy Workload, Single Point Vulnerability (SPV) Analysis
3 ANA	System Health Activities – Plant Computer, 480 V AC, Radiation Monitors
4 ANA	Analysis of Process-Related Weaknesses
5 ANA	Assessment Strategy and Implementation

1.4 Methodology

The Independent Assessment Team used DBBP-VP-0009 "Management Plan for Confirmatory Order Independent Assessments" for overall guidance.

The assessment methodology included, but was 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:

- Modification 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 was performed in accordance with the sequence of steps, summarized below. These steps were developed in preparation for the 2004 COIA of engineering programs and have been utilized in each successive assessment.

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 sixty formal interviews were conducted, with approximately 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 corrective action program use by engineering, effectiveness of assessment activities, and corrective action taken in response to ANAs identified in the 2007 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.

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 Areas of Strength, Areas For Improvement, and Areas in Need of Attention in each of the assessment areas. Potential findings were documented.

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 (five were generated during the assessment)

13. Consolidate items of interest into Areas of Strength (AS), Areas for Improvement (AFIs), and Areas in Need of Attention (ANAs). Near the end of each assessment week, issue summaries 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, site, and engineering personnel were included in this briefing. 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 summaries and talking point outlines were provided to FENOC in electronic file form after the assessment was complete. (At this stage, the findings were still considered draft, but useful information for FENOC).

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 Engineering Programs Independent Assessment Team found the engineering programs at Davis-Besse (DB) to be effective overall, and found performance in each of the six areas designated for assessment to be effective. However, the effectiveness in assessment area 6, "Corrective actions taken in response to the Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment" could have been greater if some of the issues identified in the 2007 Engineering Programs COIA Report had been addressed in more depth. The Team did not consider performance in this area to be reflective of higher standards of excellence.

Improvements have been noted over each of the five annual assessments. Examples include new practices in work management in Design Engineering, system health improvements, Equipment Apparent Cause Evaluations, and Engineering modifications milestones for outages.

Current challenges include

- Post Modification Testing definition in ECPs
- Quality of engineering work products including human performance and vendor work
- Improvement in known lagging areas (ER, Electrical Calculations)

Specific findings in the 2008 independent assessment included

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

1.5.2 Assessment Ratings by Assessment Areas

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

There was one ANA finding each in the Modifications (1), the Calculation (2), and the Follow-Up to 2007 Assessment (6) areas. There were no findings in the System Engineering (3), Corrective Action (4), and Self-Assessment (5) areas.

All the Findings are described in section 1.5.4, and those descriptions are referenced under the heading "Findings for This Area" in the discussion of each of the six assessment areas below.

Each of the three ANA findings for 2008 related to a single assessment area, i.e. there were no cross-cutting findings (findings applicable to more than one area). In the 2007 assessment, there were no cross-cutting findings (findings applicable to two or more areas).

1.5.2.1 Modifications (1)

Area Effectiveness Rating (1)

Overall, the team rated the modification process **Effective**. This is based on the quality of ECPs, interviews with engineers and managers, and Engineering Assessment Board (EAB) performance indicator trends.

There is one Strength associated with this area as a result of the workload management practices put in place the last 2 years to improve RFO modification preparation, especially the Design Engineering section's face to face work control and scheduling meetings with the staff. There are no AFIs associated with this area. The Engineering organization continues to produce quality modifications. There is one ANA associated with this area due to the vague post modification test instructions found in a number of ECPs. There was 1 condition report (CR) written during the review of this area for a procedural issue with the ECP revision process. The finding from the 2004 COIA, Modification Tracking and Closeout, continues to be addressed and further reduction in the backlog of open modifications was noted. The modifications open for approximately 2 years were being identified and a listing being developed to easily track these modifications as they become due for the required 2 year review. The milestones for 16th refueling outage modifications are being followed and challenges to the milestones are being addressed. Project Management is scheduling and aggressively following the RFO modifications.

Source Information (1)

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Sections 1.6.1 & 1.6.2).

The team reviewed selected Engineering Change Packages (ECPs), interviewed design and system engineers and managers, fleet oversight staff, and the EAB member.

Documents Reviewed (1)

ECP 05-0081-00	Mod to CMU Walls
ECP 05-0223-00	Make TM 04-0033 Permanent / BDF 11&12 Pos Alm
ECP 06-0002-00	Mod of Masonry Wall 3267
ECP 06-0118-00	Modify Caldon Leading Edge Flow Mtr Alarm Circuit
ECP 07-0019-00	Abandon 4 Clg Twr Frz Prot Circs
ECP 07-0114-00	TM-Install TM to Isolate Air Signal to HV5311H
ECP 07-0136-00&01	Increase Voltage to MTSV
ECP 07-0192-00	SFP Aux Platform for Fuel Insp
ECR 04-0258-00	SU XFRMER 02 PROT RELAYING IS INADEQUATE
ECP 05-0094-00 R03	Turbine ByPass Vlv
ECP 05-0304-00 R02	MFHB Guide Bar
ECP 06-0142-00	Main Gen Rewind
ECP 07-0014-00	Re-Rate Line Class HBD-139
ECP 07-0083-01	REPLC RCP1-2-2 CABLES OUTSIDE CTMT
ECP 07-0169-00 R01	HPI to Core Flood Tks Fill/Vent Press Ind.
ECP 07-0146-00	Replace Latching Contactor and Relay in BE1222
ECP 07-0012-00	EC Motor MC133, LV Swgr Rm Vent Fan Motor

A number of additional ECPs were also reviewed for the Post Modification testing concern. The additional ECPs expanded the initial sample of products to confirm the observation based on the limited initial set of products.

Observations (1)

Several ECP packages were reviewed, focusing on descriptions, 10CFR50.59 screens, regulatory applicability determinations, and various design interface documents. The assessment team concluded the technical content of ECPs and associated documents was acceptable with the exception of Post Modification Testing requirements as identified in the Installation and Test Requirements form NOP-CC-2003-03 Rev 6. The testing requirements were often believed to be too vague.

The ECP Procedure allows for Equivalent Changes to be performed in lieu of Design Changes, but there does not seem to be much difference in the actual amount of work required. Reducing the number of sub-types of Design Changes would simplify this process.

The plant staff did an excellent job of prioritizing the modifications for the upcoming refueling outage. The Fleet Value Ranking process is used as a starting value and the main decision process is the collegial discussions in the Plant Health Committee meetings. There are 13 major modifications scheduled for the 16th refueling outage, and all but one were identified prior to the Freeze Outage Scope milestone. The late identified modification "Canal Stairs" is scheduled to be issued no later than the last of the modification packages that did make the original cutoff date, approximately 12 months before the start of the refueling outage. The Outage milestones are being actively tracked and reported in the Monthly Performance Report.

The use of outside vendors to develop modification packages or to produce calculations is being held to a minimum. Dealing with vendor quality problems is still an issue for the Engineering department, but the reduced number of products is helping control the final product quality in the acceptance process.

The EAB Quarterly Report for the period April 1 through June 30, 2008 was reviewed. The report results were then discussed with the responsible Engineering managers. EAB review scope now includes more types of engineering products. The EAB evaluated 64 products during this period. Fifty-seven of these were products reviewed and assessed inline. The EAB continues to function as an additional backup to supervisory review of product quality. The overall number of CRs related to design workmanship and design quality diminished, while overall EAB scores for design products increased (quality declining) slightly during this review period; due in part to vendor performance.

Condition Report 08-37002 concluded that the product review process was less than adequate and that the EAB should be reformed to address this issue. In response to Corrective Action 08-37002-2, The EAB Review Board was formed to be comprised of subject matter experts from each design Engineering discipline to support a collegial review process.

The Engineering Products Review procedure was issued to provide more emphasis on the technical aspects of the group supervisors' reviews to influence product quality. This is addressed further in section 1.5.2.2 of this report.

The EAB scores have documented what appears to be a step decrease in FENOC design engineering product quality. This step change may be attributable to the change in EAB personnel, types of products reviewed, two failed products from a vendor, and increased standards in the EAB process. The EAB grades continue to be satisfactory, but below the station stretch goal. Common quality problems identified by EAB are the lack of clear articulation of the problem setup

and lack of clearly defined assumptions. The EAB does participate in quarterly engineering department continuing training to share lessons learned. Action has been taken to address in-house and vendor quality issues from the past COIAs. Vendor usage by the design department has been minimal, with only two vendor documents reviewed by the EAB, both of which failed.

The Configuration Management Interface System (CMIS) was rolled out during the first half of 2008. CMIS is a web-based computer software that enables engineering to develop ECPs and perform design reviews in an electronic environment. The automated system reduces administrative burden associated with manual creation of forms associated with ECPs. This is expected to help address the minor administrative errors and free the engineers to concentrate on the technical content of the Engineering products.

The number of Engineering Change Packages in Design Engineering is now about 200, compared to about 300 in early 2007, about 500 in early 2006, about 700 in early 2005, and about 900 in early 2004. There were a total of 619 open documents in Design Engineering as reported in the Open Site Document Report.

The modification closeout process was reviewed to ensure timely drawing and record updates. Currently there are 24 packages in the closeout process. The modification closeout process has improved over the past four years and is keeping this backlog to a manageable level. The backlog control is also helped by the continued discipline in not accepting new ECPs into Design Engineering or Rapid Response until implementation and resource commitments are assured.

Design Engineering resources had been below full staffing levels. One unfilled position existed in each of the Engineering Analysis, Mechanical / Structural and Configuration Control units. The Mechanical / Structural unit continues to experience challenges related to resources, with four individuals leaving the group in the past two years. Currently (at the time this report was written), the Design Engineering group is only one position below the 2009 staffing level. The only open position (in Mechanical Design) is currently being filled. This position was recently vacated for a promotional opportunity.

The Engineering staffing levels were noted in the Oversight Performance Report – 2nd Qtr 2008:
"The engineering staff has been below allocated manpower for several months as noted in the Monthly Performance Report. As of the end of May 2008, engineering was down 9 individuals from the allowed number, with only 2 open requisitions. Although the Integrated Staffing Plan business practice became effective in May 2008, the importance of reviewing and updating staffing levels cannot be over emphasized. In addition to being below overall staffing, there are new engineering personnel undergoing initial training and qualification indicating the experience level of the department also needs to increase. Several INPO Warning Flags relate to staffing levels where reduced staffing could lead to a

decrease in technical expertise and reduced benchmarking. Four engineering department benchmarking related trips occurred in the first two quarters of 2008 compared to fourteen that occurred in the similar time frame in 2007. Although performance issues have not been noted, the reduction in overall personnel and experience has the potential to result in future issues."

Specific Issues for This Area (1)

This section contains issues that do not rise to the level of findings, but that could be taken as Improvement Opportunities.

The Modification process is more divided than normally encountered in the industry but appears to work quite well due to the Team work and communication between groups at Davis Besse. This division of efforts does pose challenges to the overall process that should be carefully monitored.

There appeared to be some confusion about when it was more appropriate to write a Design Change than an Equivalent Change. It is believed that the fewer types of ECPs allowed by procedure (or Engineering Management direction), the less the confusion and the engineers will become more skilled with the procedure resulting in less chance for procedure compliance issues developing.

There is a strong commitment to proactively address staffing issues that will occur due to retirements over the next few years. The department has hired or plans to hire several engineers in the near future. There is also a strong engineering co-op student program with a local university, which is the source of several new hires. The Director, Site Engineering has plans to address the foreseen increased demand on the Engineering staff due to the upcoming major projects and modifications in FENOC's long term plans to upgrade the station.
The Team believes that this plan for a temporary engineering project group to meet these foreseen increases in workloads, if supported by FENOC and implemented, will also help meet demands on staff resources.

Findings for This Area (1)

There was one Area of Strength and one Area in Need of Attention uniquely associated with the Modification assessment area:

1 AS Workload Management Practices

1 ANA Inadequate Post Modification Test Instructions provided by Engineering in the Installation and Testing section of ECPs

Findings are described in detail in Section 1.5.4

Cross Cutting Findings Applicable to This Area (1)

None

CRs issued during assessment of this area (1)

CR 08-46931 COIA-ENG-2008: Clarification of Form NOP-CC-2003-16 R6 Training Expectations

CRs initiated during the 2008 assessment are described in detail in Section 1.5.3

1.5.2.2 Calculations (2)

Area Effectiveness Rating (2)

Overall the team rated the calculation area as **Effective** based on the quality of work products reviewed and the continuing progress being made. The backlog reduction effort is complete and backlogs are now maintained below steady state goal levels. Major electrical calculations (AC Power System Analysis, DC Calc) remain a challenge to maintain.

Source Information (2)

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Sections 1.6.1 and 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 a sample of new and revised staff and vendor calculations issued since the last assessment.

Interviews were conducted with engineers related to the work products reviewed.

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

Calculations reviewed included:

C-EE-002.01-010, Rev 30, Addendum A04 C-EE-002.01-010, Rev 30, Addendum A05	DC Calc – Battery and Charger Sizing, Short Circuit, and Voltage Drop
C-EE-015.03-008, Rev 4, Addendum A50 C-EE-015.03-008, Rev 4, Addendum A51	AC Power Systems Analysis

C-EE-015.03-008, Rev 4, Addendum A59	
C-NSA-049.02-026, Rev 01 A01	NPSH Licensing Basis Analysis for Davis-Besse LPI & CS Pumps
C-NSA-049.02-033, Rev 02 A01 C-NSA-049.02-033, Rev 02 A02	LPI Flow Evaluation Based on Test Data from DB-SP-04455
C-EE-002.01-011, Rev 07	Low Voltage Coordination Calculation
C-NSA-049.01-004, Rev 2	Vortex Formation w/ECCS Suction from BWST
C-EE-024.01-008 R01	Evaluation of Emergency Diesel Generation Voltage and Frequency Response During Design Basis LOOP/LOCA Loading
C-NSA-052.01-003, Rev. 8, Addendum A07	HPI Pump Acceptance Criteria
C-ICE-037.01-001 Rev 01	Condensate Storage Tank Level Instrument Uncertainty
C-ICE-058.01-008 Rev 04 A01	RPS Reactor Power Related Field Trip Setpoints
C-ICE-058.01-007 Rev 01	RPS Containment High Pressure Trip Setpoint

Observations (2)

The quality of the calculations fully met the station's high standards and expectations for technical rigor. This was affirmed by the team's independent review of fifteen calculations issued since the 2007 COIA Engineering Assessment. The team did note one instance where calculation results did not meet the acceptance criteria specified in the calculation. The deviations from the criteria were documented and justified in the calculation. However, this approach does not provide the bounding values of input parameters needed to establish the design and operating envelope. Specific details are provided in Finding 2 ANA in Section 1.5.4.

Other issues were identified during the assessment and resulted in the initiation of Condition Reports (CRs) by station staff. These CRs are listed below and discussed in Section 1.5.3 of this report.

Condition Reports (CRs) related to calculations issued since the previous assessment were reviewed. These CRs included:

07-23405	07-24244	07-24708	07-24710	07-24820
07-24875	07-24954	07-25170	07-25611	07-26754

07-27550	07-27724	07-27790	07-27835	07-27855
07-27892	07-28069	07-28242	07-28296	07-28305
07-28821	07-28984	07-29174	07-29177	07-29188
07-29269	07-29502	07-29668	07-29874	07-29917
07-29927	07-29941	07-30042	07-30090	07-30235
07-30271	07-30361	07-30437	07-30479	07-30634
07-30673	07-30679	07-30698	07-31503	07-31717
08-34466	08-35989	08-36363	08-36460	08-36591
08-37002	08-37357	08-40001	08-41189	08-41598
08-41674	08-41704	08-42276	08-42409	08-42414

Three CRs were selected for additional review and follow up, as follows.

- CR 07-30673, CDBI Potential for Insufficient Battery Margin and Surveillance Test

This CR describes NRC questions related to battery margin in calculation C-EE-002.01-010, DC Calculation, potential Tech Spec issues related to internal cell resistance and surveillance testing. The issues involved the completeness of the load lists (missing or "mis-timed" loads), battery sizing (based on a minimum cell voltage of 1.75 v), and the Tech Spec limit for internal cell resistance. The issues stem from Revision 30 of the calculation (that was vendor prepared) and the adequacy of station review and acceptance. Although the quality of vendor documents has been an issue in the past (when this revision of the calculation was prepared), these issues have been resolved and recent performance has improved. The battery sizing and tech spec limit issues have been resolved and appear to be related more to clarifications of the design basis than to calculation deficiencies.

- CR 08-37002, EAB Results Appear to Conflict with CDBI Findings.

This CR questions whether the EAB results that indicate good performance in the calculation area are in conflict with the calculation deficiencies noted in the NRC Component Design Basis Inspection (CDBI). The basis for the perceived gap was determined to be the quality of responses provided to the NRC during the CDBI, including documents prepared in a very short time period (e.g. Immediate Operability Determinations). These documents were on a very short turnaround time and EAB review was not provided. Had there been an EAB review, it is believed that a significant portion of the shortcomings would have been identified and addressed. Some of the products are not in EAB scope (Operability Determinations). Finally, the short time frame potentially introduced human error as a result of the time pressure. Corrective action was taken to create a diverse EAB board approach and examine the scope of EAB reviews. Additional corrective actions have been taken under CR 08-31120 to address the human performance issues (including supervisory involvement and grading of products). The team

concluded that the actions taken are appropriate, and that this CR did not identify weaknesses in the calculation process or standards.

- CR 08-40001, CDBI Self-Assessment-CDBI Inspection Gaps

This CR questions whether the DB CDBI Self-Assessment was adequate based on the results of the CDBI. This is discussed in more detail under self-assessments. The review concluded that many of the issues raised in the CDBI are more subtle than issues identified during the self-assessment. Issues such as the need to analyze a double-ended shear of the AFW piping, or the potential loss of water from the BWST directly to the sump (due to a lack of a check valve) during cross-over of sump suction to the containment sump, appear to be more related to clarifying the design basis than to the calculation approach. Had the design basis been more clearly identified, the calculation would have analyzed these conditions. Issues related to the adequacy of the DC Calculation were similarly subtle. Finally, since the DC Calculation had recently undergone major revision (including a design review), a conscious decision was made to use the review resources available to review older and potentially less rigorous calculations. As a result, an opportunity to identify the weaknesses in the DC Calculation was missed. The COIA team generally agrees with these conclusions. Although the CDBI self-assessment failed to identify some of the weakness that later surfaced in the CDBI, it did identify a number of potential issues and addressed them prior to the CDBI. The subtle nature of the issues found during the CDBI indicates that overall the quality of station calculations is sound.

Overall, the review of CRs did not identify any issues of collective significance. The CDBI revealed that the licensing basis upon which the design basis calculations are predicated is not always clear or well-defined. With the exception of CR 07-30673, the number and type of errors found indicate that existing calculations continue to exhibit latent, mostly inconsequential errors that are steadily being identified and corrected as the calculations are examined or updated. CR 07-30673 identified the need for significant improvement in the DC calculation (C-EE-002.01-010) rigor and methodology. This was not corrected when this calculation was updated to the new format and design verified (Rev 30).

The Calculation Health section of the Design Basis Assessment Report (DBAR) was reviewed. This section of the DBAR identifies and tracks "low margin" Tier-1 calculations, age of calculations, and calculation change backlogs. The rating for this area remained "Yellow" for the period 2Q07 to 2Q08 indicating that this area does not yet meet management expectations. One design section has achieved a "White" rating and two others are close. Efforts are continuing to address "low margin" calculations, and design engineering is confident that this rating will soon be "White". A significant effort has been undertaken to address the once large number of Tier 1 calculations with unacceptable or low margin, and most have now been addressed.

Calculation Quality ratings based on EAB review results ("scores") were reviewed since the last assessment. EAB scores have improved from the 0.82 score of the third quarter of 2007, achieving 0.38 in 4Q07, 0.39 in 1Q08, and 0.46 in 2Q08. (A lower score is better.) The stretch goal is 0.5, which is being achieved. In 2Q08, the EAB chairman was rotated, providing a fresh look at engineering products, including calculations. Results to date indicate that this change has not had a significant impact on the calculation scoring, and has provided a relatively stable transition. In September 2008, a change was made to create a multi-discipline review board to assist the EAB with the review of larger, more complex engineering changes. This approach is similar to that used at Beaver Valley. The board has not yet sat in review of a large project, so there was no opportunity to assess its effectiveness.

Overall, it is concluded that the calculation area has made continued progress since the last assessment. The technical rigor of calculations has remained excellent. Findings noted represent opportunities to improve and are not considered significant weakness or shortcomings.

Specific Issues for This Area (2)

This section contains issues that do not rise to the level of findings, but that could be taken as Improvement Opportunities.

Although overall performance is very good in this area, the main electrical calculations (AC Power System Analysis, DC Calculation) appear to be a challenge in obtaining and maintaining the desired rigor. Deficiencies in the DC calculation were identified in the NRC CDBI. Finding 2 ANA below Identifies deficiencies in the AC Power System Analysis. The AC Power System Analysis is particularly difficult to maintain with 59 Addenda currently issued-- some with "Approved, Active" and others with "Approved, Pending" status. The station is currently pursuing corrective actions for the DC calculation, and considering methods to decrease the burden to maintain the AC calculation.

Findings for This Area (2)

There was one Finding uniquely associated with the Calculation assessment area:

2 ANA Not Meeting Acceptance Criteria in AC Power System Calc

Findings are described in detail in Section 1.5.4

Cross Cutting Findings Applicable to This Area (2)

None

CRs issued during assessment of this area (2)

CR 08-46856	Nonconservative Drift Interval Used in C-ICE-037.01-001 Rev 1
CR 08-47128	Filenet status not updated for 2 calcs after MUR
CR 08-47190	Calcs not using worst case conditions or nonconservatisms justified

CRs initiated during the 2008 assessment are described in detail in Section 1.5.3

1.5.2.3 System Engineering (3)

Area Effectiveness Rating (3)

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

Source Information (3)

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 Sections 1.6.1 and 1.6.2).

