



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

August 29, 2014

EA-13-182  
EA-13-223

Mr. Thomas Vehec  
Vice President  
NextEra Energy Duane Arnold, LLC  
3277 DAEC Road  
Palo, IA 52324-9785

SUBJECT: DUANE ARNOLD ENERGY CENTER - NRC 95002 SUPPLEMENTAL  
INSPECTION REPORT 05000331/2014009 AND ASSESSMENT  
FOLLOW-UP LETTER

Dear Mr. Vehec:

On July 11, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed a follow-up supplemental inspection pursuant to Inspection Procedure (IP) 95002, "Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," at your Duane Arnold Energy Center. The enclosed report documents the results of this inspection, which were discussed at the exit and regulatory performance meeting on July 21, 2014, with Mr. R. Anderson and other members of your staff.

In accordance with the NRC Reactor Oversight Process (ROP), this follow-up supplemental inspection was performed to assess the licensee's actions taken to evaluate and correct two White findings associated with equipment failures affecting the 'A' Standby Diesel Generator and the Reactor Core Isolation Cooling systems. These two White findings were both in the Mitigating Systems Cornerstone which placed the Duane Arnold Energy Center in a degraded cornerstone as of the third quarter of 2013.

The NRC staff was informed on May 13, 2014, of your readiness, as of that date, for us to conduct this supplemental inspection. The findings were held open a fifth quarter due to the notification of your readiness for the inspection in the fourth quarter after entering the degraded cornerstone.

The NRC performed this supplemental inspection to determine if: (1) the root and contributing causes for the risk-significant issues were understood; (2) the extent of condition and extent of cause for the identified issues were understood; and (3) your completed or planned corrective actions for the identified issues were sufficient to address and preclude repetition of the root and contributing causes. The NRC also conducted an independent review of the extent of condition and extent of cause associated with the White findings and an assessment of whether any safety culture component caused or significantly contributed to the performance issues.

Based on the results of the inspection, the NRC determined that the Duane Arnold Energy Center had performed an acceptable evaluation of both of the White findings, which are now closed.

Your staff's evaluation of the White finding associated with Violation (VIO) 05000331/2013010-01, "A' Standby Diesel Generator Lube Oil Heat Exchanger Failure," identified the root causes of the issue were less than adequate instruction/work practices and that the work order that was used to replace the lube oil heat exchanger (HX) in 2012 contained a less than adequate torque value. To correct this issue and prevent recurrence, your staff created a model work order for inspection and re-assembly of Standby Diesel Generator HXs, incorporated new bolt torque values for the Standby Diesel Generator HXs; and incorporated Electric Power Research Institute (EPRI) guidance for sheet gasket material into a general maintenance practices procedure.

Your staff's evaluation of the White finding associated with VIO 05000331/2013004-03, "RCIC [Reactor Core Isolation Cooling] Turbine Overspeed Trip," identified that the root causes of the issue were that a RCIC dropping resistor failed due to unknown material changes of the resistor by the manufacturer that reduced performance margins in the given application and a less than adequate Immediate Operability Determination (IOD) of the malfunctioned control room RCIC speed indicator which resulted in the untimely identification and resolution of the RCIC inoperability. To correct this issue and prevent recurrence, your staff modified the RCIC power supply to provide more margin to age/thermal failures and included a method to validate power supply function; provided guidance for when to conduct an independent review of a Shift Manager's IOD based on a risk significance; revised the RCIC and High Pressure Coolant Injection piping and instrumentation drawings (P&ID); incorporated the use of an operability worksheet into the operability screening notes for condition reports where an IOD is required; requires weekly verification of the resistor dropping function; replaces the original specification resistor every three months; and implemented a purchase specification for the replacement resistors.

After reviewing your actions to address both of the White findings using IP 95002, the NRC concluded that completed or planned corrective actions were sufficient to address the performance that led to the White findings. Therefore, in accordance with Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," the two White findings, that were being held open pending completion of a supplemental inspection and effective corrective actions, are closed, and will only be considered in assessing plant performance until the end of the third quarter of 2014. As a result, the NRC has determined the performance at the Duane Arnold Energy Center to be in the Licensee Response Column of the ROP Action Matrix as of the date of this letter.

While the NRC has concluded you have taken appropriate actions in response to the two White findings, the inspection identified that continued management attention and focus is needed to address lower level, less risk-significant issues in the areas of operability determinations and work package quality.

Although the NRC has transitioned the Duane Arnold Energy Center to the Licensee Response Column (Column 1) from the Degraded Cornerstone Column (Column 3), the findings documented in the enclosure will be considered in the End-of-Cycle assessment. You will be

informed by a separate letter of the results of that assessment and any changes to the baseline inspection schedule that will be made to allow the NRC to evaluate the long-term effectiveness of your corrective actions for the two risk-significant issues that are the subject of this inspection report and your actions to address the lower level issues that were identified.

Based on the results of this inspection, three NRC-identified findings of very low safety significance (Green) that involved violations of NRC requirements were identified. However, because of their very low safety significance, and because these issues were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Duane Arnold Energy Center. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Duane Arnold Energy Center.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA by Christine Lipa Acting for/**

Anne T. Boland, Director  
Division of Reactor Projects

Docket No. 50-331  
License No. DPR-49

Enclosure:  
IR 05000331/2014009  
w/Attachment: Supplemental Information

cc w/encl: Distribution via LISTSERV®

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-331  
License No: DPR-49

Report No: 05000331/2014009

Licensee: NextEra Energy Duane Arnold, LLC

Facility: Duane Arnold Energy Center

Location: Palo, IA

Dates: June 23 through July 11, 2014

Inspectors: C. Phillips, Project Engineer  
B. Bartlett, Project Engineer  
R. Baker, Operations Engineer  
M. Jones, Reactor Engineer  
A. Scarbeary, Resident Inspector, Palisades  
J. Steffes, Resident Inspector, Duane Arnold

Approved by: Christine Lipa, Chief  
Branch 1  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

Inspection Report 05000331/2014009; 06/23/2014 – 07/11/2014; Duane Arnold Energy Center; Supplemental Inspection – Inspection Procedure (IP) 95002, Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area.

This inspection was conducted by four regional inspectors and two resident inspectors. The inspectors identified three NRC-identified findings of very low safety significance (Green) that involved violations of NRC requirements. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Assigned cross-cutting aspects were determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

### **Cornerstone: Mitigating Systems**

The NRC staff performed this follow-up supplemental inspection in accordance with Inspection Procedure 95002, "Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," to continue to assess the licensee's evaluation of two White inspection findings that affected the Mitigating Systems Cornerstone.

The inspection team determined that the licensee's evaluation of the issues met the inspection procedure objectives. The inspection team determined that the root cause evaluations for the "A' Standby Diesel Generator Lube Oil Heat Exchanger Failure," and the delayed recognition of a degraded component which led to the "Reactor Core Isolation Cooling (RCIC) Turbine Overspeed Trip," appropriately evaluated the root and contributing causes, adequately addressed the extent of condition and cause, assessed safety culture, and established corrective actions for the risk-significant performance issues. In addition to assessing the licensee's evaluations, the inspection team independently performed an extent of condition and extent of cause review of the two findings and a review of the site safety culture as it related to the root cause evaluations. The team concluded that the licensee's root cause evaluations and corrective actions, both completed and planned, were sufficient to address the causes and prevent recurrence for both violations.

### **NRC-Identified and Self-Revealed Findings**

Green. The inspectors identified a finding of very low safety significance and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to assure that a safety-related drawing for the High Pressure Coolant Injection (HPCI) system was accurate. Specifically, a corrective action to prevent recurrence for the RCIC system failure required that the HPCI system drawing be changed to accurately reflect the system configuration. The licensee changed the drawing, but not so that it accurately reflected the system configuration. The licensee initiated Condition Report (CR) 1977172 to document the inaccuracy of the HPCI drawing and track completion of a document change request to revise the drawing to show the proper relationship between the HPCI governor speed control and the turbine speed indicator in the control room. Additionally, the licensee directed Design Engineering to perform an apparent cause evaluation to determine why the drawings did not accurately reflect the relationship between speed sensor and speed indicator, and

why the HPCI drawing was not revised to clarify the interrelationships as was done on the RCIC drawing.

The performance deficiency was determined to be more than minor because in accordance with IMC 0612, Appendix B, if left uncorrected it would have the potential to lead to a more significant safety concern. Specifically, the HPCI drawing change was part of a corrective action to prevent recurrence of a significant condition adverse to quality. The inspectors screened the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined the finding was related to a design deficiency that did not result in a loss of a safety system or function, and is therefore a finding of very low safety significance. The inspectors determined that the finding had a cross cutting aspect in the area of problem identification and resolution, specifically evaluation, because licensee personnel failed to thoroughly evaluate issues to ensure that the resolutions address causes and extent of conditions commensurate with their safety significance. (P.2) (Section 02.03.f)

Green. The inspectors identified a finding of very low significance and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving multiple examples where the licensee failed to ensure that activities affecting quality were prescribed by documented procedures of a type appropriate to the circumstances. Specifically, in the first example, Duane Arnold Energy Center (DAEC) maintenance personnel failed to implement part of a corrective action to prevent recurrence (CAPR) to ensure alignment was measured and recorded for the standby diesel generator (SBDG) lube oil (LO) heat exchangers (HXs) following the March 8, 2013 'A' SBDG lube oil heat exchanger gasket failure. In the second example, inspectors identified that procedures lacked adequate acceptance criteria to ensure acceptability of potential flange alignment issues. As a third example, inspectors identified an actual failure to ensure adequate gasket placement due to inadequate acceptance criteria on the 'A' SBDG scavenging air heat exchanger. The corrective actions for deficient flange inspection procedure GENERA-F010-01 included revising procedures to incorporate a requirement to measure and record vertical and horizontal alignment between the lube oil and jacket water channel heads. In addition, the licensee planned to incorporate acceptance criteria on which to base in-field determinations. The immediate corrective actions for the scavenging air cooler gasket included performing an immediate operability determination (IOD) and prompt operability determination (POD) for the protruded gasket region. In addition, the licensee planned to change procedure GENERA-F010-01 to include actions to verify gasket position after torquing the flange bolts.

The inspectors determined that this finding was more than minor in accordance with IMC 0612, Appendix B, because it affected the Mitigating Systems Cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined the finding was of very low safety significance (Green) because the finding was not a

deficiency affecting the design or qualification of a mitigating structure, system or component and did not result in a loss of operability or functionality. In addition, the finding did not represent a loss of system or function, did not represent an actual loss of function of a least a single train for longer than its technical specification allowed outage time, and did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significance. The finding had a cross cutting aspect in the area of problem identification and resolution, specifically evaluation, because licensee personnel failed to thoroughly evaluate issues to ensure that the resolutions address causes and extent of conditions commensurate with their safety significance. (P.2) (Section 02.03.f)

Green. The inspectors identified a finding of very low safety significance (Green) and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to ensure the effectiveness review (EFR) attributes for a significant condition adverse to quality would appropriately evaluate whether the corrective actions were effective in eliminating or reducing the recurrence rate. The licensee initiated CRs 1977427 and 1976943 to document the poor or missing EFRs and began revising the EFRs to be more supportive of determining if the corrective actions were effective.

The inspectors determined that the licensee's failure to establish EFR criteria that would have identified whether the corrective actions to prevent recurrence (CAPRs) had effectively resolved the conditions was a performance deficiency warranting further review. The inspectors determined that this finding was more than minor in accordance with IMC 0612, Appendix B, because it affected the Mitigating Systems Cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined the finding was of very low safety significance (Green) because the finding was not a deficiency affecting the design or qualification of a mitigating structure, system or component and did not result in a loss of operability or functionality. In addition, the finding did not represent a loss of system or function, did not represent an actual loss of function of a least a single train for longer than its technical specification allowed outage time, and did not represent an actual loss of function of one or more nontechnical specification trains of equipment designated as high safety-significance. The finding had a cross cutting aspect in the area of Human Performance, specifically procedure adherence, because licensee personnel failed to follow procedures associated with developing and reviewing corrective actions commensurate with their safety significance. (H.8) (Section 02.03.f)

#### **Licensee-Identified Findings**

None.

