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Vice President - Nuclear

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Docket Number 50-346  
License Number NPF-3  
Serial Number 1-1384

November 15, 2004

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

Subject: Submittal of Independent Assessment Report of Corrective Action Program  
Implementation for the Davis-Besse Nuclear Power Station

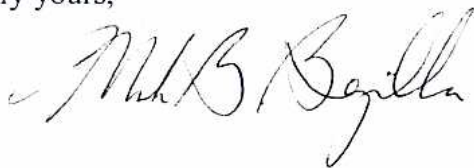
Dear Mr. Caldwell:

The purpose of this letter is to submit the Corrective Action Program Implementation Independent Assessment Report 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."

The Corrective Action Program (CAP) Implementation Independent Assessment was conducted from September 12 to October 1, 2004. The Assessment was performed in accordance with the CAP Implementation Assessment Plan submitted via letter Serial Number 1-1387 dated August 13, 2004. The enclosed report contains the results of the Independent Assessment as well as action plans to address the Areas For Improvement (AFI) raised by the assessment. Also included is an update to an Operations Performance action plan item (AFI COIA-OPS-04-06) as committed in DBNPS letter Serial 1-1390, dated October 8, 2004.

If you have any questions or require additional information, please contact Mr. Robert W. Schrauder, Director - Performance Improvement, at (419) 321-7181.

Sincerely yours,



JCS

Docket Number 50-346  
License Number NPF-3  
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Page 2 of 2

Attachment - Commitment List

Enclosure - Confirmatory Order Independent Assessment of the Davis-Besse Corrective  
Action Program Implementation

cc:

USNRC Document Control Desk  
J. A. Grobe, Chairman, NRC 0350 Panel  
DB-1 NRC/NRR Senior Project Manager  
DB-1 Senior Resident Inspector  
Utility Radiological Safety Board

### COMMITMENT LIST

The following list identifies those actions committed to by the Davis-Besse Nuclear Power Station (DBNPS) in this document. Any other actions discussed in the submittal represent intended or planned actions by the DBNPS. They are described only for information and are not regulatory commitments. Please notify the Director - Performance Improvement (419) 321-7181 at the DBNPS with any questions regarding this document or associated regulatory commitments.

#### COMMITMENTS

#### DUE DATE

##### **AFI COIA-CAP-04-01**

- |   |                      |
|---|----------------------|
| 1. Review procedure NOP-LP-2001 programmatic guidance to determine if clarification is necessary regarding the threshold criteria for Condition Report initiation. Implement procedure NOP-LP-2001 changes, if necessary. | 1. December 30, 2004 |
| 2. Issue a DBNPS site-wide expectations directive to communicate and reaffirm Condition Report threshold criteria to improve understanding of when a condition is to be documented in a Condition Report.                 | 2. January 15, 2005  |
| 3. Perform a self-assessment to evaluate the effectiveness of Condition Report initiation.  | 3. June 30, 2005     |

##### **AFI COIA-CAP-04-02**

- |   |                      |
|---|----------------------|
| 1. Create a comprehensive Integrated Backlog Reduction Plan that integrates the existing Maintenance backlog reduction plan, the Procedure change backlog plan and the Engineering backlog plan.          | 1. December 31, 2004 |
| 2. Implement the Integrated Backlog Reduction Plan. The project is sponsored by the Director - Performance Improvement. A project manager has been assigned; personnel are being dedicated to the effort. | 2. March 31, 2006    |

COMMITMENTS

DUE DATE

**AFI COIA-CAP-04-03**

- |  |                      |
|--|----------------------|
| 1. As part of the Integrated Backlog Reduction Plan (reference AFI COIA-CAP-04-02), the backlog of Significant Conditions Adverse to Quality (SCAQ) and Conditions Adverse to Quality (CAQ) Root and Apparent Cause Preventive and Remedial corrective actions will be reviewed to consider if interim corrective actions are required or if an accelerated completion date is appropriate.  | 1. November 30, 2004 |
| 2. The Condition Report Process procedure (NOP-LP-2001) currently states that corrective action extensions are to consider the need for interim actions. The CREST electronic form process for documenting requests for extension approvals will be enhanced to require an evaluation for and documentation of the decision for interim corrective actions for SCAQ and CAQ Root and Apparent Cause Preventive and Remedial Action extensions. | 2. April 29, 2005    |
| 3. As an interim action, until completion of the electronic form, the site will issue an expectation directive to have SCAQ and CAQ Root and Apparent Cause extension requests evaluate and document whether interim actions are required.   | 3. November 24, 2004 |

**AFI COIA-CAP-04-04**

- |  |                      |
|--|----------------------|
| 1. Benchmark other sites to evaluate how they perform trending. This is to include trend report format and content, use of INPO Operational Excellence Enablers, and the ability to identify Latent Organizational Weaknesses.             | 1. January 30, 2005  |
| 2. Enhance the Quarterly Trend Report to place more emphasis on active Condition Report trends. The trend report will also identify actions that are analyzing or resolving the identified issues along with their current status.         | 2. December 20, 2004 |
| 3. Improve guidance concerning timeliness for performing and completing Collective Significance Reviews.   | 3. January 31, 2005  |
| 4. Develop and implement a site wide equipment trending program for areas such as: vendor, failure mode, failure mechanism, environmental and material issues.   | 4. April 29, 2005    |
| 5. Additionally, FENOC has a Strategic Initiative to develop a common trending program. As part of this new program, guidance will be given to distribute the trend report to CR Analysts and Root Cause Evaluators in addition to Section | 5. January 30, 2005  |

COMMITMENTS

DUE DATE

**AFI COIA-CAP-04-04 (cont'd)**

Managers to improve engagement of those individuals in utilizing trend information. The new program will also stress that the trend information is to be utilized in the Section's performance of Collective Significance Self-Assessments.

**AFI COIA-CAP-04-05**

1. Business Practice NOBP-LP-2001, FENOC Focused Self Assessment Process, will be revised to clarify expectations relative to documentation of Collective Significance Self Assessment Reports. This guidance will establish expectations relative to report format, documentation of assessment results, documentation of Condition Reports and overall rating of performance. 1. March 31, 2005

**AFI COIA-CAP-04-06**

1. Business Practice NOBP-LP-2001, FENOC Focused Self Assessment Process, will be revised to clearly identify the need to consider the potential aggregate impact of programmatic concerns or trends identified as an integral part of the data analysis associated with performance of individual focused self-assessments. Self Assessment reports will be required to document the results of the aggregate impact review, whether or not programmatic issues or trends were identified, and if identified what impact they may have had on the program. 1. March 31, 2005

**AFI COIA-CAP-04-07**

1. Benchmarking will be performed to evaluate how other nuclear stations prioritize Condition Reports from self-assessments and NQA findings. Changes to procedure NOP-LP-2001 will be made, if necessary. 1. March 31, 2005
2. A sampling of current self-assessment and NQA initiated Condition Reports will be performed to determine if DBNPS is completing those Corrective Actions at a comparable rate with self-identified Corrective Actions. 2. April 29, 2005

Docket Number 50-346  
License Number NPF-3  
Serial Number 1-1384  
Enclosure

CONFIRMATORY ORDER INDEPENDENT ASSESSMENT  
CORRECTIVE ACTION PROGRAM IMPLEMENTATION  
DAVIS-BESSE NUCLEAR POWER STATION

(55 pages follow)

# Independent Assessment of the Davis-Besse Corrective Action Program Implementation

**Assessment Number:**

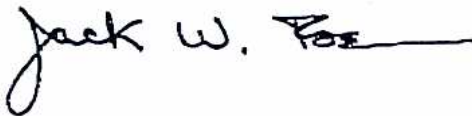
2004-0100

October 21, 2004

## Team Members:

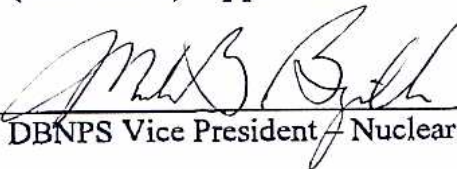
Dr. Jack W. Roe, Scientech, Team Leader  
Frank Miraglia, Independent Consultant (Scientech)  
Morris Branch, Independent Consultant (Scientech)  
Sharon Wheeler, Lead Self-Evaluation Specialist, H. B. Robinson  
John Osborne, Corrective Action Program Manager, San Onofre  
James P. O'Neil, Corrective Action Program Manager, Quad Cities

Submitted by:



Jack W. Roe - Independent Assessment Team Lead

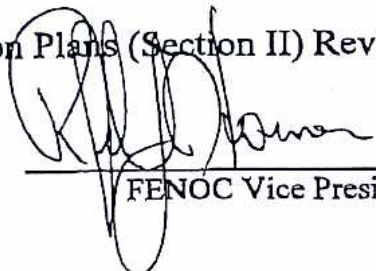
Assessment Action Plans (Section II) Approved:



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DBNPS Vice President / Nuclear

Assessment Action Plans (Section II) Reviewed:



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FENOC Vice President - Oversight

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## *Executive Summary*

This is a report on the Independent Assessment of the Corrective Action Program (CAP) at the Davis-Besse Nuclear Power Station. The Independent Assessment Team (Team) evaluated the following areas associated with the Corrective Action Program implementation:

1. Identification, Classification and Categorization of Conditions Adverse to Quality,
2. Evaluation and Resolution of Problems,
3. Corrective Action Implementation and Effectiveness,
4. Effectiveness of Program Trending,
5. Effect of Program Backlogs,
6. Effectiveness of Internal Assessment Activities, and
7. Corrective actions taken in response to the NRC Special Team Inspection - Corrective Action Program Implementation - Report 05000346/2003010.

The assessment was conducted with a focused three-week period in September 2004. The Team of six professionals, three industry peers and three consultants, conducted the assessment. The industry peers were on the Team from the preparation phase through the end of the first week of the onsite assessment. The consultants were on the assessment for the duration of assessment activities. The Team spent more than 750 professional staff hours on this assessment.

The Team noted that an independent assessment would be conducted concerning Safety Conscious Work Environment; therefore, this Team did not review that area.

The Team gave Davis-Besse's implementation of the Corrective Action Process an overall MARGINAL rating as discussed below. In addition the Team found the backlog is large and decreasing with a goal to get to an appropriate level by the spring of 2006. The Team found that Work Plans are in place that do not reflect the normal completion times for Conditions Adverse to Quality in NOP-LP-2001, Corrective Action Process. The Team found that there is a long list of factual deficiencies noted in the Design Control Collective Significance Review and that there are a number of Corrective Actions yet to be completed by Design Engineering. Given the importance of Design Engineering to the safe operation of the plant, the Team recommends that Senior Leadership Team periodically review the progress Design Engineering is making on these action to assure there are sufficient resources available to address the actions.

The Team found that many of the Team's findings are self-identified repeat findings. Based upon the rating of MARGINAL for the implementation of the Corrective Action Program and the number of repeat findings, the Team recommends an integrated approach for improvement. In addition to the issuance of individual Condition Reports, the Team recommends that the Davis-Besse staff develop and implement an "Integrated Action Plan for the Improvement of the Davis-Besse Corrective Action Program Implementation." Davis-Besse management committed to develop an integrated plan.

Based on interviews, document reviews, and observations, the Team came to the following ratings:

<b>Overall Corrective Action Program Rating</b>	<b>MARGINAL</b>
Identification, Classification and Categorization of Conditions Adverse to Quality	MARGINAL
Evaluation and Resolution of Problems	MARGINAL
Corrective Action Implementation and Effectiveness	MARGINAL
Effectiveness of Program Trending	UNSATISFACTORY
Effect of Program Backlogs	MARGINAL
Effectiveness of Internal Assessment Activities	MARGINAL
Corrective actions taken in response to the NRC Special Team Inspection - Corrective Action Program Implementation - Report 05000346/2003010	MARGINAL

The following provides a summary discussion of the ratings of each assessment area. Additional details are found in the body of this report.

**Identification, Classification and Categorization of Conditions Adverse to Quality** was rated MARGINAL because the Team found that some organizations were not initiating Condition Reports as required by NOP-LP-2001 “Condition Report Process”.

**Evaluation and Resolution of Problems** was rated MARGINAL because quality problems continue with Root Cause Analyses and Apparent Cause Evaluations. Davis-Besse has made progress in the area of Condition Report evaluation. Section 7 of this report discusses several improvements made in this area as a result of performing the Collective Significance Review of CATI items as documented in CR-03-06908.

**Corrective Action Implementation and Effectiveness** was rated MARGINAL because the Team found that the processes for prioritizing, scheduling and extending work do not consistently support the timely implementation of actions to fix long-standing problems. As discussed below, the Davis-Besse backlog has caused a negative impact on timeliness of Corrective Action implementation.

**Effectiveness of Program Trending** was rated as UNSATISFACTORY because Davis-Besse has not aggressively worked to correct deficiencies identified in previous self-assessments or oversight findings. The Team reviewed the Self-Assessment of the Corrective Action Program conducted in October 2003 that rated Corrective Action trending unsatisfactory. The Nuclear Quality Assurance organization identified concerns with the trend program on multiple occasions. The 2003 assessment has been validated in the INPO evaluation AFI (PI. 1-2) and in the August 2004 Self-Assessment of Corrective Action Program Implementation. Trending continues to be an area of concern in this Independent Assessment of the Corrective Action Program.

**Program Backlogs** was rated MARGINAL because the Davis-Besse backlog has caused a negative impact on timeliness of Corrective Action implementation. The Team found that the backlog is large and decreasing. In addition the Team found Work Plans are in place that do not reflect the normal completion times in NOP-LP-2001, Corrective Action Process. However, the Team observed that Davis-Besse management is addressing the backlog of items and is evaluating extension requests.

**Effectiveness of Internal Assessment Activities** was rated as MARGINAL with positive observations. The focused self-assessments reviewed are comprehensive and self-critical; however,

programmatic deficiencies are not aggressively rolled-up and corrected. There is currently no procedural guidance for identifying and correcting programmatic deficiencies or trends identified as a result of self-assessments. The use of Collective Significance reports for organizational assessments of Corrective Action Program health is a good practice.

**Corrective actions taken in response to the NRC Special Team Inspection - Corrective Action Program Implementation - Report 05000346/2003010** was rated as MARGINAL. Davis-Besse's responses to issues identified in the CATI inspection have not always been timely and in some instances may have missed several contributing causes as to the reasons they occurred.

***Capability of Davis-Besse to Self Identify Issues Associated with the Implementation of the Corrective Action Program***

The Team was provided a copy of the Davis-Besse Corrective Action Program Self-Assessment Report 2003-23 before the onsite portion of the Independent Assessment. In addition, the Team was provided a copy of the Davis-Besse Corrective Action Program Self-Assessment Report 2004-0103. This second report was provided to the Team at the end of the first week of the Independent Assessment. The Team reviewed this second Self-Assessment report after the interim exit. That report was dated September 20, 2004.

The findings of the Team are consistent with the findings of the Davis-Besse Corrective Action Program Self-Assessments. Therefore, the Team finds that Davis-Besse has the capability to identify the issues associated with the Implementation of the Corrective Action Program.

# **SECTION 1: Scope, Methodology and Conclusions**

## ***Introduction***

The assessment was 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 was used to identify areas for improvement, requiring Corrective Actions with action plans, and observations for other improvement opportunities. The assessment was used to evaluate the rigor, criticality, and overall quality of Davis-Besse internal self-assessment activities in this performance area.

The following Team of six professionals conducted the assessment:

- Dr. Jack W. Roe, Scientech, Team Leader,
- Frank Miraglia, Independent Consultant (Scientech),
- Morris Branch, Independent Consultant (Scientech),
- Sharon Wheeler, Lead Self-Evaluation Specialist, H. B. Robinson,
- John Osborne, Corrective Action Program Manager, San Onofre, and
- James P. O'Neil, Corrective Action Program Manager, Quad Cities.

The following are highlights of the schedule for the assessment:

- May 24 through June 11, 2004, developed, reviewed and submitted assessment plan to FENOC,
- July 1, 2004, provided selected documentation to Team members to begin off-site preparations,
- September 12, 2004, Team assembled near the plant for final assessment preparations, and
- September 13 - 17, and September 27 - October 1, 2004 conducted onsite portion of assessment and provided Davis Besse with preliminary results prior to leaving site.

## ***Methodology***

This section of the report describes how the assessment was accomplished (i.e., surveys, interviews, observations, document reviews, or a combination thereof). The Team used the general guidance of NOBP-LP-2001 "FENOC Focused Self-Assessment" to evaluate the effectiveness of the implementation of the Corrective Action Program.