The team reviewed recent and past Plant Health Reports, and interviewed system engineers responsible for the following plant systems:

HVAC Control Room
Aux Building Chilled Water
Cathodic Protection
Plant Computer *
Radiation Monitoring, Process and Area *
Feedwater
Instrument AC
Component Cooling Water *
Freeze Protection Heat Trace *
ICS NNI * (Integrated Control System, Non-Nuclear Instrumentation)
Reactor Coolant System
Radwaste
Boric Acid Addition *
Fuel Handling
(* = System was reviewed in 2007 also)

In addition, the team reviewed the 2Q 2008 Fleet Engineering Programs Quarterly Health Report, and inquired into the health status of the four programs with yellow performance cornerstones:

Appendix J
MOV Program
Snubbers
PM

A number of Plant Engineering supervisors and the Plant Engineering Manager were interviewed, as were selected management personnel from the Plant organizations responsible for operations and maintenance, to support reviews of additional topics

Observations – System Health (3)

In 2008, as in past assessment periods, System Engineering was generally viewed by station managers as effective and responsive to problems and the support needs of Operations and Maintenance. Both the technical expertise as well as the dedication of the system engineers to support of plant activities were remarked upon by interviewees, and the Team found the same.

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

Plant systems overall health was reported to be Green for the current quarter (2Q 2008), unchanged from overall health Green at the time of the 2007 assessment. At the time of the 2008 assessment, four systems were in yellow status and three were in red status. In addition, six systems were indicated to have declining performance, with one declining system in red and one declining system in yellow.

A number of systems have shown significant improvement in system health since the 2007 report. This is attributable to completion of significant system health improvement plan related work in the past year.

At the time of the 2008 assessment, three systems were in the red system health designation status. Reviews of system health information and interviews with the system owners of the 2008 red systems were conducted. At the time of the 2007 assessment, two systems were designated as in red health condition.

A summary of the recent history red system health ranking is shown below:

System	Red status in quarterly Plant Health Reports		
	2Q 2008	2Q 2007	2Q 2006
HVAC Control Room	R		
Aux BLD Chilled Water System	R		
Cathodic Protection	R		
480 V AC		R	R
Plant Computer		R	R
Med Voltage AC			R
Boric Acid Addition			R
Doors and Hatches			R
Freeze Protection/Heat Trace			R
ICS NNI			R
Rad Monitoring, Process and Area			R

System health recovery plans for the three red systems (HVAC Control Room, Aux BLD Chilled Water System, and Cathodic Protection) were reviewed and discussed with the responsible system engineers.

The quarterly Plant Health Report is a compendium of information related to the health of many DB plant systems. Information presented below was extracted from the PHR and discussed with system owners for additional insight.

HVAC Control Room

At the time of the publication of the 2Q Plant Health Report, the system was categorized as red system health condition in part because there was no current approved system health improvement plan. On 8/7/08, the revised health improvement plan was approved. This action, unless negated by other circumstances, would move the system health condition to yellow. It had been yellow in Q1 of 2008, and red in Q4 of 2007

Recent functional failures included the following:

1) Train 1 compressor tripped due to low oil pressure on 3/12/08 (CR08-36684). The oil level for this component was not being routinely monitored, which is a PM / equipment reliability program shortcoming.
2) Train 2 compressor lost its refrigerant charge due to a failed diaphragm in SW5897 on 5/27/08 (CR08-40879). This diaphragm is scheduled for PM replacement every five years. The PM replacement had been deferred twice before the diaphragm failed at a service duration of about seven years, another PM / equipment reliability program shortcoming.

As can be seen from the CRs mentioned above, this system has been adversely affected by some problems that have PM process implications that go beyond random equipment failures.

The assessment team was informed that when CR08-40879 was reviewed by CARB, the review board indicated an interest in whether the matter of deferral of critical component PMs had a global transportability implication.

During a recent plant meeting, the Plant Engineering Manager noted that two yellow coded maintenance work orders (2002298256 Repair refrigerant leak S33-2, and 2003316615 Replace sensing lines CREVS 2) for the CREVS system) were removed from the work week work schedule at the T6 point. Yellow coded work orders indicate they are necessary to move a system health out of the Yellow status, and they are supposed to be executed if at all possible, i.e. not rescheduled. The PEM initiated CR08-45502. He indicated that "incorrect or incomplete information was related by Materials, Engineering, and Maintenance in the meeting which resulted in the removal of the work from the schedule". The CR was categorized AF, so no cause analysis would be performed.

The CR response was to close it with no corrective action on the bases that there was no procedural violation and the condition was not adverse to quality. There was a detailed explanation in the closure comments as to why removal of the work, and closure of the CR, was in accordance with FENOC's requirements.

However, the PEM had documented a compelling argument for there being an adverse condition (quoting from the CR):

- *"Removal of the work would extend the period of time to recover system health*
- *This is symptomatic of the issues which have resulted in the Red/yellow average age being well above the industry norms*
- *The removal results in additional work on the system engineer to submit a schedule change to reinsert the work into the schedule*
- *These work orders are actions intended to recover the CREVS system which has caused more than half the Plant's ER clock resets since last November*
- *Previous delays in performing the work on this system have allowed failures which resulted in an NRC violation"*

The station has instituted several practices and policies to improve the success of execution of red/yellow work for system health improvement

- do not reschedule notations in the schedule for red/yellow WOs,
- a weekly tabulation of all red/yellow WOs and their status,
- a Thursday weekly MAOM meeting breakout to review status of Red/Yellow items leading to action to expedite resolution of restraints
- Monthly review of the red/yellow work list in the MAOM, and

- Monthly reports from all system engineers in rotation two per month of system health and improvement plans)

In view of the efforts underway to get the red/yellow work done, it would seem desirable to use the CR to determine what went wrong in process terms that led to the schedule challenge, and to fix them so they would be less likely to persist and affect future work.

Closing this CR on the grounds that there was no procedural violation and no adverse condition risks conveying the wrong message about DB's interest in using CRs to address problems, and perhaps inhibit initiation of future CRs. It may be that this issue and others like it are already being addressed by other means, but there was no indication of that in the CR closure.

The PEM was ultimately able to clear up the problems, get this work back into the schedule, and get it done on time, at some considerable effort.

Aux BLD Chilled Water System

At the time of the publication of the 2Q Plant Health Report, the system was categorized as red system health condition in part because there was no current approved system health improvement plan. A revised health improvement plan was targeted for 9/26/08. This action, unless negated by other circumstances, would move the system health condition to yellow. It had been Green in Q1 of 2008, and White in Q4 of 2007.

The work called for in the system health improvement plan is scheduled to be completed by the end of 2008, at which time, barring additional problems, the system would be able to be categorized as White.

Recent functional failures included the following:

1) S-12-2 was found tripped on freeze stat on 4/15/08 while S12-1 was out of service for maintenance (CR08-38324) A temperature switch had degraded switch contacts. The temperature controller was replaced. A PM called for replacement every 9 years, and the PM was revised to require future replacements every 8 years. No failure analysis was performed.
2) S12-1 tripped out on high pressure on 6/5/08 while S12-2 was out of service. (CR08-41350). In this case it was found that the air heat exchanger for the affected train was partially blocked by foreign material such that the air flow was only about 75% of that intended. The DB air heat exchanger cleaning PM was found to be less stringent in frequency and cleaning technique that that used at BV and PY.

There is no maintenance strategy for air cooled heat exchangers at FENOC plants. A template is to be developed as one corrective action for CR08-41350, but the schedule has not been determined.

During the review of CR08-41350, the system engineer's supervisor reviewed the transportability analysis and expanded the scope of the CAs to include additional plant equipment.

A condition monitoring failure also occurred:
1) S12-2 tripped on 5/31/08due to a faulty overload relay. (CR08-41087)

Cathodic Protection

At the time of the publication of the 2Q Plant Health Report, the system was categorized as red system health condition in because the Cathodic Protection System was not operating to protect any of the underground piping at DB. An approved system health improvement plan was in place. By the time of the assessment, the actions required to move the system health to Yellow had been completed, and the system was able to satisfy the requirements for Yellow. The actions completed included generation of Cathodic protection failure ECP 04-0052, completion of direct assessment ECDA (External Corrosion Direct Assessment) on the EDG fuel oil piping, implementation of ECR 04-0052-00 to replace the Cathodic protection system lines and rectifier, and completion of WO 07-24681-2 to install a replacement Cathodic Protection System for the EDG Fuel Oil System under ECR 04-0052. This system had been Red in Q1 of 2008, and Green in Q4 of 2007.

This activity demonstrated the ability to move quickly to formulate at implement system health improvement actions.

The problems with the Cathodic Protection System illustrate the issues that can arise when a system is not included in equipment performance monitoring protocols, or not given sufficient monitoring and performance maintenance attention and priority. Other examples at Davis-Besse include the seismic monitoring system (past issue, now restored), the radiation monitoring system (under a long term improvement plan), and the freeze protection heat trace systems (system health restored).

The CPS health recovery plan includes three phases:

> Phase I consisted of the work performed to date to restore the EDG piping CPS to functional.
>
> Phase II will consist of protection for the circulating water lines. Engineering is expected to be finished in 2009 and installation will be performed in 2011.
>
> Phase III will consist of the remainder on piping needing protection, including fire protection and radwaste piping. Engineering is expected to be complete for this phase in 2011, with installation to follow.

Phases II and III are reflected in abbreviated form in the System Improvement Plan.

Plant Computer *

The plant computer system ended the 2Q 2008 health measurement period in Yellow condition, unchanged from the two previous quarters.

An action plan for this system was approved in December of 2007, with three of the four corrective actions required completed, with replacement of the multiplexer power supplies remaining to be done.

One functional failure occurred late in 2Q of 2008.

A work task of considerable significance at present is replacement of the Multiplexer power supplies. Replacements are being obtained by having Beta FENOC's Lab rebuild power supplies from the plant. The system engineer is personally monitoring the progress of the Beta Lab rebuilds and providing information about expected shipment dates of refurbished power supplies from the lab to the work management process. He feels he needs to do this because he gets a lot of questions from planners and work week coordinators about WO status.

The team noted CR08-40935 which documented elimination, in 2003, of a method to perform a manual plant heat balance calculation, which could be used in the event the computer calculation became unavailable. The CA is to revise DB-NE-03230 to incorporate a method of manual heat balance calculations that does not use computer points. The process by which the ability to perform such a backup calculation could be eliminated, without recognizing when and how it might be needed, would seem to be flawed. However, the CR is an AF, which does not require any sort of cause analysis.

Radiation Monitoring, Process and Area *

The Radiation Monitoring, Process and Area, system is shown as White in the 2Q 2008 Plant Health Report. The system health was Red in the previous two quarters.

The basis for upgrading to Yellow was approval of the a(1) action plan on April 10, 2008.

The basis for upgrading to White was completion of the action plan task involving digital upgrade of 14 selected Victoreen monitors. Although all 14 selected monitors have been restored to reliable condition, only 13 were actually upgraded. The 14th was restored by refurbishing one of the Victoreens (RE8420) of the 14. The final upgrade for that monitor is currently scheduled for 8/3/2009 under Order 200170170. Although it is not necessarily a major point, the

assessment team questions whether the true intent of the system health improvement plan has been fulfilled with use of a refurbished Victoreen instead of replacement with a digital upgrade as called for in the approved plan, and thus whether the system health indicator should have been upgraded.

The upgrade of the remaining Victoreen monitors under EWR 01-0214-03 has been put on hold to allow concentration of effort on replacement of the Kaman monitors under ECR 04-0006.

The emphasis on replacement of the Kamans is prudent since the OEM no longer provides product support. Replacement of the Kamans is on the plant's top ten list. However, the "current time table" for replacement of the two Kamans of concern (Station Vent Monitors and Containment monitors) stretches to 2013-2014. And there does not appear to be a timetable for returning to the other Victoreens. The intent is to maintain the remaining Victoreens using parts salvaged from the 14 that have been upgraded with digital components.

Feedwater

This system was of interest because it declined in system health to White in 1Q 2008, remaining White in 2Q 2008 from Green in the first three quarters of 2007.

The system was categorized as White at the end of 2Q 2008 due to corrective actions associated with the 1-5 High Pressure Feedwater Heater tube failures and the Problem Solving Plan / Operational Decision Making Issue associated with the #1 MFPT control valve torque arm operating cylinder oscillation.

There were no MPFFs (Maintenance Preventable Functional Failures) during 2Q 2008.

The cause of the Failures of the two tubes in the 1-5 High Pressure Feedwater Heater is not known. The cause analysis for CR08-36528, for which a full apparent cause analysis and an EACE were performed, indicates the most probable cause of the feedwater heater tube rupture was a service induced tube failure, with the specific mechanism not identified, but likely mechanisms are fatigue failure due to FIV or circumferential cracking caused by corrosion. A contributing cause was the absence of a comprehensive strategy to maintain feedwater heater tube health. Therefore it cannot be concluded that additional failures in that or other feedwater heaters will not occur.

The assessment team found no plans to obtain samples of the broken feedwater heater tubes using cutting and extraction methods like those that have been used to obtain tube samples from steam generator tubes. Obtaining samples from the broken ends of the tubes would seem to be highly desirable due to the information that potentially could be obtained through examination of the tube ends at the location of the breaks.

The cause of the #1 MFPT control valve operating cylinder oscillation is not known. The cause analysis for CR 08-39759, for which a limited apparent cause analysis and an EACE were performed, indicates the #1 MFPT control valve operating cylinder oscillation appears to have several possible initiators: 1) foreign material introduced by the replacement of DB-F70-1 duplex oil filter assembly; 2) trapped air in any of the hydraulic system lines (and it is not known if the duplex oil filter was vented following servo valve replacement on 6/7/08; and 3) initial system gain setting error in the setup of the MDT-20 feed pump turbine control system, which may have resulted in oscillations for which the amplitude met manufacturer's requirements but for which the frequency is considered to be excessive.

The FENOC Beta lab performed a failure analysis of the servo valve for the #1 MFPT, which was suspected of causing the oil pressure and the control arm to oscillate. The testing was limited because the valve could not be pressure tested in the lab. The lab could only perform a functional test for movement and examine the valve for damage and foreign material. The lab discovered foreign material, both fibrous and particulate, inside the servo valve, which could have prevented the servo from operating while in service.

The feedwater system has suffered two significant equipment failures recently, and the cause is not known for either. The assessment team observes that the causes of these problems may be ongoing, and not necessarily isolated to the equipment that has failed to date. Therefore every effort should be made to determine the causes as soon as practicable, and to effect appropriate remedies.

The team looked for indications of any systematic problems that might be contributing to the emerging feedwater system unreliability and equipment problems. No general factors were immediately identified that could be associated with a decline in the feedwater system health or the decline in the health of the several system whose health has declined since the last assessment in 2007. However, the team believes that Davis-Besse's not-fully-implemented Equipment Reliability program, and the tendency to treat problems, both equipment and other, as isolated broke/fix issues, are likely reliability-inhibiting factors. The team would encourage Davis-Besse to take a long, hard, and broad look at the reasons for recent declines in system health of systems that have been healthy for a long time to determine and address and common causes or collective significance. Factors to be examined would include equipment care and the influences of programmatic requirements as management practices.

The assessment team also believes that Davis-Besse could benefit from a review of the tools and techniques available for determining the cause of equipment failures when the usual investigative techniques haven't allowed the cause of failures to be determined. A collective significance evaluation of equipment failures whose causes could not be determined might be a good starting point.

Instrument AC

This system was of interest because it's health score declined to White after two quarters of Green health. There were no functional failures in 2Q 2008 but there was one condition monitoring failure, of the pre-charge switch on inverter YV1 (CR 08-33644)

The reason for the decline to White is concern about the material condition of the system, specifically the diodes in the 50 KVA inverters not being of a high enough rating (apparent cause analysis, CR 08-43843). In addition, there is one critical component PM deferred to the third quarter of 2008, fourteen obsolete critical components (per the health report material condition report card)

The system health report in the 2Q 2008 Plant Health Report does not list any information about 5, 10, and 15 year long term plans except to say they exist.

CR 08-43843 addressed the Failure of Inverter YVB , and was supported by a limited apparent cause analysis and an EACE. The cause analysis concluded that the cause of the diodes is unknown, with the most likely causes being 1) the diodes are not adequately rated for the application, or 2) a manufacturing deficiency exists in the 250 amp diodes.

The cause analysis and EACE surfaced numerous issues, which provide significant learning opportunities in the area of human performance and engineering rigor:

1) PM Template NORM-ER-3301 was associated with the inverter. However, this template is not for inverters but rather for I&C power supplies. The correct PM template for the inverters would be NORM-ER-3106A Battery Systems.
2) EPRI TR-100491 UPS Maintenance and Application Guide, Rev December 2002, section 8.3.1.2 states SCRs and diodes are life-limited component that require periodic replacement. This is contrary to SCI Technical Manual E-854N-00001, which does not call for diode replacement. But neither document is referenced in NORM-ER-3106.
3) The inverter oscillator board for the inverter failed while a functional test was being performed in accordance with DB-ME-09205. Step 8.1.8 specified a test voltage of 40 vdc instead of the correct 20 vdc. This error was made by the author of DB-ME-09205 in 2002 when it was revised for the new SCI inverters (CR 08-45269)
4) Component monitoring was deficient in that thermography was not called for in monitoring the diodes
5) DB-ME-09025 specified "Kopr-Shield or equivalent" for diode-to-heat sink thermal grease. "Equivalent" grease may not receive adequate evaluation and as a result the wrong type of grease may be used for mounting power semi-conductors to heat sinks. It was determined that a grease which is NOT suitable for this application has been used, in the belief that it was equivalent.

6) Inverter YVB is non-Q, therefore the diodes are not subjected to Q level inspection upon receipt.

The assessment team notes that each of these issues provides an opportunity for learning and process/procedure and human performance improvement if it is evaluated more thoroughly than "broke/fix".

Component Cooling Water *

The Component Cooling Water System health at the end of 2Q 2008 was White, down from Green in the previous two quarters. This decline in overall performance from a long history of good performance was a matter of interest to the assessment team.

The system engineer downgraded the health indicator for this system to be conservative. At the end of the quarter, as the Plant Health Report was being prepared, he discovered that the Material Condition section of the REPORT CARD of information provided for his use indicated that there are nine critical components in the system that are obsolete. There were zero in the report of 1Q 2008. He had not been aware of any emergent obsolescence of parts. This system engineer is responsible for six systems, and has only a few days to write system health reports for the Plant Health Report at the end of each quarter. He did not have time to research the new designations of critical components as obsolete, and thus conservatively downgraded the health of the system.

It is the assessment team's understanding that the source data and calculation of obsolete critical components was changed without notice, leaving the system engineers to try to figure out the meaning of the new information. The system engineer provides additional information on this in par 3) Obsolete Components in the Material Condition section of his system health report.

The assessment team has previously pointed out that the data provided in the report card section of the system health reports is unreliable. More information can be found on this subject in section 1.5.2.6 in the discussion of CR 07-29907, IO #5 Plant Health Report Data Anomalies Need To Be Resolved of this report.

Otherwise, the component cooling system is performing well.

Several system walkdown reports prepared by the component cooling system engineer were reviewed. They were thorough and well written.

Freeze Protection Heat Trace *

This system has been problematic since the assessment team began looking at system health.

The reported system health condition at the end of 2Q 2008 was Yellow, based on an approved a(1) action plan, and it had been yellow the previous two quarters as well.

The assessment team was pleased to note that the modifications required to restore the system to reliable condition were completed early in 3Q of 2008, and the system health condition at the time of the assessment would have been White if measured at that point.

The remaining work item on the System Improvement Plan has been completed as of the time of this report, leaving the system with no actions left to achieve Green condition.

ICS NNI * (Integrated Control System, Non-Nuclear Instrumentation)

The ICS/NNI system health indicator was Yellow at the end of 2Q 2008, and it has been Yellow for many previous quarters.

The system will be able to go to White status when six currently available new ICS relay modules are replaced.

CRs 08-34538 and 08-34643 report how 41 new ICS relay modules had been installed during RFO 15, but upon startup it was discovered that six of them did not function as designed because the wrong modules had been specified, procured, and installed. They were replaced with the modules that had been removed and the six incorrect new modules were refurbished to function correctly.

Additional work called for in the ICS system improvement plan includes the following:

ECR02-0540-00 will initiate upgrade of the ICS by installing new hardware for computing core thermal power and supplying this signal to ICS for controlling plant power. This is targeted for RFO 16.

ECR04-0387-00 will continue with replacement of the Bailey ICS modules, and is targeted for FRO 17.

The NNI system Health Report notes (2Q 2008 report page 267) *"Several Modules in the Non-Nuclear Instrumentation System (NNI) have not been refurbished and at this point there is no plan for replacement of the system. Symptoms of aging have been reported such as degraded/darkened circuit boards. The NNI System provides the input signals to the ICS and thus needs to be in good health in order to ensure reliable operation of the ICS"*

The assessment team believes that the interplay between the system health improvement planning process and the processes for 1) achieving approval for

technical concepts, 2) obtaining funding for modifications or major maintenance activities, and 3) detailed execution of health improvement activities makes it difficult for the system engineer to accomplish the activities called for in the plan. Management attention and support will be required to supplement the efforts of the system engineer to effect the remedies to system health issues envisioned in the plan.

Reactor Coolant System

The reactor coolant system was of interest because of a recent decline in system health from Green to White. There were no functional or condition monitoring failures during the recent quarter.

The system was scored White in 2Q 2008, while it had been Green for the two previous quarters.

The downgrade to White was at the discretion of the System Engineer, based on his desire to bring focus to two open control room deficiencies noted in the Operational Focus area:

1. Two open control room deficiencies associated with the RCP 2-1 and 1-2 seal standpipe high level alarm circuits. Spurious
2. alarms have been received infrequently on these circuits and troubleshooting has determined that the problems are associated with the probes or cabling in containment. Remedial work is scheduled for RFO 16.
3. An open ODMI for pressurizer code safety valve leakage, which is being monitored and is at present only a small fraction of the leakage rate which would require planning to commence for a shutdown.

There is also an ODMI for RCP 2-1 and 1-1 motor lower bearing high oil level indication, believed to be attributable to level switch issues. Troubleshooting and repair work has been approved for RFO 16 or a forced outage.