## **REPORT DETAILS**

### **4. OTHER ACTIVITIES**

#### **Cornerstone: Mitigating Systems**

#### **4OA4 Supplemental Inspection (95002)**

##### **a. Inspection Scope**

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure (IP) 95002, "Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," to assess the White inspection finding for the 'A' Standby Diesel Generator (SBDG) lube oil heat exchanger gasket failure and the White inspection finding for the Reactor Core Isolation Cooling (RCIC) turbine trip.

The objectives of the supplemental inspection included:

- To provide assurance that the root and contributing causes for the White findings are understood.
- To determine if the licensee's corrective actions for risk-significant performance issues are sufficient to address the root and contributing causes and prevent recurrence.
- To independently assess the extent of condition and the extent of cause for individual and collective risk-significant performance issues.
- To assess the safety culture as a possible contributor.

The inspectors reviewed the Root Cause Evaluations (RCE), in addition to other assessments, evaluations, and corrective action program documentation completed in support of and, as a result of, the RCEs. The inspectors reviewed corrective actions that were taken or planned to address the identified causes. The inspectors interviewed selected station, corporate, and contractor personnel, and held discussions with these individuals to verify that the root and contributing causes and the contribution of safety culture components were understood and that corrective actions taken or planned were appropriate to address the causes and preclude repetition.

For clarity, documentation of each inspection requirement contains subsections for each of the two White mitigating systems findings and a subsection for the collective review of commonalities. Documents reviewed during this inspection are listed in the Attachment.

##### **b. Inspection Results**

The four attributes of IP 95002 were reviewed for each of the two White findings and for the common cause analysis performed by the licensee. Thus there were a total of 12 attributes that were reviewed. The inspectors concluded that for each of the White findings, the licensee understood the root and contributing causes. In addition, the inspectors performed an independent extent of condition and extent of cause review and



assessed the licensee's corrective actions for these two White findings and concluded that the licensee's actions met the objectives.

## 02 Evaluation of the Inspection Requirements

### 02.01 Problem Identification

- a. Determine that the Evaluation Documented Who Identified the Issue (i.e., Licensee-Identified, Self-Revealing, or NRC-Identified) and Under What Conditions the Issue was Identified

Issue identification was clearly documented in the licensee's evaluations. The licensee also noted weaknesses in their processes for identification of issues before they became risk-significant for which corrective actions have been implemented.

#### 1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The inspectors determined that the RCE for the "A' SBDG Lube Oil Heat Exchanger Gasket Failure" specifically addressed how the issue was identified. In the RCE, the licensee stated that the issue of SBDG inoperability was self-revealed during a post maintenance test on March 8, 2013. The inspectors concluded the licensee met this aspect of the IP 95002 objectives and this item is closed.

#### 2. RCIC Turbine Trip During Surveillance Test Procedure (STP) 3.5.3-02

The inspectors determined that the RCE for the unrecognized RCIC inoperability specifically stated that the event was self-revealed during the subsequent surveillance testing, and that the initial failure of the RCIC speed control circuit had been self-revealed more than two months prior when the faulty turbine speed indication was identified. The inspectors independently reviewed the original condition reports (CRs) generated for both the initial failure of the RCIC turbine speed indicator and the RCIC pump overspeed trip during the STP, and interviewed the senior licensed operators who were present in the control room when the faulty speed indication was recognized. The inspectors concurred with the licensee's assessment. The inspectors concluded the licensee met this aspect of the IP 95002 objectives and this item is closed.

#### 3. Collective Review For Commonalities

After receiving the Notices of Violation for the two White findings, the licensee assessed the extent of cause and safety culture contributors for these two events to determine if there were broader issues station-wide or if there was a potential for those identified safety culture contributors related to the White findings to affect other plant activities. For each individual White finding, the licensee identified weaknesses in their processes associated with identifying issues before they became risk-significant. An example of this was making an incorrect determination of operability, due to not thoroughly investigating the system interrelations, which allowed the system to exceed its technical specification limiting condition for operation completion time. The station has since completed an apparent cause evaluation of Organizational Effectiveness which revealed that the site, as well as NextEra corporate, did not recognize the potential risk-significance of issues when they were first identified. There are corrective actions in place to address these issues. The inspectors concluded the licensee met this aspect of the IP 95002 objectives and this item is closed.

b. Determine that the Evaluation Documented How Long the Issues Existed and Prior Opportunities for Identification

The licensee's RCEs clearly stated when and how long the issues existed. The licensee identified several prior opportunities for identification and that their existing self-assessment processes had been ineffective in identifying and correcting these issues.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The licensee's evaluation for the "'A' SBDG Lube Oil Gasket Failure" documented numerous issues that were classified as either root or contributing causes. The licensee provided a thorough and technical account of the potential root and contributing causes for each of the issues identified. Inspectors noted that for each issue, the licensee established a timeline of events to assess what prior opportunities existed for identification. The licensee clearly stated in the RCE when the problem was identified and how long it lasted. The inspectors concluded the licensee met this aspect of the IP 95002 requirements and this item is closed.

2. RCIC Turbine Trip During STP 3.5.3-02

The licensee's evaluation addressed several prior opportunities to recognize and address the actual issue resulting from the event as well as prior opportunities for implementing corrective actions which would have precluded the event. This included the use of more conservative decision-making during an immediate operability determination (IOD) and more rigorous prioritization screening by both the Work Order Screening Team and the Management Review Committee (MRC) for the original RCIC turbine speed indicator CR. The inspectors determined that the licensee's evaluation met the IP 95002 inspection objective with respect to recognizing how long the issue existed and prior opportunities for identification and this item is closed.

3. Collective Review for Commonalities

The licensee completed the Collective Review for Commonalities in March 2014, after completing root cause evaluations for the two White findings. The commonalities evaluation reviewed plant historical events/findings/issues for a two year time frame (2012-2013).

The Collective Review for Commonalities reviewed a previous root cause evaluation, related to the Turbine Building Main Steam Line Temperature Indicating Sensors, for similar underlying causes to the RCIC and SBDG events. The review of the Turbine Building Main Steam Line Temperature Indicating Sensors RCE revealed similar contributing cultural issues, such as procedure quality, the operability determination process, use of operating experience, and decision-making. The licensee did not address why actions from this root cause were not effective at fixing these cultural aspects in the Collective Review for Commonalities. The collective review also referenced missed opportunity reviews completed by Nuclear Oversight (NOS) where that organization could have been more intrusive in the individual White finding events. Condition reports with corrective actions are currently being implemented to close these identified gaps. The licensee also found that the self-assessment process was not effective when looking into procedure quality and management oversight issues identified in the past and the self-assessment process missed looking into issues with

the use and implementation of operating experience entirely. A new schedule for self-assessments has been established to look into these areas with a focus on effectively and thoroughly evaluating each area. The NRC inspectors observed that previous root cause evaluations conducted in safety culture areas, such as decision-making and management oversight, were not discussed in the Collective Review for Commonalities and the Review did not discuss why those evaluations were not effective in addressing the common themes identified in the review. While weaknesses existed in this area, the inspectors concluded the licensee had sufficient actions in place to address those weaknesses and met this aspect of the IP 95002 objectives and this item is closed.

c. Determine that the Evaluation Documented the Plant Specific Risk Consequences, As Applicable, and Compliance Concerns with the Issues Both Individually and Collectively

The licensee's evaluations individually and collectively addressed the plant specific risk consequences. In addition, the licensee's evaluations included an assessment of compliance.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The final risk evaluation performed in Root Cause Evaluation, Revision 5, for the 'A' SBDG Lube Oil Heat Exchanger Gasket Failure was determined to be reasonable and was in agreement with the positions presented by NRC Senior Reactor Analysts (SRAs) in Inspection Report 05000331/2013011, dated December 18, 2013.

The licensee's final root-cause evaluation (Revision 5) removed and corrected non-conservative assumptions discussed in Revision 4 related to potential room temperature transient effects due to ventilation damper position and support system operation. The licensee determined that there was a lack of conclusive evidence to support the inclusion of the additional postulated contributing cause of a SBDG room temperature transient. The inspectors determined that the use of this potential contributing cause would have significantly reduced the event exposure time, and as a result, would have significantly reduced calculated plant risk. The inspectors noted the changes to the licensee's plant specific risk evaluation were adequately supported by engineering evaluations and vendor data. The inspectors determined that the RCE was revised after the issuance of the above mentioned inspection report and was consistent with that report.

The inspectors concluded the licensee met this aspect of the IP 95002 objectives and this item is closed.

2. RCIC Turbine Trip During STP 3.5.3-02

The licensee's risk evaluation agreed with the NRC SRA detailed risk evaluation result of low to moderate safety significance, based upon the inoperability condition remaining unrecognized from June 21, 2013 until August 22, 2013. Once the condition was recognized, the licensee took immediate actions to restore compliance and properly characterize the condition. The RCIC governor controls dropping resistor was replaced and RCIC was returned to service on August 24, 2013. The inspectors noted that the licensee issued Licensee Event Report 2013-002 on December 20, 2013, for a condition prohibited by technical specifications, reportable to the NRC pursuant to 10 CFR 50.73(a)(2)(i)(B). Additionally, the failure of the RCIC system was entered into the

licensee's Maintenance Rule database and the site Performance Indicators, as identified in CR 1908511, "RCIC In Maintenance Rule 50.65(A)(1) [Red]." Based upon the review of these items and the licensee's understanding of the risk significance of this issue, the inspectors concluded that this aspect of the IP 95002 objectives had been met and this item is closed.

### 3. Collective Review For Commonalities

The collective review looked at the risk associated with each event separately and then looked at the combination of those two events to see if the collective station risk would have increased overall. The conclusion was that there was no overall increase in station risk from the combination of the two White finding events. The inspectors agreed with the licensee's conclusion. The inspectors concluded the licensee met this aspect of the IP 95002 objectives and this item is closed.

#### d. Findings

No findings were identified.

### 02.02 Root Cause

#### a. Determine that the Problem was Evaluated Using a Systematic Methodology to Identify the Root and Contributing Causes

The licensee used a systematic methodology for evaluation in all three cases.

##### 1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The inspectors reviewed the licensee's RCE, Contributing Cause Analysis (CCA), and supplemental documents related to the White finding. The licensee identified two root causes for the SBDG and three contributing causes using a systematic methodology. The licensee utilized a timeline of events, event and causal factor chart, root cause test, support/refute matrix, a "why" analysis, and the maintenance history during the SBDG root cause assessments and the contributing cause assessment. The inspectors determined that the RCE and CCA were conducted to a level of detail commensurate with the significance of the issues. The licensee's evaluations included details of each item along with supporting data and other information. The inspectors concluded the licensee met this aspect of the IP 95002 objectives and this item is closed.

##### 2. RCIC Turbine Trip During STP 3.5.3-02

The inspectors reviewed the licensee's RCE and other documents related to the White finding. The licensee identified one direct cause (equipment component failure), one root cause and five contributing causes using a systematic methodology. The licensee utilized event and causal factor charting, barrier analysis, an organization and programmatic evaluation, interviews with both operating shift managers and engineering staff, a site nuclear safety culture evaluation matrix, as well as a laboratory analysis of the failed RCIC failed resistor during the RCIC RCE. The inspectors determined that the RCE was conducted to a level of detail commensurate with the significance of the issue, and that the licensee's use of a systematic methodology met the IP 95002 inspection objectives and this item is closed.