The assessment methodology included the following:

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

The Team gathered data on the implementation of the CAP through document reviews, observations, and interviews. The Team observed Management Alignment and Ownership Meetings and a Corrective Action Review Board meeting. The Team reviewed Condition Reports, Apparent Cause Evaluations, Root Cause Analyses, Trend Reports, Self-Assessment, and other assessment reports.

The Team also interviewed Condition Report initiators, evaluators, and management personnel. The data obtained was evaluated to identify Strengths, Noteworthy Items, and Areas for Improvement.

The Team's observations were collectively discussed in an interim debrief on Friday, September 17, 2004 and in a final debrief on Friday, October 1, 2004.

The following general standards of acceptable Corrective Actions were applied to the Assessment of Davis-Besse Corrective Action Program implementation:

- The problem is identified in a timely manner commensurate with its significance and ease of discovery.
- Identification of the problem is accurate and complete, and includes consideration of the generic implications and possible previous occurrences.
- The problem is properly prioritized for resolution commensurate with its safety significance.
- The root causes of the problem are identified and Corrective Actions are appropriately focused to address the causes and to prevent recurrence of the problem.
- Corrective actions are completed in a timely manner.

### **Strengths, Noteworthy Items, and Areas for Improvement**

The Team developed Strengths, Noteworthy Items, and Areas for Improvement. Strengths, Noteworthy Items, and Areas for Improvement are described in the report. Strengths, Noteworthy Items, and Areas for Improvement were based on the definitions in NOBP-LP-2001, FENOC Focused Self-Assessment Guideline, using the following terminology:

#### **Strength**

This term is used to characterize performance that is **exceptionally effective** (*emphasis added*) in achieving its desired results, a high degree of attention to detail is observed in an activity or in the development of a program, or a program or activity is of such a high quality that it could serve as an example for other similar programs.

#### **Noteworthy Item (Recommendation or Enhancement)**

This term is used to characterize a condition where **acceptance criteria has been met** (*emphasis added*), including management expectations, but where changes to a program or process could be implemented to enhance the general efficiency of the program or process. (NOBP-LP-2001 states to capture this condition in the Condition Report Process).

#### **Area for Improvement**

This term is used to characterize a condition where a problem or concern is identified in which acceptance **criteria are not being met** (*emphasis added*). (NOBP-LP-2001 states to capture this condition in the Condition Report Process).

### ***Scope of Assessment***

This section of the report includes a description of the processes evaluated, observations, and results of information analysis including strengths, noteworthy items and areas for improvement. Condition Reports issued are listed.

## **1. Identification, Classification and Categorization of Conditions Adverse to Quality**

The Team reviewed self-evaluation reports, self-assessments, Condition Report responses, investigations, management meetings, CNRB minutes, performance indicators, and trend reports to determine if there were examples of CRs not being written when expected. The Team's standard was based on the standards of the three peer utilities and site management expectations. While the site has a relatively high rate of overall CR generation by industry standards, the Team noted instances where the site did not originate Condition Reports when expected. The following are examples:

- While reviewing self-evaluations and self-assessments the Team noted that CRs were not identified to address assessment Noteworthy Items. Examples of this include 2004 Self-Evaluation Reports for Operations and Engineering. In addition several Areas for Improvement in assessments did not identify Condition Reports that were or should have been written. Site Management expectations (Business Practice) are that CRs will be written for both Noteworthy Items and Areas for Improvement. The Team noted that Noteworthy Items are used to characterize a condition where **acceptance criteria has been met** (*emphasis added*), including management expectations, but where changes to a program or process could be implemented to enhance the general efficiency of the program or process.
- While reviewing SCAQ CR 2004-04087, "Main Steam Safety Valve Incorrect Set Pressure", and the associated root cause analysis the Team noted the reportability review stated the Unit Logs were incorrect when discussing results of several Crosby Main Steam Safety Valves tests. No CR was written to document this error when the reportability performer noted it. As a result of this Team identified deficiency CR 04-05926 "ROOT CAUSE AND OPERATING LOG DISCREPANCIES" was issued on September 27, 2004.
- While reviewing SCAQ CR 2004-04406, "Missed Surveillance Requirement", and the associated root cause the Team noted that although the surveillance was inappropriately documented multiple times from early April to July, one Unit Supervisor caught the error on the attachment and directed correction on April 20, 2004. No CR was written by Operations when this error was found and corrected. A CR in April with an appropriate extent of condition review would have prevented many of the recurrences.
- A review of CAP performance indicators and Trend Summary indicated several deficient areas but did not identify CRs for these areas. Examples include key conclusion and suggested actions, outlying groups, and trends discovered.

### **Area for Improvement**

The Team found that some organizations were not initiating Condition Reports as required by NOP-LP-2001 "Condition Report Process". (CR 04-06028)

### **Conclusion**

In summary, Davis-Besse's Identification, Classification and Categorization of Conditions Adverse to Quality was rated MARGINAL because the Team found that multiple organizations were not initiating Condition Reports as required by NOP-LP-2001 "Condition Report Process".

## **2. Evaluation and Resolution of Problems**

The Team reviewed ten evaluations including seven Root Cause Analyses, three Apparent Cause Evaluations, and observed a Corrective Action Review Board. The Team found multiple deficiencies including inadequate Corrective Actions to prevent recurrence (preventative actions), lack of

appropriate causal depth, factual inaccuracies, and failure to identify some contributing causes. The evaluations were reviewed against site and industry standards. The Team determined there was no generic weakness that occurred throughout the evaluations reviewed.

- While reviewing the root cause analysis for CR 03-04773, RCP / RTD Installation Not Accordance With Vendor Manual, the Team determined that the initial root cause did not address the larger issue of the Supervisor reinforcing expectations. The Root Cause Analysis indicates the individuals took the actions as recommended by the appropriate Engineer and Supervisor. The need for additional training regarding the use of swagelock fittings appeared to be directed toward I&C technicians. Swagelock fittings are used widely in the plant; therefore, the scope of the concern should have been broader. Comments made by the initial CARB review were primarily administrative in nature. The Root Cause Analysis should have been rejected at the initial review. The CARB of September 15, 2004 recognized that the quality of the initial analysis was poor and commented on this concern. The Team notes that CARB rejected this Root Cause and served as a barrier.
- While reviewing the root cause analysis for CR 04-04406, Missed Surveillance Requirement 4.3.1.1.1 For RCS Flow Channel Check, the Team determined that the root cause did not meet program requirements or management expectations. The stated root cause was a repeat of the problem statement. In addition the root cause analysis did not address some potential contributing causes. Other problems with this root cause analysis involved the use of briefings and discussions as preventative actions. None of the peer sites would allow briefings, tailgates, or discussion actions to be Corrective Action to prevent recurrence due to the limited time effectiveness of these types of actions. The Team notes that CARB rejected this Root Cause and served as a barrier.
- While reviewing the Root Cause Analysis for CR 04-04087, Main Steam Safety Valve Incorrect Set Pressure, the Team noted that the time line on pages 5 and 6 documents main safety valves B1 and B3 as inoperable due to set pressure being greater than 3%. According to information provided by Regulatory Affairs the information documented in the Root Cause Analysis was not correct. Condition Report 04-05926 was subsequently written on September 27, 2004 to evaluate and resolve this Team identified issue.
- While reviewing the root cause analysis for CR 03-08917, SFRCS Can Re-Energize In A Blocked Condition, the Team noted that it was not clear that process issues were addressed.
- Review of Apparent Cause Evaluation 04-00697 indicated untimely implementation of Corrective Actions from CR 02-00322. No interim barriers were placed to prevent recurrence after the initial CR was issued. Extensions in CA implementation for CR-02-00322 was approved by management since the CR was consider a non-restart issue. Apparent Cause Evaluation for CR-04-00697 did not recommend a Corrective Action for this apparent cause. This represents a vulnerability since the deferral of CA implementation for CR 02-00322 did not access the need for interim barriers to prevent recurrence until the permanent CA could be implemented.

Three of ten investigations reviewed by the Team were determined to meet standards including:

- Root Cause Analysis 04-01960 Feedwater Sodium Excursion,
- CR 04-02290 Dose Alarm While Installing HIC Lid,
- Apparent Cause Evaluation CR 04-03215 Siren- Salem Township Sirens Activated.

#### **Noteworthy Item**

Based on the Independent Assessment Team's review of evaluation and resolution of Conditions Adverse to Quality, the Team found deficiencies including inadequate Corrective Actions to prevent



recurrence (preventative actions), lack of appropriate causal depth, factual inaccuracies, and failure to identify some contributing causes. (CR 04-06024)

### **Conclusion**

In summary, Davis-Besse has made progress in the area of Condition Report evaluation. Section 7 of this Independent Assessment report discusses several improvements made in this area as a result of performing the collective significance review of CATI items as documented in CR- 03-06908. However, based on the Team's recent observations, quality problems continue with some Root Cause Analyses and Apparent Cause Evaluations. Therefore, this area is rated as MARGINAL.

### **3. Corrective Action Implementation and Effectiveness**

The Team performed an analysis of Corrective Action implementation and effectiveness as discussed below.

#### **Timeliness**

The Team reviewed Corrective Action timeliness throughout the scope of the independent assessment. The Team reviewed Condition Reports with open actions selected primarily on age (old) and CR priority. Station personnel provided a listing of old CRs with open Corrective Actions (see references below). This review considered the event discovery date, underlying cause evaluation results, the type of Corrective Action (compensatory, enhancement, preventive, remedial, other), the original due date, the current due date, and documented justifications for extensions.

Based on its review the Team concluded that Corrective Action implementation was not timely. For example:

CR 01-0175 describes a problem discovered in 1/2001 involving a DH Pump flange connection boric acid leak during an ISI pressure test and potential non-compliance with the ASME code. The CR Apparent Cause Evaluation states leakage was identified during a previous VT2 in 1998 but the work order only allowed examination and retorquing of bolts and not gasket replacement. CA #4 is a Remedial Action to replace the gasket and states gasket replacement is not a mode restraint but is the root cause and should be corrected. This CA was extended in 8/01 and again in 4/2003. The current due date is 1/2005. While there have been extension requests, it is not clear why it will take 6 years to fix the leak (replace the gasket) if the current work schedule is met.

CR 01-0740 describes a problem discovered in 3/2001 involving boron leakage out the side plug of a mixed bed outlet relief valve. The current CA (work order) due date is 4/2006. While there is no impact on the valve functionality, it is not clear why it will take 5 years to fix the condition if the current work schedule is met.

CR 02-00891 describes the degradation of the Reactor Pressure Vessel Head. Corrective Action 57 addresses trending programs. One Root Cause was Less than Adequate Trending. Equipment and materiel trending failed to identify recurring failures, equipment degradation, and performance issues associated with the boric acid on the RPV head and other boric acid issues. The Corrective Actions was to develop and implement a site wide equipment trending program. This program should define what is to be trended periodically (e.g. vendor, failure mode, failure mechanism, environmental, material issues). This Corrective Action is not complete and is scheduled to be completed by 12/31/2004.

It appeared there were missed opportunities to implement the actions. Based on a review of the extension requests, there was typically a lack of objective evidence in the extension request to determine the reasons for delays and acceptability of the current implementation schedule. Based on the sample of open actions, the processes for prioritizing, scheduling and extending work do not appear to consistently support the timely implementation of actions to fix long-standing problems.

#### **CRs referenced:**

1. CR 01-0004, Pressurizer Makeup Flow Control Valve (CA 4),
2. CR 01-0009, Barrier Penetration Inspections (CA 2, 5, 6),
3. CR 01-0175, Body to Bonnet Leakage Identified During ISI Pressure Test (CA 4),
4. CR 01-0220, Low Light Area of Concern (CA 3),
5. CR 01-0234, Station Switchgear Cubicles in Need of Refurbishment (CA 2),
6. CR 01-0285, Lack of Systematic and Consistent Guideline Process (CA 7),
7. CR 01-0340, Degrading Trend of Service Water Butterfly Manual Isolation Valves (CA 3, 11, 13, 14),
8. CR 01-0490, Control Room Computer Digital Input No. 1 (CA 8),
9. CR 01-0740, MU Valve Leakage (CA 4),
10. CR 01-0785, CTMT Hydrogen Analyzer System (CA 6),
11. CR 02-00891, Degradation of the Reactor Pressure Vessel Head (CA 57), and
12. July 2004, Corrective Action Program Performance Indicator Report.

#### **Area for Improvement**

The Team found that the processes for prioritizing, scheduling and extending work do not consistently support the timely implementation of actions to fix long-standing problems. (CR 04-06011)

#### **Review of the number of repeat Condition Reports and Corrective Actions and evaluation the effectiveness of Corrective Actions.**

The Team requested copies of repeat Condition Reports. The Team was provided with two Condition Reports for repeat events since plant restart, CR 04-01230 – Missed Tech Spec Entry and CR 04-04445 – Collective Significance of Tech Spec Events. The definition of ‘repeat’ as used in Davis-Besse’s Performance Indicators is a SCAQ with same cause and consequence. This definition is too limited as it masks similar events and identification of adverse trends. The NRC CATI has raised this concern as well. The Quarterly Trend Reports do provide data on similar events. However, as discussed in this report the Quarterly Trend Report was not found to be useful to the Davis-Besse staff. As a result of this narrow definition Davis-Besse is missing an opportunity to become a learning organization with regard to repeats events as a measure of Corrective Action Program Effectiveness. Peer evaluators believe that others in the industry track repeat problems at the apparent cause evaluation level and require an evaluation of the previous cause evaluation when a repeat occurs.

#### **Noteworthy Item**

The Team found that the definition used in Davis-Besse’s Corrective Action Program Performance Indicators (PIs) is too limited. Consideration should be given to developing PIs that capture repeat events at lower significance levels so as to identify adverse trend in Corrective Action Program Effectiveness. (CR 04-06023)

#### **Timeliness of CAQ and SCAQ Corrective Actions**

The Team reviewed the timeliness of conditions adverse to quality or significant conditions adverse to quality (SCAQ) Corrective Actions. The Team focus included Condition Report Corrective Actions, which were completed or extended after their due date. The Team reviewed the Corrective Action

Program Performance Indicator reports including the March 2004 report and the August 2004 draft report. The applicable Corrective Actions consist of compensatory actions, remedial actions or preventative actions from CRs categorized as conditions adverse to quality or significant conditions adverse to quality.

The number of open CAQ and SCAQ overdue in August 2004 was 19 of 2266. However, 235 of the Corrective Actions were extended in August. The average age of open CAQ or SCAQ actions is 419 days and 74.5 percent of the open Corrective Actions that are normal work or placed on the quarterly schedule are greater than 180 days old. The average of completed Corrective Actions is 333 days and the 3-month average of completed actions is 280 days.

The Team compared the August 2004 report with the report for March 2004. In March 2004, the average age of the applicable open CR Corrective Actions was 330 days. The 12-week average (1/12/04 - 4/4/04) age of completed CR Corrective Actions was 218 days.

Based upon information in the Corrective Action Program Performance Indicators Report, it can be seen that age of CAQ and SCAQ (1) Corrective Actions and (2) completed CR Corrective Actions is increasing. The average age of the CAQ or SCAQ actions increased from 330 days to 419 days (+89 days) and age of completed CR Corrective Actions increased from 218 days to 333 days (+115 days).

#### **Noteworthy Item**

The Team found that since the age of the actions is beyond or can go beyond the normal guidance of NOP-2001, Condition Report Process Management action is warranted to address the increasing trend in average age and age upon completion of CAQ and SCAQ actions. (CR 04-06013)

#### **Implementation of Corrective Actions for operating experience feedback**

The Team reviewed the evaluation and Corrective Actions resulting from industry operating experience. Station personnel provided six Operating Experience Evaluations. One Operating Experience Evaluation was included in the September 15, 2004 CARB package. This review considered the evaluation of applicability to Davis-Besse and, where necessary, the identification of actions to address issue and the schedules for implementation. The Team concluded that overall OE evaluations were good and schedules of implementing Corrective Actions were satisfactory. For example: CR 03-10495 discusses an EDG electronic governor infantile failure. The OE evaluation was clear and concise in identifying that Davis-Besse's EDG governors could also be subject to infantile electronic failure and defined an action to change the purchase specifications to require burn-in and functional tests. The time from identification (12/03) to Corrective Action implementation (8/04) was reasonable.

CR 04-02361 discusses plugging of safety injection pump lube oil coolers with lakeweed. The Team reviewed this OE evaluation and generally concluded that the evaluation for applicability at Davis-Besse was systematic and concise identifying systems that were vulnerable and not vulnerable. An action was defined to develop procedural guidance to "blow down the Hydrogen Dilution Blowers, AFW Pump Bearing Cooler, AFW Turbine Bearing Cooler, AFW Governor Cooler and MDFP Lube Oil Cooler periodically when supplied by SW to eliminate the potential for lake weed buildup. Submit PCR-CR as required." The due date of 9/30 is reasonable.