Also noted were elements of the long range plan (5, 10, and 15 years) for the RCS which involve proactive measures to address issues derived from experience at Davis-Besse and elsewhere, such as PORV replacement (leakage history at DB but not leaking now), replacement of the pressurizer safety valves in RFO 17, replacement of reactor coolant pump motors, and replacement of RTD cables affected by aging phenomena. These items will require management support and funding approval.

Radwaste

The radwaste system was of interest because the performance at the end of 2Q 2008 was White, down from Green the previous quarter. Prior to that, the system had been White for several quarters. There were no functional or condition monitoring failures during 2Q 2008.

The system engineer decided to rate the system as White until successful operation of the Boric Acid Evaporator #2 can be performed. The system engineer has been considering whether the radwaste system he is reporting on includes only Maintenance Rule scope equipment or the broader set of all radioactive waste handling and processing equipment. The Green score of 1Q 2008 was based on including only MR scope equipment. The 2Q 2008 score of White was based on the broader equipment scope of all radwaste equipment.

The system engineer was of the preliminary opinion that replacement of the #2 Boric Acid Evaporator might be required to restore its operability. Upon further discussion, he decided that an evaluation of the evaporator, with assessment of component and subsystem condition, and operating and maintenance protocols, would be desirable since, based on experience, it is unlikely that problems with a boric acid evaporator can only be resolved by replacing the unit.

It was noted that there are two work orders for pump replacement. In both cases, the pimps are to be replaced because the pumps were observed to be making abnormal noises (Clean Waste Transfer Pump, WO 200283930, made unusual noises after a bearing replacement, and Boric Acid Evaporator Concentrate Vacuum Pump, WO 200274810, pump did not coast down but came to an immediate stop when the motor was deenergized).

The assessment team believes there these two WOs, and the problems they are intended to fix, present an opportunity for learning and perhaps identification of a common failure cause or contributing cause, with the possibility of improvement of future maintenance or operating activities.

The assessment team believes the radwaste system could benefit from a review of overall condition and the timeframe for the multiple actions needed to restore the BAE #2 to service. This may be an instance where the work prioritization and / or scheduling process for maintenance work is not leading to the desired outcome of an operable evaporator.

Boric Acid Addition *

This system was of interest because it has been in Yellow system health condition for many reporting periods.

The system has an approved Maintenance Rule a(1) action plan, but it was rated Yellow because the BAAT Room radiant heated\r Condition Monitoring Criteria were exceeded at the time of the close of 2Q 2008. Since that time, the work associated with replacement of heater groups A and H has been completed, and the remaining testing/closeout for all the heater replacements has also been completed.

There are no conditions or work items that would prevent the system from being rated White remaining at the time this report is written.

The two items required to be completed to bring the system to Green condition, Field Implementation of Secondary BAAT Room Radiant Heater Reliability Improvement ECP, and Develop and Implement E2 480 VAC Unit Sub High Impedance Ground ECR, are both currently scheduled for RFO 16.

Fuel Handling

This system was of interest because the health rating had been Green in 4Q 2007, but declined to White in 1Q and 2Q 2008.

The White health rating was on the judgment of the system engineer, who maintains that the system cannot be given top grade because of "..administrative limits placed on fuel handling equipment that prevent it from operating at optimum efficiency which affects the overall time required to perform refueling operations.." which are due to design deficiencies associated with reactor fuel.

The health improvement plans include actions to

- In RFO 16, replace the existing Main Fuel Handling Bridge (MFHB) guide bars with new guide bars that provide increased face-to-face clearances and tapered ends. This should minimize potential fuel assembly damage and allow less restricted up/down speed, and
- In 2009, replace the fuel transfer mechanism baskets with slightly larger baskets that can accommodate bowed fuel assemblies, and
- In RFO 16 adjust the MFHB System Voltage Monitor to the vendor-recommended setpoint to correct tripping due to incoming line voltage spikes.

These changes are anticipated to reduce fuel handling time by 24 hours, 28 hours, and 4 hours respectively.

The system engineer had caused selected fuel handling equipment to be removed from containment at the end of RFO 15 to permit replacement of electrical relays, maintenance, and testing during the current power production cycle. This is a good practice.

The five, ten, and fifteen year plans for this system appear to address activities that seem appropriate to maintain and improve fuel handling system reliability.

Observations – Program Health (3)

The assessment team noted that several engineering programs had yellow health for one cornerstone, and one program was indicated to be in Yellow health overall.

Program	Yellow cornerstone	Program Health	SEPO/BU qualified?
Appendix J test	Program Personnel	White	Fully Qualified/ named but not qualified
MOV Program	Program Personnel	White	In qualification/ Fully Qualified
Snubber	Program Personnel	**Yellow**	Fully Qualified / No BU named
PM	Program/Equipment performance	White	Fully Qualified/ Fully Qualified

FENOC Engineering had developed an overview of program Health (Engineering Programs Program Health Report Update 2nd Quarter 2008) and the Technical Services Peer Team had met August 8, 2008 to review and evaluate the health of programs across the system.

The 2Q 2008 Program Health Report reveals that for the three programs with yellow Program/Personnel cornerstones, two have had scores for this cornerstone equal to or lower than the present score for four quarters in a row (App J and MOV) and the Snubber Program has been Yellow in that cornerstone for two of the last three quarters. This performance history would be a good subject of some sort of cause analysis.

CR08-46289 Davis Besse Engineering Program Yellow Cornerstone – PHR – 2nd Quarter 2008 was initiated on September 15, 2008 The CR noted that a CR is not required for a yellow program cornerstone (if the program is not Yellow or Red). The CR did a good job of identifying problems in program health: It noted the programs which had Yellow rated cornerstone health (Appendix J, MOV, PM). It indicated which cornerstones were yellow and why, and noted "*...yellow cornerstones are a precursor to a yellow program and require corrective actions to address the PHR noted areas of concern*" Thus the CR set the stage for action to prevent these programs from going Yellow overall.

This CR was categorized AF, and as of the time of the assessment, no further action had occurred.

CR08-46095 Snubber Program Health Graded as Yellow was initiated 9/11/08. The CR noted that a CR is required when a program is graded Red or Yellow per NOP-SS-2101. The CR was categorized AC.

The immediate action for this CR was to dismiss it. The Immediate Actions Taken statement indicated it was an administrative issue that has no effect on snubber performance, that no adverse condition exists, that the reason the program is yellow is due to poor peer communication, that the problem has been recognized by the program owner as an area that need to be improved, and that the CR will be closed to trending.

The 2Q 2008 program health report shows that peer interaction for the Snubber Program has had the lowest possible score for three quarters in a row now (3Q

2007 to 2Q 2008). This CR could have been used to discover why such a problem could be reported for several quarters in a row without any effective corrective action taking place, and to examine the implications of such a problem. But the quick closure of the CR resulted in a lost opportunity

Simply having a peer meeting in the quarter would have met the intent of the program in that area and allowed the program to avoid scoring Yellow overall, yet that action was not taken. Responsible supervisory and management personnel knew or should have known, and could have taken action.

In the relatively small number of CRs reviewed, the assessment team encountered two examples (this CR08-46095 and CR08-45502) of the usage of the practice of closing CRs when "no adverse condition exists". This approach could deny the organization the opportunity to learn important lessons about the causes of departures from management expectations and performance excellence. Further, it could, unless used with considerable skill and supported by highly effective communication about the intentions, cause personnel to form their own opinions about how receptive the organization will be to CRs written to attempt to address issues that may not be adverse conditions, strictly speaking, but well worth addressing nevertheless.

Program health monitoring and health measurement processes are in place at Davis-Besse and throughout the industry because strong programs are an important barrier to equipment degradation and challenges to safety performance. Programs can be in trouble and need effective management and corrective action before the hardware the program addresses begins to lose functional capability. In that case if action is not taken effectively and promptly to fix the program, the effect can sometimes propagate into hardware problems.

In discussions about the MOV program, an apparent failure of MOV FW601 was reviewed. Several CRs had been written to address various aspects of this MOV test failure, but none had addressed a process issue the team felt was important. The vendor of the Teledyne test equipment used at Davis-Besse had notified FENOC of a problem with the test equipment's software. When the test of FW601 was run, it appeared to have failed based on the information from the test equipment. . CR 08-34203 (AL) indicated the apparent cause was a software anomaly embedded into the written code. However, since the vendor had previously notified FENOC of this problem and offered a fix, the team inquired why the fix had not been implemented, and questioned whether there was a vendor information management process problem. CR 08-47319 COIA-ENG-2008 Untimely Vendor Notice Implementation Results In MOV Test Failure was written to report the fact that vendor information was available to Davis-Besse which, if it had been used in a timely manner, would have prevented this apparent MOV failure. However, since the CR was categorized AF, no cause analysis will be performed and it is unlikely that any improvement in the vendor information process will result.

In further follow-up discussions with members of Davis-Besse engineering management it was discovered that vendor information currently resides in three different databases which require different search and query techniques. Thus, human errors in searching for vendor information are more likely than if the information were available in a single consolidated database. This issue was not addressed at all in CR08-47319

The team has noted three instances in which engineering personnel made mistakes in their work because they were unaware of vendor technical information. (CR07-26552, CR08-43843, and the above-mentioned CR08-47319.

Specific Issues for This Area (3)

This section contains issues that do not rise to the level of findings, but that could be taken as Improvement Opportunities.

Accomplishment of red/yellow coded work for system health restoration continue to be challenged by pressure to remove work from work week schedules.

New or improved PMs developed in the recent PM template development project will be in the pipeline for initial execution for many years, so the PMs and equipment that needs PMs on a priority basis need to be identified and executed

The process that system engineers go through to formulate, gain approval for, and execute system health improvement plans and activities (modifications and maintenance) is complex and challenging to use. Process simplification with the objective of finding ways to allow the SEs to accomplish their work more easily might help reduce the long lead times observed in the past for accomplishment of system health restoration work.

The plant computer system continues to be troubled by functional failures and difficulty in executing the system health improvement plan.

The team noted CR08-40935 which documented elimination, in 2003, of a method to perform a manual plant heat balance calculation, which could be used in the event the computer calculation became unavailable. The CA is to revise DB-NE-03230 to incorporate a method of manual heat balance calculations that does not use computer points. The process by which the ability to perform such a backup calculation could be eliminated, without recognizing when and how it might be needed, would seem to be flawed. However, the CR is an AF, which does not require any sort of cause analysis.

The restoration of the radiation monitoring system will take many years and the path is not fully approved or developed at present.

Davis-Besse's not-fully-implemented Equipment Reliability program, and the tendency to treat problems, both equipment and other, as isolated broke/fix

issues, are likely reliability-inhibiting factors. The team would encourage Davis-Besse to take a long, hard, and broad look at the reasons for recent declines in system health of systems that have been healthy for a long time to determine and address any common causes or collective significance. Factors to be examined would include equipment care and the influences of programmatic requirements and management practices.

Davis-Besse might benefit from a review of the tools and techniques available for determining the cause of equipment failures when the usual investigative techniques haven't allowed the cause of failures to be determined. A collective significance evaluation of equipment failures whose causes could not be determined might be a good starting point (nature of failures, factors preventing cause determination, etc.).

The assessment team notes that each of the six additional issues identified in the EACE for CR 08-43843 (see above) provides an opportunity for learning and process/procedure and human performance improvement if it is evaluated more thoroughly than "broke/fix".

The assessment team has previously pointed out that the data provided in the report card section of the system health reports is unreliable. More information can be found on this subject in section 1.5.2.6 in the discussion of CR 07-29907, IO #5 Plant Health Report Data Anomalies Need To Be Resolved of this report.

The NNI system Health Report notes (2Q 2008 report page 267) *"Several Modules in the Non-Nuclear Instrumentation System (NNI) have not been refurbished and at this point there is no plan for replacement of the system. Symptoms of aging have been reported such as degraded/darkened circuit boards. The NNI System provides the input signals to the ICS and thus needs to be in good health in order to ensure reliable operation of the ICS"*

The interplay between the system health improvement planning process and the processes for 1) achieving approval for technical concepts, 2) obtaining funding for modifications or major maintenance activities, and 3) detailed execution of health improvement activities makes it difficult for a system engineer to accomplish the activities called for in the system health improvement plan. Management attention and support are required to supplement the efforts of the system engineer to effect the remedies to system health issues envisioned in the plan.

The two WOs for replacement of pumps in the radwaste system, and the problems they are intended to fix, present an opportunity for learning and perhaps identification of a common failure cause or contributing cause, with the possibility of improvement of future maintenance or operating activities.

The radwaste system could benefit from a review of overall condition and timeframe for the multiple actions needed to restore the BAE #2 to service. This

may be an instance where the work prioritization and / or scheduling process for maintenance work is not leading to the desired outcome of an operable evaporator. If this is the case, the implications could be explored to discover better ways to effect system health improvements.

There is no protocol corresponding to the Equipment Apparent Cause Evaluation (EACE) template for considering the implications of equipment failures or CRs affecting equipment and system health in areas such as process and procedure content and human performance. In the human performance area, inquiry into the areas of management expectations, procedure and work document instruction complexity, scope, and clarity, and the presence of conditions creating error prone situations have proven quite useful, in the experience of assessment team members. The Davis-Besse engineering organization has a significant human performance improvement initiative underway, but rarely looks into the human performance implications of the CRs it initiates or dispositions.

CR08-46289 Davis Besse Engineering Program Yellow Cornerstone – PHR – 2nd Quarter 2008 did a good job of identifying problems in program health: It noted the programs that had Yellow rated cornerstone health (Appendix J, MOV, PM). It indicated which cornerstones were yellow and why, and noted "*...yellow cornerstones are a precursor to a yellow program and require corrective actions to address the PHR noted areas of concern*". This CR was categorized AF, and as of the time of the assessment, no further action had occurred. There is a history of yellow performance in the personnel cornerstones that might be overlooked and the causes not addressed,

The team also noted CR08-46095 Snubber Program Health Graded as Yellow, which was initiated 9/11/08. A CR is required when a program is graded Red or Yellow per NOP-SS-2101. The CR was initiated, but then was categorized AC, and using the immediate action statement, it was dismissed. While it is true that snubber performance has not evidenced a decline in capability, the program is intended to act as a barrier to equipment degradation, and it is the performance of the program barrier that was the subject of the CR. The reasons for the program barrier degradation, which took place without effective management recognition and intervention to avoid program score degradation to Yellow, and also for missing that implication in dispositioning the CR, would be good subjects for evaluation.

CR 08-47319 is unlikely to determine why available vendor information was not effectively utilized to upgrade Teledyne Quicklook II software before a vendor-reported software problem caused an apparent failure of FW601, because the CR is categorized AF. Also, the CR makes no mention of the human performance challenge posed by three different vendor information databases (on different platforms) with different associated search techniques, and is thus unlikely to stimulate any improvement in the work tools provided in this area. The team has noted three instances in which engineering personnel made mistakes in their work because they were unaware of vendor technical

information. (CR07-26552, CR08-43843, and the above-mentioned CR08-47319).

Findings for This Area (3)

There were no Strengths, AFIs, or ANAs for this assessment area.

Cross Cutting Findings Applicable to This Area (3)

None

CRs issued during assessment of this area (3)

CR 08-47319	Untimely Vendor Notice Implementation Results in MOV Test Failure

CRs initiated during the 2008 assessment are described in detail in Section 1.5.3

1.5.2.4 Use of the Corrective Action Process (CAP) by Engineering (4)

Area Effectiveness Rating (4)

The Independent Assessment Team's overall rating for the Corrective Action area is **Effective**. Corrective action backlog steady state goals for CR investigations and for corrective action implementation are being met. The backlog reduction goal was meet during the third quarter of 2007, and backlogs remain below the steady state goal. Engineering's implementation of the CAP is very good to excellent.

Source Information (4)

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Sections 1.6.1 and 1.6.2).

The 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. Additionally, a sample of Engineering root cause analyses, and full and limited apparent cause analyses performed since the last assessment were reviewed.

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

Since there is a separate Confirmatory Order Independent Assessment of the Corrective Action Program, the team did not assess the corrective action process, per se, and focused on the implementation of the program within Engineering.

Observations for This Area (4)

Efforts to reduce the Corrective Action backlogs to "steady-state" levels were completed in the third quarter of 2007, and backlog levels have been maintained below the goals since.

The team found that Engineering was promptly initiating Condition Reports when appropriate..

Condition reports appeared to be appropriately classified as Significant or Adverse. Issues that are not considered Adverse to Quality are documented and tracked through SAP notifications. The type of actions included requiring root cause analyses ("SR" or "AR"), full apparent cause analyses ("AA"), limited apparent cause analyses ("AL"), and no causal analyses required ("AF",) and closed to trending ("AC")., The items chosen for root cause, full apparent cause and limited apparent cause analyses appeared appropriate.

One root cause evaluation was reviewed:

- CR08-32521, Pressure Boundary Leak Found During DH Drop Line Weld Overlay

  This event involved a primary system leak found during weld overlay of stress-corrosion-cracking susceptible area where the Decay Heat removal system attaches to a primary loop. The leak, which was characterized as a slight weep, was the result of an axial crack of approximately 1.75 inches. It is believed that the weld overlay activity was the "final straw" that caused the crack to propagate through the pipe wall to the surface, and for the leak to occur. The most probable root cause was determined to be stress corrosion cracking. A definitive root cause was not provided since the affected areas were not removed and sent out for analysis.

  The root cause analysis did an excellent job of identifying all potential causes including fatigue, a previously undiscovered existing flaw, thermal stress, and stress corrosion cracking. The analysis was well presented and not only supported the root cause selected, but provided convincing arguments as to why the other possible mechanisms were not the cause of this condition. Although the root cause was listed as the "most probable", the arguments presented support that conclusion with near certainty.

The corrective actions were appropriate for the root cause. Additionally, corrective action included the need for an industry Operating Experience notification.

Overall, the team judged this root cause analysis to be clear, concise and meeting station expectations.

Two full apparent cause evaluations were reviewed:

- CR08-36528 Probable Feedwater Heater Tube Leak In Train 1 High Pressure Feedwater Heaters

  The event occurred while the plant was at full power and resulted in a 5% derate (to 95%) to mitigate the effects of failed FWH tubes. Investigation identified two failed tubes, sheared off near the tube sheet, one with 35 inches of tube missing and one with 3 inches of tube missing from Stage 5 FWH. Recovery of the missing material was not possible, at this time. The failed tubes, and those immediately adjacent were plugged, and the plant returned to full power.

  Apparent cause of the tube failure was not fully determined and believed to be either fatigue failure due to flow-induced vibration or crevice corrosion near the tube sheet. The determination of the exact mechanism was impossible due to the lack of inability to retrieve the failed tube material.

  The apparent cause was supported by a Failure Modes Analysis (FMA) and an Equipment Apparent Cause Evaluation (EACE). Both were well done and comprehensive. The FMA eliminated some causes, for example, foreign material impingement, but was unable to identify the failure mechanism with certainty. The EACE examined the equipment classification and preventive measures and reached no conclusions since the exact nature of the failure is unknown. However, it did indicate that it was probable that such failures should be preventable with appropriate monitoring. The area around the tube was identified as particularly difficult to monitor.

  The previous experience/industry operating experience review identified that a similar event had occurred at the station in another feedwater heater stage in 2005. A corrective action to develop a comprehensive strategy for maintaining FWH performance had not been implemented. This failure was considered a contributing cause related to lack of effective corrective action.

  Corrective actions appear appropriate and addressed both the root cause (the immediate actions) and the contributing cause (inadequate CA, failure to implement a comprehensive strategy for FWH performance.

  Overall, the team judged this apparent cause analysis to be clear, concise and meeting station expectations.

- CR 08-34065 DB0SC003022 Breaker 34562 Closed And Reopened

This CR was for an event that resulted in flashover over the A and C lightning arrestors for transformer SUT X02 when conducting switchyard testing in preparation for restoring the connection to the main grid. The electrical failure caused a momentary plant voltage transient that tripped a number of plant components.

First Energy Planning & Protection (FEP&P) staff was called in and assisted the Problem Solving and Operational Decision Making Team, as well as the Root Cause Analysis effort. From FEP&P, it was determined that sustained over voltage condition had occurred for approximately 20 seconds after the lockout of X02 approximately one hour before the failure occurred. Analysis indicates that this is consistent with the conditions that cause a phenomenon known as ferroresonance. During ferroresonance, voltage nearly twice the line voltage is induced, exceeding the design voltage for the arrestors and causing them to fail. When the breakers were closed approximately one hour later, the flashover of the failed arrestors caused tripping of the Beaver line and tripping of some plant equipment during the resulting transient. Ferroresonance required conditions include:

1. capacitance
2. iron core inductance
3. low resistance
4. voltage source

The capacitance condition is provided by the 60+ mile long line to the Beaver substation. No breaker or other isolation mechanisms are provided for this line. The other elements are present normally during lockout of X02. The source of the voltage was believed to be that breakers HX01B and HX02B were simultaneously closed for about 20 seconds. The breakers are interlocked to prevent this and breakers appear to operate normally when tested after the event.

The apparent cause of the lightning arrestor failures was determined to be a ferroresonance condition that occurred during transformer X02 lock-out (approximately one hour before the circuit was reenergized. The reason that the B lightning arrestor did not fail was investigated but could not be determined with certainty, but a wave trap installed only on the B phase may have prevented the resonant condition.

The cause of the condition that allowed breakers HX02B and HX01B to be closed simultaneously for approximately 20 seconds could not be determined, and is assumed to be control circuit failure. A corrective action has been established to continue investigating these control circuits (inspect and test).

A review for prior occurrences identified a similar event in 2005 when the same test was conducted, and no occurrence in 2006 when the test was run. It was concluded that ferroresonance was the probable cause of the 2005 event. No industry events were identified. (An OE notification was issued by Davis-Besse related to this event.)

Corrective actions appear appropriate and a direct relationship to the apparent cause is evident. Contributing causes are not required for apparent cause evaluations, and none were provided. However, failure to identify this phenomenon in 2005 and take corrective action contributed to the recurrence of this event.