### 3. Collective Review for Commonalities

The Collective Review for Commonalities was completed per a charter that was approved by the MRC as a deviation from the prescribed procedure for conducting common cause evaluations. The purpose of this review was to assess the extent of the White findings' causes and safety culture contributors on a station-wide level with respect to other plant activities. The licensee conducted the review using a systematic process, including Pareto analyses, that collected and analyzed data from the past two years of plant performance issues looking at the safety culture aspects associated with the root and contributing causes of the White findings, prior NRC non-cited violations, root cause evaluations, apparent cause evaluations, and NOS findings. The review for commonalities evaluated all areas of plant operation including programmatic, organizational, human performance, and equipment reliability. The collective review of this data identified these top seven areas for improvement: procedure quality; management oversight; use/implementation of operating experience; decision-making; maintaining design margins; work planning; and the evaluation of problems (corrective action program (CAP)).

The NRC inspectors identified one discrepancy between the approved charter and the final Collective Review for Commonalities. Specifically, the charter stated that if new common causes were identified, then new corresponding corrective actions to prevent recurrence (CAPRs) for those causes should also be identified. The conclusion section stated that the licensee learned something new in that the common cause areas identified were underlying contributors to other historical station-wide issues. Contrary to the charter requirement stated above, no corrective actions to prevent recurrence were established for these new common safety culture contributing aspects, only corrective actions, and subsequently no effectiveness reviews were required. This is a minor finding for not following procedure PI-AA-204, "Condition Identification and Screening Process," for not completing the Collective Review for Commonalities in accordance with the MRC approved charter. The licensee entered this into the CAP as CR 1985334. The inspectors concluded this aspect met the IP 95002 inspection objectives and this item is closed.

#### b. Determine that the Root Cause Evaluation was Conducted to a Level of Detail Commensurate with the Significance of the Problem

The inspectors determined that the licensee's RCE were conducted to a level of detail that was commensurate with the significance of the problem.

#### 1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The licensee's RCE utilized the above mentioned systematic methodologies and determined the root causes of the SBDG issue were:

- Less than adequate instruction/work practice.
- The work order used to replace the lube oil heat exchanger in 2012 contained a less than adequate torque value.

The inspectors determined that the RCE for the SBDG White finding was conducted to a level of detail commensurate with the significance of the issues. The inspectors determined that this aspect of the IP 95002 was met for the SBDG White finding and this item is closed.

## 2. RCIC Turbine Trip During STP 3.5.3-02

The licensee identified one direct cause, DC1, predominantly equipment related, and one root cause, RC2, predominantly personnel related. The RCE stated that the RCIC dropping resistor failed due to unknown material changes of the resistor by the manufacturer that reduced performance margins in the given application (DC1). This resulted in over-heating and ultimate failure of the resistor. The RCE also stated that a less than adequate IOD of the malfunctioned control room RCIC speed indicator resulted in untimely identification and resolution of the RCIC inoperability (RC2). Additionally, the licensee identified the following contributing causes (CC) associated with process weaknesses linked to the failed barriers resulting in the RCIC White finding.

- CC1: A less than adequate evaluation of industry Operating Experience (OE) related to failed resistors in governor control systems contributed to inadequate technical challenge to the installed RCIC governor resistor reliability.
- CC2: A less than adequate prioritization screening by the work order screening team for the RCIC speed indicating instrument contributed to untimely identification and resolution of the RCIC inoperability.
- CC3: A less than adequate knowledge of the integration of the speed control and indication functions of the RCIC governor circuit contributed to untimely identification and resolution of the RCIC inoperability.
- CC4: A less than adequate MRC review during the screening of CR 01884388, "RCIC Turbine Speed Indicator SI2457 Reading 1200 RPM [rotations per minute] Shutdown," contributed to untimely identification and resolution of the RCIC inoperability.
- CC5: Less than adequate decision-making during the operability, CR and work order screening when the degraded RCIC speed indication was discovered.

The licensee performed detailed evaluations on each of the processes associated with the demonstrated weaknesses which led to the failed barriers and identified corrective actions to modify and enhance these processes. The inspectors determined that the RCE for the RCIC White finding was conducted to a level of detail commensurate with the significance of the issue, and that this aspect of the IP 95002 objectives was met and this item is closed.

## 3. Collective Review for Commonalities

The Collective Review for Commonalities thoroughly evaluated potential common underlying contributors with a detailed questioning process that thoroughly evaluated the programmatic, organizational, human performance and equipment reliability fundamental areas to identify core safety culture aspects that were related to the root and contributing causes of previous station performance problems. The top safety

culture areas where corrective actions were assigned to resolve the identified gaps properly assessed other potential causal areas. The inspectors concluded that the level of detail in the review was commensurate with the significance of the potential problems that could occur. The inspectors concluded that this aspect of the IP 95002 objectives was met and this item is closed.

c. Determine that the Root Cause Evaluation Included a Consideration of Prior Occurrences of the Problem and Knowledge of Prior Operating Experience

The inspectors determined that the RCEs included a consideration of prior occurrences of the problem and knowledge of prior operating experience (OE). Both the licensee and the inspectors noted weaknesses in the licensee's use of OE.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The inspectors determined the licensee's evaluation included consideration of prior occurrences of the issues and industry operating experience. The RCE for the 'A' SBDG White finding identified that two previous opportunities to utilize industry OE during the maintenance planning process were identified for lube oil cooler work performed during refueling outage (RFO) 23 in 2012 and subsequent 2013 maintenance in response to the 'A' SBDG lube oil cooler leak. The licensee documented that weaknesses in the work order planning process were revealed where work planners failed to include available operating experience in work order packages for review during the pre-job briefs, per site procedures. The licensee previously documented these weaknesses in the maintenance planning organization's utilization of OE in a 2012 quick hit self-assessment (QHSA) and an associated apparent cause evaluation. The licensee generated a CR from the RCE to evaluate this as a new condition; these issues were evaluated separately from the 2012 QHSA.

The inspectors noted the licensee's RCE considered the use of internal self-assessments, condition reports, and external data bases developed to identify and track OE issues. The licensee documented that electrical, mechanical, and instrument and control (I&C) maintenance work planners were inconsistently incorporating operating experience contrary to the requirements of plant procedures.

The inspectors determined the licensee's RCE reviewed prior occurrences of the issues and implementation of industry operating experience. The inspectors noted that although the licensee identified weaknesses associated with incorporating applicable OE, these issues were entered into the corrective action program to be corrected. The inspectors concluded that this aspect of the IP 95002 objectives was met for the SBDG White finding and this item is closed.

2. RCIC Turbine Trip During STP 3.5.3-02

The inspectors determined that the licensee's evaluation included a review of prior occurrences of similar component failures and relevant industry operating experience. The RCE for the RCIC determined that a prior opportunity was missed in late 2004 during an OE applicability review for a resistor failure at Quad Cities. This OE recommended replacing the 200 ohm 70 watt resistor with a 200 ohm 250 watt resistor. The OE also recommended a replacement frequency of two years for this new type of resistor. The DAEC review for this OE stated that no action was required for the DAEC

because the Quad Cities failure was an isolated event. The 70 watt resistor was deemed adequate based on DAEC history (no failures, with original supplied resistor being in-service for over 25 years, and the current installed resistor in service for 4 years).

Additionally, DAEC personnel did not attend the EPRI/TTUG (Terry Turbine User's Group) meetings which occurred in 2004, 2005, and 2006. The licensee obtained meeting minutes for the EPRI/TTUG 2005 and 2006 meetings. The material presented had detailed information on other dropping resistor failures that had occurred and were also considered missed opportunities to identify the issue.

Although the licensee failed to properly assess these prior opportunities at the time they occurred, the inspectors concluded that the RCE included an adequate review of prior issues and has now properly evaluated internal and industry operating experience. The inspectors concluded that this aspect of the IP 95002 criteria was met, and this item is closed.

### 3. Collective Review for Commonalities

The Collective Review for Commonalities looked broadly at previous occurrences of performance issues at the plant that had the same or similar contributing safety culture aspects. The evaluation reviewed one RCE, for the main steam line temperature indicating sensors, and the corrective actions related to it, as a similar historic equipment issue. Shortcomings in the corrective actions assigned in that RCE were not discussed in the review.

The inspectors completed a historical review of previously completed evaluations in safety culture areas. Examples of these evaluations included root causes completed for a trend in the area of H.1(a), Decision-Making, and Management Oversight (as defined in IMC 0310, dated October 28, 2011), as well as condition evaluations completed for the use and implementation of OE in maintenance planning. The corrective actions that were established to address those issues were not re-analyzed or referenced in the review for commonalities to determine why they were not effective at preventing recurrence.

An example of where the Collective Review of Commonalities fell short in assessing previous corrective actions was in the area of H.1(a), Decision-Making and Management Oversight. Previous corrective actions in this area included revising procedures, such as the Operability Determination procedure (multiple times), conducting training, creating additional checklists and desktop guides to help work through processes such as the CR screening process, and focusing observations by senior management in these areas. However, from QHSAs that have been completed in this area, gaps still exist in process adherence at a station-wide level. The identified gaps were not discussed in this review, and the review did not address why the previous corrective actions had not been successful. The same discrepancy was noted with the prior evaluations of management oversight and the use of OE in maintenance planning.

Additional examples were in the areas of the use of OE in maintenance planning and procedure quality, which were large contributors to both White findings. Specifically, a condition evaluation was conducted after the SBDG heat exchanger leak to identify gaps where previous corrective actions from an ACE in 2012 ineffectively resolved the issue



of using OE and following station procedures when planning work packages. This condition evaluation is not referenced in the Collective Review for Commonalities, but was found by the inspectors during this inspection. The gap analysis found that planners were not following the planning procedures when constructing work packages; feedback was not effectively captured to prevent recurrence of issues related to the execution of work orders; the OE database was hard to use; and management did not reinforce the expectations to follow procedures. There were actions put in place to address these areas from the Collective Review for Commonalities (separate from the gaps identified in the condition evaluation), such as paper feedback forms to grade the quality of work packages, a management review of OE evaluations that have been completed, and establishing a First Time Quality procedure to list the attributes of what should be included in a risk-significant work order. However, more condition reports have been written in 2014 on gaps that still exist in these areas.

The Collective Review for Commonalities did not review external databases for operating experience. The Collective Review for Commonalities also identified that the station's internal self-assessment program missed opportunities to broadly assess the areas of procedure quality and management oversight at a station-wide level and completely missed opportunities to evaluate the use and implementation of operating experience. A corrective action associated with the Collective Review for Commonalities was to perform benchmark assessments of other plants to look at specific areas such as procedure quality and use of operating experience to identify areas for improvement in their own processes.

The inspectors believe the aforementioned gaps constituted missed opportunities for the licensee to discover potential gaps in their CAP and lessons learned to enhance their corrective actions going forward. While weaknesses existed in this area, the inspectors concluded the licensee had sufficient actions in place to address those weaknesses and met this aspect of the IP 95002 objectives and this item is closed.

d. Determine that the Root Cause Evaluation Addresses the Extent of Condition and the Extent of Cause of the Problem

The inspectors determined that the licensee's RCEs addressed the extent of condition and extent of cause.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The inspectors noted that the licensee's extent of condition review for the SBDG White finding assessed if any additional vulnerabilities existed on other risk-significant systems due to inadequately assembled flanged and gasketed joints; this assessment also included a review of inadequate torque practices.

The licensee documented that the current condition of plant equipment where leaks are present is addressed, based on the risk-significance of the affected equipment. The licensee's extent of condition review did not reveal any additional indications of active pressure boundary leaks that challenge the reliability of risk-significant systems.