The Team found that the OE evaluations were complete.

**Review the activities of the Corrective Action Review Board (CARB) and evaluate the effectiveness of the CARB.**

The Team reviewed CARB activities and effectiveness. This was accomplished by review of the September 15, 2004 CARB package, prior to the meeting, and attending the meeting to observe interactions and results. The package contained two Root Cause Analyses (RCA), four Effectiveness Reviews (ER) and one Operating Experience (OE) Evaluation. The Team assessed and discussed the quality of these documents. The general consensus was that the quality of documents didn't meet generally accepted industry standards, with the exception of the OE Evaluation. The CARB was effective in identifying the same and similar issues, and directing appropriate actions. For example:

The Team concluded that RCE (CR 03-0773) concerning RCP/RTD installation not in accordance with vendor manual was shallow in identification of causes. The CARB appropriately challenged and rejected the RCE because the revision did not address the CARB comments that were the reason for the revision and didn't meet standards for a root cause evaluation. Specifically, the cause analysis was focused on what happened and not why it happened in defining cause. The CARB comments were to redo the analysis. The CARB also accepted with comments RCA (CR 04-04406) concerning missed surveillance requirement for RCS flow channel check. The CARB comments were that the RCE documentation needed to clarify the Operator errors from administrative errors, and state why the Operators did not follow procedures. There was good consensus among CARB members on the results of their reviews.

The Team reviewed the four ERs and concluded that they all were lacking objective evidence to support the conclusions of either effective or ineffective Corrective Action. Based on the ER documentation, it is difficult to see how reviewers could approve the ERs and how the CARB could accept or reject the ER. Based on the records, it was obvious that either the process and/or the knowledge levels of the personnel conducting and reviewing ERs were lacking. There were also legacy issues involving past expectations for scope and use of ERs. While the CARB made the right calls in the meeting to reject/rework and to generate a Condition Report to evaluate the process/knowledge issues, the Team noted that the CARB, and more specifically the Director of Performance Improvement, was the barrier to ensure adequate quality. Responsibility and accountability for product quality at lower levels of the organization appeared to be lacking.

The Team noted the CARB meeting started late and was two hours in duration. Given one of the ERs and the OE was not reviewed; the time required appeared to be a low value demand on management resources. The three ERs that were discussed clearly did not meet today's expectations either in scope and/or implementation. It was apparent that some up front work could have reduced the duration of the CARB.

The Team observed that all CARB members must take mandatory training concerning root cause analysis and apparent cause evaluations. This is the same training Root Cause Analysts receive. Davis-Besse is utilizing the systems approach to training (SAT) in developing and in presenting this training. In the conduct of management interviews, the Team was told that the quality of Root Cause Analyses and Apparent Cause Evaluations and effectiveness of the CARB has improved as a result of the training.

**Strength**

The Team considers the SAT approach to cause training and mandatory cause training for CARB members a strength.

## **Conclusions**

The Team found that the OE evaluations were complete. The Team rated performance in this area was SATISFACTORY. The Team found the CARB was effective. They were a good backstop to reinforce standards and drive improvement in the quality of cause evaluations and effectiveness reviews.

Team found that the definition of repeat event as used in the Correction Action Program Performance Indicators is too limited.

In summary, Davis-Besse's Corrective Action Implementation and Effectiveness was rated as MARGINAL because that the processes for prioritizing, scheduling and extending work do not consistently support timely implementation of Corrective Actions.

## **4. Effectiveness of Program Trending**

The purpose of this part of the assessment was to evaluate the effectiveness of Davis Besse's trending activities associated with the implementation of the Corrective Action Program and to review the deficiencies tracked in the Corrective Action and Maintenance Rule Monitoring Programs.

The Team evaluated the effectiveness of Corrective Action Program Performance Indicators, five Quarterly Trend Reports for the Corrective Action Plan and audits of the Corrective Action Program, organizational self assessments of Corrective Action activities, and Corrective Action implementation for items identified as a result of self assessments, management responsiveness to trending activities. The Team also reviewed the Company Nuclear Safety Review Board minutes concerning their oversight of the Corrective Action Program.

The assessment was conducted through observations, document reviews, and interviews. During the course of this assessment, the Team reviewed the FENOC Self-Assessment Process Business Practice, the Self-Assessment of the Corrective Action Program conducted in October 2003 (SA 2003-23), INPO Evaluation findings concerning CAP in April 2004, the Self-Assessment of Corrective Action Program Implementation conducted in August 2004 (SA 2004-0103), the last five quarterly Nuclear Quality Assurance Reports, five Quarterly Trending Reports, the last four sets of Company Nuclear Review Board meeting minutes, and numerous Condition Reports.

## **Review of the deficiencies tracked in the Corrective Action and Maintenance Rule Monitoring Programs.**

The Team reviewed the Corrective Actions that were generated as a result of Self-Assessment of the Corrective Action Program conducted in October 2003. That assessment rated the effectiveness of the Corrective Action Program as marginal. Most of the Condition Reports that pointed to deficiencies with specific issues in CR's, Apparent Causes or Root Causes have been evaluated and closed. The Condition Reports that dealt with Corrective Action process issues such as timeliness, trending, management support, CARB, effectiveness reviews, and CR extension process were addressed. Some of the issues continued to be identified by the NQA organization and self-assessments as weaknesses. The Team's evaluation of the effectiveness of the implementation of the Corrective Action Program is discussed in this report as follows:

- Identification, Classification and Categorization of Conditions Adverse to Quality (Section 1.);
- Evaluation and Resolution of Problems (Section 2.),
- Corrective Action Implementation and Effectiveness (Section 3.),
- Effectiveness of Program Trending (Section 4.),

- Effect of Program Backlogs (Section 5.), and
- Effectiveness of Internal Assessment Activities (Section 6.).

With respect to deficiencies in Maintenance Rule Monitoring Program the Independent Assessment Team reviewed the Davis-Besse System Health Report, Maintenance Program - 2<sup>nd</sup> Quarter 2004; Periodic Maintenance Assessment Report for 13RFO; DB-PF-00003 Maintenance Rule; NRC Inspection Report 2003-022 and numerous Condition Reports.

The Second Quarter Davis - Besse System Health Report for the Maintenance Rule indicates the program's health is acceptable. Incorporation of the Maintenance Rule Program into System Health Reviews occurred in the third Quarter of 2003. The report captures outstanding Condition Reports and Corrective actions. The Maintenance Rule Engineer provided the Team with a list of CR's associated with the Maintenance Rule and a list of Systems in (a)(1) status. The Periodic Maintenance Assessment Report for 13RFO provides an assessment of Maintenance Rule Implementation for the period of May 2002 to mid-March 2004. This report indicates that Corrective Actions have been generally effective in preventing repeat failures of equipment. There were some instances where Corrective Actions were not timely enough to prevent additional failures of systems (e.g. Station and Instrument Air System). There also were some instances where cause was not fully understood and interim actions were not effective (e.g. Containment Spray/480 VAC and Auxiliary Feedwater Systems).

The Team reviewed CR 04-00697-Procedure Changes that determine Maintenance Rule Equipment Availability. The Apparent Cause was untimely implementation of Corrective Actions for a previously identified problem. The same procedural change issue was identified and documented in CR 02-00322. The Corrective Actions were classified as non-restart CA's and implementation was delayed. No interim actions were identified in CR 02-00322; thus, the issue recurred. Since there was a conscious decision to extend Corrective Action implementation for CR 02-00322, CR 04-00697 did not recommend any Corrective Actions for apparent cause #1(untimely implementation of Corrective Actions). The Team views that this Apparent Cause missed an opportunity to identify a Corrective Action to review all CA implementation extensions that were classified as non-restart issues to ensure appropriate interim compensatory actions are in place.

#### **Evaluation of the effectiveness of the Corrective Action Trending Program**

The Team reviewed the Self-Assessment of the Corrective Action Program conducted in October 2003 that rated Corrective Action trending unsatisfactory. The Nuclear Quality Assurance organization identified concerns with the trend program on multiple occasions. The 2003 assessment has been validated in the INPO evaluation AFI (PI. 1-2) and in the August 2004 Self-Assessment of Corrective Action Program Implementation. Trending continues to be an area of concern in this Independent Assessment of the Corrective Action Program. Davis-Besse has not aggressively worked to correct deficiencies identified in previous self-assessments or oversight findings.

Trending of Corrective Action report data was suspended during the extended plant outage. In response to the October 2003 Self-Assessment issuance of Quality Trend Reports was resumed in October 2003. The Team reviewed five Quality Trend Summary Reports issued since their resumption. The Nuclear Quality Assessments through 1<sup>st</sup> Quarter of 2004 continued to identify weaknesses in the Corrective Action trending program. The INPO evaluation in May identified that the Condition Report process and self-evaluation trending process lacks in-depth analysis to identify precursors or adverse trends AFI (PI 1-2).

The Team reviewed the Quality Trending Reports. The reviews indicated that the reports were a collection of statistical data of Condition Report timeliness, review times and information aimed at backlog reduction. The reports did not provide an evaluation or analysis of the data of trends and specific Corrective Actions to improve the effectiveness of the Corrective Action Program.

The review of the Quality Trend Reports for the 1<sup>st</sup> and 2<sup>nd</sup> Quarter of 2004 revealed the following concerns:

- The Executive Summary contains a section designated as “Key Conclusions and Suggested Actions”. These items warrant linking to ongoing Corrective Actions or the initiation of separate Condition Reports.
- Trends in the statistical data are not clearly identified and tied to a Key Conclusion and Suggested Actions.
- The reports do not indicate recurring trends and effectiveness of actions to address performance issues. Status of previously identified trends or the effectiveness of actions to correct an identified trend should be identified. The reports have identified performance levels that are ‘below industry average or bottom quartile’ for several months with no recommended action or Condition Report. Therefore, no information is provided to the management that an issue remains a concern.

The Team interviewed a number of managers to assess the usefulness of the trend reports to their sections and departments. Based on interviews, it was determined that Management is aware of concerns with the trend program. Specific issues identified were:

- The Quarterly Quality Trend Summaries do not provide useful trend data to focus on performance improvement initiatives.
- The Quality Trend Summary provides statistical data available in other reports (System Health Report); detailed evaluation of the data to identify trends is needed.
- One discipline (Work Management) was observed performing their own CR trending/analysis/coding-bucketing to collect needed data via “yellow stickies”. Although this was being performed principally to support their Collective Significance Self-Assessment, this effort was presented to the assessment Team as providing more meaningful trend data than the Quality Trend Summary report.
- A questionnaire was included in each of the last two quarterly Quality Trend Summary reports to provide an opportunity to provide feedback on the need to improve the report quality/format/usefulness to the Performance Improvement Organization. The Team requested copies of the feedback provided. The Team was informed that there was one supervisor who provided feedback to the 1<sup>st</sup> Quarter 2004 Report and the same supervisor and several CR Analysts and Root Cause Evaluators provided only limited feedback to the 2<sup>nd</sup> Quarter Report. The feedback forms provided to the Team only provided superficial comments concerning improvement in the statistics presented. No Managers provided feedback. Most of those interviewed indicated that they had not provided any feedback to improve the process. The Performance Improvement Unit initiated a Condition Report (CR 04-02457) concerning the lack of feedback on the part of the management team.

The fourth Quarter Nuclear Quality Assessment Report recommended that implementation of initiatives to improve the Corrective Action Program become a management priority (CR 04-01240). The investigation summary for this CR recognizes that there are numerous Corrective Actions concerning Corrective Action Program Improvement initiatives, i.e., involving trending and self-

evaluation. The Team has specific comments later in this report regarding its evaluation of the quality of the Collective Significance Self-Assessments reviewed.

The Team noted that CR 04-01240 - Recommendation to Improve Management Attention on Corrective Action Program was categorized as “NF”. The Team has commented on classifying these CRs from Collective Significance Assessments, as “NF” does not convey the significance of these issues and the programmatic importance of their timely completion. The August 2004 CAP Self-Assessment report expressed similar concerns.

### **Area for Improvement**

The Team found that a review of all CA implementation extensions that were classified as non-restart issues should be conducted to ensure appropriate compensatory actions are in place. The Team Report provides examples where untimely implementation of Corrective Actions with no interim actions in place has resulted in ‘repeat’ events. (CR 04-06016)

The Team found that Davis-Besse has not aggressively worked to correct Corrective Action Trending Program deficiencies identified in previous self-assessments or oversight findings. The Team reviewed the Self-Assessment of the Corrective Action Program conducted in October 2003 that rated Corrective Action trending unsatisfactory. The Nuclear Quality Assurance organization identified concerns with the trend program on multiple occasions. The 2003 assessment has been validated in the INPO evaluation AFI (PI. 1-2) and in the August 2004 Self-Assessment of Corrective Action Program Implementation. Trending continues to be an area of concern in this Independent Assessment of the Corrective Action Program. The Team found that continued Management is needed to focus on all Corrective Action Program Initiatives, with specific attention to those initiatives to improve trending. (CR 04-06017)

### **Conclusion**

In summary, the Team found that:

- (1) Review of the deficiencies tracked in the Corrective Action Monitoring Programs indicates that certain areas require continued management attention,
- (2) Review of the deficiencies tracked Maintenance Rule Monitoring Program is SATISFACTORY and
- (3) Davis-Besse’s Corrective Action Trending activities are rated UNSATISFACTORY.

### **5. Effect of Program Backlogs**

The Team reviewed the status of the backlog of work items. The Team interviewed the station staff and reviewed the “Open Davis-Besse Site Documents” reports. The Team focused on the reports for 1/04/04, 4/18/04, 8/22/04, and 9/12/04.

Davis-Besse has a large backlog of work items. Contained in the total for 09/12/04 total are the following:

Work Orders	3,779
Condition Reports	1,341
Corrective Actions	4,069
Work Order related Corrective Actions	1,423
Engineering Change Packages	1,232
Procedure Change Requests	2,078.



The total number of Condition Reports and Corrective Actions is 5,410 of the total population of work items of 14,606. These two categories of CRs and CAs are 37% of the total population.

The Team evaluated the change in number of work items from 04/18/04 to 09/12/04. The following table shows the number of items and change during the time period.

Item	04/18/04	09/12/04	Change
Work Orders	4,190	3,779	-411
Condition Reports	3,122	1,341	-1,780
Corrective Actions	6,535	4,069	-2,466
Engineering Change Packages/ Modifications	1,331	1,232	-99
Procedure Change Requests	2,081	2,078	-3

The backlog for Davis-Besse is large and trending downward. As stated in the Davis-Besse Design Engineering Self Evaluation Report for the 1st Quarter 2004, the backlog for the first quarter was not originally reduced as originally planned due to the extended start-up of the plant. The report indicates some frustration by several individuals due to assignment to Problem Solving Teams, or Backlog Reduction Teams. Concern about the backlog was also expressed by the Davis-Besse staff during the August 2004 “4 Cs” Meeting. The staff expressed concerns about the backlog team “getting off the ground”, and pulling Engineering personnel to participate on the Engineering backlog team.

The backlog is having an impact on the timeliness of Corrective Actions. In the Davis-Besse Design Engineering Work Plan Cycle 14 December 4, 2003, the Resource Assessment and Summary states that it is assumed that new Condition Reports identified during the next two years result in a work load similar to that which resulted from the existing Post-Restart Corrective Actions. This Work Plan states that the workload is to be completed within **one year of identification (emphasis added)**. This Work Plan is greater than the 135-day and 180-day normal period stated in NOP-LP-2001.

Items in the backlog are being evaluated using NOBP-ER-1004, Fleet Value Rating (FVR) Methodology. NOBP-ER-1004 has defined attributes to be used to weight the FVR. The attributes are listed in the order of importance. The NOBP also has Fleet Value Rating Worksheets that provide points for the attributes. The point value listed for some of the items under the attributes do not appear to properly reflect the order of importance of the attributes.

During interviews, the Team was informed that Engineering was in the process of reviewing their open Engineering Change Packages/ Modifications backlog. The purpose of this review was to reassess the need to perform this open work using the Fleet Value Rating system discussed above. The initial population for the reassessment was approximately 1300 open Engineering Change Packages/ Modifications. The first scrub involved evaluating and eliminating component equivalency modifications from the population of open design work. There were approximately 400 equivalencies removed leaving the backlog population at approximately 900. Of these 900 open Engineering Change

Packages/ Modifications, 400 were determined to be in some state of field implementation leaving the actual open population around 500.