Since this condition represents a phenomenon not previously discussed or addressed in the System Description, the team asked whether the System Description should be updated and a reference to this CR (or OE resulting from the CR) to capture this new information. The preparer indicated that a System Description update would be considered.

Overall, the team judged this apparent cause analysis to be clear, concise and meeting station expectations. Those aspects of the investigation for which the cause was not determined were addressed in the corrective action.

Three limited apparent cause evaluations were reviewed:

- CR 07-30673, Potential for Insufficient Battery Margin and Surveillance Test

  This CR was issued during the NRC CDBI related to concerns related to whether there was sufficient margin for station batteries and whether the acceptance criteria in the surveillance test were sufficient. The CR lists six specific issues raised during the CDBI.

  The investigation focuses on the technical aspects of the issues raised and attempts to resolve those issues where possible. It focuses on Calculation C-EE-002.01-010 weaknesses, but appears to ignore whether the USAR minimum cell voltage (1.75V) and the Surveillance Test Acceptance Criteria need to be modified. However, the apparent cause was determined to be lack of rigor in documenting DC loads in the DC calculation. A contributing cause was determined to be that the size and complexity of the calculation was challenging.

  The apparent cause only addresses the two issues where DC loads were improperly documented (DC EDG FO pump not included & EDG field flash not included in the right time frame). The other issues are not addressed by this apparent cause and only partially addressed by the contributing cause. Issues not addressed include using field data that might not be conservative, not accounting for harsh environments, and not taking appropriate corrective action to a previously identified issue.

The corrective actions appear to cover the conditions described but do not address the lack of rigor issue or the calculation complexity issue.

In the opinion of the team, the apparent cause of this situation was an inadequate interface with the vendor who prepared the calculation and an inadequate review and acceptance process that accepted this calculation. There are potential lessons to be learned from this calculation that are not explored or identified. This is an example where an underlying process issue (control of vendor activities and products) has not been addressed.

Also, in the opinion of the team, any revision of this calculation should address each IEEE 485 requirement (e.g. design margin) in a manner that is clear and unambiguous. The data analysis indicates there were some inconsistencies with IEEE 485 related to battery margin (15%) and such factors as temperature and aging, which appear to be part of the 15% but IEEE 485 treats them separately.

Overall, the team judged this apparent cause analysis to be weak in that it did not address process weaknesses. Some aspects of the condition do not appear to have been analyzed. Additionally, the apparent cause and contributing cause are general in nature and do not address the inadequacy of the verification of design inputs and the weakness in the owner acceptance processes for vendor prepared products.

Overall, the team felt that the causal analysis was not performed in sufficient depth to identify a process issue (waiving a DIE review when an impact existed) not a procedure content issue was the identified cause of this problem. Though limited apparent cause analyses are not intended to be to the depth of analysis of a root or full apparent cause, the team feels that an opportunity to identify (and correct) a process issue with waiving DIE reviews was missed.

- CR 08-37023, DB-SA-08-023 Site IPA-Emerging Trend Noted In Area Of Equipment Degradation

  This CR documented an apparent trend from an IPA. The CR identified 48 Condition Reports compiled from several IPAs that were the basis for the potential adverse trend in equipment degradation. The analysis of the failures concluded that there was no adverse trend because most of the items identified as "equipment degradation" were either not equipment degradation or not critical components. The CR concluded that there was no adverse condition and therefore no action required. The team agrees with that analysis. However, there was an opportunity to address the issue of CRs being inappropriately considered as "equipment degradation" and the binning process. Several examples of inappropriate coding of functional location and cause of failure were identified. The failure to screen out non-critical

components was also a factor in binning for trend analysis. The team felt that this was an opportunity to address process weaknesses and improve the process. Discussions with the preparer indicate that some feedback was provided to staff that codes Condition Reports to improve the accuracy of coding. This was not discussed in the CR or listed as a corrective action.

- CR 07-30718, CDBI, Close To A Notification W/O Due Date

  This CR was issued after follow up to an NRC question during the CDBI identified that a corrective action to CR 03-10130 to implement periodic testing of minimum pickup voltage on contactors and relays. The corrective action had been considered an enhancement ("NF") and closed to an SAP item in 2004 in accordance with the guidance related to removing "NF" items in CREST. The SAP item had not been scheduled, and as a result, the testing had not been implemented. The apparent cause was that the item had been inappropriately classified as "NF" originally. Corrective action was taken to create a Corrective Action to address the implementation of the periodic testing. This determined to be an isolated case by the limited cause investigator based on discussions with corrective action program staff. It was concluded there have been numerous reviews of the DB corrective program and this issue has not been identified previously. The team agreed that the apparent cause, extend of condition, and corrective action was appropriate.

Specific Issues for This Area (4)

This section contains issues that do not rise to the level of findings, but that could be taken as Improvement Opportunities.

The team assessment was structured to avoid duplication with the recently completed Corrective Action COIA. The team focused on implementation of the program by Engineering. Process issues found in the Corrective Action COIA should be considered as equally applicable to Engineering.

The analysis and corrective actions taken for CRs related to the 2007 COIA are assessed in Area 6.

There were no specific issues in this area.

Findings for This Area (4)

None

Cross Cutting Findings Applicable to This Area (4)

None

CRs issued during assessment of this area (4)

None

1.5.2.5 Effectiveness of Assessment Process (5)

Area Effectiveness Rating (5)

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 (5)

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Sections 1.6.1 and 1.6.2).

The team reviewed the following self-assessments:

Number	Title
DB-SA-08-015	Reactor Engineering 2nd Half IPA
DB-SA-08-012	Plant & Equip Reliability Eng 2007 2nd Half IPA
DB-SA-08-059R1	Operations 2008 First Half IPA
DB-PA-08-02	Oversight Performance Report – 2nd Qtr 2008
DB-SA-08-045R1	15 RFO Design Modifications
DB-SA-08-058R1	Maintenance 2008 First Half IPA
MS-C-08-01-13	Fleet Oversight Audit Report - Engineering
MS-C-08-04-15	Fleet Oversight Audit Report – Reactor Engineering
DB-SA-08-078	Critical Component Failures
DB-SA-08-032	Operational Chemical Control Limits
DB-SA-08-044	Pre-INPO EP Self-Assessment
DB-SA-08-072	Davis-Besse Site Summary IPA - 2008 First Half
DB-SA-08-062	Plant & Equipment Reliability Eng IPA - 2008 1st Half

Number	Title
DB-SA-08-055R1	Design Engineering IPA - 2008 First Half
DB-PA-07-03	Oversight Performance Report – 3rd Qtr 2007
DB-PA-07-04	Oversight Performance Report – 4th Qtr 2007
DB-PA-08-01	Oversight Performance Report – 1st Qtr 2008

Observations (5)

In 2008, 17 engineering related self-assessments were scheduled and 12 reports were available at the time of the 2008 COIA. One of the assessments was still in draft form and unsigned, but was essentially complete and considered available. Two assessments were Cyber Security assessments and not available for that reason. One assessment had been delayed due to other workload and it was not a time depended assessment. Two assessments were scheduled after the start of the COIA and not requested.

The assessments did not indicate that the 2007 ANA issue with implementation and timeliness persisted into 2008. The lack of an overall strategy does persist despite attempts by INPO and the CNRB to get the message through.

A review of ten engineering related assessments, (3 Oversight, 5 IPAs and two snapshot) was performed and the following noted:

- The Independent Performance Assessments appeared to be critical and resulted in identification of areas to improve.
- The use of external assessment team members to gain outside perspective of engineering effectiveness was quite limited.
- This COIA is one of only two focused assessments scheduled for Davis-Besse engineering in 2008.

The Design Basis Assessment Report is produced quarterly and assesses the health of design engineering section design basis, engineering programs, calculations, drawings, design criteria manual, engineering quality, and engineering workload activities. This practice provides management with a thorough periodic review (self assessment) of key design basis health issues.

Integrated Performance Assessments are performed by each Engineering Section twice each year. This practice establishes a consistent process for trending human, organizational, and program performance by binning and analyzing condition reports and other assessment information. The aggregate information is presented to the management team and later "rolled up" to the fleet

level. It should provide early warning of isolated issues that may be occurring but are spread across the fleet and hard to detect or correlate.

Four DB Fleet Oversight Quarterly Reports were reviewed for engineering issues and are listed above. These were Quarterly Quality Assessment reports for Q3-2007, Q4-2007, Q1-2008 and Q2-2008. The assessments covered the following engineering areas: WANO AFI Issue, nuclear fuel, 15RFO, boric acid corrosion control (BACC), MTSV issue, equipment reliability, system health reporting and staffing levels. Only the 2008 reports were comprehensive enough for an Engineering rating, which was Effective for both reports. Condition reports were generated as necessary.

Two DB Fleet Oversight Audits for Engineering areas were reviewed and are listed above. These audits covered design control, equipment reliability, engineering programs, NRC performance indicators, reactor engineering, test control, nuclear fuels and engineering overall. Davis Besse areas were rated Effective/White and condition reports were generated as necessary. In particular, MS-C-08-05-15 covered the Test Control Program and 6 CRs were written for this area at Davis Besse. The audit did not cover the procedures that control Post Modification Testing or review this area in detail but did issue one CR due to a procedure violation to process test results as a quality record for a test required as a result of the generator rewind.

The receptivity, responsiveness, and aggressiveness of management and staff to resolving issues raised in self-assessments were evaluated by conducting interviews of engineers, oversight personnel, and managers. In addition, several condition reports and SAP notifications for 2007 and 2006 self assessment items were reviewed to evaluate aggressiveness to address issues. The sample revealed CR are generally quickly closed, but many of them are coded AF (no cause investigation) and are often closed without further actions. . Overall, the results of the interviews and CR/notification review of previous years' self assessments indicated management was aggressively addressing the issues generated by the self-assessments. An integrated strategy may help get more benefit from the assessments by prompting more cause coding for the CRs because there is a defined mission for the assessments.

Engineering management should develop a long-range strategy for assessments. This issue was documented in CR 07-29895 (COIA 2007 ANA 5). It was also noted in COIA 2006 that this condition (no articulated strategy) has persisted since the first COIA for Engineering:
"The assessment team was not able to determine the station's strategy for selecting assessment areas. The Fleet and station develop schedules for focused and snapshot self-assessments but there is no strategy guidance that we have found after inquiring for the past two COIA assessments. It was noted that in 2005 several focused self-assessments were related to engineering subjects, but in 2006 there are none scheduled. The review of the 2006

Oversight Quarterly reports indicate that the only primary element reviewed for engineering to this date was the area of Reactor Engineering and Fuels."

Observations - Section 5.f of the 2008 COIA Assessment Plan

The 2008 COIA Team was specifically asked to:
"Review progress to date of Davis-Besse's initiative to develop and implement an integrated approach to improving engineering quality, including corrective actions taken in response to the cross-cutting aspects of Human Performance/Resources/Long-Term Plant Safety associated with the Green Non-Cited Violations identified during the 2007 NRC Component Design Basis Inspection. This review will assess the comprehensiveness of the actions identified, progress on implementation of the actions, and an assessment of their effectiveness to date."

The problems being solved by the DB (and Fleet) initiative are:

- CDBI findings and findings from the preceding self-assessment
- WANO AFI for Design Change Package Weakness
- Various other minor quality issues with Engineering products

Human Performance Issues are the challenge to Engineering Quality based on management's sense of the collective significance of the problems.

FENOC has initiated an approach to improving quality with a plan that includes a number of Human Performance Initiatives. Based on interviews with DB senior Engineering management the COIA Team believes that the following are either within the scope of the initiative or are being carried out at the same time, and reviewed them for effectiveness.:

1. Station Clock(s) resets (NOBP-LP-2602-07)
2. Senior Consultant level engineer, the Section's HP Advocate assigned to Electrical Design to address identified knowledge gaps
3. Fleet Design Engineering Peer Group excellence plan focus area
4. Excellence Plan gap analysis
5. Fleet Engineering Product Quality Review business practice (See # 17)
6. Engineering staff training in HP tools (CA 07-26486-1)
7. Engineering Dept. morning meeting includes focus on HP Tools
8. Design Engineering Manager will review the issues and expectations on the use of HP tools (CA 07-31120-8)
9. Needs and Performance Gap Analysis per NOBP-TR-1102 to determine if Training is appropriate to resolve HP gaps (CA 07-31120-9)
10. Benchmark other stations regarding methods to track progress (CA07-26486-2)
11. Present Action Plan to Sr. NRC Resident Inspector
12. Use metrics to track improvement progress

The above are in the Cross Cutting Aspects Performance Indicator Gap Closure Plan for H.2(a)

13. Design Engineering staff directed to attend NRC exit briefing
14. AFW Pump Issues communicated with the DBMS group (CA 07-30698-4)
15. EAB – CDBI gap analysis and EAB changes (CR 08-37002)
16. Engineering Product Review (Scorecards) NOBP-CC-2006

The above 4 items are from the May Action Plan (That are not on the Cross Cutting Aspects Performance Indicator Gap Closure Plan for H.2(a)

17. INPO Workshop takeaway – Procedure of the Month
18. RFO MOD Meetings discuss HP
19. Engineering staff Observations program (NOBP-LP-2607)
20. INPO HP Training for Supervisors
21. Human Performance Handbook
22. Mis-positioning Review Committee – Ops
23. Monthly HP Meeting
24. FENOC Engineering Fundamentals and Human Performance Leadership Team
25. DBEI Personnel changes – additional experienced engineers added

The above 9 items are from management and interview discussions, including the "Integrated Approach to Improve Engineering Quality" presentation provided by the Director, Site Engineering.

The NRC CDBI cross-cutting aspects are all Human Performance, Resources, because the licensee failed to maintain the long term plant safety by maintenance of design margins (H.2(a)), which applied to the following findings.

- Verification of the adequacy of design with respect to the battery voltage drop calculations was inadequate

- The design basis analysis for the transfer of the emergency core cooling system pumps from the borated water storage tank (BWST) to the containment sump did not address the potential of air entrainment under the most limiting conditions

- The design basis analysis for the turbine driven auxiliary feedwater pumps suction pressure switch setpoint did not adequately evaluate a postulated failure of the pumps' common suction piping in the turbine building

- The licensee failed to verify and ensure that the 125 VDC safety related batteries would remain operable if all the inter-cell and terminal connections were at the resistance value (150 micro-ohms) allowed by Tech Specs surveillance requirement

In the area of Design Change Package Weakness [WANO 2007 AFI CM.3-1 (CR 07-261486)], completed Corrective Actions include; reinforcement of human performance tool usage, benchmarking assistance through INPO's Human Performance group, and the approval of NOBP-CC-2006, "Engineering Product Review", which provides a method for the Design Engineering supervisors to measure the quality of the preparation of various engineering products.

A self assessment performed during this IPA review period determined that the quality of 15WO Engineering Change Packages was greatly improved over 14RFO ECPs; which was the focus of the WANO AFI.

The previous IPA report identified an Area-For-Improvement in the area of Potential Human Performance Issues as noted by the NRC (CR 07-31120). This CR documented the results of the NRC Component Design Basis Inspection, which identified four cross-cutting aspects in the area of Human Performance, Resources. An action plan; which was developed and discussed with the NRC, has been implemented and continues to be monitored.

A more detailed walk through of INPO 05-002, "Human Performance Tools for Engineers and Other Knowledge Workers", is being followed in these ECP development meetings, along with the expectation that each ECP go through a Pre-Job Briefing Card as part of package development.

FENOC Engineering recently approved a new Business Practice, NOBP-CC-2006, "Engineering Product Review", which applies to ECPs and calculations. This Business Practice offers several advantages currently not in place. Specifically, the Cognizant Engineering Supervisor performs a review of the engineering product. This allows the supervisor to directly interface with the originator and to reinforce the behaviors and expectations. While the Engineering Assessment Board performs a high level review, this discipline specific review is tailored more to improving engineering rigor. Scorecards are being utilized to promote continuous improvement of engineering products through immediate feedback of their results to the Preparer and to measure the quality of the product. These scorecards can then be used to identify weaknesses and training opportunities.

The metrics that DB has proposed to monitor the effectiveness for the overall "HP Performance Initiative" have been defined as:

1. The DB Design Engineering Assessment Report for Engineering Quality, which includes metrics for the EAB Assessment of Engineering Quality, Calculation Quality and ECP Quality.

2. The IPA process provides a review for trends in Engineering Quality based on CRs, Observations and clock reset evaluations.

3. The Engineering Product Quality Review will include evaluation and reporting on product quality "scorecard" trends from the NOBP-CC-2006 process.

The initiative actions have been reviewed by the COIA Team and we believe that they are comprehensive both in scope and diversity. They include actions that address attention to the quality of the products, and influence personnel behavior characteristics to address Human Performance issues, such as the "Scorecards" and "Observations" programs.

Good Progress has been made in implementing the initiatives, as shown by the completion of all the single event and institutionalized meeting actions and the initiation of the Observation and Scorecard programs. Results from these programs were reviewed during the COIA assessment at the station.

The actions appear to be effective based on reviews of the assessment reports that show the existing metrics. The Product Quality Review scorecard data is being collected but trending information is not yet available.

The Scorecard and Observation programs are believed likely to be the most effective programs based on experience of the assessment team members. They have direct impact on the personnel behavior and performance of the staff and supervision. If these programs are supported by management with direct examples of the expectations of quality levels and high standards, it is believed these programs can have positive effects on the engineering organization to improve overall quality.

The DBAR and IPA metrics will provide long term confirmation, but the Scorecard information can provide short term information and feedback.

The Focused Procedure of the Month and "Check Print" (highlight what was checked by the reviewer) Human Performance Tools were taken from the INPO Human Factors Workshop and show promise of helping reduce procedural errors and focus reviewers and supervisors attention on important product areas.

The implementation of the Configuration Management Information System (CMIS) is expected to help reduce minor administrative errors during the development of ECP Supplements and Design Interface Evaluations (DIEs).

Specific Issues for This Area (5)

This section contains issues that do not rise to the level of findings, but that could be taken as Improvement Opportunities.

Consider developing an integrated strategy for Self Assessments.

The Scorecard results data should be used as soon as possible to identify areas that need attention and to influence the work of all individuals.

Finding for This Area (5)

None

Cross Cutting Findings for This Area (5)

None

CRs issued during assessment of this area (5)

None

1.5.2.6 Follow-up to ANAs from 2007 (6)

Area Effectiveness Rating (6)

The Independent Assessment Team rates DB Engineering Performance in this area as **Effective**. However, the effectiveness in this area could have been greater if some of the issues identified in the 2007 Engineering Programs COIA Report had been addressed in more depth. The Team considered performance in this area to be **not reflective of higher standards of excellence**.

The findings from the 2007 COIA were dispositioned in accordance with FENOC procedures and policies, but some of the dispositions were narrow and in some cases did not address or resolve the problems or issues reported in 2007. Performance was at a level of achieving compliance but not at a level for achieving excellence of results. Opportunities to identify and resolve issues when they could first be addressed, rather than awaiting emergence of trends, and to address process and human performance issues, were missed in a number of the resolutions of the CRs generated to address findings of the 2007 Engineering Programs COIA..

Source Information (6)

The Independent Assessment Team conducted interviews of selected Engineering and Site personnel and reviewed selected documents from the reference library (See Sections 1.6.1 and 1.6.2).

The team reviewed the actions taken on last assessment's Areas in Need of Attention (ANAs) by reviewing the Condition Reports initiated to document and resolve them.

There were no Areas For Improvement (AFIs) from the 2007 COIA-ENG assessment, therefore no Condition Reports or Action Plans were required.

However, FENOC's DB CNRB recommended during the February 2006 meeting that DB use CRs to track action on the findings of the 2005 assessment, and this practice was continued in response to the 2007 assessment findings. The team considers this a good practice.

Five CRs were initiated to track response to the 2007 findings. These CRs covered each the five ANAs from the 2007 assessment.

There were five additional CRs initiated as Improvement Opportunities (IOs) based on material presented in the six "Specific Issues For This Area" subsections in Section 1.5.2 of the 2007 COIA report. These were issues raised by the assessment team for Davis-Besse's attention that did not result in either Findings or CRs during the assessment.

There were also five additional CRs written during the 2007 assessment period for conditions Davis-Besse chose to report for evaluation via the Corrective Action Program.

The team reviewed these fifteen CRs as well as additional related documents provided by FENOC for the assessment library (see Section 1.6.2). The team also interviewed a number of individuals responsible for the resolution of the CRs and for authorizing closure of the associated CR corrective actions and/or SAP Notifications for the Condition Reports issued to resolve the 2007 Findings.

The coverage of the 2007 ANA findings by the CRs generated was found to be somewhat lacking in that they either did not address or resolve the reported problem or were viewed in a very narrow sense, i.e. they did not reflect a desire to consider the general implications of the problem reported, e.g. process, procedure, and human performance implications.

The following table and the notes immediately following summarize the assessment team's observations on the findings and CRs from the 2007 assessment.

CR #	Topic	Cat	Stat	Eff	Similar findings (2)
07-29888	ANA #1 Waiver of Mandatory Design Interface Reviews (DIE)	AF	C	E	
07-29891	ANA #2 ER Program: Forecast of PM Strategy Workload, SPV analysis	AF	C(1)	**NE**	
07-29893	ANA #3 System Health Activities: Plant Computer, 480 VAC, Rad Monitor	AF	C	E	
07-29894	ANA #4 Process Weakness in Causal Analyses and Investigations	AL	C	**Ind**	**Y**
07-29895	ANA #5 Assessment Strategy and Implementation	AF	C	**NE**	**Y**

CR #	Topic	Cat	Stat	Eff	Similar findings (2)
07-29897	IO #1 Filenet Search for Calcs Lists Previous Addenda and PINS	AF	C	E	
07-29899	IO #2 System Description Maintenance Needs More Emphasis	AF	C	E	
07-29902	IO #3 Calc Utility Training not included in Engineering JFG	AF	C	E	
07-29903	IO #4 Plant Computer & 480 VAC Health improvement plans	AF	C	E	
07-29907	IO #5 Plant Health Report Data Anomalies Need To Be Resolved	AF	C(1)	**NE**	
07-26552	NORM-ER-3103-D Rev 3 does not indicate replacement frequency	AL	C	E	
07-26754	C-EE-02.01-010 Rev 30 (DC Calc) Addendum A03, Calculation Error	AF	C(1)	E	
07-26779	NNI Module Not Included for Calibration Under PM 4222	AF	C(1)	E	
07-27185	Snap Shot Self Assessment Not Finalized (Heavy loads DB-SA-068)	AF	C	**ME**	
07-27389	AOV Program Self Assessment Implementation Not Evaluated	AF	C	**NE**	

E = Effective
NE = Not Effective
ME = Marginally effective
Ind = Indeterminate
(1) = SAP or Work Order tasks remain open. There are four CRs in this condition.
(2) = Similar findings have been reported by CNRB, 2008 CAP COIA, or a DB assessment

Roll-Up of observations on fifteen CRs from 2007 COIA report.