The inspectors noted the extent of cause evaluation performed an expanded scope review on each root and contributing cause identified for the SBDG gasket failure. The licensee reviewed an expanded population of work orders, procedures, condition

reports, corrective actions, rework activities, operating experience, post maintenance tests, and maintenance practices. As a result of the extent of cause review the licensee took action to address the following items:

- Obtain as-found bolt-torques on 25 risk-significant systems prior to start-up from RFO 24 (Oct-Nov 2014). The licensee planned to use this data to assess if torque practices have resulted in system pressure boundary integrity conditions on risk-significant systems. The licensee entered this issue into the corrective action program under CR 1947427, to ensure a QHSA was initiated and completed to assess as-found torque values on risk-significant equipment with RFO 24 planned work instructions.
- Revised the actions required for bolt torque requests made to Engineering by the Work Planning department to ensure a formal tracking action is generated. The licensee issued CR 1947429 to update MD-042, "Bolting Practices," to require that the bolt torque request sheet is submitted with a condition report to track the bolt torque determination for the work planners. In addition, a recently adapted fleet procedure, EN-AA-203-1100, "Engineering Evaluation," provides a new formal process for communication of engineering information to other departments, needing engineering input to work documents.

The inspectors reviewed work plans, condition evaluations, revised procedures, and work practices. The inspectors verified the licensee implemented the corrective actions appropriate to the circumstance to ensure 1) adequate gasket compression is maintained, with as-found and as-left data measured; and 2) work planning documents ensure engineering inputs are requested and processed appropriately.

The inspectors reviewed the corrective action associated with RCE CR 1855032-44 to perform bolt checks on selected risk-significant equipment. The inspectors reviewed the as-found/breakaway torque values measured under WO 40247300-00 and noted the licensee documented the as-found torque value measurement was lower than the as-left recorded value by as much as 30-50 percent. The licensee evaluated the method used in Condition Evaluation (CE) 1966427-01 and determined that the data did not accurately represent actual bolt torques, or breakaway torque values. The licensee documented that the low as-found torque values were caused by a combination of bolt-load relaxation and inaccuracies in the as-found torque measurements. The inspectors determined that the licensee is in the discovery phase for determining an effective method for measuring as-found bolt torques to properly assess the magnitude of bolt relaxation over time, on DAEC top 10 risk-significant systems. This process will further allow the licensee to ensure gasket compression is maintained between maintenance intervals and to prevent bolted joint integrity issues. The inspectors determined that the corrective actions that have been implemented, and that are planned for as-found and as-left torque measurement, should provide additional assurance that SBDG heat exchanger flange bolts will not experience significant bolt relaxation following joint make up.

- The licensee identified a performance gap in documenting lessons learned from previous work. The licensee generated CR 1947460 to track and make adjustment to DAEC's process for incorporating lessons learned into work orders.

- The licensee determined that the extent of cause evaluation, for Contributing Cause 3, associated with less than adequate decision making when the bolt torques were reduced in 2008, impacted all areas of daily plant activities. The licensee documented that the cause is a safety culture component and will be addressed by the actions taken in the Collective Review for Commonalities addressed in CR 1934710. Actions included revising procedures and reinforcing management expectations for CR screening of CR deficiency WOs; posting and communicating expectations for use of the “4 block poster” (which described key Duane Arnold probabilistic risk assessment results); Site Vice President conducting all hands meeting to discuss risk-significant decisions; and Plant General Manager and senior leaders conducting training related to application of the “4 block poster.”

The inspectors determined that the RCE for the SBDG LO HX gasket failure White finding included an evaluation of the extent of condition and extent of cause. Based on the licensee evaluations the inspectors concluded that this IP 95002 aspect was met and this item is closed.

## 2. RCIC Turbine Trip During STP 3.5.3-02

The licensee’s RCE included an evaluation of both the extent of condition and extent of cause. The licensee’s extent of condition focused on failures of similar electrical subcomponents at the facility and a review of similar governor control circuits performance. Two similar control systems, the HPCI and the SBDG governor systems, have been replaced, in 1990 and 2009 respectively, with control systems which do not utilize dropping resistors. The extent of cause focused on a quality review of previous IOD performed during the year prior to the issue, as well as a review of the current ‘Operable but Degraded’ and ‘Operable but Non-Conforming’ items for process compliance. The inspectors performed an independent review of the licensee’s CR database for trends in inaccurate or missing operability determinations, and did not identify any trends. Based on the CR database review, a review of the RCE, and on interviews and discussions conducted with licensee management, operations department personnel, and engineering staff personnel, the inspectors concluded that the evaluations for the RCIC White finding adequately addressed the extent of condition and the extent of cause. The inspectors concluded this aspect of the IP 95002 objective was met and this item is closed.

## 3. Collective Review for Commonalities

One purpose of the Collective Review for Commonalities was to assess the extent of condition in which the identified top safety culture areas could exist in all plant processes, programs, and human performance issues at a station-wide level. This intent was extensively evaluated in this review and in particular in the area of risk-recognition and conservative decision-making. Another purpose of the Collective Review for Commonalities was to assess the extent of cause of the safety culture contributors to the White findings and how those contributors could affect other station programs and human performance site-wide. An example of this was reviewing procedure quality related to maintenance work instructions for the two White findings and identifying trends in procedure quality in the radiation protection department. The inspectors concluded that this aspect of the IP 95002 objective was met and this item is closed.

e. Findings

No findings were identified.

02.03 Corrective Actions

a. Determine that Appropriate Corrective Actions are Specified for Each Root and Contributing Cause or that the Licensee has an Adequate Evaluation for Why No Corrective Actions are Necessary

The inspectors determined that the licensee appeared to have appropriate corrective actions for each root and contributing cause.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The inspectors assessed the corrective actions for the RCEs and the CCA. The inspectors verified that all root causes had associated CAPRs and that all contributing causes had associated corrective actions. The inspectors also performed a more detailed assessment of selected CAPRs and corrective actions. The detailed assessment included a sample of corrective action program documents, work order and procedure reviews, field walkdowns, interviews with selected licensee staff, and reviews of the design and licensing basis.

The inspectors reviewed additional corrective actions with no further substantive observations. The inspectors concluded that the CAPRs and corrective actions for the SBDG LO HX gasket failure White finding met the objectives of IP 95002 and this item is closed.

2. RCIC Turbine Trip During STP 3.5.3-02

The inspectors assessed the corrective actions for the RCE for the RCIC White finding. The inspectors verified that all root causes had associated CAPRs and that all contributing causes had associated corrective actions. The inspectors also performed a more detailed assessment of selected CAPRs and corrective actions. The detailed assessment included a sample of corrective action program documents, field walkdowns, interviews with selected licensee individuals, and reviews of the design and licensing basis.

The licensee developed and implemented the following CAPRs to address the identified risk-significant performance issues:

- CAPR 1 required action: Modify the RCIC power supply to both provide 50 percent margin to thermal and provide monitoring of output to detect any failures.
- CAPR 2 required action: Provide guidance in EN-AA-203-1001 or station specific procedure for when to conduct the independent review of the Shift Manager's IOD on a risk-significant System, Structure, or Component (SSC). Consider using an example (such as this RCIC event) in the procedure.
- CAPR 3 required action: Revise RCIC and HPCI P&IDs to reflect the tie between the speed indicator and the EGM/power supply.

- CAPR 4 required action: Incorporate use of the Nuclear Asset Management System (NAMs) Operability worksheet EN-AA-203-1001-F04 – into the Operability screening notes for CRs where IOD is required. The intention of this action is not to require the actual form to be pasted into NAMs (although this would be acceptable) but to require that the 7 attributes described in the form be documented in the Operability screening notes of the CR.

The inspectors concluded that, with the exception of CAPR 3, the CAPRs were complete and appeared to be adequate to prevent recurrence of the identified significant condition adverse to quality. The inspectors identified that the licensee failed to correctly implement CAPR 3 because the changes made to the HPCI P&ID were incorrect and may not prevent recurrence. The identified performance deficiency, incorrect implementation of CAPR 3, rose to the level of a finding. The licensee entered the issue into the CAP, as CR 01977172, and the NCV is documented in Section 02.03.f. The remaining corrective actions associated with the CCs and associated process weaknesses for the RCIC White finding were adequately documented and essentially complete. The only remaining exceptions are EFRs associated with the CAPRs. The inspectors concluded that the CAPRs and corrective actions for the RCIC White finding met the objectives of IP 95002 and this item is closed.

### 3. Collective Review for Commonalities

The Collective Review for Commonalities established corrective actions to address the identified safety culture aspect areas. However, the inspectors were concerned that these corrective actions may not fully address the identified performance issues. Based on a review of previous condition evaluations in these areas and the similarity of corrective actions that were implemented to resolve those issues, which have not prevented recurrence, the inspectors determined that the corrective actions from this review were not significantly different from those actions and may not appropriately address the identified performance gaps.

Several examples of this were referenced in previous sections of this report, such as the use of operating experience in maintenance planning and in decision-making related to using the operability determination process. Another example was in the area of problem identification and resolution related to the evaluation of problems. Corrective actions being taken to address this area are similar to actions taken in 2010, following a licensee identified trend, which involved sending out an expectations letter to employees and training management on their specific roles and responsibilities within the CAP process in 2010. The licensee observed that plant metrics improved, which indicated to them that CAP performance (evaluation of issues) had improved, and was the reasoning behind closing the issue in the past. The current effectiveness of these actions was being monitored via plant metrics and performance appraisal scoring. In reviewing these actions and the methods to validate if they are successful, the inspectors did not see a recognizable difference between what is being implemented presently and what was implemented in the past that would result in marked improvement in performance. Also, the corrective actions that are currently being taken do not appear to resolve the issue of thoroughly evaluating problems so that the correct solutions are reached.

The inspectors did observe an example where the corrective actions from the Collective Review for Commonalities were effectively addressing the safety culture area of using conservative assumptions in decision-making, specifically related to risk recognition.

The licensee appeared to have increased site awareness of the top risk-significant systems and components within the plant and the risk impact of having one of those SSCs out-of-service. The site provided large posters in common areas and repeatedly discussed risk at the many daily plant status meetings and department briefings. Risk recognition has also been incorporated into the work management system, where work orders are coded with a risk category, risk is delineated in the daily and weekly schedules, and mitigating actions to address higher risk activities are briefed and visible during the week and on the day of execution.

The aforementioned observations were discussed with the licensee and they have established more robust corrective actions to address the identified gaps. While weaknesses existed in this area, the inspectors concluded the licensee had sufficient actions in place to address those weaknesses. The inspectors determined that this objective of IP 95002 was met and this item is closed.

b. Determine that the Corrective Actions Have Been Prioritized with Consideration of Risk-Significance and Regulatory Compliance

The inspectors concluded that the corrective actions were prioritized with consideration of both risk significance and regulatory compliance.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The inspectors assessed the licensee's timeliness of the corrective actions for the SBDG LO HX gasket failure White finding with consideration of risk significance and regulatory compliance. The inspectors noted the licensee performed extensive evaluation of the SBDG LO HX gasket failure White finding and took reasonable actions to correct the root and contributing causes prior to the completion of the final revision of the root cause evaluation.

The inspectors concluded that while there were notable weaknesses (such as re-performing maintenance before the corrective actions were completed) in the prioritization of corrective actions, the licensee had successfully implemented significant corrective actions associated with work instructions that prescribe correct gasket materials and work instructions that ensure adequate torque values are used.

The inspectors noted that the licensee implemented corrective actions to ensure sustainability in the majority of the actions that were developed to address the SBDG LO HX gasket failure.

The licensee updated the SBDG lube oil heat exchanger flange inspection procedure, GENERA-F010-01, to evaluate flange surfaces and alignment. The inspectors noted however, the licensee failed to incorporate guidance that would ensure alignment was measured and recorded as required by root cause CAPR assignment CR 01855032-15. As a result, the licensee failed to "measure and record" potential alignment issues since the March 8, 2013, SBDG LO HX gasket failure during several available opportunities.