These remaining 500 open engineering packages were then evaluated using the Fleet Value Rating process. Approximately 100 of these packages made the cut (i.e. were rated >300 FVR), leaving approximately 400 open Engineering Change Packages/ Modifications that could potentially be voided.

The Team observed that there might not be clear linkage between the proposed Engineering Change Packages/ Modifications and the CR system, which may be driving the proposed modification. It was not clear to the Team that a CR may be linked to a proposed engineering change is well understood by all groups performing this evaluation.

The Team observed that Davis-Besse has several priority schemes. These priority schemes do compete with each other. The Team found that the Senior Leadership Team and the Executive Leadership Team were evaluating and addressing competing priorities.

### **Noteworthy Items**

NOBP-ER-1004, Fleet Value Rating (FVR) Methodology has defined attributes to be used to weight the FVR. The attributes are:

Safe Plant Operations

Contribution towards EPS

Excellent Material Condition

Outage Performance

Fleet Efficiency/Effectiveness

The point values listed in the Screen Fleet Value Rating Worksheet and Final Fleet Value Rating Worksheet for weighting some of the attributes do not appear to properly reflect the significance and importance of the attributes contribution to safe operation. (CR 04-06030)

The Team found that the backlog is large and slowly decreasing. Work Plans are in place that do not reflect the required completion times required by NOP-LP-2001, Corrective Action Process. The Team found that Davis-Besse management is addressing the backlog of items. The Team is concerned that the resources currently available to address the backlog are not sufficient to meet the station's goals.

The Team found the backlog is impacting the timely completion of Corrective Actions and that many of the Team's findings concerning the implementation of the Corrective Action Program are repeat findings. Based upon the rating of MARGINAL for the implementation of the Corrective Action Program and the number of repeat findings, the Team recommends that an integrated approach for improvement be used. In addition to the issuance of individual Condition Reports, the Team recommends that Davis-Besse staff develop and implement an "Integrated Action Plan for the Improvement of the Davis-Besse Corrective Action Program Implementation." Davis-Besse management has committed to develop an integrated plan. (CR 04-06031)

### **Conclusion**

In summary, the Davis-Besse backlog has caused a negative impact on timeliness of Corrective Action implementation. The Team found that the backlog is large and slowly decreasing. In addition the Team found Work Plans are in place that do not reflect the required completion times required by NOP-LP-2001, "Corrective Action Process".

## **6. Effectiveness of Internal Assessment Activities**

The purpose of this part of the assessment was to evaluate the effectiveness of Davis Besse's self-assessment activities associated with the implementation of the Corrective Action Program and to evaluate the effectiveness of the Corporate Nuclear Review Board (CNRB) oversight of the implementation of the Corrective Action Program.

The Team evaluated the effectiveness of plant audits of the Corrective Action Program, organizational self-assessments of Corrective Action activities, Corrective Action implementation for items identified as a result of self-assessments, management responsiveness to self-assessment activities. The Team also evaluated the effectiveness of the safety committee's oversight of the implementation of the Corrective Action Program.

The assessment was conducted through observations, document reviews, and interviews. During the course of this assessment, the Team reviewed the FENOC Focused Self-Assessment Process Business Practice, the Self-Assessment of the Corrective Action Program conducted in October 2003 (SA 2003-23), the last five quarterly Nuclear Quality Assurance Reports, a Self-Assessment of Training (2004-0012), six first quarter 2004 organizational Collective Significance Reports, the last three sets of Company Nuclear Review Board meeting minutes, and numerous Condition Reports.

### **Review of Davis-Besse Plant audits that evaluated the effectiveness of the implementation of the Corrective Action Program**

The Team evaluated the effectiveness of the Self-Assessment of the Corrective Action Program conducted in October 2003. That Team included four industry management level peers. Areas assessed included: initiation, classification, evaluation, Corrective Actions effectiveness reviews, trending, collective significance, performance indicators, and management. The 2003 CAP Self-Assessment rated trending UNSATISFACTORY, and Root Cause Analysis MARGINAL. All other areas were rated satisfactory. This assessment was comprehensive and self-critical. The Team was provided with a copy of Self-Assessment of Corrective Action Program Implementation (SA 2004-010) at the debrief meeting of following week 1 of it's the Team's onsite review. The Team found that this assessment was comprehensive and self-critical.

### **Evaluation of the Effectiveness of self-assessment capability**

The Team reviewed Nuclear Quality Assurance Reports and organizational Collective Significance Reports. The Nuclear Quality Assurance reports were in-depth, provided bases and supporting details for conclusions, and appropriately referenced conditions reports.

The Team reviewed Collective Significance Self-Assessments of Quality Services, Maintenance, Operations, Plant Engineering, Project Management, Procurement Engineering, and Training. This is a relatively new practice at Davis-Besse. The Team found that the quality of the reports varied widely. Maintenance and Radiation Protection could have been more self-critical. Maintenance, Procurement Engineering, and Operations did not include an overall rating of organizational performance. Operations, Radiation Protection, Procurement Engineering, and Plant Engineering did not reference Condition Reports initiated to address Areas of Improvement and Noteworthy Items.

The Team considered the Quality Services Collective Significance Self-Assessment, CSSA 2004-004, May 2004, a rigorous assessment. The assessment identified appropriate Strengths, and Noteworthy Items. As required, Condition Reports captured the Noteworthy Items.

The Team considered the Procurement Engineering Collective Significance Self-Assessment, CSSA 2004-0014 as UNSATISFACTORY and not consistent with the guidance, NOP-LP-2006, "Collective Significance Reviews" and NOBP-LP-2001, FENOC Focused Self-Assessments. The body of this report was only three pages in length. Strengths were listed that are normal expected accomplishments. For example, the establishment of monthly performance indicators was considered a strength. The word "Strength" should be used to characterize performance that is **exceptionally effective** (*emphasis added*) in achieving its desired results, a high degree of attention to detail is observed in an activity or in the development of a program, or a program or activity is of such a high quality that it could serve as an example for other similar programs. In addition this report stated that a Noteworthy Item is section personnel were actively involved in efforts to improve the mechanics of SAP. The report also includes an Area for Improvement that did not meet guidance.

During the review of Collective Significance Self-Assessments an issue arose associated with documenting Noteworthy Items and Areas for Improvement. Specifically, NOBP-LP-2001, FENOC Focused Self-Assessment requires that a Condition Report be written to capture Noteworthy Items or Areas for Improvement. However, NOBP-LP-2006, Collective Significance Review process does not contain similar language for how to capture/document a Noteworthy Item or Areas for Improvements identified during that review. For example, the Root Cause Analysis for Collective Significance Review CR 03-06907 dealt with site design basis calculations not being maintained or upgraded to be current with industry standards/methods. The Collective Significance Review determined that this issue was a financial decision, rather than a shortcoming of the calculations, personnel, or process. This area was listed as a potential "area for improvement"; however, no CR was issued. There appears to be a discrepancy in the procedural methods as to how to consistently capture items that need further review or evaluation by management.

The Team found that the practice of conducting periodic Collective Significance Reviews is positive; additional guidance and/or expectations are warranted in order to ensure maximum benefit from this effort.

#### **Determination if the Davis-Besse staff is aggressive in correcting self-assessment findings on the implementation of the Corrective Action Program**

The Team evaluated the effectiveness of the Self-Assessment of the Corrective Action Program conducted in October 2003. The 2003 CAP Self-Assessment rated trending UNSATISFACTORY, and Root Cause Analysis MARGINAL. The Nuclear Quality Assurance organization identified concerns with the trend program on multiple occasions. The August 2004 CAP Implementation Self-Assessment raised similar issues. Trending and Root Cause quality continue to be areas of concern in this Independent Assessment of the Corrective Action Program.

Davis-Besse has not aggressively corrected deficiencies identified in previous self-assessments or oversight findings.

#### **Interview of individuals involved with the oversight function, as well as the audited organization, to gain their insight on the effectiveness of their effort and the responsiveness of utility management and staff to issues raised**

Interviews were conducted with the Manager-Performance Improvement, the Supervisor-Corrective Action Program, the Supervisor-Compliance, and the Supervisor-Quality Assurance. Based on interviews, it was determined, the site is aware of challenges with evaluation quality and the timeliness associated with closing actions. The Supervisor-Quality Assurance also identified responsiveness as a

concern. Management is aware of concerns with the trend program and noted that function is being transferred to corporate. It is the view of the Team that transfer of this function to Corporate will result in further delays in improving the trending program.

The Team concluded that Site Management is actively engaged in the oversight of the Corrective Action Program, aware of Corrective Action Program weaknesses, and working to implement program improvements.

**Identification of what issues the safety committee reviews and actions initiated by the safety committee to identify, assess, and correct areas of weakness**

The Corporate Nuclear Review Board conducted thorough reviews of Corrective Action Program data. The bases for conclusions and requests for information were well documented. The Corporate Nuclear Review Board previously identified areas of concern that were also independently concluded by the Team. The Corporate Nuclear Review Board Action items are tracked and dispositioned via meeting minutes. This area of performance was deemed SATISFACTORY.

**Review of audits of the Corrective Action Program conducted under the cognizance of the offsite safety committee and determine if the audit finding were consistent with such external assessments as INPO, NRC, and consultants**

There were no Corrective Action Program audits conducted during this evaluation period under the cognizance of the Corporate Nuclear Review Board.

**Evaluation of the Davis-Besse follow-up to items on the Corrective Action Program identified by the safety committee**

The Corporate Nuclear Review Board conducted thorough reviews of Corrective Action Program data. The bases for conclusions and requests for information were well documented. The Corporate Nuclear Review Board previously identified areas of concern that were also independently concluded by the Team. The Corporate Nuclear Review Board Action items are tracked and dispositioned via meeting minutes. This area of performance was deemed SATISFACTORY.

**Evaluation of the effectiveness of self-assessment activities associated with at least two performance areas**

The Team reviewed self-assessments conducted by Performance Improvement, Maintenance, Operations, Plant Engineering, Project Management, and Training.

The Team evaluated the effectiveness of the Self-Assessment of the Corrective Action Program conducted in October 2003. The 2003 CAP Self-Assessment rated trending UNSATISFACTORY, and Root Cause evaluation MARGINAL. All other areas were rated satisfactory. This assessment was comprehensive and self-critical. The Nuclear Quality Assurance organization identified concerns with the trend program on multiple occasions. The August 2004 CAP Implementation self-assessment was also self-critical and raised similar issues. Davis-Besse has not aggressively worked to correct deficiencies identified in the trend program. In addition, responsibility for the trend program has recently been transferred to Corporate, which has added uncertainty to rate of progress in this area.

The Training self-assessment was considered in-depth and self-critical. The 1<sup>st</sup> Quarter 2004 Training Collective Significance Report rated Training as MARGINAL. A self-assessment of Technical Training completed in June 2004 identified seven Areas for Improvement. Training was also addressed at the Corporate Nuclear Review Board meeting in July 2004. Davis-Besse has not

aggressively corrected the deficiencies identified in the 1<sup>st</sup> Quarter 2004 Collective Significance Report.

The remaining assessments reviewed were Collective Significance Assessments. The results of that review are discussed above.

### **Strengths**

The Team found the following to be strengths

1. Comprehensive and self-critical focused self-assessments of the Corrective Action Program (October 2003) and Technical Training (June 2004).
2. Quality and depth of quarterly Nuclear Quality Assessment Reports
3. Corporate Nuclear Review Board Oversight

### **Noteworthy Item**

NOBP-LP-2001, FENOC Focused Self-Assessment requires that a Condition Report be written to capture Noteworthy Items or Areas for Improvement. However, NOBP-LP-2006, Collective Significance Review Process does not contain similar language for how to capture/document a Noteworthy Item or Areas for Improvements identified during that review. (CR 04-06018)

### **Areas for Improvement**

1. The Team found that improvement is warranted in the documentation of organizational Collective Significance Reports with respect to minimal procedure guidance; expectations; documentation; documentation of Condition Reports and overall rating of performance. (CR 04-06019)
2. The Team found that the Self-Assessment Process does not provide a mechanism for identifying and correcting programmatic concerns or trends identified during the course of the assessment. Condition Reports are initiated for each specific issue in lieu of evaluating the errors in aggregate. (CR 04-06021)
3. The Team found that additional emphasis is warranted on timely correction of items identified as a result of self-assessments and Nuclear Quality Assurance findings. (CR 04-06022)

### **Conclusion**

In summary, Davis-Besse's self-assessment of Corrective Action activities is rated MARGINAL with positive observations.

The focused self-assessments reviewed are comprehensive and self-critical; however, programmatic deficiencies are not aggressively rolled-up and corrected. There is currently no procedural guidance for identifying and correcting programmatic deficiencies or trends identified as a result of self-assessments.

The use of Collective Significance reports for organizational assessments of Corrective Action Program health is a good practice. This program has room for continued improvement. Disparity exists in the depth of these reports. Limited guidance exists on how to conduct these assessments. There is inconsistency in the title of the reports (Collective Significance Report, Self-Assessment, and Self-Evaluation). Condition Reports are either not consistently referenced in the body of the reports. It cannot be determined if Condition Reports were initiated for some Areas of Improvement and/or Noteworthy Items.

The Davis-Besse management team actively participates in the oversight of the Corrective Action Program. The management team was aware of program weaknesses and is working to implement program improvements.

The Nuclear Quality Assurance organization and the Corporate Nuclear Review Board are providing comprehensive and critical oversight of the Corrective Action Program.

### **7. Corrective actions taken in response to the NRC Special Team Inspection - Corrective Action Program Implementation - Report 05000346/2003010**

This section of the report addresses the Corrective Actions taken in response to the NRC Special Team Inspection – Corrective Action Program Implementation – Report 05000346/2003010.

On January 7, 2004, the U.S. Nuclear Regulatory Commission completed a special Corrective Action team inspection (CATI) at Davis-Besse Nuclear Power Station to assess the effectiveness of the implementation of the Davis-Besse Corrective Action Program.

The CATI was accomplished by eleven NRC inspectors and contractors over a period of ten months involving five weeks of onsite effort and multiple additional weeks of in-office review. The CATI evaluated the effectiveness of the implementation of various aspects of the Davis-Besse Corrective Action Program, including: (1) identifying and documenting plant design-related deficiencies; (2) categorizing and prioritizing safety issues for resolution; (3) conducting apparent and root cause analyses; (4) determining extent of condition and (5) implementing appropriate and timely Corrective Actions to ensure adequate resolution of problems. Overall, the CATI team reviewed the resolution of several hundred conditions adverse to quality. Many of the deficiencies reviewed by the CATI involved safety system design engineering issues.

In addition, the CATI reviewed management involvement in and oversight of the implementation of the Corrective Action Program, including the routine performance indicators utilized to monitor the program implementation, and the effectiveness of conditions adverse to quality trending analyses and quality assessment audits of the CAP implementation. Finally, due to the nature of multiple NRC inspection findings, the Team focused additional effort on assessing the adequacy of engineering work products, including analyses and calculations.

Even with a large number of performance deficiencies identified during the Inspection, based on input from the CATI team, the NRC's Davis-Besse 0350 Panel concluded that the Corrective Action Program was sufficiently acceptable for plant restart. The significance of each performance deficiency identified during the inspection was evaluated in accordance with the NRC's Significance Determination Process and concluded to be of very low safety significance. While the individual risk significance of each performance deficiency was low, two themes emerged from a collective evaluation of the number and nature of the CATI findings:

1. A weakness in identifying and evaluating the nature and extent of issues when performing apparent cause evaluations to identify the cause(s) and full scope of necessary Corrective Actions, particularly in the area of safety system design deficiencies; and
2. A weakness in the quality of engineering work products, including design calculations and analyses, to correct conditions adverse to quality.

Following the conclusion of the onsite phase of the inspection in September 2003, Davis-Besse staff implemented actions to further assess the specific areas identified by the CATI and develop

improvement initiatives to address those areas. Continuing actions to further address the areas of Corrective Action Program effectiveness and engineering product quality are documented in the Davis-Besse Operational Improvement Plan, Operating Cycle 14, Revision 3, submitted on February 19, 2003.

The CATI team reviewed those ongoing and planned actions and concluded that, if properly implemented; they should address the concerns identified during this inspection and further improve the Corrective Action Program effectiveness at Davis-Besse. However, the NRC could not evaluate the effectiveness of the actions at the time of the CATI due to the relatively short implementation time of many of those Corrective Actions.

During this independent assessment, similar concerns to those expressed by the NRC were also identified. For example, chapter 1 of this report described concerns associated with the threshold for the identification of conditions adverse to quality. Similarly, chapter 2 through 6 describes concerns associated with other elements of the CAP. Additionally, this section of the assessment report also addresses cases where the Corrective Actions specified were not correct or did not entirely match those proposed. This was of concern since several of these issues were associated with the closure of NRC identified items.