	Effective	Marginally Effective	Not Effective	Indeterminate	Found by others also (1)
5 ANAs	2		2	1	2
5 OIs	4		1		
5 other	3	1	2		
Total	9	1	5	1	2

(1) Findings similar to those of the Eng Programs 2007 COIA have also been made by other parties for the two 2007 Eng Prog COIA ANAs which were not effectively resolved.

Observations – 2007 Areas Needing Attention CRs (6)

CR 07-29888 ANA #1 Waiver of Mandatory Design Interface Reviews (DIE)

Closed, AS, 1 CA type S, complete

The Design Engineering Manager issued a memo communicating expectations that all calcs should have in the affected documents section that reflects either that 1) System Descriptions were reviewed or 2) a DIE was sent to System Engineers to accomplish the review.

The team's review of calcs (section 1.5.2.2) indicated the desired effect was taking place. EAB review caught one calc that did not contain the statement before the assessment team arrived.

This CR was judged to have been resolved effectively (E).

CR 07-29891 ANA #2 ER Program: Forecast of PM Strategy Workload, SPV analysis

Closed, AF, 2 CAs Type S completed

No actions regarding forecast of downstream workload were taken in response to this CR, because, it claimed, "*CR 07-26478 encompasses the cited condition and the response will address the condition of not forecasting the workloads that will impact the organization downstream of the engineering analysis…*" .

CR 07-26478 was in response to a condition report that station equipment failures continue to occur as a result of shortcomings in the station's Equipment Reliability Program. CA 1 of that CR called for development and approval of an action plan addressing ten areas, including #8) "*Create a PI to monitor New, or Increased Scope, or Increased Frequency PM revisions through first performance*".

The action plan developed per CA #1 was attached to the CR, and it indicates the metric for tracking project resource impacts is due 12/17/07. This Plan was passed to SAP tracking via Notification 600423218.

SAP Notification 600423218 does not include this activity at all. Thus, at the end of the chain of activity going from CR 07-29891 to CR 07-26478 to SAP Notification 600423218, there is no response whatsoever to this issue.

A SPV Action Plan was developed, and its progress is being tracked under SAP Notification 600475580. There is no completion due date, the SPV plan is in part a plan for a plan, and several items had gone overdue at the time of the 2008 assessment. CR08-47323 was initiated during the 2008 assessment to report that due dates for work items in the SPV action plan had been exceeded and were not complete as of 10/2/08.

This CR response has not been effective (NE).

CR 07-29893 ANA #3 System Health Activities: Plant Computer, 480 VAC, Rad Monitor

Closed, AF, 3 CAs, 2 type G, 1 Type S, completed

Plan format and Content were upgraded in the 3Q 2007 Plant health Report, and a review process to maintain quality was instituted.

This CR was effective (E) in addressing the ANA issue for the three systems cited.

CR 07-29894 ANA #4 Process Weakness in Causal Analyses and Investigations

Closed, AL, 1CA, Type S, Complete

There was ample information presented in the CR and it's cause analysis to demonstrate that the issue raised by the assessment team was well understood, and also that the potential effect of not resolving the issue. ("*Failure to identify or consider related process issues in causal analyses and investigations may result in failing to self-identify and address needed process improvements, either directly or through corrective actions or indirectly through identification of adverse trends through the trending of CREST cause codes" CR07-29894 pg 1 of 2)*

The evaluation stated "*...the common cause of the examples cited...is Management (including Supervisors/Analysts) acceptance of investigations that lacked sufficient depth to identify (potential) process issues".*

The apparent cause was characterized as a Management Expectations (H04) issue in that the depth of analysis advocated by the COIA team is not routinely performed.

The corrective action was to "*review the insights provided by the COIA team ...to promote discussion of the appropriate standard for consideration of possible practices during condition report evaluation*"

This was done but it is quite uncertain whether any effect or change resulted.

NOTE: CR 08-44707 COIA-CAP-2008 Weak Cause Evals and Corrective Actions for Human Error Situations reported a similar problem.

NOTE: The unsigned draft of DB-SA-08-078 "Critical Component Failures" provided to the assessment team reported, in Other Noteworthy Items, "*Corrective action plans to prevent recurrence (CATPR) were hardware focused – neglecting process/program and procedural deficiencies*" (Pg 1 of 16)

The effectiveness of the CA for this CR is indeterminate (Ind)., as no change has been directed or detected that would enhance consideration of process implications in CR evaluations.

CR 07-29895 ANA #5 Assessment Strategy and Implementation

Closed, AF, No CAs

This CR identified implementation issues with two specific snapshot assessments and advocated development of a long term strategy for assessment of various engineering endeavors.

The CR concluded "*There are no corrective actions required for this Condition Report*"

The two specific assessment issues were dealt with via other CRs (07-27389 and 07-27185).

CR 07-27389 concluded there was no problem with the conduct of the AOV program triennial assessment.

The assessment team does not agree, and CR08-47303 was written during the assessment to report this disagreement.

CR 07-27185 reports that the report of the Snap Shot Self Assessment for the preparation for the NRC Reactor Head Inspection was approved on October 9, 2007, which "*completes the action required for this CR*"

No significant evaluation of how these two conditions came about or how to prevent the problems they represented from recurring were found

The matter of need for a strategy for assessments was evidently not understood and not addressed effectively.

The resolution of this CR was not effective (NE)

NOTE: The DB CNRB has also made the suggestion that a strategy is needed for the assessment program (CNRB 7/14/08 minutes, page 14)

Observations – 2007 Improvement Opportunity CRs

CR 07-29897 IO #1 Filenet Search for Calcs Lists Previous Addenda and PINS

Closed, AF, 2 CAs, Type I, completed

The calc submittal form was revised and engineering personnel were informed of the change. Document control checked the effectiveness of the CAs and found some personnel were still using the old form. They took action to re-inform personnel of the new form.

This CR was resolved in an effective manner.

CR 07-29899 IO #2 System Description Maintenance Needs More Emphasis

Closed, AF, 1 CA, type S, Complete

A memo issued to all DB site personnel clarifying that System Descriptions are to be kept up to date, and that this is a requirement, not an "enhancement"

This CR was resolved in an effective (E) manner.

CR 07-29902 IO #3 Calc Utility Training not included in Engineering JFG

Closed, AF, 1 CA, type Q, completed

The Engineering JFG was revised to include training and demo of proficiency re: the calc utility. All engineering personnel required to be trained (DE, PE, TS) had completed the new training as of 9/14/08 except three new hires undergoing initial training. In addition, ME and PE personnel had requested and completed the training.

This CR was resolved in an effective (E) manner

CR 07-29903 IO #4 Plant Computer & 480 VAC Health improvement plans

Closed, AF, 1 CA, Type S, Complete

Improvement to the cited system health improvement plans were defined and implemented 2007 Q3. (See the response to ANA #3 above)

This CR was resolved effectively (E).

CR 07-29907 IO #5 Plant Health Report Data Anomalies Need To Be Resolved

Closed, AF, no actions, No CAs, Notification 600429546 is still open with no "complete by" date

The CR investigation recognizes "*The tables should contain correct information that will help the engineer or end user understand the system condition*", but it also concludes there is no adverse condition, so action to change the System Health Report will be tracked in an SAP notification.

The FENOC PE Peer Group is working on this, under the SAP Notification 600429546, which is still open with no "complete by" date

The resolution of this CR was not effective (NE) as action items are still open in SAP and the problem has not been corrected.

NOTE: The assessment team discovered one situation in which a system engineer relied on information contained in the system report card information provided to him to make his system health condition determination for 2Q 2008. He used the data provided for the number of obsolete critical components, which he could not confirm and did not have time to independently develop. (see Component Cooling in section 1.5.2.3)

Observations – 2007 Other CRs written during the assessment (6)

CR 07-26552 NORM-ER-3103-D Rev 3 does not indicate replacement frequency

Closed, AL, 6 CAs Type G completed, one CA type N completed

A manufacturer of a MCCB had published a technical bulletin recommending 20 yr replacement, but that task was not included in the template.

Apparent cause was failed barrier, template team failed to use the guidance of NOBP-ER-3092 to consider and communicate the vendor's tech info. A contributing cause was that although the TB had been evaluated for DB, it was never communicated to the peer team developing the template.

The assessment team questioned whether TB should be or could practicably be, communicated to the ad hoc peer team or whether such an ad hoc team should search the vendor info for it.

The assessment team questioned if vendor information database and process are solid. Quick follow-up by Davis-Besse personnel indicated vendor information resides in three separate databases each of which requires its own search and query techniques to find vendor information of interest.

The CAs #1-6 for this CR involved notifying multiple Subject Matter Experts (SMEs) of the process problem and directing them to check if Technical Bulletins or other industry information needs to be considered for impact on templates. The CA owner did not get responses from all, but management follow-up indicated strong likelihood that there were no further instances to be discovered, so the CAs were closed.

CA #7 revised NOBP-ER-3092 to require consideration of manufacturer info such as Technical Bulletins. In response, Rev 04 contains step 4.3.3 that directs the user to validate a Component Template to the latest site and industry

recommendations. The step contains ten bullets listing "materials to consider". Technical Bulletins (from Westinghouse) are not specifically called out. Therefore, they are covered in the last bullet by the "etc." at the end of the bullet. This creates a situation where the knowledge of the person preparing the template would be called on to invoke a Westinghouse TB. This knowledge did not come to bear in the initial template development, as no one on the template peer team knew of the W TB.

See also CR 08-43843, which has another example of a task not included in a PM template (from an EPRI TR) That CR also is a case of the wrong template assigned to a component.

This CR effectively (E) addressed the specific task omission cited in the CR. The procedure revision is an improvement but it may or may not provide recurrence prevention protection because it may not provide an effective barrier to the cause.

CR 07-26754 C-EE-02.01-010 Rev 30 (DC Calc) Addendum A03, Calculation Error

Closed, AF, No CAs, Notification 600419358 still open

The electrical DE staff was informed of the problem and its implications in a tailgate session on 10/18/07. The discussion outline was well thought out.

Notification 600419358 was instituted to review all loads identified with Assumption 2.5 in attachment 32 and Appendix B6 to recapture margin or document the existence of margin formally.

The assessment team noted that the following aspects of the reported problem were not addressed 1) the assumed 100% load is highly conservative; and may restrict margin for operating the system; 2) Use of a Post-it-Note to prompt correction of a calculation error; and 3) no CR was generated for missing an error in the review of Rev 30 of the DC Calc.

The response to the CR was effective (E).

CR 07-26779 NNI Module Not Included for Calibration Under PM 4222

Closed, AF, No CAs

The calibration work was to be accomplished in RFO 15 per WO 200237383. It was not done then. It is now scheduled for week of 10/22.

The CR effectively (E) addressed correction of the error and rescheduling the work

The assessment team notes that perhaps an opportunity to address a human performance issue was missed

CR 07-27185 Snap Shot Self Assessment Not Finalized (Heavy loads DB-SA-068

Closed, AF, action taken was completion of SA the report, no CAs

The SA report was written after the CR was generated.

The CR was effective in documenting that the report was not written and then later that the report had been completed, but the team felt the resolution was only marginally effective (ME).

The assessment team notes that perhaps an opportunity to address a human performance issue was missed, in particular the matter of a management expectation being missed by a member of the DB management team.

CR 07-27389 AOV Program Self Assessment Implementation Not Evaluated

Closed, AF, No CAs

The CR concluded that the assessment scope utilized situation was acceptable, as DB procedures for development of assessment scope were complied with.

However, the AOV program triennial assessment for Davis-Besse only contained two of the eight scope areas that the Beaver Valley AOV Program assessment conducted in the same time frame (the programmatic compliance areas), and did not include the six areas from the BV assessment that required assessment activities at the DB site (implementation and execution areas).

The assessment team does not agree with this resolution, and deems the resolution of this CR not effective (NE), not being persuaded that a triennial assessment of a site's AOV program can be effective without looking at any activities conducted at the site.

Specific Issues for This Area (6)

This section contains issues that do not rise to the level of findings, but that could be taken as Improvement Opportunities.

Several ANAs were not resolved effectively (see 3 ANA below)

Two of the ANAs that were not resolved effectively have also been made by other assessment and oversight parties, indicating these issues were not uniquely the views of the Engineering Programs COIA team.

Several CRs from the 2007 COIA had actions passed to SAP notifications, and the work was not done and, in one case, lost from tracking

Davis-Besse continues to address some types of CR conditions with a narrow focus, missing opportunities for process, procedure, and human performance improvement.

CRs 07-27185 Snap Shot Self Assessment Not Finalized (Heavy loads DB-SA-068), and 07-27389 AOV Program Self Assessment Implementation Not Evaluated, may have commonalities and higher implications that were not recognized. For example, in both cases problems with the ongoing work (assessment report going late, assessment scope being developed with scope severely limited) were not recognized as they emerged, at a time when there was an opportunity to intervene in a timely manner to prevent the problems before they matured. Also, in both cases it was not recognized or reflected in dispositioning the CRs that standards of excellence had been challenged even though compliance with FENOC requirements was achieved. The late assessment report and narrowly drawn assessment scope relate to standards of excellence in the assessment performance area. The CRs accepted that the Reactor Head assessment report was done, and that the AOV program assessment scope met FENOC's requirements. In neither case did the CR dispositions indicate that the late reports and narrow assessment scopes do not meet standards of excellence or serve Davis-Besse's best interests.

Findings for This Area (6)

3 ANA Some Findings from 2007 COIA not effectively resolved

Findings are described in detail in Section 1.5.4

Cross Cutting Findings Applicable to This Area (6)

None

CRs issued during assessment of this area (6)

CR 08-47303	Disagreement with CR 07-27389 AOV Program Assessment
CR 08-47323	Action Plan for Single Point Vulnerability Not Completed by Due Date

CRs initiated during the 2008 assessment are described in detail in Section 1.5.3

1.5.3 CR summary

The table below indicates the assessment areas the seven CRs relate to.

2008 Condition Reports	Areas of Assessment					
	Modifications	Calculations	System Engineering	Use of CAP	Self Assessment Effectiveness	2007 Findings
CR 08-46856, Nonconservative Drift Interval Used in C-ICE-037.01-001 Rev 1		X				
CR 08-46931, COIA-ENG-2008: Clarification of Form NOP-CC-2003-16 R6 Training Expectations	X					
CR 08-47128, Filenet status not updated for 2 calcs after MUR		X				
CR 08-47190, Calcs not using worst case conditions or nonconservatisms justified		X				
CR 08-47303, Disagreement with CR 07-27389 AOV Program Assessment						X
CR 08-47319, Untimely Vendor Notice Implementation Results in MOV Test Failure			X			
CR 08-47323, Action Plan for Single Point Vulnerability Not Completed by Due Date						X

A summary of each of the CRs follows:

CR 08-46856 CST Level Instrument Drift Not Fully Accounted for in Design Calculation

The COIA team review of calculation C-ICE-037.01-001, CST Instrument Uncertainty, questioned whether the 18-month drift interval used in the calculation based on calibration frequency included an allowance for the grace period for the preventative maintenance action for periodic calibration (generally an additional 25%). Plant staff determined that such a grace period had not been included, but should have been, and initiated this CR.

CR 08-46931, COIA-ENG-2008: Clarification of Form NOP-CC-2003-16 R6 Training Expectations

During the review of ECPs, it was discovered that there was no procedure restrictions or training guidance that would prevent an engineer who is not 50.59 Screen qualified from deciding that a revision was not necessary for an ECP revision. This CR was written to address a minor procedural issue with the ECP revision process. The ECP revision form determines whether a new or revised 50.59 Screen is required but does not require the engineer deciding not to revise

or redo the screen to be qualified in the 50.59 process. This is only a concern when the Engineer is marking NO, that the existing 50.59 Screen does not have to be redone because this assumes that the Engineer is qualified in the process to be able to make that determination.

CR 08-47128 Calculation Status in Filenet Not Updated to Active when MUR Uprate Implemented

During review of Calculation C-ICE-058.01-008 Rev 4 A01, RPS Reactor Power Related Field Trip Setpoints, the COIA team noted that Filenet still listed the addendum (as the calculation revision status as "Pending" after implementation of the Measurement Uncertainty Recovery (MUR) Update in July. It was also noted that Calculation C-ICE-037.01-001 Revision also supporting implementation of the MUR Uprate was also "Pending" in Filenet. Subsequent investigation revealed that the calculations had not been listed as "Affected Documents" in the ECP upon implementation of the MUR Uprate. Design Engineering staff initiated a CR for this condition, and took immediate action to update Filenet status for these calculations.

CR 08-47190 Bounding Conditions and/or Conservative Assumptions Did Not Assure that Worst-Case Conditions Were Properly Considered in Design Calculations (3 Examples)

During the COIA review of calculations, a few instances were noted where the calculation had not fully bounded by worst-case conditions. The instances included:

a. The calculation drift error noted above (CR 08-46856) that used a value not bounded by the worst-case interval using the allowed grace period.
b. The results of Calculation C-EE-015.03-008, AC Power Systems, failed to meet the acceptance criteria for minimum starting voltage for a few limiting motors/electrical equipment. The deviations were judged acceptable (in the results section of the calculation) based on their small size and conservatism built into the calculation. Engineering judgment was used to conclude that the equipment would have started in these cases. However, the calculation was not updated to properly bound the conditions.
c. Calculation C-NSA-052.01-033, Rev 08, A07, HPI Pump Acceptance Curve, modeled a portion of the acceptance curve as a "straight-line". The discussion noted that although the curve was convex and a straight-line approximately was non-conservative, it was acceptable to use since the deviations were small and within the conservatism in the calculation. A more conservative (and bounding) approach would have been to determine the amount of deviation caused by the straight line approximation, and raise the acceptance line to allow for this maximum deviation.

CR 08-47303 COIA-ENG-2008 Disagreement with CR 07-27389 AOV Program Assessment

This CR was written to document the assessment team's disagreement with the resolution of CR 07-27389 AOV Program Self Assessment Implementation Not Evaluated

That disposition concluded that the development, approval, and execution of the triennial audit of the AOV program was in compliance with FENOC's applicable procedures and requirements. The assessment's scope included two of the eight assessment areas for the Beaver Valley AOV program assessment in the same time frame, and it excluded assessment of any work or documents relating to execution of the program at the Davis-Bess site and results achieved,

The assessment team does not dispute that FENOC's requirements were satisfied in a compliance sense. However, the team does not believe that a thorough assessment can be performed or should be attempted using only program programmatic requirements and only confirming that these requirements are included in the DB AOV program. The assessment team holds that a program assessment would be unlikely to identify problems with execution of program requirements at the site without looking at site documents and contacting site personnel, and that identification of such problems would be even less likely when the scope of the assessment excludes site activities from consideration.

CR 08-47319, Untimely Vendor Notice Implementation Results in MOV Test Failure

In discussions about the MOV program, an apparent failure of MOV FW601 was reviewed. Several CRs had been written to address various aspects of this MOV test failure, but none had addressed one process issue the team felt was important. The vendor of the Teledyne test equipment used at Davis-Besse had notified FENOC of a problem with the test equipment's software. When the test of FW601 was run, it apparently failed. CR 08-34203 (AL) indicated the apparent cause was a software anomaly embedded into the written code. However, since the vendor had previously notified FENOC of this problem and offered a fix, the team inquired why the fix had not been implemented, and questioned whether there was a vendor information management process problem CR 08-47319 COIA-ENG- 2008 Untimely Vendor Notice Implementation Results In MOV Test Failure was written to report the fact that vendor information was available to Davis-Besse which, if it had been used in a timely manner, would have prevented this apparent MOV failure. *(However, since this CR 08-47319 was categorized AF, no cause analysis will be performed and it is unlikely that any improvement in the vendor information process will result. See additional discussion in section 1.5.2.3)*

CR 08-47323, Action Plan for Single Point Vulnerability Not Completed by Due Date

This CR was written to document that in the transfer of the actions to be taken in response to CR 07-29891 ANA #2 ER Program: Forecast of PM Strategy Workload, SPV Analysis to tracking under an SAP notification, the completion of some ongoing and future activities under the SPV action plan went overdue without extension or revision of the plan. CR 07-29891 was closed and the CAs were indicated to be complete. The CA relating to conducting the SPV evaluation called for development of an action plan and the CA was closed. The actual work to be performed was not executed in accordance with the plan.

The resolution of this new COIA 2008 CR should address the matters of generating a "plan for a plan" and then transferring tracking of intended resolution activities to SAP, where the oversight of completion of work as scoped and scheduled is far less rigorous that in the CAP process.

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.

The table below shows a list of the 2008 findings and relates them to the assessment areas.

2008 Findings	Areas of assessment					
	Modifications	Calculations	System Engineering	Use of CAP	Self Assessment Effectiveness	2007 Findings
1 AS Workload Management Practices	X	X				
1 ANA Inadequate Post Modification Test Instructions in ECPs	X					
2 ANA Not Meeting Acceptance Criteria in AC Power System Calc			X			
3 ANA Some Findings from 2007 COIA not effectively resolved						X

Discussion of findings

None of the ANAs is applicable to more than one assessment area. By comparison, none of the five 2007 ANAs were applicable to more than one assessment area, three of the seven 2006 ANAs were applicable to more than

one assessment area, and five of the six ANA findings in the 2005 assessment were applicable to more than one assessment area. Thus the 2008 findings were somewhat narrower in applicability.