The inspectors determined the failure to implement procedures to measure and record flange alignment was a finding that did not result in the loss functionality or operability. This issue is documented as an example of an NCV in Section 02.03.f of this report.

The inspectors concluded that an appropriate schedule had been established for the majority of the corrective actions identified for the SBDG lube oil gasket failure White finding. The inspectors determined that while the failure to implement a procedure to measure and record flange alignment was a finding with an associated violation, it would neither cause a repeat gasket failure, nor did it indicate a programmatic issue for prioritizing corrective actions. The inspectors determined that this objective of IP 95002 was met and this item is closed.

## 2. RCIC Turbine Trip During STP 3.5.3-02

The inspectors assessed the licensee's timeliness of corrective actions taken to address the risk-significant issues identified in the RCE for the RCIC White finding. The inspectors reviewed the licensee's CAP documentation to assess corrective actions taken immediately following identification of the issues, prior to the completion of the RCE. The inspectors noted that once the RCIC inoperability was recognized, all required actions to restore compliance with technical specifications were performed. Additionally, the following interim actions to prevent recurrence were established:

- Establish a weekly maintenance task to verify the proper functioning of the dropping resistor.
- Direct the use of the IOD screening checklist on the top ten risk systems.
- Provide interim guidance on peer checking for CRs that are associated with top ten risk-significant systems.
- Perform periodic replacement of the original specification resistor every three months.
- Establish and implement a purchase specification for the replacement resistors.

The licensee's CAP documentation has also provided formalized tracking measures designed to assure the actions are satisfactorily completed and allow retention of the basis for closure. The inspectors determined that this objective of IP 95002 was met and this item is closed.

## 3. Collective Review For Commonalities

The corrective actions established from the Collective Review for Commonalities were appropriately prioritized according to their risk-significance and overall plant impact. Most of the corrective actions had been completed by the time of the inspection with a few remaining that were appropriately scheduled based on their complexity and required plant conditions to implement (i.e. during refueling outage). The inspectors determined that this objective of IP 95002 was met and this item is closed.

### c. Determine that a Schedule Has Been Established for Implementing and Completing the Corrective Actions

The inspectors concluded that the licensee established a schedule for implementing and completing the corrective actions.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

As mentioned in section 02.03.b, above, the inspectors determined that the licensee established an appropriate schedule for implementing and completing the corrective actions for the SBDG lube oil heat exchanger gasket failure White finding. The inspectors determined that this objective of IP 95002 was met and this item is closed.

2. RCIC Turbine Trip During STP 3.5.3-02

The inspectors determined that the licensee had established an appropriate schedule for implementing the corrective actions for the RCIC White finding. As discussed in Section 02.03.a.2 above, the CAPRs were complete, with the exception of associated EFRs, as are the remaining corrective actions associated with the CCs and associated process weaknesses. The inspectors determined that this objective of IP 95002 was met and this item is closed.

3. Collective Review for Commonalities

Corrective actions were assigned to the correct departments and, for the most part, were taken in a timely manner. There were some minor discrepancies identified of corrective actions not being completed by their assigned due dates and being inappropriately extended or closed without supporting closure documentation. Condition reports have been generated for these items for resolution. The inspectors determined that this objective of IP 95002 was met and this item is closed.

d. Determine that Quantitative or Qualitative Measures of Success Have Been Developed for Determining the Effectiveness of the Corrective Actions to Prevent Recurrence

The inspectors concluded that the licensee failed to develop adequate measures of success for determining the effectiveness of the corrective actions to prevent recurrence. A finding with an associated NCV was written and this issue is documented in Section 02.03.f of this report. The inspection objectives of IP 95002 for this specific aspect were not met. The inspectors did determine that the overall objective of Section 02.03 was met because the lack of effectiveness reviews does not equate to ineffective corrective actions. The NRC will re-evaluate this area by reviewing licensee actions during the 2015 Problem Identification and Resolution Biennial Inspection (CR 1976943).

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

The licensee performed a RCE for the 'A' SBDG White finding discussed earlier in this inspection report. The RCE was performed in accordance with licensee procedure PI-AA-100-1005, Revision 9 and as required by this procedure and PI-AA-205, Revision 25, the licensee established an EFR plan. The purpose of the EFR plan was to outline the attributes needed to assess the effectiveness of the CAPRs.

The inspectors reviewed the CAPRs established by the licensee and the EFRs that were established to support the CAPRs. The licensee determined that there were two CAPRs for the 'A' SBDG White finding. The licensee wrote EFRs to address one CAPR and two selected contributing causes. The inspectors assessed the adequacy of the EFRs and their ability to verify that the CAPRs and selected contributing causes were effective.



The inspectors determined that the EFRs selected by the licensee appeared to be more focused on whether the root causes had been addressed or if the White findings had repeated and failed to address whether the CAPRs had been effective, sustainable and institutionalized. This led to a number of the CAPRs not having a specific EFR.

Of the two CAPRs for the SBDG White finding, the one involving the need to revise the procedure for the use of sheet gasket material had no EFR. The remaining CAPR to develop a maintenance procedure to assist in planning and performing flanged connections did not have a specific EFR. There were EFRs designed to look for repeat leak examples and perform in field checks of as found torque values but none were designed to specifically verify if the CAPRs had been effective.

The inspectors determined that the identified performance deficiency associated with the noted weaknesses in the EFR plan developed for the 'A' SBDG White finding, rose to the level of a finding. The licensee entered the issue into the CAP, as CR 01976943, and the finding is documented below in section 02.03.f. The identified weaknesses will be addressed through the licensee's CAP in sufficient time to develop an adequate EFR plan prior to the scheduled implementation.

## 2. RCIC Turbine Trip During STP 3.5.3-02

The inspectors reviewed the EFR plan developed for the RCIC White finding and identified several weaknesses. The licensee's RCE initially identified two CAPRs; CAPR 1 and CAPR 2 associated with DC1 and RC2, respectively. The EFR for CAPR 1, which was to modify the power supply by using a better dropping resistor and install a new meter to continuously monitor the output, would determine if any new failures occur during the first year following implementation, but would not otherwise assess the effectiveness of the new design. The EFR for CAPR 2, which was to revise procedure EN-AA-203-1001, "Operability Determinations/Functionality Assessments," for when to conduct independent reviews of IODs performed on a risk-significant SSC, would only determine if an IOD had been improperly performed, not if the specific change to the procedure was responsible for preventing incorrect IODs.

These EFRs would simply assess whether or not the risk-significant issue had recurred; that type of 'yes or no' verification is not the intent of an effectiveness review. The EFR should adequately assess if the implemented CAPR was effective in preventing a recurrence of the risk-significant issue.

The inspectors noted an additional weakness in the EFR plan for the RCIC RCE. The licensee contracted an external, independent assessment in April 2014, using Revision 2 of the RCIC RCE. The licensee incorporated several recommendations from the independent assessment team into Revision 3 of the RCIC RCE. The independent assessment team had recommended upgrading two completed corrective actions from assignment type CA to CAPR. Specifically, these corrective actions for including the information, verbatim, from the NAMs Operability worksheet, EN-AA-203-1001-F04, when completing the Operability screening notes for CRs which require an IOD and for revising P&IDs (RCIC & HPCI) became CAPR 3 and CAPR 4 respectively. However, when the licensee completed the revision of the RCE, new EFRs were not included as part of the EFR plan to assess these CAPRs.

The inspectors determined that the identified performance deficiency associated with the noted weaknesses in the EFR plan developed for the RCIC White finding, rose to the level of a finding and is characterized as another example of the finding discussed above in Section 2.03.d.1 of this report. The licensee entered the issue into the CAP, as CR 01976943, and the one finding for both examples is documented in Section 02.03.f of this report. The identified weaknesses will be addressed through the licensee's CAP in sufficient time to develop an adequate EFR plan prior to the scheduled implementation.

### 3. Collective Review for Commonalities

For the Collective Review for Commonalities, a method was not established to validate the effectiveness of the overall corrective action plan. Some corrective actions had individual quantitative or qualitative effectiveness measures established, such as completing a QHSA in the area of work order quality, which will review the metric implemented and condition reports generated from the weekly management reviews of risk-significant work orders. However, in this area, there is not an effectiveness measure to review the feedback forms/process to the planners that is intended to help incorporate internal lessons-learned (OE) from the execution of work activities and also review the quality of work orders. Based on the inspectors' observations in this area, the licensee wrote CR 1877427 to look at conducting broader effectiveness reviews for the corrective actions of the most significant safety culture aspects.

The corrective actions established in the Collective Review for Commonalities had mostly been implemented by the time of the inspection. To see if these actions have been effective so far in preventing the identified safety culture contributors from causing other issues, the inspectors did a condition report review from March through June 2014 looking for CRs trended with the safety culture codes of interest. The inspectors also reviewed condition reports coded with "DNA" (risk recognition and accountability code) and those written from weekly management reviews of work package quality. Some themes were identified from those reviews that may indicate some areas still need time for the corrective actions to be effective or potential actions that need to be altered. Examples of those themes were: procedure use and adherence, such as use of the First-Time Quality process for constructing risk-significant work orders; inappropriately closing out corrective actions or condition reports without finishing the actions or without proper documentation; and the quality of engineering change packages by incorporating all required information and applying sufficient levels of technical rigor. The licensee has implemented additional corrective actions for these themes. While weaknesses existed in this area, the inspectors concluded the licensee had sufficient actions in place to address those weaknesses and met this aspect of the IP 95002 objectives and this item is closed.

#### e. Determine that the Corrective Actions Planned or Taken Adequately Address a Notice of Violation that was the Basis for the Supplemental Inspection, if Applicable

The inspectors determined that there were corrective actions planned or taken which appeared to adequately address the NOV's associated with the two White findings.

1. 'A' SBDG Lube Oil Heat Exchanger Gasket Failure

For the 'A' SBDG lube oil HX gasket failure White finding, the licensee did not respond to the initial NOV because the corrective actions taken and planned to be taken to correct the violation, and the date when full compliance was achieved was already addressed on the docket in NRC Inspection Report 05000331/2013010 and 05000331/2013011. As part of the 95002 inspection, the inspectors performed a sampling of the immediate corrective actions and determined that full compliance had been restored. The inspectors considered that the IP 95002 objectives were met for the 'A' SBDG lube oil heat exchanger gasket failure White finding.

In addition, the inspectors performed walkdowns, reviewed procedures, and conducted interviews with plant personnel. During a system walkdown with plant staff, the inspectors identified an additional deficiency in that a small portion, approximately a 1/8<sup>th</sup> inch sliver of gasket material, protruded beyond the tube sheet outer diameter of the 'A' SBDG scavenging air heat exchanger. When the licensee followed up on this issue, the licensee determined that the corresponding compressive stress due to the surface area reduction was greater than the maximum allowable stress initially provided by the vendor.

The licensee contacted vendor representatives and determined that while margin was significantly reduced, the licensee had not exceeded the actual maximum compressive stress of the gasket material. The licensee classified the 'A' SBDG as operable-but-degraded and planned to replace the 'A' SBDG scavenging air heat exchanger tube sheet to shell gasket at the next available opportunity.

The inspectors reviewed procedures and work documents from the May 2014, tube sheet to shell gasket replacement, and determined that no acceptance criteria was provided to ensure gasket position was maintained throughout flange bolt up and following the completion of work activities. Therefore, the inspectors determined the licensee failed to provide post maintenance testing instructions for activities affecting quality that were appropriate to the circumstances and that included appropriate acceptance criteria for determining that important activities have been satisfactorily accomplished. This issue is documented in Section 02.03.f.