For the purpose of this review, NRC identified issues were selected based on their potential impact on the overall health of the CAP. Fundamental elements of the CAP (i.e. problem identification, evaluation, scope, correction, and the prevention of recurrence) were reviewed and discussed in other sections of this Assessment Report.

**Review of Collective Significance Review (Collective Significance Review) CRs written for Engineering to address global issues or themes identified during the NRC's Corrective Action Team Inspection (CATI)**

Following the NRC's (CATI) weekly debrief meeting of August 15, 2003 the Director – Nuclear Engineering requested that the Davis-Besse Response Team review the CATI inspection activities for areas that warrant collective significance consideration.

As a result of the CATI Response Team's trending and binning efforts and the NRC observations/experience comments, several collective significance areas were identified. There were three areas identified that warranted CSRs and three CRs were written to document the need for further review. This sensitivity of Davis Besse engineering management to further learn from the indicators represented an appropriate response and met the entrance level thresholds of Nuclear Operating Business Practice NOBP-LP-2006, "Collective Significance Review." Although proactive, this early response may have created somewhat of a disconnect in responding to the specific issues as addressed in the inspection report violation and NCV discussion. Examples and the basis for this concern are discussed later in this section.

The three engineering areas identified as requiring a Collective Significance Review are listed below along with their respective Condition Report numbers. The Team reviewed these three CSRs using the guidance contained in Nuclear Operating Business Practice NOBP-LP-2006, "Collective Significance Review."

CR 03-06907, CATI: CALCULATION QUALITY COLLECTIVE SIGNIFICANCE REVIEW.  
CR 03-06908 CATI: CORRECTIVE ACTION PROGRAM IMPLEMENTATION  
CR 03-06909, CATI: DESIGN CONTROL COLLECTIVE SIGNIFICANCE REVIEW.



### **Condition Report CR 03-06907, "CATI: Calculation Quality Collective Significance Review."**

This CR listed four CATI identified CRs as belonging to the population of the issue (Calculation Quality) that required further review. Additionally, the Collective Significance Review CR described what appeared to be the message or theme that the NRC was pursuing during their review. As stated in the Collective Significance Review CR, Davis-Besse staff was hearing that the NRC team believed that the four listed CRs were indicators of engineering products not having stand-alone documentation, lacking engineering rigor and inattention to detail. Additionally, the NRC expressed concerns that the four CRs were also indicators of an ineffective review and approval process, including self-checking and independent/objective peer-reviews of evaluation and Corrective Action closeouts.

The Collective Significance Review CR also included a review of issues identified by the Sargent and Lundy calculation assessment that was completed on October 3, 2003. Davis-Besse had considered that most of the NRC identified issues associated with calculation quality were legacy issues associated with older existing calculations. This S&L assessment was focused on recent calculations developed under the new process. The Team considered the inclusion of problems from the S&L review as well as the CATI to be a strength. The Collective Significance Review generated a matrix of common problem categories from the CRs/CATI and S&L Reviews. These categories were:

1. Inadequate Design Assumptions,
2. Wrong Discipline,
3. Incomplete Documentation,
4. Technical Weakness,
5. CAP Improvements,
6. CATI Communication / Non Issue,
7. Industry Standards / Current Method, and
8. Calculation Administration.

After binning the issues the results were analyzed and four areas arose as having a larger number of hits. They were: Incomplete Documentation, Technical Weakness, Industry Standards / Current Methods, and Calculation Administration. The Collective Significance Review determined that the collective significance was that there was a general failure to meet responsibilities outlined in the FENOC Engineering Principles and Expectations (FEPE) policy NOPL-CC-0001. The Collective Significance Review was very detailed but did not always address issues other than a lack of implementation of the FEPE. For example, the classic reasons for failure to correctly implement the process such as lack of training, time pressures (real or perceived), etc, which are examples contained in the NOBP-LP-2006 were not considered by the Collective Significance Review teams.

Additionally, the DES units were asked to evaluate the impact of the observed weakness on the results of the specific calculation. This effort, as documented in Attachment 1 of the Collective Significance Review, appeared to dismiss most of the observations as minor or having little or no negative impact on the results of the calculations. However, the Collective Significance Review did contained language to the effect that through meetings and feedback, DES staff recognized the need to improve and developed a Calculation Improvement Plan. The Collective Significance Review described that CA #6 tracked development of the plan, but continued tracking would be conducted by the "Design Basis Assessment Report."

Elements of the Calculations improvement plan were discussed with the Manager of Design Engineering and the Team reviewed the Second Quarter Design Basis Assessment Report. Specific

concerns associated with the current status of improvements being monitored are discussed later in this section.

One item noted in the Collective Significance Review Cause Analysis dealt with site design basis calculations not being maintained or upgraded to be current with industry standards/methods. The Collective Significance Review determined that this issue was a financial decision, rather than a shortcoming of the calculations, personnel, or process. This area was listed as a potential “area for improvement”; however, no CR was issued.

The Team’s review of the Second Quarter Design Basis Assessment Report identified that many of the performance improvement indicators are still challenging Design Engineering. Specifically, backlog appears to be causing many of the performance windows to be white, yellow, and red. For example Corrective Actions and design changes are currently red. Additionally, UFSAR updates linked to CRs are not meeting timeliness goals either. On a positive note, it appears that Design Engineering has made progress in reducing its backlog of CR investigations. However, based on interviews, it appears that the backlog reduction only dealt with raw numbers and site prioritization of the items was not a top priority.

### **CR 03-06908 CATI: CORRECTIVE ACTION PROGRAM IMPLEMENTATION**

The Team reviewed CR 03-06908 CATI: CORRECTIVE ACTION PROGRAM IMPLEMENTATION and the associated Collective Review Significance Review and the status of the Corrective Actions associated with CR 03-06908 CATI: CORRECTIVE ACTION PROGRAM IMPLEMENTATION.

The Collective Review Significance Review developed a matrix of common problem categories from the CRs/CATI Items (14 from CR 03-06908 and 37 from the additional queries). These categories were:

1. Lacking Engineering Rigor (limited scope evaluation, technical issue),
2. Ineffective Review and Approval Process (ineffective self-checking, peer review of evaluations, and CAF closeouts),
3. Evaluation does not address or only partially addresses the original issue,
4. Rollover Issue,
5. Less than adequate documentation,
6. Inattention to detail (typographical errors, etc.),
7. Not having stand-alone documentation (lacking detail),
8. Timeliness Issue, and
9. Preconditioning.

The Team reviewed the “CR ACTIONS TO BE TAKEN” from the Collective Significance Report. The Team found that numerous Corrective Actions have been implemented. The Team reviewed the summary of Corrective Actions implemented or scheduled for completion. The Team found that the Corrective Action taken were appropriate.

The Team selected CRs that had not been completed when the report was issued in November 2003, to review and evaluate the status of those Corrective Actions. The following is a discussion of the CRs selected:

**CR 03-04140 (SECTION CAP IMPROVEMENT PLAN RESTART GOALS - DES)**

Corrective Action 2 develops CAP Performance Indicators for Design Engineering, which will monitor CR and Corrective Action Workloads. Corrective Action due date was 12/31/03.

Corrective Action 7 will develop and implement a Condition Report sampling plan to review, evaluate and score evaluated Condition Reports (due date of 12/1/03). Review by the Team found the Corrective Actions were acceptable and completed by the due date.

As part of the scope of the Collective Significance Review, additional queries were performed from the CATI database to determine if other Condition Reports or CATI Items were related to the CAP and should be considered during the Collective Significance Review. The results of the review identified nine groups of issues listed above. Eight of the nine areas were already being addressed by existing Condition Reports/Corrective Actions. The ninth area, however, was determined to be unique in that no other CRs have been found that described the potential consequence of preconditioning, preconceived notions, or biased statements within a CR that might precondition the results of the evaluation or Corrective Actions. CR 03-10019 (PRECONCEIVED IDEAS MAY BIAS CR EVALUATION OR CORRECTIVE ACTIONS) was written, therefore, to document the findings and initiate an investigation into the issue of preconditioning, preconceived ideas of the problem and Corrective Action(s) prior to the CR evaluation, or biased statement within a CR that might precondition the results of the evaluation or Corrective Actions.

The Team reviewed this CR and found by reviewing the Corrective Actions for this CR and by interviewing the Davis-Besse staff that Design Engineering has addressed this issue both from the Corrective Action Program implementation and from the general employee expectations perspectives. The need to rigorously follow the Corrective Action Procedure with particular regard to fully understanding, resolving and documenting the issues has been the subject of numerous Design Engineering Section meetings. Implicit in this training has been the need for a questioning attitude both during the initiation and investigation of CRs. These same expectations are at the root of the Engineering Principles and Expectations that are regularly reviewed and reinforced at both section meetings and at daily unit meetings. Additionally, Critical Thinking Skills Training has been developed which focuses on reinforcing the guidance currently provided in the FENOC Engineering Principles and Expectations section V, "Rigorous Approach to Problem Solving". Key points made during this training are that problems at all levels need to be presented, investigated, and solved based on unbiased facts after consideration of the appropriate information and potential causes.

Procedure NOP-LP-2001 (Condition Report Process), Revision 4, effective 3/1/03, incorporated numerous enhancements and Corrective Actions associated with the implementation of the Corrective Action Program. Revision 4 Improved the Corrective Action Program

Items added by NOP-LP-2001 (Condition Report Process) Revision 4 included Senior Management review and endorsement of all Root Cause evaluations; criteria for escalation to higher-tier evaluations for repeat equipment failures; requirements for formal cause determination technique(s); improved guidance on CA effectiveness reviews; requirement to use the Safety Precedence Sequence for CA's; and, guidance on timeliness for condition resolution.

Also, included in this revision is the addition of a CR Analyst for each Section, which will assist and monitor the implementation of the CAP for their Section, including peer reviews, and Corrective Action closeouts. The Team considered the addition of a CR Analyst for each Section a strength.

#### **CR 03-06909- CATI: DESIGN CONTROL COLLECTIVE SIGNIFICANCE REVIEW**

The Team reviewed CR 03-06909 CATI: DESIGN CONTROL and the associated Collective Review Significance Review and the status of the Corrective Actions associated with CR 03-06909.

The Collective Review Significance Review developed a matrix of common problem categories from the CRs/CATI Items (four from CR 03-06909 and an additional 49 design control CR's that were generated as a result of NRC inspections). Each CR was categorized three ways: (1) general area of deficiency or 'bin' (2) significance of issue and (3) by responsible engineering discipline.

The following is a listing of the bins and their disposition in the Collective Significance Review categories were:

- Operating Experience not implemented or less than adequate, changes to Operating Experience Program addresses the issues in this bin.
- Engineering design basis knowledge, skill or training was less than adequate, additional Corrective Action recommended.
- Corrective Action or Condition Report Investigation was less than adequate. CR's in this bin passed to Collective Significance Review of Corrective Actions CR 03-06908.
- Documentation of Design Basis less than adequate, additional Corrective Action recommended.
- Design Basis less than adequate - CR's from Safety Function Validation Project address these issues, no further action recommended.
- Calculations less than adequate - CR's passed to Collective Significance Review Design Calculations CR 03-06907.
- Configuration Control is less than adequate, no trend identified and no further action recommended.
- Modification or the calculation process less than adequate, existing CR's address concerns.
- Updating of design basis documentation is less than adequate, no further action recommended.
- Original Design less than adequate - existing Root Cause 03-04375 addresses concerns no further action recommended.
- 50.9 concern - single an isolated event no follow-up action recommended.
- 50.59 evaluations - single event no follow-up action recommended.
- Material or Maintenance concerns - small number of instances no trend identified.
- Rigor of engineering products is less than adequate; Corrective Actions in CR 02-07525 Assessment of Engineering Capabilities address concerns. No further action recommended by this collective significance review.

Based on interviews with selected engineering staff and review of the Root Causes for CRs 02-07525, and CR 02-07646 and the basic cause in CR 02-09224 the collective significance review developed the following facts:

1. There has been a lack of engineering rigor as determined by this collective significance review and other CRs this outage.
2. The Davis-Besse staff has been relying on a few key individuals with extensive knowledge of the requirements and the ability to find the applicable documentation.
3. The key knowledgeable personnel are retiring or nearing retirement.
4. A large number of Condition Reports were generated during the System Health and Readiness Reviews and Latent Issue Reviews on the inability to find supporting documents or identify design basis supporting information.
5. Extensive backlog of System Description change notices, many pre-date the current outage.
6. Significant plant modifications required due to failure to understand design basis requirements. Previous opportunities to identify and correct these design deficiencies were not successful.
7. The training program on design basis requirements is very limited. Design Engineering gets most of this training as part of the initial qualification process.

8. There is an extensive backlog of items from the Design Basis Validation Project that are a significant number of years old. The correction of these items had been given low priority, but it is now being actively corrected.
9. Efforts to improve the Design Basis documentation were not given appropriate priority by upper management.
10. Knowledge gaps in the design basis requirements and documentation of some of the design basis information was identified in this collective significance evaluation.”

The review concluded the following apparent causes contributed to the lack of understanding of the design bases:

- Written Communications is less than adequate with Omission of Relevant Information.
- Training content is less than adequate, with over-reliance on experience personnel. There is a need to provide the training for less experienced engineers.
- Managerial Methods, in that Management Direction provided less than adequate standards.

The Collective significance review recognizes the existence of other CR's that have similar conclusions. The Corrective Actions for this Significance Determination take credit for these existing Corrective Actions. The following is a discussion of above apparent causes.

1 Written Communication is less than adequate:

Consider collecting all of the design bases information that was generated or recovered in the various Condition Report evaluations, the Safety Function Validation project, System Latent Issue review and System Health reviews conducted this outage. Then determine if this information should be added to the System Descriptions, Design Criteria Manual, or other design documents (CR 03-06909, Corrective Action #31). CR 02-07646, SR Corrective Action #37; CR 03-02199, Corrective Action #1; CR 02-09224, Corrective Action #3; and CR 02-07646, Corrective Action #22 were identified as Corrective Actions needed to be completed to correct this apparent cause.

1 Training Content is less than adequate

There are a number of Corrective Actions already approved to correct some aspects of this Deficiency: CR 02-07646 Corrective Action #22, CR 02-07646 Corrective Action #34 and CR 03-06909 Corrective Action #2 to 28. CR 03-06909 Corrective Action #29 is proposed in this Collective Significance Review.

3. Management Methods and the management direction provided less than adequate standards, or “Lack of Rigor”. Corrective actions are approved to correct this deficiency and no additional Corrective Actions are proposed. The existing Corrective Actions are CR 02-07525 Corrective Actions #7, #9 – #13, #15 - #18, #21 - #25, #29, and #42.

The Team reviewed the status of the 31 recommendations associated with CR 03 - 06909 and the following remain open. The recommendations remaining open were numbered 18 – 31.

- Implement identified intervention for Analyses and PSA unit In Design Engineering -due 4/30/05.
- Implement identified intervention for Mechanical Engineering unit In Design Engineering -due 4/30/05.
- Implement identified intervention for Electrical/I&C Engineering unit In Design Engineering -due 4/30/05.
- Implement identified intervention for Structural Mechanics Engineering Unit in Design Engineering -due 4/30/05.
- Implement identified intervention for Rapid Response Team unit of Nuclear Engineering -due 4/30/05.

- Implement identified intervention for Mechanical Systems unit in Plant Engineering -due 5/31/05.
- Implement identified intervention for Predictive Maintenance and Reliability unit in Plant Engineering -due 5/31/05.
- Implement identified intervention for Electrical /I&C Systems unit in Plant Engineering -due 5/31/05.
- Implement identified intervention for Components and Materials unit in Plant Engineering -due 5/31/05.
- Implement identified intervention for Plant Support unit in Plant Engineering -due 5/31/05.
- Implement identified intervention for Project Management Engineering Section - due 06/30/05.
- Implement identified intervention for Davis-Besse Reactor Engineering Group -due 5/31/05.
- Revise Instructions to require Engineering Change Package to provide discussion of design requirements. Include requirements found in the USAR, Design Criteria Manual and System Description - due 1/4/05 (twice to await completion of training and other procedural changes).
- Consider collecting all design bases information collected during 13RFO then consider if information should be added to Systems Descriptions - due 11/30/04 (one extension).

In addition the Team selectively reviewed the Corrective Actions associated with CR 02-07646; CR 03-02199; CR02-09224 and CR 02-07525 a number of these actions remain open.