The 2008 ANA findings are not related to findings of the 2007 COIA-ENG assessment and are not considered to be repeat findings.

The 2008 AS finding 1 AS Workload Management Practices is related to the 2006 finding 7 ANA Management of engineering workload in that it is an area that went from Area in Need of Attention to an Area of Strength in the past 2 years.

Findings statements

The following section contains the findings statements and their bases.

1 AS Workload Management Practices

The workload management practices put in place the last 2 years to improve RFO modification preparation, especially the Design Engineering section's face to face work control and scheduling meetings with the staff.

The noted STRENGTH was the collection of Workload Management Practices put in place in the last two years to greatly improve DB's performance in both Outage and mid cycle modification work. These include but are not limited to:

- Scope Control Meetings
- Outage Milestones, including scope cutoff dates, which are adhered to
- Strong Project Management for Programs and large Outage Modifications
- Multidiscipline Product Review Meetings
- Weekly Supervisor meetings to discuss workload and use of spreadsheets for identifying engineers' workloads and schedules.

1ANA Inadequate Post Modification Test Instructions in ECPs.

Several examples of ECP testing requirements were found that did not meet the expectations of the reviewers. They had concerns that vague test Instructions found in the ECPs would not prompt the Planners to develop testing Instructions that are beyond Post Maintenance Testing levels.

Post maintenance testing is not considered adequate to demonstrate that the installed modifications will be able to meet all design functions and not cause unintended consequences.

There were no instances found were the testing created an adverse condition. This is considered an area to be proactive to prevent issues from developing.

The Industry Peer reviewer provided material to assist DB in addressing this concern.

2 ANA Not Meeting Acceptance Criteria in AC Power System Calc

Engineering judgment was inappropriately used in the Tier 1 AC Power System calculation to justify small deviations from acceptance criteria and judge the overall calculation results as "acceptable".

Small deviations from the acceptance criteria for minimum equipment starting voltage were noted in the results section of Calculation C-EE-015.03-008, AC Power Systems (a Tier 1 calculation). These deviations were justified based on engineering judgment concluding that equipment would still start, and, as a result, the overall calculation was considered acceptable to demonstrate compliance with design basis requirements. This practice has been in use since the original issue of this calculation and it is now up to Revision 4, Addendum A59.

As a matter of principle, calculations used to establish or confirm the design basis of the plant (Tier 1 calculations) must meet acceptance criteria. If the initial set of inputs and assumptions do not produce results satisfying this condition, then the calculation must be redone with a set of conditions and assumptions that result in the acceptance criteria being met. In some conditions (that is, with calculations having "low margin"), the new set of conditions and assumptions may result in restrictions to operations and maintenance to ensure that the plant is operated and maintained within the design basis. Attempting to justify small deviations rather than adjust the calculation does not adequately define the plant design and/or operating limits and is therefore an unacceptable approach.

3 ANA Some Findings from 2007 COIA not effectively resolved

Of the five CRs written to address ANA findings from the 2007 COIA, two were judged to have been not effective (NE) and one was judged to have been of indeterminate effectiveness in resolving the problems reported. Resolutions of other CRs for Opportunities for Improvement (OI's) and other issues were similarly not all effectively resolved.

There were fifteen CRs written during or after the 2007 COIA. Of these fifteen, five were for ANAs five were for "OI" CRs for issues identified in the 2007 report but not made findings, and five additional CRs were written during the assessment for issues recognized by Davis-Besse as needing resolution. Of the fifteen, five were not effectively resolved, the resolution of another one was only marginally effective, and the effect of the resolution of another was indeterminate. The summary table and notes at the beginning of section 1.5.2.6, and the observations on the individual CRs provide details on each CR.

Two of the ANA findings that were not effectively resolved (ANA4 and ANA5) have also been the subject of findings of other assessment or oversight bodies for Davis-Besse. The specific references to similar findings made by others are provided in Notes in the text under those CRs in Section 1.5.2.6.

1.6 References

1.6.1 List of persons interviewed and meetings observed

Individual	Title
Bair, R.N.	Staff Nuclear Engineer
Barron, James	Mgr, Site Projects
Beier, M.P.	Staff Nuclear Specialist
Blakely, D	Chairman EAB
Bleau, C. J.	Supv, Elec/I&C Eng
Boles, Brian D.	Dir, Site Maintenance
Browning, Kevin	Staff Nuclear Specialist
Byrd, Ken	Mgr, Design Engineering
Calvert, T.	Supv, Nuc Mechanical Maint
Chowdhary, J.R.	Staff Nuclear Engineer
Chung, G.T.	Staff Nuclear Engineer
Cunnings, John	Supv, Nuc Plant Syst Eng
Dreier, D.	Sr. Nuclear Engineer
Dunn, K. L.	Supv, Nuc Document Control
Duquette, D.D.	Sr. Nuclear Engineer
Fili, K.	Director, Fleet Project Management
Gatter, S.L.	Adv Nuc Engineer
Haley, D.E.	Staff Nuclear Engineer
Hennessy, B. T.	Supv, Nuc Perf Improvement
Hetrick, T.F.	Nuclear Engineer
Hook, John	Supv, Nuc Mech/Str Eng
Hovland, Robert	Mgr, Site Training
Hower, S.	Nuclear Specialist
Isherwood, D	Senior Nuclear Specialist
Jiamachello, J.J.	Staff Nuclear Engineer
Johnson, Eric	Staff Nuclear Engineer
Kaminskas, Vito	Dir, Site Operations
Kemp, J.D.	Senior Nuclear Engineer
Kendrick, Gary	Mgr, Site Work Mgmt
Kreinbihl, W.	Staff Nuclear Engineer
Kremer, D. F.	Supv, Nuc Construction Svcs
Laurer, T.J.	Staff Nuclear Engineer
LeBlanc, G.N.	Senior Consultant
Mainhardt, P.J.	Staff Nuclear Engineer
Mallernee, J.	Senior Nuclear Specialist
Marley, J.W.	Staff Nuclear Engineer
McClure, M.D.	Adv Nuclear Engineer
Moore, C. J.	Supv, Nuc Config Control
Moul, Donald A	Dir, Site Engineering
Mugge, William A.	Mgr, Outage Management
Murtha, M.J.	Staff Nuclear Engineer

Nelson, M.L.	Staff Nuclear Engineer
Osting, S	Staff Nuclear Engineer
Otermat, J.E.	Staff Nuclear Engineer
Patchett, W	Nuclear Engineer
Plymale, Scott T.	Mgr, Plant Engineering
Price, Clark	Dir, Site Perf Improvement
Quaderer, A.S.	Adv Nuclear Engineer
Fine, Ray	PRA manager
Rossomme, Randy	Manager, Fleet Corrective Action Program
Rupp, C.E.	Contract Engineer
Schreiner, D	Sr. Consultant
Simonetti, T	Supv, Nuc Technical Training
Smith, R.	Design Engineer
St. Clair, T.A.	Supv, Nuc Eng Programs
Steagall, C. Steven.	Mgr, Fleet Oversight
Stelmaszak, J.R.	Adv Nuclear Engineer
Stevens, M	Manager, Program and Component Engineering
Swim, T	Sr. Consultant
Swope, S.B.	Sr. Nuclear Engineer
Thompson, T.A.	Staff Nuclear Engineer
Ulinsky, Steve	Sr. Nuclear Engineer
Wahlers, D. R.	Supv, Nuc Supt Oversight
Whitright, J.	Staff Nuclear Engineer
Wilcox, J. H.	Mgr, Design & Procurement Eng
Wilson, J.	Advanced Nuclear Specialist
Wise, Al	Mgr, Tech Support Engineering
Wuokko, Dale R.	Mgr, Site Regulatory Compliance
Young, Brian	Supv, Nuc Elect Syst Eng
Zellers, Kevin	Supv, Eng Analysis

1.6.2 Reference Documents

The information listed below was provided either in advance or during the assessment by FENOC for the use of the Independent Assessment Team

Some document titles were changed to support organization of the documents within the data file document 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.

Document Library #	document or file name
10 FENOC engineering assessment planning information	
10.001	Project contacts 080807.xls
10.002	10.002 Final Plan for 2008 Eng COIA 080624 L08-194.pdf

Document Library #	document or file name
10.002a	10.002a Final Plan for 2008 Eng COIA 062408.doc
10.003	COIA-ENG-2008 DB Report FINAL (later)
10.004	COIA-ENG-2007 DB Report FINAL 071012-1.doc
10.005	COIA-ENG-2006 DB Report 061012 FINAL.doc
10.006	COIA-ENG-2005 DB Report 122905 final.doc
10.007	COIA-ENG-2004 DB IAR.doc
10.008	Three Plant FSA REPORT 041124.doc
10.009	Agenda for Sunday 080921 Overview
11 INPO reference material	
11.001	SOER02-4.doc
11.002	CR 2002-00891 RCA RPV head degradation Rev 1.pdf
12 assessment plans, reports	
12.003	2008 DB Site Assessment Log.xls
12.100	**Assessments (IPA, Focused SA, Snapshot SA)**
12.062	DB-SA-07-062 Site IPA Roll-up 1st Half 2007 .pdf
12.105	DB-SA-08-005 R1 DBDM 2nd Half 2007.pdf
12.108	DB-SA-08-008 DBMM 2nd Half 2007.pdf
12.109	DB-SA-08-009 R1 DBOP 2nd Half 2007 .pdf
12.110	DB-SA-08-010 R1 DBOM 2nd half 2007.pdf
12.111	DB-SA-08-011 R1 DBPI 2nd Half 2007.pdf
12.112	DB-SA-08-012 DBPE R1 2nd Half 2007.pdf
12.115	DB-SA-08-015 R1 DBRE 2nd Half 2007.pdf
12.116	DB-SA-08-016 R1 DBRC 2nd Half 2007.pdf
12.117	DB-SA-08-017 R1 DBPR 2nd Half 2007.pdf
12.120	DB-SA-08-020 R1 DBTS 2nd Half 2007.pdf
12.122	DB-SA-08-022 DBWM 2nd half 2007.pdf
12.123	DB-SA-08-023 R1Site 2nd Half 2007.pdf
12.125	DB-SA-08-025 cross cutting aspects of NRC IRs 070101 to 071231.pdf
12.127	DB-SA-08-027 Outage limited ACEs.pdf
12.131	DB-SA-08-031 Testing IST Program Pressure Limiting Devices.pdf
12.132	DB-SA-08-032 DB-CH-06900-Ops Chem Ctrl Lmts.pdf
12.133	DB-SA-08-033 Actions Necessary After an Earthquake.pdf
12.134	DB-SA-08-034 Minor Deficiency Monitoring Program March 08.pdf
12.137	DB-SA-08-037 Op Resp to Rising Condenser Pressure-Reactivity vent .pdf
12.145	DB-SA-08-045 RGO 15 Design Modifications.pdf
12.145	DB-SA-08-048R1 15RFO Outage Critique.pdf
12.149	DB-SA-08-049 CR Initiation.pdf
12.151	DB-SA-08-051 Op Fund during trip of station air compressor and emer air compressor 2 .pdf
12.153	DB-SA-08-053 CREVS and Chilled Water.pdf
12.155	DB-SA-08-055r01 2008-1 Design Eng IPA .pdf
12.158	DB-SA-08-058r01 2008-1 Maint IPA .pdf
12.159	DB-SA-08-059r01 2008-1 OPS IPA .pdf
12.161	DB-SA-08-061 2008-1 PI IPA.pdf

Document Library #	document or file name
12.162	DB-SA-08-062 2008-1 P&ER Eng IPA.pdf
12.163	DB-SA-08-063 2008-1 Proc IPA.pdf
12.165	DB-SA-08-065 2008-1 Rx Eng IPA.pdf
12.166	DB-SA-08-066 2008-1 DBRC IPA.pdf
12.167	DB-SA-08-067 2008-1 Projects IPA.pdf
12.169	DB-SA-08-069 2008-1 TechSvcs Eng IPA.pdf
12.170	DB-SA-08-078 Critical Componanr Failures
12.171	DB-SA-08-071 2008-1 Work Mgmt IPA.pdf.pdf
12.172	DB-SA-08-072 Site IPA Roll-up 2008-1 .pdf
12.176	DB-SA-08-076 #1 main feedpump turbine.pdf
12.180	DB-SA-08-080 Minor Deficiency Monitoring Program July 08.pdf
12.300	**Ongoing SAs**
12.400	**Quarterly Oversight reports**
12.401	DB-PA-07-03 Oversight 3rd Quarter 2007 Assessment.pdf
12.402	DB-PA-07-04 Oversight 4th Quarter 2007 Assessment.pdf
12.403	DB-PA-08-01 Oversight 1st Quarter 2008 Assessment.pdf
12.404	DB-PA-08-02 Oversight 2nd Quarter 2008 Assessment.pdf
13 INPO reports on FENOC	not listed
14 engineering procedures	
14.000	DBBP-DCU-0109R08 Processing ECPs.pdf
14.001	DBBP-DCU-0010r14 EC Closeout Process.pdf
14.002	DBBP-PES-0005r04 Systems Walkdowns.pdf
14.003	DBBP-VP-0009-R3 R3 Management Plan for Confirmatory Order Independent Assessments.pdf
14.004	DB-DP-00023 R6 Labels & Signs.pdf
14.005	DB-DP-00307r04 Ctrl of Positionable Comp.pdf
14.006	DB-FP-00007 R08 Control of Transient Combustibles.pdf
14.007	DB-OP-06331r18 Freeze Protection & Electrical Heat Trace.pdf
14.008	DB-OP-06913r19 Seasonal Plant Preparation Checklist.pdf
14.009	EN-DP-01150r04 System Descriptions.pdf
14.010	14.010 ESI-001 R03 System Engineer Qual Card.pdf
14.011	NG-EN-00309r03 Plant Modification.pdf
14.012	NOBP- LP-4003B-R1 50.59 Mentoring Review Committee.PDF
14.013	NOBP-CC-1003_R0 Design Basis Info for Atlas.pdf
14.014	NOBP-CC-1004 Calc Utility.PDF
14.015	NOBP-CC-1005r02 FENOC Latent Issues Rvw Process.pdf
14.016	NOBP-CC-2003Ar02 Prelim Cost Est.pdf
14.017	NOBP-CC-2003Br02 Conceptual Design Pkg.pdf
14.018	NOBP-CC-2003Cr02 Project Team.pdf
14.019	NOBP-CC-2003Dr02 Walkdowns.pdf
14.020	NOBP-CC-2003r03 Config Mgmt Database Ctrl.pdf

Document Library #	document or file name
14.021	NOBP-CC-2004-R0 Engineering Change Risk Analysis.pdf
14.022	Not used
14.023	NOBP-CC-2005r00 Eng Assmt Board.pdf
14.024	NOBP-CC-2006 ENGINEERING PRODUCT REVIEW .doc
14.025	NOBP-CC-3002-R3 Processing Calcs.PDF.pdf
14.026	NOBP-CC-7001r14 Procurement Pkgs.pdf
14.027	NOBP-CC-7002r04 Enhanced Procurement.pdf
14.028	NOBP-ER-1002-R4 Proj Apprvl and Resource Allocation.PDF
14.029	NOBP-ER-1004-01r02 FVR Worksheet FORM.doc
14.030	NOBP-ER-1004-R2 Fleet Value Rating Methodolog.pdf
14.031	NOBP-ER-3002-R3 Plant Health Committee.pdf
14.032	NOBP-ER-3005r03 FENOC Equipment Vulnerability Rvw Process.pdf
14.033	NOBP-ER-3009 FENOC Plant Health Report Program Rev 2.doc
14.034	NOBP-ER-3902R05 Component Template Devlpmt ER Wrkbnch M-2.pdf
14.035	NOBP-ER-3903r03 Component Tmplt Impl ER Wkbnch Module 3.pdf
14.036	NOBP-LP-2001 FENOC SA_Benchmark.pdf
14.037	NOBP-LP-2001r10 FENOC SelfAssmt-Benchmrkg.pdf
14.038	NOBP-LP-2007r5 Condition Report Process Effectiveness review.pdf
14.039	NOBP-LP-2008r07 FENOC CARB.pdf
14.040	NOBP-LP-2010r05 CREST Trending Codes.pdf
14.040a	NOBP-LP-2010r06 CREST Trending Codes.pdf
14.041	NOBP-LP-2011r07 FENCO Cause Analysis.pdf
14.042	NOBP-LP-2018r03 IPA-Trending.pdf
14.043	NOBP-LP-4003Ar05 FENOC 5059 User Guildlines.pdf
14.044	NOBP-SS-2101r02 Peer Groups and Teams.pdf
14.045	NOBP-SS-3401r07 FENOC Document Hierarchy.pdf
14.046	NOBP-SS-4001-R2 Change Management Guide.pdf
14.047	NOBP-TR-1111-01-R0 Eng suppt personnel training sylabus Rev02.doc
14.048	NOBP-TR-1111r02 FENOC Training Program Descriptions.pdf
14.049	NOP-CC-1001r01 Change Mgmt Program.pdf
14.050	NOP-CC-2001r05 Design Verification.pdf
14.051	NOP-CC-2002r03 Design Input.pdf
14.052	NOP-CC-2003 Design Report forms 080721.zip
14.057	NOP-CC-2003R14 Engineering Changes.pdf
14.058	NOP-CC-2004R07 Design Interface Rvws&Evals.pdf
14.059	NOP-CC-2004-02r07 Design Interface Review Checklist.doc
14.060	NOP-CC-2004-05r09 Design Interface Summary FORM.doc
14.061	NOP-CC-2004-07-R03 Design Interface Evaluation.doc
14.062	NOP-CC-2004r06 Design Interface Reviews&Evals.pdf
14.063	NOP-CC-3002r04 Calculations.pdf
14.064	NOP-CC-7002r10 Procurement Engineering.pdf

Document Library #	document or file name
14.065	NOP-ER-1001r02 Cont Eqpmt Perf Improvement.pdf
14.066	NOP-ER-3001r04 Problem Solving and Decision Making.pdf
14.067	NOPL-CC-0001-R1 Eng Principles and Expectations.pdf
14.068	NOPL-ER-0001r00 FENOC Policy Statement Eqpment Reliability.pdf
14.069	NOPL-LP-2003-R2 SCWE Policy.pdf
14.070	NOP-LP-2001r18 Corrective Action Program.pdf
14.071	NOP-LP-2100 R3 Operating Experience Program
14.072	NOP-LP-2006r03 CNRB.pdf
14.073	NOP-LP-4003r04 Eval of Changes-Tests-Experiments.pdf
14.074	NOPL-SS-3201_R1 Document Hierarchy.pdf
14.075	NOPL-SS-3201-R1 Document Hierarchy.pdf
14.076	NOP-OP-1010r01 Operational Decision-Making.pdf
14.077	NOP-SS-8001 Rev1 FENOC Activity Tracking.pdf
14.078	NOP-WM-1001r10 Order Planning Process.pdf
14.079	NOP-WM-2001r06 Work Mgmt Scheduling Process.pdf
14.080	NOP-WM-4300r06 Order Execute Process.pdf
14.081	NOP-WM-4305r01 Order Closure.pdf
14.082	NORM-CC-2001 Engineering Change Process Flowcharts.pdf
14.083	Vendor Technical Information Processing 070618

15 engineering program documents

15.001	List of Calculations 2008.xls
15.002	List of Problem Solving Decision Making Issues PSDM (ref NOP-ER-3001)10-1-07 to 080814.xls
15.003	List of ECPs - Open-Closed.xls
15.004	List of Open Operational Decision Making Issues ODMIs (ref NOP-OP-1010) 08-05-2008.pdf
15.005	List of 16RFO Major Mods.xls
15.006	List of OPEN TMs.xls
15.007	List of TMs closed since 10-1-07.xls

16 engineering work products

16.100	**Individual calcs**
16.100	069.002 Rev01 NA.pdf
16.100	C-EE-002.01-010Rev30 A05.pdf
16.100	C-EE-002.01-011Rev07 (1).pdf
16.100	C-EE-002.01-011Rev07.pdf
16.100	C-EE-015.03-008 R4 A50.pdf
16.100	C-EE-015.03-008 R4 A51.pdf
16.100	C-EE-024.01-008 R01 NA.pdf
16.100	C-ICE-037.01-001 Rev 01.pdf
16.100	C-ICE-058.01-007 R01 NA.pdf
16.100	C-ICE-058.01-008 R04 A01.pdf
16.100	C-NSA-011.01-015 R01 NA.pdf
16.100	C-NSA-049.01-003 R08 A07.pdf
16.100	C-NSA-049.01-004 R02 NA.pdf
16.100	C-NSA-049.02-026 R01 A01.pdf

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16.100	C-NSA-049.02-026 R01 A02.pdf
16.100	C-NSA-049.02-033 R02 A01.pdf
16.100	C-NSA-049.02-033 R02 A02.pdf
16.100	C-NSA-049.02-033 R02 NA.pdf
16.100	C-NSA-049.02-048 R00 A01.pdf
16.100	C-NSA-049.02-048 R00 A02.pdf
16.100	C-NSA-049.02-048 R00.pdf
16.100	C-NSA-052.01-003 R08 A07.pdf
16.100	C-NSA-052.01-011 R01 A01.pdf
16.100	C-NSA-052.01-011 R01.pdf
16.100	C-NSA-052-01-011 R01 A02.pdf
16.100	MPR Calculation 0200-0087-RP01 Draft R3 EDG response during LOOP LOCA .pdf
16.100	C-EE-015.03-008 R04 A59.pdf
16.200	**Individual ECPs**
16.200.ECP05-0081-00	Mod to CMU Wall5107.pdf
16.200.ECP05-0223-00	Make TM 04-0033 Permanent.pdf
16.200.ECP06-0002-00	Mod of Masonry Wall 3267.pdf
16.200.ECP06-0118-00	Modify Caldon Leading Edge Flow Mtr Alarm Circuit.pdf
16.200.ECP06-0142-00	Main Gen Rewind.pdf
16.200.ECP07-0014-00	Re-Rate Line Class HBD-139.pdf
16.200.ECP07-0019-00	Abandon 4 Clg Twr Frz Prot Circs.pdf
16.200.ECP07-0038-01	REPLC RCP1-2-2 CABLES OUTSIDE CTMT .pdf
16.200.ECP07-0083-01	REPLC RCP1-2-2 CABLES OUTSIDE CTMT .pdf
16.200.ECP07-0114-00	TM-Install TM to Isolate Air Signal to HV5311H.pdf
16.200.ECP07-0136-01	Increase Voltage to MTSV.pdf
16.200.ECP07-0192-00R00	SFP Aux Platform for Fuel Insp.pdf
16.200.ECR04-0258-00	SU XFRMER 02 PROT RELAYING IS INADEQUATE.pdf
16.200.ECR05-0094-00R03	Turbine ByPass Vlv.pdf
16.200.ECR05-0304-00R02	MFHB Guide Bar.pdf
16.200.MOD99-0001-00R02	OD 99-0001-00 2 Year Mod Rvw.pdf
16.200.MOD99-0009-00	Remove Orifices.pdf
16.500	**SAP Notifications**
16.500.600383603	NOTIFICATION Process EDG Transient Analysis as VTI.pdf
16.500.600423218	Notification Implement Action Plan for AFI ER2.1 .pdf
16.500.600429546	Notification Make SHR Tables relfect correct info.pdf
16.500.600469082	Notification OED IN 2008-09 Turbine Aux Fe dpump Bearing Issues