While the inspectors have identified a failure to provide formal qualitative or quantitative acceptance criteria for flange bolting for the 'A' SBDG, the inspectors concluded the remaining corrective actions implemented provided reasonable assurance for continued operability. The inspectors determined through visual inspections that no other SBDG heat exchanger was affected. The licensee documented this issue in their corrective action program for resolution as CR 1975318. The inspectors determined that this objective of IP 95002 was met and this item is closed.

2. RCIC Turbine Trip During STP 3.5.3-02

For the RCIC White finding, the licensee did not respond to the initial NOV since the corrective actions taken to correct the violation and prevent recurrence, and the date when full compliance had been achieved was already adequately addressed on the docket in NRC Inspection Report No. 05000331/2013004 and during the regulatory conference held on January 8, 2014. As part of the 95002 inspection, the inspectors performed a review of the initial immediate corrective actions and determined that full

compliance had been restored. The inspectors determined that this aspect of the IP 95002 objectives was met and this item is closed.

### 3. Collective Review for Commonalities

The inspection objectives of this aspect of IP 95002 did not apply to the Collective Review for Commonalities.

#### e. Findings

##### 1. Inaccurate Safety-Related Drawings

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to ensure that safety-related drawings for RCIC and HPCI were accurate.

Description: On July 10, 2014, the inspectors determined that two safety-related drawings were inaccurate. As part of the corrective action for the RCIC White finding, the licensee had determined that a P&ID needed to be corrected. The licensee had also determined that due to the similarity of the two systems, the P&ID for the HPCI system also needed to be revised.

Drawing BECH-M124, P&ID Reactor Core Isolation Cooling System (Steam Side), Revision 59, was in effect at the time of the RCIC IOD decision and the licensee concluded an inaccuracy in the drawing significantly contributed to the erroneous decision that the RCIC system remained operable. The Senior Reactor Operator (SRO) utilized drawing BECH-M124 and observed that sensing element (SE) 2457 was connected to the shaft of the RCIC turbine and then was shown to be connected to speed indicator (SI) 2457 but there was no other connections shown. This led the SRO to erroneously conclude that any component that had failed was related to indication only and was not related to speed control.

In fact, SE-2457 puts out an ac signal and thus it could not directly provide an input to the dc powered SI-2457. The ac signal was processed by the RCIC turbine governor and then sent to SI-2457. The resistor that had failed was in the circuit that supplied power to the control circuit and thus both the SI and the speed control circuit were affected.

Drawing BECH-M124, Revision 60 was issued to show that there was a connection to the RCIC turbine governor through the use of a drawing reference arrow. During the preparation of the engineering change package to add a power indicating meter, licensee personnel determined that Revision 60 failed to show that the RCIC turbine governor was in between SE-2457 and SI-2457 but in fact still showed that SE and the SI were directly connected. Revision 61 of drawing BECH-M124 was issued showing that the SI came off of the RCIC turbine governor and not directly from the SE. At this point, the only error remaining on drawing BECH-M124 was a minor error in the direction of the location arrows.

The licensee had included the need to revise HPCI drawing BECH-M122 as part of their CAPR for the RCIC White finding. This was due to the great similarity between the HPCI and the RCIC drawings. During their review of the extent of condition and

corrective actions, the inspectors observed that while drawing BECH-M122 had been revised similar to revision 60 of RCIC drawing BECH-M124, it had not been further corrected. The sensing element HPCI SE-2284 was shown directly connected to the speed indication SI-2284 without the associated HPCI turbine governor in between them. The inspectors determined that the HPCI drawing was inaccurate.

Analysis: The inspectors determined the failure to ensure safety-related drawing BECH-M122, High Pressure Coolant Injection system, Revision 63 was technically accurate was contrary to 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and was a performance deficiency.

The performance deficiency was determined to be more than minor because in accordance with IMC 0612, Appendix B, if left uncorrected it would have the potential to lead to a more significant safety concern. Specifically, the HPCI drawing change was part of a corrective action to prevent recurrence of a significant condition adverse to quality.

The inspectors screened the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined the finding was related to a design deficiency that did not result in a loss of a safety system or function, and is therefore a finding of very low safety significance (Green).

The inspectors determined that the finding had a cross cutting aspect in the area of problem identification and resolution, specifically evaluation, because licensee personnel failed to thoroughly evaluate issues to ensure that the resolutions address causes and extent of conditions commensurate with their safety significance. (P.2)

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, on July 10, 2014, the inspectors determined that the drawing BECH-M122, P&ID HPCI, Revision 63, was incorrect in that SE-2284 was shown directly connected to SI-2284 without the associated HPCI turbine governor in between them.

The licensee initiated CR 1977172 to document the inaccuracy of the HPCI P&ID drawing and track completion of a document change request to revise the drawing to show the proper relationship between the HPCI governor speed control and the turbine speed indicator in the control room. Additionally, the licensee directed Design Engineering to perform an apparent cause evaluation to determine why the drawings did not accurately reflect the relationship between speed sensor and speed indicator, and why the HPCI P&ID was not revised to clarify the interrelationships as was done on the RCIC P&ID.

Because this violation was of very low safety significance, and the licensee entered it into its Corrective Action Program as CR 1977172, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000331/2014009-01: Inadequately Performed Drawing Revision Related to CAPR).**

2. Multiple Examples of Procedures Lacking Adequate Work Instructions and Acceptance Criteria

Introduction: The inspectors identified a finding of very low significance and an associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving multiple examples where the licensee failed to ensure that activities affecting quality were prescribed by documented procedures of a type appropriate to the circumstances to assure that for a SCAQ, the cause of the condition was determined and corrective actions were taken to preclude repetition. Specifically, in the first example, the licensee failed to implement a CAPR to ensure alignment was measured and recorded for the SBDG lube oil heat exchangers following the March 8, 2013, 'A' SBDG lube oil heat exchanger gasket failure. In the second example, the inspectors identified that procedures lacked adequate acceptance criteria to ensure proper flange alignment. As a third example, the inspectors identified an actual failure to ensure adequate gasket placement due to inadequate acceptance criteria in the procedure controlling maintenance on the 'A' SBDG scavenging air heat exchanger.

Description: For the first example, the inspectors reviewed licensee condition reports, procedures, and work documents used following the March 8, 2013 gasket failure. The inspectors reviewed the CAPR recommended per Revision 5 of the RCE CR 1855032. The inspectors noted that Root Cause 1, CAPR 3, required the licensee to develop a maintenance procedure for the 'A' and 'B' SBDG similar to the model work order, for 1E053A2 and 1E053B2 (lube oil heat exchangers) to:

- Perform visual inspection of flange surfaces.
- Perform visual inspection of flange channel head to HX shell sealing surfaces.
- Measure clearances between the shell and tube bundle flanges without the gasket installed.
- Measure flatness of shell flanges and re-machine flange surfaces if not within tolerance.
- Measure and record vertical and horizontal alignment between the lube oil and jacket water channel heads.
- Specify a Garlock multi-swell gasket to be used for the stationary end of the HX.
- Torque to the value identified in updated evaluation (CA 01855032-12).
- Torque the floating end "finger-tight" plus 1-2 turns.

The inspectors reviewed licensee work packages that incorporated procedure GENERA-F010-01, "1E053A2 (B2) Flange Inspection," Revision 4 and determined the licensee failed to incorporate the CAPR item to "Measure and Record vertical and horizontal alignment between the lube oil and jacket water channel heads." The inspectors determined that the "Flange Inspection" procedure instructed the individual performing the flange inspection to "measure horizontal and vertical alignment between 1E053A2 (B2) channel head flange and 1E053A3 (B3) channel head flange visually or using a ruler."

In addition, the licensee determined that they failed to measure and record flange alignment as specified by RCE 01855032 on September 24, 2013, during SBDG lube oil heat exchanger flange inspections. The licensee documented this issue in CR 1955777, dated April 10, 2014, following interviews with site maintenance and engineering staff. The licensee stated that the channel head flange alignment was visually inspected per procedure GENERA-F010-01, and that no visible misalignment issues were noted. The licensee stated the procedure did not require gap and alignment parameters to be documented as requested by RCE 01855032 CAPR-11 or CAPR-15.

The inspectors determined the licensee provided the above assessment and closed this condition report and failed to revise procedures to incorporate CAPR-11 and CAPR-15 to measure and record flange alignment in accordance with RCE 1855032. The inspectors concerns were entered into the licensee CAP as CR 1974810, to ensure CAPR items are adequately incorporated into procedures in a measureable, achievable and timely manner in accordance with Root Cause Analysis procedure PI-AA-100-1005, and Condition Evaluation and Corrective Action Procedure, PI-AA-205.

For the second example, the licensee failed to provide qualitative or quantitative acceptance criteria for the assessment of flange alignment issues. The inspectors reviewed the implementing procedure GENERA-F010-01, Revision 0 through Revision 4, for flange inspections and noted the procedure required the flange inspector to:

**“MEASURE** horizontal and vertical alignment between 1E053A2(B2) channel head flange and 1E053A3(B3) channel head flange visually or using ruler. Contact Engineering if any excessive misalignment exists.”

The inspectors determined that these work instructions failed to adequately implement CAPR-11 and CAPR-15 from RCE 01855032 which required the flange inspector to measure and record horizontal and vertical flange alignment.

The inspectors concluded that the procedure allowed maintenance personnel to make an in-field determination of acceptability of alignment, based on judgment, in the absence of qualitative or quantitative acceptance criteria. The inspectors concerns were entered into the licensee corrective actions program as CR 1975553, to ensure acceptance criteria are developed and included in “Flange Inspection procedure,” GENERA-F010-01.

For the third example, the inspectors reviewed licensee procedures, RCE 1855032, CAP documents, and work instructions, and performed a system walkdown. The inspectors noted that the most recently implemented work orders performed on May 17, 2014, and May 24, 2014, to replace ‘A’ and ‘B’ SBDG heat exchanger gaskets, failed to incorporate acceptance criteria that would ensure gaskets remained in place following flange assembly.

The inspectors determined that the work plans used to replace gaskets on the ‘A’ and ‘B’ SBDG heat exchangers (jacket water, lube oil, and scavenging air cooler) only contained a note, at step 35, which stated that “the gasket should be installed so the outside edge of the gasket does not protrude beyond the outside edge of the tube bundle flange.” The inspectors determined that the action provided in this step does not ensure that final gasket placement will meet the “notes” informal acceptance criteria without formal

gasket inspection acceptance criteria following the final torque pass on the heat exchanger flanges.

The inspectors noted the licensee's Support Refute Matrix in RCE 01855032, stated in Cause 1.1, "Gasket damaged by bolt at 10 to 11 o'clock position," that "work order instruction would ensure damage would not occur during installation." The inspectors determined that procedures and work plans failed to provide adequate acceptance criteria, that would ensure gasket degradation is prevented during gasket installation.

The inspectors walked down several heat exchangers with site staff. The inspectors identified that the scavenging air cooler heat exchanger gasket was located outside of the tube sheet flange, and in direct contact with flange bolting. The inspectors noted this condition was in direct conflict with the assembly procedure note in step 35 of the work plan documented in WO 40247300 and the notes provided in Cause 1.1 of the support/refute matrix of RCE 01855032.

Additionally, the inspectors determined WO 40247300, "Re-torque and Gasket Change-out," dated May 18, 2014, for the SBDG scavenging air heat exchanger did not require documentation of the as-left condition of the gasket nor did it require any acceptance criteria related to gasket position to be met.

The licensee performed both immediate and prompt operability determinations and determined the gasket was degraded due to exceeding the maximum recommended compressive stress recommended by the vendor for the Garlock multi-swell 3760 type gasket.