The Team notes that the Collective Significance Review identified three categories or 'bins' (1) Documentation of Design Basis less than adequate, (2) Rigor of Engineering products is less than adequate and (3) Engineering design basis knowledge, skill or training was less than adequate have common apparent causes. The apparent causes identified above could also have contributing causes – “such as inadequate manning and time pressures, but not sufficient evidence was available to support these as the apparent causes and not (sic) further discussion is needed.”

The Team found in Design Engineering (1) a long list of factual deficiencies noted in this assessment, (2) a number of Corrective Actions yet to be completed, and (3) a number of contributing causes for Condition Reports. The Team recommends that the Senior Leadership Team periodically review the progress of improvement the quality and timeliness of design basis engineering products.

### **Review of Specified Corrective Actions to address the 29 NRC Identified Violations or Non-Cited Violations (NCV)**

Of the 29 specific issues identified, Davis Besse Commitment Tracking system TERMS identifies 0 as closed, 12 as ready for NRC for review, 2 as in Licensing for review, and 15 as still open. Discussion with the licensing representative tracking these issues determined that the NRC plans to re-inspect the CAP sometime in late November of this year. Licensing indicated that they are working to have most issues fully addressed before the NRC's re-inspection.

The Team selected the following items that were in the “NRC” or “Licensing” status for review. Additionally, one open issue was also reviewed, as it appeared that it should have been included in the Collective Significance Review for Calculation Problems discussed earlier in this section of the report.

### **NCV 03-010-09; Increased Dose Consequences Due to Degraded Thermal Performance Operations of CAC**

This review of selective responses to NRC findings associated with this item identified that the Corrective Actions documented did not match the proposed Corrective Actions. This package had been reviewed and accepted by licensing as ready for NRC review. Specifically, in response to NRC's NCV # 03-010-09, CA # 1 for CR 03-03980 stated that the off-site exposure was calculated for a

known containment leakage rate with a sustained containment pressure of 39 psig. However, the analysis was performed at a containment pressure of 38 psig as indicated by the “Assessment of Thermal Performance For The Containment Air Coolers”, which was a scanned attachment to the CR. Although subtle, the values specified in the closure documentation were to address the NRC’s concerns. CR 04-05863 “2004 CAP ORDER ASSESSMENT – DISCREPANCY IN RESPONSE TO CA 03-03980-01” was written to address this discrepancy and to correct the record.

The Team noted that previous Corrective Action for CR 03-04302 contained a CA requiring that Managers/Section Heads from all sections at Davis Besse perform section reviews monthly of a sample of completed Corrective Actions in their department. A review of the Management Observations database determined that not all managers or groups are performing these reviews. Additionally, in several cases these management observations have been delegated to lower level supervision or CR Analysis. On September 16, 2004 a new Condition Report CR 04-05700, “2004 CAP ORDER ASSESSMENT – MONTHLY MANAGER CAF OBSERVATIONS NOT PERFORMED” was issued to document this concern and to address another Team’s concern where this management review missed an opportunity to correct inappropriate statements contained in the CA closure documentation.

#### **NCV 03-010-11 Accumulator Sizing Calculation Errors**

The Team performed a review of this TERMS package. The TERMS status was NRC, which meant the package has been completed and ready for NRC review for closure. Section 4OA3(3).4 of Inspection Report 05000346/2003010(DRS) indicated that the calculation in question had been revised to correct the technical issues and that Davis-Besse had entered the issue into their CA Program. CR 03-06556 was written to address the NRC’s concerns as expressed during the onsite review.

When the Inspection Report was issued, the stated concern for NCV 03-010-11 was that Davis-Besse failed to implement design control measures to check and verify the adequacy of the design basis calculation. A review of CR 03-06556 and the TERMS item closure package determined that the concern expressed in the NRC’s inspection report was not specifically addressed. Neither the CR nor the Causes Analysis, or the Enhancement Corrective Action addressed the issue of inadequate checking or verification of the calculation in question.

Although the proactive response to the NRC’s technical concerns while the NRC’s team was still on-site resulted in a quick revision to the specific calculation, the actions specified in the issue closure did not address all of the NRC’s concerns, as subsequently expressed in the inspection report. Discussion with licensing determined that there was a gap review done between the issues identified on-site and how they were characterized in the final approved report. However, the licensing representative indicated that clearer linkage between the TERMS closure package and all actions performed to satisfy the NRC’s concerns needs to occur. This enhancement, to link all actions necessary to support NRC closure is identified as a noteworthy item.

#### **NCV 03-010-08, Failure to Verify Adequacy of HPI Minimum Recirculation Line Design**

This item remains open in the TERMS database. This item involved the NRC’s concern that no calculation existed to verify the adequacy of the 35 gpm minimum flow recirculation flow path for the High Pressure Injection pump. The Team’s concern with this issue is that it was not considered as an input to the collective significance review of calculation problems. It appears that the lack of a calculation was not considered a calculation program deficiency by the Collective Significance Review CR team. Additional other NRC NCV’s that implied there was a “lack of calculations”. NCV 03-010-17 and NCV-03-010-07 were also not assessed as part of the collective significance review for CR 03-

06907. This observation is considered a noteworthy item and was discussed with Design Engineering personnel.

### **Evaluate the Effectiveness of the Corrective Actions taken as a result of the NRC's CATI**

Since only about half of the NCVs that resulted from the CATI are considered ready for NRC review this item cannot be verified at this time. Additionally, the collective significance review for CR 03-06907 "CATI: Calculation Quality Collective Significance Review" resulted in Corrective Actions to conduct an effectiveness review. However, this effectiveness review is not scheduled until late December of 2004. NOBP-LP-2007, Condition Report Process Effectiveness Review, provides guidance on this subject in a NOTE below step 4.1.2. Typically, effectiveness reviews are scheduled to occur no sooner than 6 months after implementation of the last Corrective Action, which in the case of Collective Significance Review CR 03-06909 "CATI: Design Control Collective Significance Review" will not occur until late in 2005.

It could be said, however, that the findings from this Team are indicators that Corrective Actions taken to date have not been fully effective, in that, the overall CAP was found to be marginal effective by this evaluation Team.

### **Observations**

The Team found that there is a long list of factual deficiencies noted in the Design Control Collective Significance Review and that there are a number of Corrective Actions yet to be completed by Design Engineering. Given the importance of Design Engineering to the safe operation of the plant, the Team recommends that Senior Leadership Team periodically review the progress Design Engineering is making on these action to assure there are sufficient resources available to address the actions.

The Team notes that the number of closed NRC identified issues is minimal and the NRC's follow-up inspection is scheduled for late November 2004.

### **Strengths**

The Team found the following strengths:

- The Initiation of the S&L calculation review and inclusion of its finding in the Calculation Collective Significance Report.
- The use of the CR Analysis Position.

### **Noteworthy Items**

Improvement is warranted in the review and closure of previous NRC inspection findings from the CATI Report. Attention to detail in the closure of CRs and CAs needs improvement (Ref CR-04-05863 and CR-04-05700). One of the Collective Significance Reviews did not capture all inputs and did not address all contributing causes. The Cause Analysis appeared to stop short and defaulted to not implementing the FENOC Engineering Principles and Expectation (FEPE) policy. (CR 04-06025)

One item noted in the Collective Significance Review Cause Analysis for CR-03-06907 dealt with site design basis calculations not being maintained or upgraded to be current with industry standards/methods. The Collective Significance Review determined that this issue was a financial decision, rather than a shortcoming of the calculations, personnel, or process. This area was listed as a potential "area for improvement"; however, no CR was issued. (CR 04-06026)



Clearer linkage between the TERMS closure package and all actions necessary to satisfy the NRC's issue needs to occur. This enhancement, to link all actions necessary to support NRC closure is captured by (CR 04-06027).

Management observations of the Closure of CAs as required by a previous CA are not consistently being performed. Pockets of groups are not aware of the commitment and some are not performing the reviews at all. Reference CR-04-05700.

### **Conclusion**

In summary, Davis-Besse's resolution of NRC CATI inspection findings through the use of the Corrective Action Program is rated as MARGINAL based on the Noteworthy Items referenced above. Davis-Besse's response to issues identified in the CATI inspection have not always been timely and in some instances may have missed several contributing causes as to "why" they occurred. CR 04-05863 was written based on the Team's observation that closure of a Corrective Action, which resulted from CATI identified items, contained the wrong values, indicating a lack of attention to detail. This area is rated as MARGINAL.

Engineering management's direction to utilize the Collective Significance process to address CATI identified issues and understand the breath and depth of the problem was considered good. The CSRs were very detailed but they did not in all cases address all of the NRC identified issues. For example, the Collective Significance Review for CR-03-06907 did not review NRC identified concerns such as missing calculations. Additionally, the CR-03-06907 team appeared to have defaulted to an apparent cause of failing to implement the "Engineering Principals and Expectations manual requirements and stopped short of considering the classic reasons for failure to correctly implement the process such as lack of training, time pressures (real or perceived), etc. These fundamental causes were examples contained in the NOBP-LP-2006, Collective Significance Review.

## ***Overall Conclusions***

The Team gave Davis-Besse's implementation of the Corrective Action Process an overall MARGINAL effective rating because of the MARGINAL areas and UNSATISFACTORY area discussed in the report. In addition the Team found the backlog is large and decreasing with a goal to get to an appropriate level by the spring of 2006. The Team found that Work Plans are in place that do not reflect the normal completion times for Conditions Adverse to Quality stated in NOP-LP-2001, Corrective Action Process.

The Team found that many of the Team's findings are repeat findings. Based upon the rating of MARGINAL for the implementation of the Corrective Action Program and the number of repeat findings, the Teams recommends that an integrated approach for improvement. In addition to the issuance of individual Condition Reports, the Team recommends that Davis-Besse staff develop and implement an "Integrated Action Plan for the Improvement of the Davis-Besse Corrective Action Program Implementation." Davis-Besse management has committed to develop an integrated plan.

## ***List of Condition Reports Generated***

1. CR 04-06011 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
CORRECTIVE ACTION IMPLEMENTATION AND EFFECTIVENESS
2. CR 04-06013 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
CORRECTIVE ACTION IMPLEMENTATION AND EFFECTIVENESS
3. CR 04-06016 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EFFECTIVENESS OF PROGRAM TRENDING
4. CR 04-06017 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EFFECTIVENESS OF PROGRAM TRENDING
5. CR 04-06018 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EFFECTIVENESS OF INTERNAL ASSESSMENT ACTIVITIES
6. CR 04-06019 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EFFECTIVENESS OF INTERNAL ASSESSMENT ACTIVITIES
7. CR 04-06021 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EFFECTIVENESS OF INTERNAL ASSESSMENT ACTIVITIES
8. CR 04-06022 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EFFECTIVENESS OF INTERNAL ASSESSMENT ACTIVITIES
9. CR 04-06023 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
CORRECTIVE ACTION IMPLEMENTATION AND EFFECTIVENESS
10. CR 04-06024 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
EVALUATION AND RESOLUTION OF PROBLEMS
11. CR 04-06025 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
CORRECTIVE ACTIONS TAKEN IN RESPONSE TO THE NRC SPECIAL TEAM INSPECTION -  
CORRECTIVE ACTION PROGRAM IMPLEMENTATION - REPORT 05000346/2003010
12. CR 04-06026 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
CORRECTIVE ACTIONS TAKEN IN RESPONSE TO THE NRC SPECIAL TEAM INSPECTION -  
CORRECTIVE ACTION PROGRAM IMPLEMENTATION - REPORT 05000346/2003010
13. CR 04-06027 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
CORRECTIVE ACTIONS TAKEN IN RESPONSE TO THE NRC SPECIAL TEAM INSPECTION -  
CORRECTIVE ACTION PROGRAM IMPLEMENTATION - REPORT 05000346/2003010
14. CR 04-06028 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
IDENTIFICATION, CLASSIFICATION AND CATEGORIZATION OF CONDITIONS ADVERSE  
TO QUALITY

15. CR 04-06030 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM-  
FLEET VALUE RATING

16. CR 04-06031 INDEPENDENT ASSESSMENT OF THE CORRECTIVE ACTION PROGRAM  
NEED FOR INTEGRATED PLAN

## References

CARB Package for 9/15/2004 Meeting
CATI- Calculation - Collective Significance Review for CR # 03-06907
CATI- Corrective Action Program Implementation - Collective Significance Review for CR # 03-06908
CATI- Design Control- Collective Significance Review for CR # 03-06909
CNRB Meeting Minutes dated April 15, 2004
CNRB Meeting Minutes dated April 24, 2004
CNRB Meeting Minutes dated July 15, 2004
CNRB Meeting Minutes dated July 17, 2004
CNRB Meeting Minutes dated November 20, 2003
CR 01-0004, PRESSURIZER MAKEUP FLOW CONTROL VALVE (CA 4)
CR 01-0009, BARRIER PENETRATION INSPECTIONS (CA 2, 5, 6)
CR 01-0175, BODY TO BONNET LEAKAGE IDENTIFIED DURING ISI PRESSURE TEST (CA 4)
CR 01-0220, LOW LIGHT AREA OF CONCERN (CA 3)
CR 01-0234, STATION SWITCHGEAR CUBICLES IN NEED OF REFURBISHMENT (CA 2)
CR 01-0285, LACK OF SYSTEMATIC AND CONSISTENT GUIDELINE PROCESS (CA 7)
CR 01-0340, DEGRADING TREND OF SERVICE WATER BUTTERFLY MANUAL ISOLATION VALVES (CA 3, 11, 13, 14)
CR 01-0490, CONTROL ROOM COMPUTER DIGITAL INPUT NO. 1 (CA 8)
CR 01-0740, MU VALVE LEAKAGE (CA 4)
CR 01-0785, CTMT HYDROGEN ANALYZER SYSTEM (CA 6)
CR 02-00322 - AFFECT OF PROCEDURE CHANGES ON RISK SUMMARIES
CR 02-00412, DC VOLTAGE DROP CALCULATION
CR 02-7525 ASSESSMENT OF ENGINEERING CAPABILITIES
CR 03- 05074 INAPPROPRIATE CATEGORIZATION AND METHOD ASSESSMENT FOR RP CONDITION REPORTS
CR 03-00120, CONTAINMENT AIR COOLER (CAC) THERMAL PERFORMANCE COLLECTIVE SIGNIFICANCE REVIEW
CR 03-00169 - CAP/SA EVALUATIONS ARE COMPLETED AFTER ORIGINAL DUE DATES
CR 03-02199 RRR SAFETY CULTURE ASSESSMENT, DESIGN, ENGINEERING ITEM 1C
CR 03-02616, CATI; RFA – BYPASSING OVERLOAD HEATER TRIPS ON 1E 480V MOTORS
CR 03-03986, CATI; RATING OF THE CONTAINMENT AIR COOLER FAN MOTORS
CR 03-04302, RVW INADEQUATE DOCUMENTATION TO SUPPORT CR/CA CLOSURE
CR 03-05043, IN 2003-08 POTENTIAL FLOODING THROUGH UNSEALED CONCRETE FLOOR CRACKS
CR 03-05058 APPARENT CAUSE EVALUATION FOR CR 03-01869 IS LESS THAN ADEQUATE
CR 03-05920, BASIS NOT DEFINED FOR ALL APPENDIX R DC AND 120VAC
CR 03-06519 PERIODIC VIBRATION TESTING OF LPI PUMPS ON MINIMUM
CR 03-06578, CONCERN OVER AFW STRAINER LIMITING PARTICLE SIZE REPORT