17 NRC reports

17.001	NRC Restart Confirmatory Order.pdf
17.002	Davis Besse Inspection Findings Summary 2007-2008.doc
17.002	BD Inspection summary.pdf
17.003	2008 Performance Summary - Davis-Besse.pdf
17.004	all plants performance indicator summary.pdf
17.005	DB Performance Indicator details.pdf
17.006	DB Mid-cycle performance review davi_2007q2.pdf

Document Library #	document or file name
17.007	Mid-cycle performance review davi_2007q3.pdf
17.008	Annual Assessment Letter davi_2007q4.pdf
17.009	Assessment follow-up letter davi_2008q1.pdf
17.010	Integrated inspection report 2007-004 of 071025ML072990514.pdf
17.011	Integrated inspection report 2007-005 of 080201 ML080360447.pdf
17.012	Integrated inspection report 2008-002 of 080505 ML081270558.pdf
17.013	Integrated inspection report 2008-003 of 080721 ML082040478.pdf
17.014	Component design basis inspection 2007-007 of 080114 ML080140333.pdf
17.015	R08-182 DBNPS PLANT MOD INSP RPT.pdf

18 Root cause analyses and CR information

18.001	DBDM CR List 063008.xls
18.002	DBDM CA List 063008.xls
18.003	DBDE CR List 063008.xls
18.004	DBDE CA List 063008.xls
18.005	DBPE CR List 063008.xls
18.006	DBPE CA List 063008.xls
18.007	DBTS CR List 063008.xls
18.008	DBTS CA List 063008.xls
18.009	CR and CA Assignment List dictionaries 070108.rtf
18.100	**CRs from 2007 COIA**
18.100	summary of COIA-ENG-2007 CRs.pdf
18.100CR 07.26552	NORM-ER-3103-D REV.3 DOES NOT INDICATE REEPLACEMENT FREQUENCY.pdf
18.100CR07.26754	C-EE-02.01-010 REV 30 (DC CALC) ADDENDUM A03, CALCULATION ERROR.pdf
18.100CR07.26779	NNI MODULE NOT INCLUDED FOR CALIBRATION UNDER PM 4222.pdf
18.100CR07.27185	SNAP SHOT SELF ASSESSMENT NOT FINALIZED.pdf
18.100CR07.27389	2007 COIA ENGINEERING - AOV PROGRAM SELF ASSESSMENT IMPLEMENTATION NOT EVALUATED TITLE.pdf
18.100CR07.29888	ANA #1 WAIVER OF MANDATORY DESIGN INTERFACE REVIEWS (DIE).pdf
18.100CR07.29891	ANA #2 ER PROGRAM FORECAST OF PM STRATEGY WORKLOAD, SPV ANALYSIS.pdf
18.100CR07.29891	CA-2 ACTION PLAN.pdf
18.100CR07.29893	ANA #3, SYSTEM HEALTH ACTIVITIES; PLANT COMPUTER, 480VAC, RAD MON.pdf
18.100CR07.29894	ANA #4, PROCESS WEAKNESS IN CAUSAL ANALYSES & INVESTIGATIONS.pdf
18.100CR07.29895	ANA #5, ASSESSMENT STRATEGY AND IMPLEMENTATION.pdf

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18.100CR07.29897	IO #1, FILENET SEARCH FOR CALCS LISTS PREVIOUS ADDENDA & PINS.pdf
18.100CR07.29899	IO #2, SYSTEM DESCRIPTION MAINTENANCE NEEDS MORE EMPHASIS.pdf
18.100CR07.29902	IO #3, CALC UTILITY TRAINING NOT INCLUDED IN ENGINEERING JFG.pdf
18.100CR07.29903	IO #4, PLANT COMPUTER & 480VAC HEALTH IMPROVEMENT PLANS.pdf
18.100CR07.29907	IO #5, PLANT HEALTH REPORT DATA ANOMALIES NEED TO BE RESOLVED.pdf
18.200	**Other CRs**
18.200CR03.05808	E-2014 RC3706 Discrrpancies
18.200CR03.07199	Verification of Appendix R Circuits - Apendix C3 - Fuse Type and Rating
18.200CR04.07151	DC LIR - Independence between load groups
18.200CR06.02865	Caldon Cabinet Configuration (C5757E)
18.200CR07.18398	Teledyne Quicklook Error Notice 2006-269-1 MOV Acquisition softwarw
18.200CR07.26478	WANO 2007 - AFI ER.2-2 SHORTFALLS IN IMPL OF MAINT STRATEGY.pdf
18.200CR07.26486	WANO 2007-AFI CM.3-1, DESIGN CHANGE PACKAGE WEAKNESSES.pdf
18.200CR07.26486	WANO 2007 - AFI CM 3-1, Design Change Package Weakness
18.200CR07.28312	DH2736 MOTOR TERMINATIONS.pdf
18.200CR07.29202	KAMAN RADIATION MONITOR PC ISOLATION BOARD.pdf
18.200CR07.29388	ADDL ACTION FROM EFFECTIVENESS RVW OF CR 06-00207.pdf
18.200CR07.29410	TS VIOLATION DUE TO BOTH CTRM MONITORS OOS.pdf
18.200CR07.29941	NRCCDI07 CALCULATION C-ME-050-03-129 DEFICIENCY.pdf
18.200CR07.30437	NRCCDBI07 UNCLEAR LICENSING BASIS FOR THE AFW SUCTION FROM CST.pdf
18.200CR07.30673	NRCCDBI07 POTENTIAL FOR INSSUFICCIENT BATTER MARGIN AND SURV TEST.pdf
18.200CR07.30698	NRCCDBI07 CALCULATION C-ME-050-03-129 REV 01 DEFICIENCY.pdf
18.200CR07.30718	NRCCDBI07-CLOSE TO A NOTIFICATION wo DUE DATE.pdf
18.200CR07.31120	NRCCDBI07 - POTENTIAL HUMAN PERFORMANCE ISSUES AND NCVS NOTED BY NRC.pdf
18.200CR07.31959	UPWARD TREND IN RCS UNIDENTIFIED AND TOTAL LEAKRATE.pdf
18.200CR07.32112	PRZR LVL DECREASE WHILE PLACING DH TRN 1 IN STANDBY.pdf
18.200CR08.32218	DB-PA-08-01: Insufficient Detail in ECP 06-0142 Test Requirements
18.200CR08.32521	PRESSURE BOUNDARY LEAK FOUND DURING DH DROP LINE WELD OVERLAY.pdf
18.200CR08.32667	DH9B DID NOT FUNCTION PROPERLY WHILE PERFORMING STATIC TEST.pdf

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18.200CR08.34065	DB0SC003022 BRKR 34562 CLOSED AND REOPENED.pdf
18.200CR08.34187	FW601 Stroke Tyime Exceeds ISTB3 Maximum Limit
18.200CR08.34203	Anomaly foind in Quicklook2 data during 15RFO
18.200CR08.34217	UNEXPECTED START OF SBODG AFTER FUSE RPLCMT.pdf
18.200CR08.34718	NRC NCV INADEQUATE BATTERU VLTG DROP-SIZING DSGN CALC.pdf
18.200CR08.34719	NRC NCV PERIODIC TSTG OF 480V STARTER COILS NOT IMPLTD.pdf
18.200CR08.34720	NRC NCV FAILURE TO ADEQUATE CONSIDER AIR ENTRNMT TO ECCS DURING XFER.pdf
18.200CR08.34721	NRC NCV FAILURE TOP EVAL POSTULATED FAILURE OF AFW SUCTION PIPING.pdf
18.200CR08.34722	NRC NCV BATTERY CONNECTION RESISTANCE LIMIT SPECIFIED IN TS INSUFF.pdf
18.200CR08.34786	High Vibrations on Geneerator Bearing 7
18.200CR08.35417	NRC NCV INTERNALS HANDLING ADAPTER CALC DIDNOT CONSIDER FRACTURE TOUGHNESS.pdf
18.200CR08.35616	MS-C-08-01-13 - AT-RISK CHANGE MODS STILL OPEN.pdf
18.200CR08.35827	MTSV A TEST RESET TIME 10 MINUTES TEST FAILED.pdf
18.200CR08.35889	CYCLE 16 FUEL DEFECT-RADIOGRAPHY DATA INDICATES FUEL DEFECT.pdf
18.200CR08.35922	ODMI-MTSV Resetting Failures.pdf
18.200CR08.36528	PROPABLE FW HTR TUBE LEAK IN TRN 1 HIGH PRSR FW HTRS.pdf
18.200CR08.36684	CREVS 1 CMPRSR TRIP DURING MNTHLY TEST DB-SS-03041.pdf
18.200CR08.36684	CREVS 1 COMPRESSOR TRIP DURING MONTHLY TEST DB-SS-03041.pdf
18.200CR08.36684a	Cause Analysis Form.pdf
18.200CR08.37002	4TH QTR 2007 EAB RESULTS APPEAR TO CONFLICT WITH CDBI POTENTIAL FINDINGS.pdf
18.200CR08.37023	DB-SA-08-023 SITE IPA-EMERGING TREND NOTED IN AREA OF EQPMT DEGRADATION.pdf
18.200CR08.37919	ECP 04-0052-00 Graded as a Failed Product By EAB
18.200CR08.38135	SURVEILLANCE RQMTS FOR SOURCE RNG NIs.pdf
18.200CR08.38871	MN STMLN RM TEMPS ABOVE 110F.pdf
18.200CR08.38959	Switch would not actuate on PDIS-5018
18.200CR08.39142	SPEC E-057 REV 0 GRADED AS A FAILED PROD BY EAB.pdf
18.200CR08.40001	CNRB CDBI SELF ASSESSMENT CDB IINSPECTION GAP Tab 8.pdf
18.200CR08.40242	DB-SA-08-013 Lic Operator Training Instructions not Fully mtg ACAD 97-014 Requirement
18.200CR08.40879	UNEXPECTED DROP IN CREVS SUCTION PRESSURE.pdf
18.200CR08.40935	METHOD FOR CALCULATING HEAT BAL wo PLT CMPTR.pdf
18.200CR08.41087	CTRL RM CHILLER 2 FOUND TRIPPED.pdf

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18.200CR08.41274	ECR 03-0444-00 DEFICIENCY.pdf
18.200CR08.41350	Trip of Chiller #1 while restoring from DB-SS-03710, CREVS #1 Refuel test
18.200CR08.41350	TRIP OF CHILLER 1 - DB-SS-03710-CREVS 1 REFUEL TEST.pdf
18.200CR08.41352	CREVS #1 tripped on high refrigernat Press whhilke in air cooled mode
18.200CR08.41598	CALC C-EE-004-01-049 INPUT ERROR.pdf
18.200CR08.41838	DB-PA-08-02: System Health Reporting of Corrective Actions not Accurate
18.200CR08.41860	DB-PA-08-02: System Health Reports do not Accurately Reflect Requirements
18.200CR08.41958	EDG LOADING TBL LOADS DO NOT MATCH ENERGZD AC PWR SYS LOADS.pdf
18.200CR08.42276	PROC ADHERENCE ISSUES.pdf
18.200CR08.42477	NRC MOD50.59 INSP, RFI-08-MOD-0040, AFW TSTG ACCPTNC CRITERIA.pdf
18.200CR08.42606	C-EE-005-01-009 NOT IDd AS AN INPUT TO C-EE-015-03-008 (ETAP).pdf
18.200CR08.43023	NRC MOD50.59 - PERFORMANCE DEFICIENCY WITH CR 06-02521 INVESTIGATION.pdf
18.200CR08.43068	DB-PA-08-02 Finding Organizational Attention Needed for Site raining Activities
18.200CR08.43843	Inverter YVB failed - YBU transferred to alternate as expected
18.200CR08.44469	DB-PA-08-03: Self Assessment Actions not Documented in CAP
18.200CR08.44484	DB-PA-08-03: Self Assessment Actions not Documented in CAP
18.200CR08.45511	Snapshot Self-Assessment DB-SA-08-045 Noteworthy Item
18.200CR08.45934	DB-PA-08-03: Margin Management Program / Implementation Weakness
18.200CR08.46095	Snubber Program Health Graded as Yellow
18.200CR08.46289	Davis Besse Engineering Program Yellow Cornerstone – PHR – 2nd Quarter 2008
18.200CR08.47303	COIA-ENG-2008 DISAGREEMENT WITH CR 07-27389 EVALUATION AOV PROG ASSESS.pdf
18.200CR08.47319	COIA-ENG- 2008 UNTIMELY VENDOR NOTICE IMPLEMENTATION RESULTS IN MOV TEST FAILURE.pdf
18.200CR08.47323	COIA-ENG-2008 ACTION PLAN FOR SINGLE PNT VULNERABILITY NOT COMPLETED BY DUE TITLE DATE.pdf

19 General procedures

19.001	Post Maintenance Test Manual Rev 31
19.002	NOP-WM-1003 R3 Nuclear Maintenance Notification Initiation, Screening, and Minor Deficiency Monitoring Processes

Document Library #	document or file name

20 Organzation Charts and contact lists

20.001	Draft Org Chart Rev 52 June 2008.ppt

21 Performance Indicators

	Component Health Reports
21.000	not used
21.001	not used
21.002	07Q3 Component Health Trending Rpt.pdf
21.003	07Q4 Component Health Trending Rpt.pdf
21.004	08Q1 Component Health Trending Rpt.pdf
21.100	**Program health reports**
21.101	2007 2nd qtr fleet program health.zip
21.102	Program Health Reports 2007-Q3
21.103	Program Health Reports 2007-Q4
21.104	Program Health Reports 2008-Q1
21.105	Program Health Reports 2008-Q2
21.106	Engineering Programs Update (2nd Quarter 2008).ppt
21.200	**Plant Health reports**
21.201	2007-Q2 Plant Health Report.pdf
21.202	2007-3 Plant Health Report.pdf
21.203	2007-4 Plant Health Report.pdf
21.204	2008-1 Plant Health Report.pdf
21.205	2008-2 Plant Health Report.pdf
21.300	**Monthly Performance Reports (MPRs)**
21.301	0707 DB MPR.pdf
21.302	0708 MPR DB Aug-07.pdf
21.303	0709 MPR 2007-Sept DB MPR.pdf
21.304	0710 MPR-DB 2007 OCT.pdf
21.305	0711 MPR-DB 2007 NOV.pdf
21.306	0712 MPR-DB 2007 DEC.pdf
21.307	0801 MPR-DB 2008 JAN.pdf
21.308	0802 MPR-DB 2008 FEB.pdf
21.309	0803 MPR-DB 2008 MAR.pdf
21.310	0804 MPR-DB 2008 APR.pdf
21.311	0805 MPR-DB 2008 MAY.pdf
21.312	0806 MPR Jun 2008.pdf
21.313	0807 MPR-DB 2008 July.pdf
21.314	0808 MPR-DB 2008 August.pdf
21.400	**Plant Health Committee meeting minutes**
21.400.070613	PHC Minutes,2007-06-13.pdf
21.400.070711	PHC Minutes,2007-07-11.pdf
21.400.070723	PHC Minutes,2007-07-23.pdf
21.400.070725	PHC Minutes,2007-07-25.pdf
21.400.070808	PHC Minutes,2007-08-08.pdf

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21.400.070822	PHC Minutes,2007-08-22.pdf
21.400.070827	PHC Minutes,2007-08-27.pdf
21.400.070829	PHC Minutes,2007-08-29.pdf
21.400.070906	PHC Minutes,2007-09-06.pdf
21.400.070912	PHC Minutes,2007-09-12.pdf
21.400.070924	PHC Minutes,2007-09-24.pdf
21.400.070926	PHC Minutes,2007-09-26.pdf
21.400.071003	PHC Minutes,2007-10-03.pdf
21.400.071114	PHC Minutes,2007-11-14.pdf
21.400.071118	PHC Minutes,2007-11-28.pdf
21.400.071205	PHC Minutes,2007-12-05.pdf
21.400.071212	PHC Minutes,2007-12-12.pdf
21.400.080225	PHC Minutes,2008-02-25.pdf
21.400.080227	PHC Minutes,2008-02-27.pdf
21.400.080303	PHC Minutes,2008-03-03.pdf
21.400.080312	PHC Minutes,2008-03-12.pdf
21.400.080326	PHC Minutes,2008-03-26.pdf
21.400.080409	PHC Minutes,2008-04-09.pdf
21.400.080423	PHC Minutes,2008-04-23.pdf
21.400.080428	PHC Minutes,2008-04-28.pdf
21.400.080514	PHC Minutes,2008-05-14.pdf
21.400.080528	PHC Minutes,2008-05-28.pdf
21.400.080611	PHC Minutes,2008-06-11.pdf
21.400.080625	PHC Minutes,2008-06-25.pdf
21.400.080709	PHC Minutes,2008-07-09.pdf
21.400.080714	PHC Minutes,2008-07-14.pdf
21.400.080723	PHC Minutes, 2008-07-23 Draft.doc
21.400.080813	PHC Minutes, 2008-08-13 Draft.doc
21.500	**DBARs**
21.501	DBAR 2ndQ 2007.pdf
21.052	07Q3 DBAR.pdf
21.053	07Q4 DBAR.pdf
21.504	2008Q1 DB Design Basis Assessment Report.pdf
21.505	082Q DBAR
21.600	**CNRB meeting reports**
21.601	2008 CNRB Schedule.doc
21.602	070608 CNRB Meeting Minutes Approved 6-8-07.pdf
21.603	070914 CNRB Meeting Minutes Approved 9-14-07.pdf
21.604	080129 CNRB LAR 2001-22-2008-TelCon.pdf
21.605	080314 CNRB Meeting Minutes Approved 3-14-08.pdf
21.606	080425 DB CNRB LAR TeleCon.pdf
21.607	080514 DB CNRB LAR TeleCon.pdf
21.608	080626 CNRB LAR 06-26-2008 DB TeleCon.pdf
21.609	080722 CNRB LAR 07-22-2008 DB TeleCon.pdf
21.610	080804 CNRB LAR 08-04-2008 DB TeleCon.pdf
21.611	080711 CNRB Minutes 7-11-08.pdf

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21.700	**EAB results**
21.701	EAB Log 2007 & 2008.xls
21.701a	EAB score template
	EAB quarterly reports.xls
21.703	EAB second quarter 2007 report- final.doc
21.704	07Q3 EAB Report.doc
21.705	07Q4 EAB Report.pdf
21.706	08Q1 EAB Report.pdf
21.707	08Q2 EAB 2nd Quarter Report-final-new page 5.doc
21.800	**CARB minutes**
21.800.070813	070813 CARB Minutes.doc
21.800.071001	071001 CARB Minutes.doc
21.800.071008	071008 CARB Minutes.doc
21.800.071029	071029 CARB Minutes.doc
21.800.071105	071105 CARB Minutes.doc
21.800.071112	071112 CARB Minutes.doc
21.800.071126	071126 CARB Minutes.doc
21.800.071126	071126 CARB Mtg Notice Revision 01.doc
21.800.071217	071217 CARB Minutes.doc
21.800.071220	071220 CARB Minutes.doc
21.800.080204	080204 CARB Mtg Notice.doc
21.800.080204	080204 CARB Package.zip
21.800.080211	080211 CARB Minutes.doc
21.800.080218	080218 CARB Minutes.doc
21.800.080218	080218 CARB Package.zip
21.800.080225	080225 CARB Minutes.doc
21.800.080225	080225 CARB Package.zip
21.800.080303	080303 CARB Minutes.doc
21.800.080317	080317 CARB Minutes.doc
21.800.080331	080331 CARB Minutes.doc
21.800.080402	080402 CARB Mtg Notice (1).doc
21.800.080402	080402 CARB Mtg Notice.doc
21.800.080402	080402 CARB Package.zip
21.800.080407	080407 CARB Minutes.doc
21.800.080414	080414 CARB Attachment.pdf
21.800.080414	080414 CARB Minutes.doc
21.800.080421	080421 CARB Minutes.doc
21.800.080428	080428 CARB Minutes.doc
21.800.080505	080505 CARB Minutes.doc
21.800.080512	080512 CARB Minutes.doc
21.800.080519	080519 CARB Minutes.doc
21.800.080602	080602 CARB Minutes.doc
21.800.080609	080609 CARB Minutes.doc
21.800.080616	080616 CARB Minutes.doc
21.800.080630	080630 CARB Minutes.doc
21.800.080707	080707 CARB Minutes.doc
21.800.080714	080714 CARB Minutes.doc
21.800.080728	080728 CARB Minutes.doc

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21.800.080811	080811 CARB Minutes.doc
21.800.080818	080818 CARB Minutes.doc
21.800.080821	080821 CARB Minutes.doc
21.900	**Outage performance**
21.901	16RFO Milestones.pdf

22 Business and performance improvement/action plans

22.001	FENOC Business&Excellence Plans 2008-2012.pdf
22.002	FENOC_Shared_PeerGroups_Excellen.pdf
22.002a	FENOC Excellence Plan Remaining Activities by Plant.xls
22.003	FENOC Excellence Plan WBSevel 4.pdf

23 General information

23.001	NRC Eng IP 37001 50-59 Process.pdf
23.002	NRC IP 40500 Problem Resolution.pdf
23.003	NRC IP 37551 System Engineering .pdf
23.004	NRC IP 37550 T-Mods.pdf

26 Management reports and information

26.001	Plant Status - Daily while assessment team on site
26.002	080807 Management Alignment and Ownership Meeting MAOM Package.pdf
26.005	Fleet Value Rankings for Projects with cycle.xls
26.006	FOUR WEEK ACTIVITIES LOOK 9-8-08.pdf
26.006a	FOUR WEEK ACTIVITIES LOOK 9-15-08.doc
26.007	080904 Red-Yellow System Health Items R1.pdf
26.008	080904 MAOM_PACKAGE.pdf
26.009	080904 MR a(1) system system status.pdf
26.010	080911 MAOM Package.pdf
26.011	080910 Red-Yellow System Health Items R1.xls
26.012	Trainee Tracking report 9/24/08 exceptions to Calc Utility Training
26.013	Qualification Card / Job Familiarization Guide eff 4/1/08
26.014	080924 PHC meeting Agenda
26.015	MAOM agenda and package 080924
26.016	MAOM agenda and package 080925
26.100	**Response to CDBI inspection (document 17.014)**
26.100a	CDBI Req_Response.pdf
26.101	CDBI Prep Report CFB Summary.pdf
26.102	CDBI_Resp Actions taken CFB summary _Tab 2 .pdf
26.105	CDBI Gap Closure Plan Tab 4 August 2008.pdf
26.106	Integrated Approach to Improve Engineering Quality.ppt

27 Correspondence to NRC

27.100	**LERs**
27.101	LER 07-001.pdf
27.102	LER 07-002.pdf

Document Library #	document or file name
27.103	LER 08-001.pdf

1.7 Team Members' Biographies

The following assessment team member biographies are included

John Garrity	The Marathon Consulting Group, Team Leader
Harold Baumberger	The Marathon Consulting Group
Charles Bergeron	The Marathon Consulting Group
Bruce Beuchel	Seabrook Station, FPLE
Rod Filipek	St. Lucie Nuclear Power Plant, FPL
Rodney Pickard	DC Cook Nuclear Station, AEP

John H. Garrity
President and Chief Executive Officer
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 areas 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.
  - Team Leader, Davis-Besse Independent Assessment of Engineering Programs Effectiveness 2004, 2005, 2006, and 2007
- 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.