The licensee declared the 'A' SBDG operable but degraded after evaluating the condition and consulting the gasket vendor. The licensee determined that even though the maximum recommended compressive stress was exceeded, additional margin remained until the maximum allowable stress would be reached.

The inspectors concluded the licensee failed to ensure the work plans contained adequate qualitative or quantitative acceptance criteria to ensure flange gaskets remain in place following the final flange bolt torqueing. The licensee entered the inspectors' concerns for this issue into the CAP as CR 1973992, CR 1976210, CR 01975318, and CR 1976939.

Analysis: The team determined the licensee's failure to provide procedures of a type appropriate to the circumstances to assure that for a SCAQ, the cause of the condition was determined and corrective actions were taken to preclude repetition was a performance deficiency warranting further review.

The inspectors determined that this finding was more than minor in accordance with IMC 0612, Appendix B, because it affected the Mitigating Systems Cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions."



The inspectors determined the finding was of very low safety significance (Green) because the finding was not a deficiency affecting the design or qualification of a mitigating SSC and did not result in a loss of operability or functionality. In addition, the finding did not represent a loss of system or function, did not represent an actual loss of function of a least a single train for longer than its technical specification allowed outage time, and did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significance.

The inspectors determined this finding had a cross cutting aspect in the area of problem identification and resolution, specifically evaluation, because licensee personnel failed to thoroughly evaluate issues to ensure that the resolutions address causes and extent of conditions commensurate with their safety significance. (P.2)

Enforcement: Title 10 of CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," required, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Step 4.10 of procedure PI-AA-100-1005, "Root Cause Analysis," Revision 9, stated "that all corrective actions shall be consistent with the "SMART" approach - (Specific, Measurable, Achievable, Relevant, and Timely) (refer to PI-AA-205)." Procedure PI-AA-205, "Condition Evaluation and Corrective Action," Revision 25, stated that "Due dates should be reasonable, taking into consideration, next expected execution." Additionally procedure PI-AA-205 stated, in part, in Step 4.8.2.A. "that CAPRs shall be sustainable and institutionalized within existing controlled processes / programs to ensure the CAPR is not nullified by subsequent actions, scheduled work windows, modification due dates, outage periods, etc. when determining due dates."

Contrary to the above, prior to June 30, 2014, the licensee failed to ensure that

- flange inspection procedure GENERA-F010-01 included the required action to "Measure and record vertical and horizontal alignment between the lube oil and jacket water channel heads;"
- flange inspection procedure GENERA-F010-01 provided qualitative or quantitative acceptance criteria to ensure acceptability of flange alignment issues; and,
- work order plans provided adequate acceptance criteria for maintenance activities to verify adequate gasket placement on the SBDG scavenging air cooler heat exchangers.

The corrective actions for deficient flange inspection procedure GENERA-F010-01 included revising procedures to incorporate a requirement to measure and record vertical and horizontal alignment between the lube oil and jacket water channel heads. In addition, the licensee planned to incorporate acceptance criteria on which to base in-field determinations.

The immediate corrective actions for the scavenging air cooler gasket included performing an immediate operability determination (IOD) and prompt operability determination (POD) for the protruded gasket region. The licensee's evaluation determined that even though the maximum vendor recommended compressive stress was exceeded, that this maximum value was set conservatively low and positive margin,

although relatively low, remains to the actual maximum compressive stress. The licensee consulted with the gasket manufacturer and they were in agreement that positive margin remained to the actual maximum compressive stress to protect against gasket over stress and potential gasket failure.

The licensee determined the SBDG was operable but degraded and plans to replace the gasket at the next available opportunity.

This violation is being treated as a NCV, consistent with Section 2.3.2 of the Enforcement Policy because it was of very low safety significance (Green) and was entered into licensee's corrective action program as CR 01974810, as CR 1973992, CR 1976210, CR 01975318, and CR 1976939. **(NCV 05000331/2014009-02, Incomplete Corrective Actions To Prevent Recurrence).**

### 3. Failure to Establish EFR Attributes to Assess the Effectiveness of Corrective Actions

Introduction: The inspectors identified a finding of very low safety significance (Green) and an associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the failure to ensure the EFR attributes for a significant condition adverse to quality would appropriately evaluate whether the corrective actions were effective in eliminating or reducing the recurrence rate.

Description: The licensee performed RCEs for the two White findings discussed earlier in this inspection report. The RCEs were performed in accordance with licensee procedure PI-AA-100-1005, Revision 9 and as required by this procedure and PI-AA-205, Revision 25, the licensee established an EFR plan. The purpose of the EFR plan was to outline the attributes needed to assess the effectiveness of the corrective actions to prevent recurrence (CAPRs). The EFRs were not limited to just CAPRs but could also apply to other corrective actions when necessary.

The inspectors reviewed the CAPRs established by the licensee and the EFRs that were established to support the CAPRs. The licensee determined that there were four CAPRs for the RCIC White finding and two CAPRs for the SBDG White finding for a total of six CAPRs. The licensee wrote EFRs to address CAPRs and two selected contributing causes. The inspectors assessed the adequacy of the EFRs and their ability to verify that the CAPRs and selected contributing causes were effective.

The inspectors determined that the EFRs selected by the licensee appeared to be more focused on whether the root causes had been addressed or if the White findings had repeated and failed to address whether the CAPRs had been effective, sustainable and institutionalized. This led to a number of the CAPRs not having a suitable EFR planned.

Two of the six corrective actions had relatively recently been upgraded to CAPRs and the licensee had inadvertently neglected to write EFRs following this action. These were CAPRs 3 and 4 of the RCIC White finding RCE which were to revise the RCIC and HPCI P&IDs and to use a list of ten questions during the performance of IODs. The CAPR associated with the RCIC White finding RCE which was to modify the power supply and add a stronger resistor and a new power meter (CAPR 1) had an EFR which would have determined if there had been any new failures but would not have otherwise assessed the effectiveness of the new design. The remaining CAPR, CAPR 2 for RCIC which was to revise the procedure for the performance of independent reviews of IODs did not have

a specific EFR designed to assess its effectiveness. There were EFRs which would have determined if an IOD had been improperly performed but none to determine the effectiveness of CAPR 2.

Of the two CAPRs for the SBDG White finding, the one involving the need to revise the procedure for the use of sheet gasket material had no EFR. The remaining CAPR to develop a maintenance procedure to assist in planning and performing flanged connections did not have a specific EFR. There were EFRs designed to look for repeat leak examples and perform in-field checks of as-found torque values but none were designed to specifically verify if the CAPRs had been effective.

Analysis: The inspectors determined that the licensee's failure to establish EFR criteria that would have identified whether the CAPRs had effectively resolved the conditions was a performance deficiency warranting further review.

The inspectors determined that this finding was more than minor in accordance with IMC 0612, Appendix B, because it was affected the Mitigating Systems Cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.

The inspectors evaluated the finding using IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," dated June 19, 2012, and Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined the finding was of very low safety significance (Green) because the finding was not a deficiency affecting the design or qualification of a mitigating structure, system or component and did not result in a loss of operability or functionality. In addition, the finding did not represent a loss of system or function, did not represent an actual loss of function of a least a single train for longer than its technical specification allowed outage time, and did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significance.

The inspectors determined the finding had a cross cutting aspect in the area of Human Performance, specifically procedure adherence, because licensee personnel failed to follow procedures associated with developing and reviewing corrective actions commensurate with their safety significance. (H.8)

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, that activities affecting quality be prescribed by procedures of a type appropriate to the circumstances and shall be accomplished in accordance with these procedures. Licensee procedure PI-AA-100-1005, Revision 8, "Root Cause Analysis," had been written and established in accordance with 10 CFR Part 50, Appendix B, Criterion V.

Step 4.11.2, of PI-AA-100-1005, required, in part, "The effectiveness review plan outlines attributes to verify responsibility and due dates. The attributes of effectiveness are the critical elements from those improvements that will guarantee success."

Contrary to the above, on July 11, 2014, the NRC inspectors identified that three of the four CAPRs for RCE 1898931 for the RCIC White finding and one of two CAPRs for RCE 1934710 for the SBDG White finding did not have EFRs assigned. In addition, the remaining two CAPRs had EFRs, which would not have assessed the critical elements of the CAPRs and thus the verification that the corrective actions were effective would not have been performed, as required by PI-AA-100-1005.

The licensee initiated CRs 1977427 and CR 1976943 to document the inadequate or missing EFRs and began revising the EFRs to be more supportive of determining if the corrective actions were effective.

This violation is being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy, because it was of very low safety significance (Green) and was entered into the CAP as CR 1976943. **(NCV 05000331/2014009-03: Failure to Establish EFR Attributes to Assess the Effectiveness of Corrective Actions).**

#### 4. Failure To Update the Updated Final Safety Analysis Report

Introduction: The inspectors identified an unresolved item regarding the potential failure to update the Updated Final Safety Analysis Report (UFSAR) in accordance with 10 CFR 50.71(e). The licensee provided information to the inspectors which documented the safety classification of the RCIC system which did not match the safety classification description in the UFSAR.

Description: The inspectors questioned the safety classification of the RCIC system. The licensee provided EC-01.12 Equipment Data Sheet – SQA Level B, which identified the RCIC system as safety-related. This document was last updated in May 2010. The UFSAR page 5.4-30, Revision 17, has a note at the bottom that states that RCIC is not safety-related. Whether or not RCIC had always been classified as safety-related and the UFSAR has always been wrong or whether the classification of RCIC had changed at some point and the UFSAR had not been updated is an Unresolved Item pending additional inspector review. **(URI 05000331/2014009-04: Failure to Update the Updated Final Safety Analysis Report)**

#### 02.04 Independent Assessment of Extent of Condition and Extent of Cause

As directed by IP 95002, the inspectors independently assessed the validity of the licensee's conclusions regarding the extent of condition and extent of cause of the issues. The objective of this requirement was to independently sample performance, as necessary, that was related to the subject issues and to provide assurance that the licensee's evaluations regarding the extent of condition and extent of cause were sufficiently comprehensive. The extent of condition review differs from the extent of cause review in that the extent of condition review focuses on the actual condition and its existence in other places. The extent of cause review focuses more on the actual root causes (RC) of the condition and on the degree that these RCs have resulted in additional weaknesses. The inspectors' independent review identified that there were still weaknesses in the area of operability/functionality assessments. The inspectors reviewed three recent operability/functionality assessments and identified weaknesses in all three.

a. Inspection Scope

The inspectors conducted an independent extent of cause and extent of condition review of the SBDG White finding and the RCIC White finding issues. The inspectors' review focused on the conditions identified in the primary root causes associated with the above issues.

The inspectors interviewed station personnel, and reviewed program and process documentation, maintenance procedures, and corrective action documents. In addition, the inspectors conducted field walk downs of both the safety related equipment and the areas in which that equipment is located and operated. The inspectors looked for conditions that may challenge the recently installed equipment modifications or the operability of the risk-significant safety systems.

The inspectors also performed activities specific to each of the White findings, which included: (1) a review of all safety related heat exchangers that support operability of the 'A' and 'B' SBDGs, (2) a review of approximately 25 CRs to assess the quality of screening activities documented for issues requiring operability/functionality evaluations, and (3) a review of two operability determinations and one functionality assessment. This review focused on identified conditions associated with issues at the site that have occurred since receiving the NRC's Inspection Reports containing the final White findings.

b. Assessment

Review of All Safety Related Heat Exchangers that Support Operability of the 'A' and 'B' SBDGs

The inspectors' independent extent of condition and extent of cause review considered all safety related heat exchangers that support operability of the 'A' and 'B' SBDGs. This included the scavenging air cooler heat exchanger, the lube oil cooler heat exchanger, and the jacket water heat exchangers. The inspectors reviewed assembly instructions and the torque values contained within the work instructions. The inspectors identified a number of minor concerns associated with SBDG HX assembly procedures but none that were determined to pose significant operational challenges to the SBDGs.