CR 03-06907, CATI: CALCULATION QUALITY COLLECTIVE SIGNIFICANCE REVIEW
CR 03-06908, CATI: CORRECTIVE ACTION PROGRAM IMPLEMENTATION
CR 03-06909, CATI: DESIGN CONTROL COLLECTIVE SIGNIFICANCE REVIEW
CR 03-06941, CATI; RECOMMENDED SW BALANCE PROCEDURAL ENHANCEMENT
CR 03-07069, CATI; ADEQUACY OF ELECTRICAL DC CONTACTOR TESTING
CR 03-09096 - CAP/SA IDENTIFIED CR 03-03139 IMPROPERLY CLOSED CR 04 - 01240 - RECOMMENDATION TO IMPROVE MANAGEMENT ATTENTION ON CORRECTIVE ACTION PROGRAM
CR 03-09172 - CAP/SA MULTIPLE DEFICIENCIES IN ROOT CAUSE EVALUATION FOR CR 03-4773
CR 03-10157 - CAP/SA CR INITIATION RATE FOR RP LOWER THAN EXPECTED
CR 03-10158 - CAP/SA CR INITIATION RATE FOR OMWC LOWER THAN EXPECTED
CR 03-10159 - CAP/SA SRO REVIEW OF CRS NOT TIMELY CR 03-10160 - CAP/SA NOTEWORTHY MRB ITEMS
CR 03-10160 CAP/SA NOTEWORTHY MRB ITEMS
CR 03-10161 EMERGENCY BATTERY PACK LAMP DIRECTION
CR 03-10162 - CAP/SA STATION & SECTION CLOCK RESET PROCESS AFI AND NOTEWORTHY ITEM
CR 03-10163 - CAP/SA MARGINAL QUALITY OF ROOT CAUSE EVALUATIONS
CR 03-10164 - CAP/SA DEFICIENCIES IN THE ROOT CAUSE EVALUATION FOR CR 03-5402
CR 03-10165 - CAP/SA DEFICIENCIES IN THE GENERIC IMPLICATIONS EVALUATION FOR CR 03-7049
CR 03-10166 - CAP/SA WRONG DISPOSITION SELECTED FOR CR 03- 3398
CR 03-10167 - CAP/SA NOTEWORTHY CR CAUSE EVALUATOR ITEMS
CR 03-10170 - CAP/SA DEFICIENCIES IN THE EVALUATION AND EFFECT RVW FOR CR 03-2910 & 03-3937
CR 03-10171 - CAP/SA DEFICIENCIES IN THE EVALUATION AND EFFECT REVIEW FOR CR 02-1624
CR 03-10172 - CAP/SA DEFICIENCIES IN THE EVALUATION OF CR 03-2550
CR 03-10173 - CAP/SA DEFICIENCIES IN THE EVALUATION OF CR 03- 1831
CR 03-10174 - CAP/SA DEFICIENCIES IN THE EVALUATIONS OF CR 03- 1869 AND CR 03-2292
CR 03-10175 -CAP/SA DEFICIENCIES IN THE EVALUATIONS OF CR 03- 4430
CR 03-10176 - CAP/SA DEFICIENCY IN THE EVALUATION OF CR 02-7948
CR 03-10177 - CAP/SA DEFICIENCY IN THE EVALUATION OF CR 03-5285
CR 03-10178 - CAP/SA DEFICIENCY IN THE EVALUATION OF CR 03-2439
CR 03-10179 - CAP/SA DEFICIENCIES IN THE CORRECTIVE ACTIONS & EFFECTIVENESS RVW FOR CR 02-55
CR 03-10180 - CAP/SA DEFICIENCY IN THE EFFECTIVENESS REVIEW FOR CR 2003-4871
CR 03-10181 - CAP/SA LACK OF EFFECTIVE TRENDING AND EVALUATION
CR 03-10182 - CAP/SA DEFICIENCY IN COLLECTIVE SIGNIFICANCE EVALUATION OF CR 2003-8418
CR 03-10183 - CAP/SA DEFICIENCIES IN CAP PERFORMANCE INDICATORS
CR 03-10184 - CAP/SA LACK OF MANAGEMENT SUPPORT OF HUMAN PERFORMANCE PROCESS

CR 03-10185 - CAP/SA DEFICIENCIES IN THE CA & CR EVALUATION EXTENSION PROCESS
CR 03-10186 - CAP/SA CARB WEAKNESSES
CR 03-10187 - CAP/SA EFFECTIVENESS REVIEW PROCEDURE COMMENTS
CR 03-10495, OE16993 CONFIRMATORY SCREENING, EDG ELECTRONIC GOVERNOR INFANTILE FAILURE
CR 03-11242, SER 6-03 COOLING WATER SYSTEM DEBRIS INTRUSION
CR 03-11246, OE17466 ABB27N RELAY FAILURE DUE TO CASE PIN DEFORMATION
CR 04 - 00697 - PROCEDURE CHANGES THAT DETERMINE MAINTENANCE RULE EQUIPMENT RELIABILITY
CR 04 -01230 – MISSED TECH SPEC ENTRY
CR 04- 03940 TITLES FOR PCR TYPE CONDITION REPORTS ARE NOT IN ACCORDANCE WITH NOP-LP-2001 STEP 4.3.5
CR 04- 04098 SUGGESTION TO CAPTURE MCTM CONDITION REPORT CHANGES IN CREST CRPA TABLE
CR 04-00186, NO PMS FOR AC/DC LIGHTING PANEL AUTOMATIC TRANSFER SWITCHES OE17024 & OE17029
CR 04-00789 - COLLECTIVE SIGNIFICANCE REVIEW OF CRS INVOLVING CORRECTIVE ACTION ACTIVITIES
CR 04-01976, SEN 248 REACTOR SCRAM, SAFETY INJECTION ACTUATION, AND RAPID COOLDOWN
CR 04-02361, IN 2004-07 PLUGGING OF SAFETY INJECTION PUMP LUBE OIL COOLERS WITH LAKEWEED
CR 04-02457- QUALITY TREND REPORT IMPROVEMENT OPPORTUNITIES
CR 04-02986 SA 04-0087 DECLINE IN KEY TRAINING FUNCTIONS
CR 04-02991 SA 04-0087 DECLINE IN THE QUALITY OF CONDUCT OF TRAINING
CR 04-03243 EAB 1 <sup>ST</sup> QUARTER 2004 REPORT/OBSERVATIONS OF ENGINEERING WORK PRODUCTS
CR 04-03612 CSSA 2004-0003, PLANT ENGINEERING PROCEDURE DEVELOPMENT
CR 04-03643 CSSA 2004-0016, AFI – SELF CHECKING NOT APPLIED
CR 04-03940 TITLES FOR PCR TYPE CRS ARE NOT IN ACCORDANCE WITH NOP-LP-2001 STEP 4.3.5
CR 04-04098 SUGGESTION TO CAPTURE MCTM CR CHANGES IN CREST CRPA TAB
CR 04-04425 – COLLECTIVE SIGNIFICANCE OF TECH SPEC EVENTS
CR 04-05599 RESULTS OF DESIGN CORRECTIVE ACTION OBSERVATIONS FOR AUGUST 2004
CR 04-05680 - CATEGORIZATION OF IDENTIFIED TRENDS AS “NF”
DAVIS-BESSE SYSTEM HEALTH REPORT, MAINTENANCE PROGRAM B-PF-00003 MAINTENANCE RULE
FENOC Collective Significance Review Nuclear Operating Business Practice NOBP-LP-2006
FENOC Focused Self-Assessment Process Business Practice
July 2004, Corrective Action Program Performance Indicator Report
Maintenance Collective Significance Report – 2004-0020
METHODOLOGY CR 02-07646 SSDPC – CALC C-EE-004.01 TEMPERATURE VARIATION NOT CONSIDERED
NOBP-LP-2001, FENOC Focused Self Assessment
NOBP-LP-2007, Effectiveness Reviews
NOBP-LP-2008, Corrective Action Review Board

NOP-LP-2001, Condition Report Process
NRC Inspection Report 2003-022
Nuclear Quality Assessment Report DB-C-04-01
Nuclear Quality Assessment Report DB-C-04-02
Nuclear Quality Assurance Report DB-C-03-02
Nuclear Quality Assurance Report DB-C-03-03
Nuclear Quality Assurance Report DB-C-03-04
Operations Self Evaluation Report 1 <sup>st</sup> Quarter 2004
Plant Engineering Self Assessment 1/1/04 – 4/30/04
Project Management Collective Significance Report – 2004-0016
Radiation Protection Self Evaluation Report 1/1/04 – 4/30/04
Second Quarter 2004, Periodic Maintenance Assessment Report for 13RFO
Self Assessment of Corrective Action Program Implementation SA 2004-010
Self Assessment of Corrective Action Program SA 2003-23
Self Assessment of Training SA 2004-0012
Training Section Collective Significance Report – 2004-0012



## *List of Persons Contacted*

Robert W. Schrauder	Director, Performance Improvement
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Barry Allen	Plant Manager
Cheryl Kraemer	Project Manager
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William Wagner	Supv, Quality Control
Charles A. Hawley	Manager, Special Projects
Randy Patrick	Supt, Ops Services
Michael J. Stevens	Manager, Maintenance
John Johnson	Staff Nuc Specialist
Gary Melssen	Maintenance Rule Engineer
Bill Mugge	Mgr, Wrk Mgmt
Brian D. Boles	Manager Plant and Equip Rel Engrg
Steven A. Loehlein	Director, Site Engineering
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David Wahlers	Supv, Support Oversight
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Ray Hruby	Mgr, Nuclear Oversight
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Ken Filar	Sr Nuc Specialist
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Gabriel R. Barteck	Staff Nuc Engineer

## SECTION 2: Action Plans for Identified Areas for Improvement

The Areas For Improvement (AFI) Action Plans contained in this section were developed by the Davis-Besse Nuclear Power Station (DBNPS) in response to the AFIs identified in Section 1 by the Independent Assessment team.

The Confirmatory Order assessment provided an independent and comprehensive review of Corrective Action Program (CAP) Implementation at the Davis-Besse Nuclear Power Station. The assessment team identified seven (7) "Areas for Improvement" (AFI). These AFIs have been entered in the Corrective Action Program. The AFIs and the associated Action Plans are presented in this Section. In addition to the AFIs, there were several "Noteworthy Items" documented by the assessment team both during and after the assessment. These Noteworthy Items have been captured in the Corrective Action Program.

### Davis-Besse Action Plans to address Corrective Action Program Implementation Assessment Areas for Improvement

#### AFI COIA-CAP-04-01 (CR 04-06028)

- *Based on the Independent Assessment team's review of Identification, Classification and Categorization of Conditions Adverse to Quality, the Team found that some organizations were not initiating Condition Reports as required by NOP-LP-2001 "Condition Report Process".*

#### Action Plan for AFI-04-01

1. Review procedure NOP-LP-2001 programmatic guidance to determine if clarification is necessary regarding the threshold criteria for Condition Report initiation. Implement procedure NOP-LP-2001 changes, if necessary by 12/30/04.
2. Issue a DBNPS site-wide expectations directive to communicate and reaffirm Condition Report threshold criteria to improve understanding of when a condition is to be documented in a Condition Report. This action will be completed by 01/15/05.
3. Perform a self-assessment to evaluate the effectiveness of Condition Report initiation. This self-assessment will be completed by 06/30/05.

#### AFI COIA-CAP-04-02 (CR 04 -06011)

- *Based on the Independent Assessment Team review of Corrective Action Implementation and Effectiveness, the team found the process for prioritizing, scheduling and extending work do not consistently support the timely implementation of actions to fix long-standing problems.*

#### Action Plan for AFI 04-02

1. Create a comprehensive Integrated Backlog Reduction Plan that integrates the existing Maintenance backlog reduction plan, the Procedure change backlog plan and the Engineering backlog plan. This Plan is to be issued by 12/31/04.

2. Implement the Integrated Backlog Reduction Plan. The project is sponsored by the Director - Performance Improvement. A project manager has been assigned; personnel are being dedicated to the effort. The integrated backlog reduction effort will be completed by 03/31/06.
3. Improvements of corrective action extensions is described in AFI-COIA-CAP-04-03 below.

#### **AFI COIA-CAP-04-03 (CR 04-06016)**

- *Based on the Independent Assessment Team review of Effectiveness of Program Trending, the Independent Assessment Team found that a review of open Corrective Action (CAQ/SCAQ Preventive & Remedial actions) implementation extensions that were classified as non-restart issues should be conducted to ensure appropriate compensatory actions are in place. The Independent Assessment Team Report provides examples where untimely implementation of corrective actions with no interim actions in place has resulted in 'repeat' Condition Reports.*

#### **Action Plan for AFI 04-03**

1. As part of the Integrated Backlog Reduction Plan (reference AFI COIA-CAP-04-02), the backlog of Significant Conditions Adverse to Quality (SCAQ) and Conditions Adverse to Quality (CAQ) Root and Apparent Cause Preventive and Remedial corrective actions will be reviewed to consider if interim corrective actions are required or if an accelerated completion date is appropriate. This action will be completed by 11/30/04.
2. The Condition Report Process procedure (NOP-LP-2001) currently states that corrective action extensions are to consider the need for interim actions. The CREST electronic form process for documenting requests for extension approvals will be enhanced to require an evaluation for and documentation of the decision for interim corrective actions for SCAQ and CAQ Root and Apparent Cause Preventive and Remedial Action extensions. This action will be completed by 04/29/05.
3. As an interim action, until completion of the electronic form, the site will issue an expectation directive to have SCAQ and CAQ Root and Apparent Cause extension requests evaluate and document whether interim actions are required. This action will be completed by 11/24/04.

#### **AFI COIA-CAP-04-04 (CR 04-06017)**

- *The Independent Assessment Team found the Davis-Besse has not aggressively worked to correct Corrective Action Trending Program deficiencies identified in previous self-assessments or oversight findings. The Team found that continued management focus is needed on those initiatives to improve trending.*

#### **Action Plan for AFI 04-04**

A number of assessments have indicated improvement of site trending is required. The site has recently completed several Remedial/Preventive and Enhancement corrective actions to improve the trend analysis at Davis-Besse. A Collective Significance Self-Assessment process has been implemented for enhancing department level self-evaluation and trending. Listed below are four remaining open corrective actions documented as a result of the aforementioned assessments that require implementation:

1. Benchmark other sites to evaluate how they perform trending. This is to include trend report format and content, use of INPO Operational Excellence Enablers, and the ability to identify Latent Organizational Weaknesses. This will be completed by 01/30/05.
2. Enhance the Quarterly trend Report to place more emphasis on active Condition Report trends. The trend report will also identify actions that are analyzing or resolving the identified issues along with their current status. This will be completed by 12/20/04.
3. Improve guidance concerning timeliness for performing and completing Collective Significance Reviews. This will be completed by 01/31/05.
4. Develop and implement a site wide equipment trending program for areas such as: vendor, failure mode, failure mechanism, environmental and material issues. The equipment trending program will be implemented by 04/29/05.

Additionally, FENOC has a Strategic Initiative to develop a common trending program. As part of this new program, guidance will be given to distribute the trend report to CR Analysts and Root Cause Evaluators in addition to Section Managers to improve engagement of those individuals in utilizing trend information. The new program will also stress that the trend information is to be utilized in the Section's performance of Collective Significance Self-Assessments. This action will be completed by 01/30/05.

#### **AFI COIA-CAP-04-05 (CR 04-06019)**

- ***Based on the Independent Assessment Team's review of effectiveness of Internal Assessment activities, the Team found that improvement is warranted in the documentation of organizational Collective Significance Self Assessment (CSSA) Reports with respect to minimal procedure guidance; expectations; documentation; documentation of Condition Reports and overall rating of performance.***

#### **Action Plan for AFI-04-05**

1. Business Practice NOBP-LP-2001, FENOC Focused Self Assessment Process, will be revised to clarify expectations relative to documentation of Collective Significance Self Assessment Reports. This guidance will establish expectations relative to report format, documentation of assessment results, documentation of Condition Reports and overall rating of performance. This revision to the program will be completed by 03/31/05.

#### **AFI COIA-CAP-04-06 (CR 04-06021)**

- ***Based on the Independent Assessment Team's review of effectiveness of Internal Assessment activities, the Team found that the Self-Assessment Process does not provide a mechanism for identifying and correcting programmatic concerns or trends identified during the course of the assessment. Condition Reports are initiated for each specific issue in lieu of evaluating the errors in aggregate.***

#### **Action Plan for AFI-04-06**

1. Business Practice NOBP-LP-2001, FENOC Focused Self Assessment Process, will be revised to clearly identify the need to consider the potential aggregate impact of programmatic concerns or trends identified as an integral part of the data analysis associated with performance of individual focused self-assessments. Self Assessment reports will be required to document the results of the aggregate impact review, whether or not programmatic issues or

trends were identified, and if identified what impact they may have had on the program. This revision will be completed by 03/31/05.

#### **AFI COIA-CAP-04-07 (CR 04-06022)**

- *Based on the Independent Assessment Team's review of effectiveness of Internal Assessment activities, the Team found that additional emphasis is warranted on timely correction of items identified as a result of self-assessments and Nuclear Quality Assurance findings.*

#### **Action Plan for AFI-04-07**

Procedure NOP-LP-2001, "Condition Report Process", Revision 7 was evaluated for potentially including additional guidance relative to the assessment team recommendation. The following response is provided:

The procedure NOP-LP-2001 steps (4.6.1.4 - NOTE, and 4.11.1.1 - NOTE) provide guidance for the determination of due dates for Condition Report evaluations and CR corrective actions based on the relative significance and importance of the issue as it relates to processes, programs or equipment required for safe operation. The guidance for CR corrective action extensions provides similar detail, where step 4.14.2.1.d states, "Provide justifications for the extension. This is to include an evaluation of the risk of not completing the corrective action and consideration of interim actions."