John H. Garrity (continued)

- 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.
- 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)

Harold E. "Rusty" Baumberger
Vice President and Director, Performance Assessment
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, Corrective Action Program assessments, and Maintenance Rule implementation. Also serve as Marathon's Quality Assurance Manager.
  - Team Member, Palo Verde ImPACT Review Team, root cause evaluation and corrective action program area, responsible for review of programs and practices in preparation for NRC 95003 Inspection.
  - Consultant, responsible for assessment of Perry Corrective Action Program for effectiveness of past actions, current status, performance monitoring and goals, and ongoing 95003 recovery plans.
  - Team Member - Davis-Besse Independent Assessment of Engineering Programs Effectiveness in 2004, 2005, 2006, and 2007.
  - 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,

Harold E. "Rusty" Baumberger (continued)

- original system and component specifications, and vendor-supplied data.
- Performed assessment of Design Basis programs at Vermont Yankee including Design Basis document program development.
- 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.
- 1977-1980: *Nuclear Power Consultants*; Consultant – Provided services to nuclear utilities and government agencies conducting reviews and audits in areas of operations, maintenance, engineering, quality assurance, nuclear fuel fabrication and procurement, and licensing. Project manager for the update of Fort St. Vrain Final Safety Analysis Report. Participated in the review of Ontario Hydro's heavy water production costs and uranium fuel requirements for the Providence of Ontario.
- 1967-1977: *U. S. Naval Submarine Service*; Naval Nuclear Propulsion Officer – Responsible for supervision, operation and maintenance of nuclear propulsion plant and ship's auxiliary systems. Certified Navy Nuclear Propulsion Engineer Officer. Participated in refueling, pre-operational testing, and startup of two reactors following extended outages, including one after a change of NSSS.

Charles Bergeron
Senior Consultant
Marathon Consulting Group

- 1995 – present: *Marathon Consulting Group*; Senior Consultant

  - Team Member - Davis-Besse Independent Assessment of Engineering Programs Effectiveness in 2006
  - Palisades – single point vulnerability studies, electrical and I&C systems
  - Nine Mile Point - provided consulting for Electrical Switchyard upgrades and support to the power systems assessment and single point vulnerability assessment tasks associated with the Equipment Reliability Improvement Program.
  - Florida Power and Light - prepared specifications for the procurement of replacement Control Rod Drive Motors (CRDM) associated with the reactor vessel head replacement project at Turkey Point and St. Lucie.
  - Nine Mile Point - provided industry expertise and acted as a "White Team" member and critical reviewer for regulatory actions required by NRC IMC 0305 for White Performance Indicators at Units 1 & 2. Assisted in the successful preparations for the NRC Inspection Procedure 95001 Inspections at both Units.
  - Performed a Digital Control Complex Upgrade Survey/Study performed for a Japanese Utility and consulted on their plans for a plant control room upgrade.
  - D. C. Cook Nuclear Plant - provided design review, licensing support, and construction coordination of Control Room HVAC Systems improvements to conform to new Lake Temperature requirements.
  - Wolf Creek Nuclear Station - provided computer systems consulting for the Y2K issue and assisted the Project Manager in meeting project goals by expediting problem areas.
  - Clinton Nuclear Power Station - Detailed Design Review Team member for an Engineering Quality Assessment performed to support the Restart Program.
  - Central Maine Power (CMP) - reviewed Business Plan development activities to assess the overall company position to address stockholders concerns and prepare for deregulation.
  - Cooper Station / Nebraska Public Power District - participated in the Configuration Management Assessment Project.
  - South Texas Project - developed a re-engineered approach to QA Procedures and participated in a training assignment for the Training Department in Project Management.
  - Maine Yankee - participated on corporate engineering Independent Safety Assessment Response Team. Conducted a review of a Maine Yankee's FSAR to current design basis, identifying and resolving apparent discrepancies. Prepared FSAR changes, Design

Charles Bergeron (continued)

Basis Summary Document updates, plant modification packages, and other engineering information as needed to completely resolve issues found during reviews.

1988 – 1995: *Grove Engineering, Inc.* - Vice President and Director - founded and managed the Boston Office, which specialized in Power

- Plant Life Extension, Severe Accident Analysis, Information Management Systems, and innovative solutions to industry problems. Acted as Project Manager at Maine Yankee as for major outage modifications, including main electric generator replacement, containment penetration replacement, and radiation monitoring system upgrades.
- 1987: *FIW Corp*; COO, Vice President and Director - responsible for overall management of administrative, retail, contracts, and finance, with specific responsibility for the profitability of the company and acquisition strategy.
- 1984 – 1987: *Stone & Webster Engineering Corp.*; Consultant - performed numerous studies for plant life and license extension efforts. Managed special Task Force for Nuclear Safety Studies and was Special Projects Manager for Maine Yankee Atomic Power Station.
- 1979-1983: *Stone & Webster Engineering Corp.*; Supervisor - responsible for the Nuclear Safety Group, Nuclear Safety Task Force, Engineered Safety Systems and Analysis (Thermal-Hydraulic) Group, and the Emergency Planning Group.
- 1978-1979: *Stone & Webster Engineering Corp.*; Senior Engineer - responsible for management systems development, corporate I&C standards, problem reporting system, and other Design Review Board functions.
- 1974-1978: *Stone & Webster Engineering Corp.;* Control Engineer - Lead Engineer for Control Systems on fossil and nuclear powered electric plants.
- 1972-1973: *Stone & Webster Engineering Corp.;* Engineer - responsible for I&C section of engineering and design of a dual unit nuclear power station.
- 1970-1971: *Stone & Webster Engineering Corp.;* Field Engineer - responsible for construction and testing of I&C systems for a natural gas fired power plant.
- 1967 – 1970: *Bettis Atomic Power Laboratory;* Joint Test Group member / Bettis Technical Advisor - responsible for on-site direction of testing of nuclear power plants for naval vessels and directed decontamination of two nuclear reactors with personal onsite control of the evolution, including emergency response management.

Bruce E. Beuchel
Project Engineer
FPL Energy Seabrook, LLC

- Aug 2005 - Present: *Seabrook Station Nuclear Power Plant*; Project Engineer – Responsible for engineering activities on major projects. This includes coordination of FPLE resources and oversight/contract management of contracted engineering resources. Ongoing projects include, Digital Turbine Controls, Loose Parts Monitoring System Replacement, Incore Detector System Replacement, and planning for Digital Feedwater Controls. Recently completed projects include Generator Protective Relaying, P-9 Setpoint Change, Steam Generator Level Control Enhancements, CADD System Upgrade, RWST Silica Removal System, and Thermal Camera Modification for Security System. Also prepared procedure infrastructure for station Capital Projects Engineering Group and created an introductory guide for contracted engineers to improve contractor efficency.
- Jul 1998 - Aug 2005: *Seabrook Station Nuclear Power Plant*; Project Manager - Responsible for the completion of major projects ranging in value from $0.1M to $17.1M. Projects have included the installation of several camera systems, two large building air conditioning systems, and the addition of a partial flow Condensate Polisher System. For several years during this period also responsible for the performance controls group (cost reporting and estimating) and other project managers.
- Aug 1996 - Jul 1998: *Seabrook Station Nuclear Power Plant*; Engineering Performance Manager - Responsible for Reliability and Safety Engineering Group, including Plant Safety Assessment (PRA); Program Support Group (ASME code testing requirements and Predictive Maintenance programs); and Configuration Management Group (responsible for drawing maintenance, and records retention of original engineering documents).
- Jan 1996 – Aug 1996: *Millstone Point Unit 1*; Temporary assignment as the Design Engineering Manager - Part of the initial recovery team to restore Millstone Unit I to operation. Reorganized the design engineering department and identified the scope of the work necessary for restart. The effort included both design basis reconstitution, and identification and preparation of modifications. Initiated changes in the design engineering organization in the area of work planning and time reporting, increased the technical standards, and worked on resolution of infrastructure deficiencies, such as equipment data bases.
- Oct 1994 - Jan 1996: *Seabrook Station Nuclear Power Plant*; Engineering Performance Manager - The responsibilities were essentially the same as indicated for the period of Aug. 1996 to July 1998 and also included the Engineering Services Group which was responsible for engineering assurance and provided the administrative support to the entire engineering department.

Bruce E. Beuchel (continued)

- Jan 1994 - Oct 1994: *Seabrook Station Nuclear Power Plant*; Temporary assignment as the Mechanical Design Engineering Manager - Responsible for Mechanical Engineering Group (civil/structural engineering, pipe stress analysis, support design and stress analysis, seismic analysis, etc.); NSSS System Engineering Group (system design, pumps, valves, system interactions, etc. for the piping systems supplied by the NSSS vendor); and Balance of Plant System Engineering Group (similar responsibilities to the NSSS group, but on systems supplied by the architect engineers). These groups prepared design modifications for the station and responded to day to day questions with regard to the design bases of mechanical systems for the station.
- Dec 1988 - Jan 1994: *Seabrook Station Nuclear Power Plant*; I&C Engineering Supervisor - Responsible for the supervision and technical direction of I&C engineering, responsible for preparing all I&C design change packages. Recipient of the utility's "Values for Excellence" Award in 1990.
- Mar 1985 - Dec 1988: Assigned to the -Seabrook Project in Framingham/Bolton office for Yankee Atomic Electric Co. - Member of group responsible for oversight of architect engineering I&C work for the completion of construction of Seabrook Station. Performed initial verification of technical values in Seabrook Technical Specifications. Following construction, responsible for preparation of I&C design changes.
- Aug 1984 - Mar 1985: *General Electric Company*; Engineer in Startup, Test and Operations Group - Completed SRO Certification on Black Fox BWR-6 simulator. Assigned as a test engineer at Shoreham for three months.
- Nov 1980 - Aug 1984: *Seabrook Station Nuclear Power Plant*; Senior I&C Engineer
- Jun 1975 - Oct 1980: U S Navy; Division Officer on board the USS Tecumseh (SSBN 628) - Qualified to stand watch as Engineering Officer of the Watch (EOOW) responsible for the operation of the nuclear power plant and as Officer of the Deck (OOD) responsible for the operation of the entire ship. Passed Engineer's Exam for Navy Nuclear program.

Rod Filipek
Engineering Manager, Performance and Improvement
St. Lucie Nuclear Power Plant, Florida Power & Light

- April 2008 – Present: *St. Lucie Nuclear Plant, Florida Power and Light;* Engineering Manager - Performance and Improvement – Manage the training, CAPCO, budget, planning and HU personnel for Engineering.
- January 2006 – April 2008: *St. Lucie Nuclear Power Plant, Florida Power and Light;* I&C and Digital Design Engineering Supervisor - Supervise the production of I&C design Modifications and support the recently-installed Distributive Control System (DCS). Acted as Shift Design Engineering Manager during the last two Unit outages.
- January 2004 - December 2005: *St. Lucie Nuclear Power Plant, Florida Power and Light;* Procurement Engineering and Configuration Management Supervisor -Supervised Procurement Engineering and Configuration Management activities for the station. Team Lead for Configuration Management Self-Assessment. Mid-cycle INPO Plant Evaluation Team Member for St. Lucie.
- October 1990 - December 2003: *St. Lucie Nuclear Power Plant, Florida Power and Light;* I&C Design Engineering Supervisor - Supervised production of I&C design modifications for the station. For periods of time was also the Electrical Design Engineering Supervisor.
- October 1989 - October 1990: *St. Lucie Nuclear Power Plant, Florida Power and Light;* I&C Design Engineer - Prepared I&C design modifications for the station.
- December 1985 - October 1989: *Fermi II Nuclear Power Plant, Detroit Edison Company;* I&C Engineer - Head of I&C Plant Maintenance and Technical Department. System Engineering Supervisor - Supervised I&C and Electrical System Engineering groups. Member of the Detroit Edison Company Nuclear Speaker's Bureau.
- April 1979 - December 1985: *Fermi II Nuclear Power Plant, General Electric Company;* Co-Startup Test Engineer - Supported pre-operation and startup testing. Obtained General Electric (GE) Boiling Water Reactor Senior Reactor Operator certification and Professional Engineering License.
- January 1978 - April 1979: *General Electric Company;* Field Engineering - Provided training and testing support at the GE Power Generation Control Complex and training facilities in San Jose, California.
- July 1977 - January 1978: *General Electric Company;* Field Engineering - Training and field training assignments.

Rodney G. Pickard
Engineering Programs Supervisor
Donald C. Cook Nuclear Plant, American Electric Power

- June 1997 – Present: *Donald C. Cook Nuclear Plant, American Electric Power:*
- August 2006 – Present: Engineering Programs Supervisor - Responsible for the implementation of various Engineering Programs to ensure compliance with applicable technical specification, ASME code requirements, INPO best practices, and industry standards including:
  - In-Service Inspection
  - In-Service Testing
  - Flow Accelerated Corrosion
  - Steam Generator Tube Integrity
  - Boric Acid Corrosion Control
  - Appendix J
  - Welding
  - GL 89-13 and BOP Heat Exchanger Inspections
  - Tank Inspections

  Notable accomplishments include
  - Two industry records for completion of containment integrated leak rate tests
  - Implementation of risk informed in-service inspection

- June 2003 – August 2006: Probabilistic Risk Assessment Engineer –
  - Development and application of probabilistic risk models for Donald C. Cook Nuclear Plant
  - Perform maintenance rule (a)(4) configuration risk assessments for planned activities
  - Analyze plant events in accordance with the Significance Determination Process
  - Preparation of risk basis for emergency technical specification changes
  - Train Engineering and Operations personnel on PRA methods and risk informed applications

- June 2001 – June 2003: Training Supervisor –
  - Administer the accredited training program for Donald C. Cook Nuclear Plant engineering personnel
  - Evaluate the effectiveness of the engineering training program, curriculum, materials, facilities, and instructional staff to develop continuing improvement plans
  - Implementation of the Systematic Approach to Training

Rodney G. Pickard (continued)

- Provide the infrastructure necessary for maintaining an adequate supply of well-trained, qualified individuals to meet the operational and outage needs of the plant
- Responsible for hiring decisions and conducting performance evaluations

- June 1997 – June 2001: Nuclear Fuel Safety and Analysis Engineer –
  - Purchase uranium concentrates, conversion services, and enrichment services for Cook Nuclear Plant
  - Negotiate and maintain a portfolio of intermediate and short term contracts for the supply of nuclear fuel and related services
  - Project management of cycle specific reactor core design, fuel fabrication, delivery, and installation
  - Preparation of design change packages
  - Fuel cycle management and fuel safety analysis subject matter expert
  - Reactor engineering support for plant startup physics testing, initial criticality, and power ascension
  - Reactor physics analyst for the emergency response organization

Section 2 Assessment of Internal Self-Assessment Performance

This topic is an explicit assessment area in the 2008 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 2008 Independent Assessment of Engineering Programs, therefore no action plans are required.

Appendix 2 Independent Assessment Plan submittal

NUMBER:
COIA-ENG-2008

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 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 Programs and Practices
4. Implementation of the Corrective Action Program (CAP) by Engineering
5. Effectiveness of self-assessments
6. Corrective actions taken in response to the Areas in Need of Attention (ANAs) identified during the 2007 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, 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 2007 assessment (Permanent and Temporary Modifications)
d. Closeout of modification packages and supporting document updates
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 and owner acceptance sub-process (review of contracted work)
c. Margin management and allocation
d. Linkages and consistency with other calculations
e. Preservation of design bases
f. Documentation/traceability/attribution
g. Calculation health and improvement program
h. Interaction and support from parallel processes
i. Systems descriptions design information
j. Engineering rigor and attention to detail

3. System Engineering Programs and Practices

The team will investigate the following items:

a. System Engineering alignment and plant support
b. System Health evaluation and reporting
c. Process for prioritizing, communicating, and resolving health deficiencies and program deficiencies
d. Equipment Reliability Improvement Program as reflected in the FirstEnergy Nuclear Operating Company (FENOC) Excellence Plans
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 Process by Engineering

The Assessment Team will assess the following:

a. Condition Report ownership and appropriate initiator involvement
b. Quality of root and apparent causes produced by Engineering and associated management behavior and guidance

c. The Assessment Team will review selected Condition Reports related to Engineering Section performance initiated since the 2007 Independent Assessment of Engineering Performance and independently assess the corrective actions taken

5. Effectiveness of Davis-Besse 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. Planning of assessments over the short and long term for ongoing assessment of Engineering performance
b. Review the results of the Davis-Besse Nuclear Oversight Reports and Audits that evaluated Engineering. Determine if the assessments were comprehensive and if effective actions were taken to correct problems or weaknesses identified.
c. 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.
d. 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.
e. Determine the receptivity and responsiveness of management and staff to issues raised in self-assessments and assessments.
f. Review progress to date of Davis-Besse's initiative to develop and implement an integrated approach to improving engineering quality, including corrective actions taken in response to the cross-cutting aspects of Human Performance/Resources/Long-Term Plant Safety associated with the Green Non-Cited Violations identified during the 2007 NRC Component Design Basis Inspection. This review will assess the comprehensiveness of the actions identified, progress on implementation of the actions, and an assessment of their effectiveness to date.

6. Corrective actions taken in response to the Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment of the Davis-Besse Engineering Program Effectiveness

The Assessment Team will evaluate the responses to the five (5) Areas in Need of Attention (ANAs) identified during the 2007 Independent Assessment:

- 1 ANA Waivers of Design Interface Evaluation (DIE) Reviews
- 2 ANA Equipment Reliability (ER) Program – Forecast of Preventive

Maintenance (PM) Strategy Workload, Single Point Vulnerability (SPV) Analysis

- 3 ANA System Health Activities – Plant Computer, 480 V AC, Radiation Monitors
- 4 ANA Analysis of Process-Related Weaknesses
- 5 ANA Assessment Strategy and Implementation

INDEPENDENT ASSESSMENT TEAM:

- John Garrity, Marathon Consulting Group, Team Leader
- Harold Baumberger, Marathon Consulting Group
- Charles Bergeron, Marathon Consulting Group
- Rod Filipek, Peer Assessor, Engineering Manager, St. Lucie Nuclear Plant, Florida Power and Light
- Bruce E. Beuchel, Peer Assessor, Project Engineer, Seabrook Station Nuclear Power Plant
- Rodney G. Pickard, Peer Assessor, Engineering Program Supervisor, Donald C. Cook Nuclear Plant

Biographies attached.

SCHEDULE:

- July 8, 2008: Send selected documentation to team members to begin off-site preparations.
- September 2, 2008 to September 12, 2008: Offsite (in office) review in preparation for onsite assessment.
- September 21, 2008: Assessment team will assemble at the plant for final assessment preparations.
- September 22, 2008 to October 3, 2008: Conduct onsite assessment and provide Davis-Besse with preliminary results prior to leaving site.
- October 17, 2008: Draft team assessment report and final debrief (marks the completion of the assessment) will be provided to Davis-Besse.
- October 24, 2008: Final team assessment report provided to Davis-Besse.
- December 1, 2008: 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:

- Modification 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 Program
- Action items from NRC inspection reports issued since September 21, 2007, 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 September 21, 2007
- Davis-Besse Nuclear Oversight Reports and Audits for past three quarters
- CNRB meeting minutes from last three CNRB intervals.
- Applicable Section or area Performance Indicators

ASSESSMENT PLAN APPROVALS:

Prepared by: John H Garrity Date: 6/23/08
John H. Garrity, Assessment Team Lead

Approved by: Lori J Strauss Date: 6/24/08
Lori J. Strauss, Project Manager

Approved by: Jeannie M Rinckel Date: 6/24/2008
Jeannie M. Rinckel, Executive Sponsor