As such, any attempt to emphasize timelines, or to place priority based on who generated a Condition Report versus the safety significance or potential impact to the plant or public safety would not be desirable. Issues need to be prioritized based solely on their significance and importance. Trying to prioritize based on whether it was identified by NQA, the NRC, INPO, etc. would cause confusion which could result in incorrect safety significance prioritization.

The following actions are planned:

1. Benchmarking will be performed to evaluate how other nuclear stations prioritize Condition Reports from self-assessments and NQA findings. Changes to procedure NOP-LP-2001 will be made by 03/31/05, if necessary.
2. A sampling of current self-assessment and NQA initiated Condition Reports will be performed to determine if DBNPS is completing those Corrective Actions at a comparable rate with self-identified Corrective Actions. This sampling will be performed by 04/29/05.

## **Update to Davis-Besse Action Plans to Address Operations Performance Area for Improvement**

### **AFI COIA-OPS-04-06 (CR 04-05920)**

- *Cause determination does not go deep enough. Use the methodology of asking the “five whys.”*

### **Update for Action Plan for AFI 04-06**

As discussed in DBNPS letter Serial 1-1390, dated October 8, 2004, the Operations Performance Independent Assessment AFI COIA-OPS-04-06 stated, in part, that the CAP Implementation Independent Assessment response would address Condition Report evaluation depth.

The CAP Independent Assessment team also identified deficiencies in lack of appropriate Condition Report causal depth. However, the deficiencies identified were identified as a “Noteworthy Item.” This “Noteworthy Item” was entered into the Corrective Action Program for evaluation (CR 04-06024). This Condition Report will also review the Corrective Action Program programmatic requirements for apparent cause evaluation depth as identified in AFI COIA-OPS-04-06.

*Team Members Biographies*

**Dr. Jack W. Roe**  
**Director, Regulatory Support Services and**  
**Senior Executive Consultant**  
**Sciencetech, Inc.**

- 1999 - present: *Sciencetech, Inc.* – Regulatory Support - Member of the Davis-Besse Nuclear Power Plant Engineering Assessment Board to provide senior level oversight and technical review during the two-year regulatory shutdown and restart period. Conducted System Health Readiness Reviews for fluid, electrical and ventilation systems to approve system health readiness for these systems. Reviewed regulatory-mandated programs at Davis-Besse for structure, thoroughness, and readiness for restart. Provided extensive licensing support for the nuclear industry, which included activities such as the development of Licensing Amendment Requests and licensing issues.

License Renewal - Managed the License Renewal Services for the following clients: Arkansas Nuclear One, Hatch Nuclear Plant, Turkey Point Units 3 and 4, Peach Bottom Atomic Power Station. Assisted in the development and finalization of several License Renewal Applications.

High Level Waste - Conducted safety and licensing reviews of the Department of Energy's Yucca Mountain High Level Waste Repository Project. The reviews include a detail evaluation of the Site Recommendation Consideration Report and programmatic advice for developing and implementing the strategy, approach, and schedule for the facility.

Materials Licensing - Conducted a safety and licensing review of the Department of Energy's Remote Handled Waste Facility at the West Valley Demonstration Project. The review included a detail evaluation of the Preliminary Safety Analysis Report and programmatic advice for developing and implementing the strategy, approach, and schedule for the facility.

- 1976-1999: *U. S. Nuclear Regulatory Commission (NRC)* - Deputy Executive Director - Supported the Executive Director by managing the safety, administrative and financial operations of the agency. Supervised the Office of the Executive Legal Director, Office of Administration, Office of Resources Management, Office of International Programs, Office of State Programs, and the Office of Small Business and Civil Rights.

Reactor Programs Management - Supervised nine Senior Executives and managed a division of 130 staff members. Responsible for national programs in a wide range of significant areas including nuclear power plant license renewal for more that 40 years, environmental issues, advanced nuclear power plant designs, nuclear power plant decommissioning, emergency preparedness, security, radiation protection, financial matters, and antitrust matters. U.S. Delegate to the International Atomic Energy Agency's Convention on Nuclear Safety, and international treaty.

Project Management for Regions III and IV - Supervised seven Senior Executives and managed 60 staff members performing the overall safety and environmental project management function and monitoring daily operations of 48 nuclear power plants.

Licensee Performance and Quality Evaluation - Supervised six Senior Executives and 50 staff members for the nationwide implementation of maintenance inspections of nuclear power plants, operator licensing and qualification programs, assurance of quality inspections, emergency procedures development and use, and systematic assessment of licensed performance.



**Frank J. Miraglia, Jr.**  
**Senior Nuclear Regulatory Advisor**  
**Sciencetech, Inc.**

- 2001 - present: *Sciencetech, Inc.* - Independent Consultant
- 1975-2001: *U. S. Nuclear Regulatory Commission (NRC)* - Management - Program management experience with U. S. government organizations from 10 to 1,500 persons. Deputy Executive Director for Operations – directed all NRC reactor regulatory programs, including the four NRC Regional Offices. Nuclear Reactor Safety Management - Directed and implemented nuclear reactor regulation programs including licensing, inspection, enforcement, and rulemaking. Also directed and implemented the NRC regulatory program for training and licensing reactor operators. Positions held included the following:
  - Deputy Executive Director for Reactor Programs
  - Director Executive Director for Regulatory Programs
  - Deputy Director of the Office of Nuclear Reactor Regulation
  - Associate Director of Technical Assessment and Inspection, Office of Nuclear Reactor Regulation
  - Associate Director of Projects, Office of Nuclear Reactor Regulation
  - Division Director in Reactor Regulation for Combustion Engineering and Babcock & Wilcox reactor licensing, reactor system safety and radiological safety
  - Deputy Division Director in Reactor Regulation for Licensing
  - Assistant Director for Safety Assessment
  - Branch Chief of Licensing Projects
  - Chief of Resource and Scheduling Branch
  - Rogovin Report Task Group Leader For Assessment of Radiological Releases from the TMI-2 Accident
  - Environmental Project Manager for a number of light water reactors for construction and operations
  - Co-group Leader for Reassessing Fuel Cycle Environmental Impacts associated with a 1000 MWe reactor

Operational Readiness Review - Led NRC operational readiness team reviews as part of licensing reviews following the TMI-2 accident. Focus included not only plant physical condition, but also licensed operators' training and readiness. Security - Developed and implemented security standards for U.S. commercial nuclear industry, including both powers reactor and major fuel cycle facilities. Participated in two Task Forces assessing safety/safeguards interface and the vital island concept.

Emergency Preparedness - Directed NRC reactor safety and protective measures teams in headquarters emergency response organization. Led and participated in NRC emergency response exercises for commercial nuclear facilities, both reactor and non-reactor facilities. Developed NRC emergency preparedness regulations and directed their implementation. Y2K - Implemented the regulatory response for NRC's oversight of the nuclear industry Y2K response. Represented NRC on the President's Y2K Conversion Council 1998 through 2000.

- 1967 - 1975: *U. S. Atomic Energy Commission* - Environmental Project Manager, Chemical Engineer, Division of Nuclear Materials Safeguards.

**Morris W. Branch**  
**Executive Consultant**  
**Sciencetech, Inc.**

- 2003 - present: *Sciencetech, Inc.* – Assisted the Japanese in implementing a NRC type inspection program in Japan. Developed material and presented information to NUPEC (Japan’s Research or National Lab) and METI (Japan’s NRC) associated with training requirements for NRC inspectors, how to conduct QA type inspections, and development of a Resident Inspector Program in their country. Also provided information to Tokyo Electric and Power to assist them in understanding upcoming changes in their regulator’s oversight.
- 2003: *Wisconsin Electric Company* - Performed independent system level review for the Asset Owner to determine feasibility and vulnerabilities associated with license renewal efforts at Point Beach Nuclear Power Plant.
- 2002: *First Energy Nuclear Operating Company* - Participated as a member of an independent Validation Team at Davis-Besse Nuclear Power Plant. Performed review and assessments of products prior to their presentation to and review by the NRC. Provided technical and regulatory guidance to the Engineering Design Manager as to strategy in dealing with NRC identified issues associated with Engineering. Also participated as an outside consultant and voting member of the management level Restart Station Review Board.
- 2001-2002: *Dominion Generation* - Conducted independent review of utilities implementation of QA Topical Report in the areas of inspections and inspector qualifications at Surry and North Anna Nuclear Power Stations. Conducted Independent reviews of the utilities Employee Concerns Program for the Dominion facilities and provided a written assessment to the Chief Nuclear Officer. Conducted employee interviews and program acceptance surveys.
- 2000-2001: *Consolidated Edison of New York* - Advised the Design Engineering Manager on technical issues associated with the NRC’s Large Team Inspection of the Indian Point 2 facility. Developed several “White Papers” in response to NRC concerns and advised on strategy to keep the plant operating while concerns were being evaluated and resolved.  
  
Provided direct quality oversight of the Engineering portion of the Steam Generator Replacement efforts. Reviewed technical reports and licensing issues prior to approval. Developed and implemented detailed oversight plans and issued periodic assessments and surveillance reports. Certified as a Lead-Auditor under the company’s program.
- 1980-1999: *U. S. Nuclear Regulatory Commission (NRC)* - Transition Task Force Lead for Development of the SDP. Convened a twelve-member panel to review the feasibility of the new reactor oversight process and presented the results along with additional insights to the NRC.  
  
Team Leader - planned, staffed and managed system design evaluation teams comprised of contract personnel from Architect Engineering firms. Section - Chief Engineering Group In Division of Reactor Safety - managed 15 or more engineers responsible for inspecting areas such as Fire Protection, MOV and Section XI Programs, and Post Maintenance Testing.  
  
NRC Restart Coordinator - developed strategy and implemented the NRC's restart review efforts for Sequoyah Unit 2. Senior Resident Inspector - supervised and performed in-depth evaluations of day to day reactor operations and abnormal conditions.

**Sharon A. Wheeler**  
**Lead Nuclear Self Evaluation Specialist**  
**Robinson Nuclear Project (RNP)**

- 1999 - present: *Robinson Nuclear Project* - Lead Nuclear Self Evaluation Specialist - Responsible for managing RNP's Corrective Action Program in accordance with regulatory and administrative requirements. Site lead for the Self Evaluation cornerstones. Member of INPO Performance Improvement Committee. Position is in daily communication with site Unit Evaluators and site management. Conducts site trend analyses and implements corrective action recommendations. Focuses on strengthening RNP's Human Performance awareness. Participates on the Passport Action Tracking Team. Received Progress Energy's prestigious Competitive Edge Award for recommending a new reactor cavity seal and saving the company significant critical path time, dose, and cost.
- 1994-1999: *Robinson Nuclear Project* - Senior Technical Specialist - Responsible, during outages, for managing the activities of all involved work groups (approximately 1,000 people) to optimize performance regarding scope, schedule, cost, nuclear and personnel safety, and radiation exposure. Responsible, during operating periods, for future outage planning including optimum utilization of personnel and minimizing outage duration and dose. Managed shifts of 500 to 1000 people during 2 refueling outages at RNP. Identified efficiency and nuclear safety improvements. Certified Senior Reactor Operator.
- 1991-1994: *Robinson Nuclear Project* - Refueling Coordinator - Responsible, during an outage, for managing the activities of approximately 100 contractors in all aspects of reactor, steam generator, and reactor coolant pump maintenance while minimizing schedule, cost, and dose and maximizing nuclear and personnel safety. Responsible, during operating periods, for future outage planning, including upgrading plant equipment to ensure optimized performance. Negotiated and administered performance based multimillion-dollar contracts with Fortune 500 companies. Consistently reduced schedule, cost, and dose with each outage performance. Position required excellent organization, innovation, communication, negotiation, project management, and technical skills.
- 1986- 1991: *Robinson Nuclear Project* - Senior Contracts Specialist - Responsible for negotiating and administering multiple contracts simultaneously. Focused on reducing contractor cost while improving quality and efficiency of work. Recognized in writing for contract cost savings realized as a result of contract negotiations.
- 1982-1986: *Robinson Nuclear Project* - Engineering Technician, Mechanical - Responsible for minor HVAC and piping designs and mechanical drawing accuracy for Progress Energy's nuclear and fossil generating plants.

**John B. Osborne**  
**Corrective Action Program Manager**  
**San Onofre Nuclear Generating Station**

- 2002 - present: *San Onofre*; Corrective Action Program (CAP) Manager - Managing the Corrective Action Program. Defining implementation standards/processes and monitoring implementation/effectiveness via participating in core activities, conducting independent reviews, and publishing metrics and performance reports.
- 1996-2002: *San Onofre*; Programs & Assessment Engineer - Developed and maintained Corrective Action and Self-Assessment processes and mentored the line organizations in conducting cause evaluations for more significant equipment/human performance events.
- 1994-1996: *San Onofre*; Assessment Engineer - Conducted equipment/human performance root cause and common cause evaluations for line organizations and the Nuclear Safety Concerns program.
- 1989-1994: *San Onofre*; Independent Safety Engineering Group Engineer - Reviewed NCR dispositions, evaluated industry operating experience for applicability to SONGS, and conducted root cause evaluations for significant equipment/human performance events involving line organizations and the Nuclear Safety Concerns program.
- 1987-1989: *San Onofre*; Maintenance Supervisor - Supervised the group in defining EQ maintenance activities, reviewing design changes for impact on the maintenance program, and responding to Quality Assurance findings for the Maintenance organization.
- 1986-1987: *San Onofre*; Maintenance Engineer - Supported the Maintenance line organization by defining EQ maintenance activities, responding to Quality Assurance findings, and working special projects as directed by management including a Maintenance readiness review for an INPO evaluation.
- 1982-1986: *San Onofre*; Quality Assurance Engineer - Performed civil, mechanical and electrical surveillances/inspections, and established/operated a civil materials test lab in partnership with another civil engineer.
- 1982-1982: *San Onofre*; Contact Quality Control Inspector - Performed civil quality control reviews/inspections including working off a backlog of civil inspection documents requiring engineering review/disposition of findings.
- 1979-1982: *Schwerin, Xinos and Associates*; Civil Engineer - Performed project/design activities from planning through construction for residential and commercial land development projects.

**James P. “Pat” O’Neil**  
**Corrective Action Program Manager**  
**Quad Cities - Exelon Nuclear**

- 2001 - present: *Exelon*; Corrective Action Program (CAP) Manager - Coordinates Site Corrective Action Program including: Departmental CAP Coordinators, Root Cause Investigators, Site Coding and Trending, Develops and implements CAP Improvement Plans and Procedures. Root Cause SME. Team Lead for four PIR Inspections, Participated in Kewaunee INPO E&A as CAP peer.
- 1999 - 2001: *Exelon*; Root Cause Coordinator (CAP Analyst) - Facilitate Corrective Action Review Board (CARB), Review Root Cause and Apparent Cause packages, SME Root Cause Analysis. Team Lead for NRC Pilot Problem Identification and Resolution Inspection. Corporate CAP Improvement Team Member.
- 1997 - 1999: *Entergy*; Senior Technical Specialist – Nuclear Safety & Regulatory (Licensing – Reportability / LERs / Inspection Support / presentation preparation) Areas of specialty within Licensing included Operations, Emergency Preparedness, and Corrective Action Program. Team Lead for three NRC 40500 CAP inspections. Non-departmental work included: Significant Event Response Team Root Cause Expert, Team Leader STAR Trainer, Team Leader Human Performance Team, ISEG Representative, Alternate Employee Concern Coordinator.
- 1996 - 1997: *Entergy*; Employee Concerns Coordinator - Investigation and disposition of sensitive confidential issues.
- 1994 - 1996: *Entergy*; In-House Events Analysis (IHEA) Root Cause Analysis SME Event Review, CARB Package Review
- 1990 - 1994: *Entergy*; Operations Training Instructor - Developed and administered training including Fundamentals, BWR Systems, General Systems, NEO, and Initial License. Supervised LOTM upgrade project, Operations Management Monitoring Team, System Responsibility Program Development.
- 1987 - 1990: Various Nuclear Contract Outage Positions at seven plants while attending Graduate School for various utilities including CECO, Duke, PECO, and GPU and GSU including Radiation Protection, Instrument Calibration and Repair, and Training.
- 1978 - 1986: *U.S. Navy*; Nuclear Repair Facility (AD-38) - Overseas assignment, Supervised Instrument Repair and Calibration Facility, Supervised Training Program, Managed (Senior enlisted) Nuclear Repair Facility. Reactor Operator USS Nathan Hale SSBN 623. Navy Training included: Boot Camp, Basic Electricity and Electronics (BE&E), Electronic Technicians School, 6 month assignment teaching BE&E, Nuclear Power School, and S3G Prototype Training.