The inspectors performed a walkdown of all flanges on the 'A' and 'B' SBDG HXs and interconnecting flanges. The inspectors did not identify any conditions that would challenge the alignment of the flanges during assembly. The inspectors noted that the SBDG heat exchangers are the only heat exchangers onsite in a three stack configuration where potential misalignment, inadequate torque values, and inadequate work order instructions could introduce similar failure mechanisms that contributed to the failure of the 'A' SBDG lube oil heat exchanger gasket. The inspectors' observations resulted in the generation of the following CRs. CR 1974911 was initiated to ensure bolt torque specification sheets are attached to all work orders. CR 197666 was initiated to revise procedures to verify gasket placement after final torquing of flange bolting. CR 1976912 was initiated to ensure trouble shooting actions are contained in the proper procedure to evaluate and correct flange leakage. CR 1977083 was initiated to ensure an adequate post job review is performed.

The inspectors identified a condition adverse to quality during a system walkdown where the licensee failed to ensure 'A' SBDG scavenging air cooler HX fixed end to shell gasket remained in place following system maintenance. The inspectors documented this issue as an NCV in Section 02.03.f of this report. The licensee generated CR 1973992, CR 1976210, CR 1975318, and CR 1976939 to evaluate the identified condition.

The inspectors found no evidence to contradict the licensee's conclusion that there were no other unusual/challenging joint configurations identified. Additionally, there were no other specially developed torque values supplied by Engineering as supported by the reviewed performed work documents, condition reports, and planned maintenance work packages.

Root Cause 1 for the 'A' SBDG was less than adequate work instructions. The inspectors determined that the work instructions and work practices for reassembling flanged gasketed joints consistently applied a method for torque value selection, for work packages developed by work planning and implemented at the site. The inspectors sampled condition reports identified by the licensee generated between January 1, 2012 and February 26, 2014, where rework was required. The licensee identified 6 total CRs related to rework due to potential torqueing issues or potential margin to design issues. The inspectors noted the licensee identified 6 instances, out of 86 identified CRs, where less than adequate work instructions, such as wrong torque value selected, wrong torque sequence specified or lack of guidance on interference prevention, were identified. Neither the licensee, nor the inspectors, identified any additional issues that dealt with torque values being changed or modified in the field.

The inspectors determined that the licensee expanded their review to include heat exchangers, valves, pumps, and piping flanges on risk-significant systems (FID1 and FID2) and components. The inspectors noted the licensee determined that additional effort is needed to ensure the process of work planning and implementation is adequate to minimize rework. In order to ensure this effort is completed, the licensee has planned to measure the breakaway torque on twenty-five separate gasketed joints prior to start-up from RFO 24.

The inspectors concluded, based on the small number of instances where inadequate procedures led to rework, or in-field procedure changes, that this objective of IP 95002 was met for RC1, pending completion of the licensee's EFR.

Root Cause 2 for the 'A' SBDG was that the work order that replaced the lube oil heat exchanger tube bundle contained a less than adequate torque value. The inspectors reviewed the licensee's historical review of work documents that contained a bolt torque request form, referred to in MD-042, "Bolting Practices," and instances where the process for calculation of bolt torque was not used correctly. The inspectors noted the licensee identified one instance since January 2012 where an engineering torque evaluation was performed, during the maintenance activity, due to inadequate guidance provided in a maintenance procedure. This issue was identified by the licensee under CR 582682. The inspectors noted this issue was resolved by site engineering with vendor input.

The inspectors noted the licensee performed engineering evaluations to determine bolt torque values on an infrequent basis. The licensee noted the possibility exists that record keeping/documentation was poorly kept due to the licensee's failure to implement a formal process for tracking significant actions to change bolt torque values when procedures/ maintenance instructions are identified as deficient or lacking. The licensee recently implemented a formal tracking mechanism and process to require planners to submit a bolt torque request form with a CR to track the completion of the bolt torque determination.

The inspectors concluded the objective of IP 95002 was met and this item is closed.

#### Review of Approximately 25 CRs To Assess The Quality Of Screening Activities Documented For Issues Requiring Operability/Functionality Evaluations

The inspectors' independent extent of condition and extent of cause review included a review of the licensee's CAP documents focused on adverse equipment conditions which would require timely evaluation for either continued operability or the implementation of compensatory actions until the conditions were corrected. Based upon this review and the results from the system walkdowns and interviews conducted, the inspectors did not identify any substantive issues of which the licensee was unaware. The inspectors concluded that the objective of IP 95002 was met and this item is closed.

#### Review of Two Operability Determinations and One Functionality Assessment

The inspectors' independent extent of condition and extent of cause review of the above mentioned operability determinations and functionality assessment included a review of the licensee's CAP documentation, operability determination and functionality assessment process as well as the licensing basis. Based upon this review, the inspectors made note that all three examples had significant weaknesses that warranted further examination.

Prompt Operability Determination 1971819: The operability determination incorrectly concluded that the RCIC system was operable because the accuracy of the instrument measuring the system flow rate need not be taken into account for the flow calculation. However, the RCIC system was operable because the required minimum flow rate stated in the Surveillance Test Procedure already included a standard value for the instrument inaccuracy, as stated in the UFSAR.

Functionality Assessment 1964875: The functionality assessment was being completed, based upon invoking the 'missed surveillance' TSR 3.0.3 allowance, to document a risk assessment to ensure the functionality of the deluges until performance of the surveillance requirement possible. The deluges were non-functional since TSR 3.0.3 may not be applied if the surveillance has never yet been performed, and a functionality assessment was not applicable. This issue is documented as a NCV in Section 1R15 of in the NRC Inspection Report 05000331/2014-003.

Prompt Operability Determination 1905880. The operability determination regarding the SBDG flange gasket stress did not take into account the added stresses imposed when the gasket was subject to wetting, and more accurately should reference the vendor's graphs on stress limits to ensure the results remain acceptable.

The weaknesses identified above are characterized as knowledge deficiencies associated with specific component requirements. These inaccuracies do not result from a procedural or process implementation similar to the causes identified for the RCIC White finding issues. The inspectors determined that the weaknesses noted above do not identify any substantive extent of cause issues that the licensee was not aware of and had not already addressed. The inspectors concluded therefore, based on the corrective actions taken so far, and with the additional actions entered into the licensee's corrective action program, that the extent of cause objectives of the 95002 inspection procedure were met and this item is closed.

c. Findings

No findings were identified

02.05 Safety Culture Consideration

a. Inspection Scope

As part of the 95002 inspection, the inspectors independently confirmed that a number of safety culture components that contributed to the risk-significant issues that were the subject of this inspection were identified in the licensee's RCEs. The licensee's RCEs included a discussion of the applicable safety culture components described in Regulatory Issue Summary 2006-013, "Information on the Changes Made to the Reactor Oversight Process to More Fully Address Safety Culture," (ADAMS Accession No. ML061880341) as they applied to the violations and findings. The licensee determined that weaknesses in decision making (conservative assumptions and systematic process), resources (design margins and work instructions), work practices (oversight), and the corrective action process (evaluations and operating experience) were the most prevalent safety culture attributes.

b. Assessment

The inspectors independently confirmed a sample of other safety culture components which contributed to the issues that were also identified in the RCEs. These additional safety culture components included weaknesses in the evaluation and use of OE and procedural adherence. For each of the identified prevalent and contributing safety culture components, the inspectors confirmed that the licensee established appropriate corrective actions to address the issues. Some corrective actions were complete, but other corrective actions remained open. During the course of interviews with licensee personnel, the inspectors asked interviewees questions related to safety conscience work environment (SCWE) to determine if the licensee's staff were reluctant to raise safety concerns or if fear of retaliation existed for raising safety concerns. The inspectors did not identify concerns related to SCWE.

The inspectors confirmed that the licensee's root cause, extent of condition, and extent of cause evaluations appropriately considered the safety culture components as described in IMC 0305, Operating Reactor Assessment Program.

The inspectors noted that the O.1 (a) safety culture component may not have been adequately considered during the licensee's safety culture evaluation. Specifically, O.1 (a) is focused on ensuring that accountability is maintained for important safety



decisions. The accountability safety culture aspect was listed as one of causes of the RCIC White finding by the licensee but was not included in the DG heat exchanger RCE nor was it included in the licensee's common cause assessment. The inspectors' review of the root cause reports and interview statements revealed that while there were definitive accountability aspects and corrective actions for the management members that were involved in the decision making process there were no corrective actions for the individual crew members.

For example, during the period of approximately two months that the control room speed indicator was indicating 1,200 rpm, no reactor operator or any of the other SROs questioned either operability of the RCIC or the priority of the repair efforts. This was despite there being numerous opportunities to challenge the operability decision during control room activities. In addition, during the 2012 'A' SBDG maintenance, the maintenance crew and their direct supervision failed to initiate a CR when they recognized that the initial torque requirements would not be sufficient and that additional torques at higher values would be required during the work. The licensee had a number of corrective actions directed to all site personnel regarding the knowledge of plant risks, procedural adherence, and the need to initiate CRs in a timely manner but there were none focused on actions to prevent recurrence for the White findings. The inspectors concluded that the objective of IP 95002 was met and this item is closed.

b. Findings

No findings were identified

02.06 Evaluation of IMC 0305 Criteria for Treatment of Old Design Issues

The licensee did not request credit for self-identification of an old design issue. Consequently, the subject risk-significant issues were not evaluated against the IMC 0305 criteria for treatment of an old design issue.

4OA6 Management Meeting

Exit Meeting Summary

On July 21, 2014, the inspectors presented the inspection results to Mr. R. Anderson, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary.

Regulatory Performance Meeting

On July 21, 2014, NRC management met with the licensee to discuss its performance in accordance with IMC 305, Section 10.02.b.4. During this meeting the NRC and licensee discussed the risk significant issues that resulted in Duane Arnold being placed in the

Degraded Cornerstone (Column 3) of the NRC's ROP Action Matrix. This discussion included the causes, corrective actions, extent of condition, extent of cause, and other planned licensee actions.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee

R. Anderson, Site Vice President  
G. Pry, Plant General Manager  
K. Kleinheinz, Site Engineering Director  
W. Bentley, Site Maintenance Director  
M. Davis, Emergency Preparedness and Licensing Manager  
K. Peveler, Nuclear Oversight Manager  
R. Wheaton, Operations Director  
S. Inghram, Systems Engineering Manager  
G. Holt, Configuration Control Manager  
R. Porter, Radiation Protection Manager  
D. Olsen, Chemistry Manager  
J. Schwertfeger, Security Manager  
S. Huebsch, Mechanical Design Engineering Supervisor  
B. Seemann, Maintenance Training Supervisor  
G. Merza, Electrical Maintenance Department Head  
J. Wofford, Mechanical Maintenance Supervisor  
T. Manders, Mechanical Maintenance Supervisor  
B. Murrell, Licensing Engineer Analyst  
L. Swenzinski, Licensing Engineer  
T. Gordon, Assistant Operations Manager-Shift  
M. Strobe, Shift Manager  
D. Bedel, Work Management Manager  
D. Brigl, Employee Concerns Coordinator

#### Nuclear Regulatory Commission

K. O'Brien, Director, Division of Reactor Safety  
C. Lipa, Chief, Branch 1, Division of Reactor Projects  
L. Haeg, Senior Resident Inspector, Duane Arnold  
J. Steffes, Resident Inspector, Duane Arnold

## **LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

### Opened

05000331/2014009-01	NCV	Inadequately Performed Drawing Revision Related to CAPR
05000331/2014009-02	NCV	Incomplete Corrective Actions To Prevent Recurrence
05000331/2014009-03	NCV	Failure to Establish EFR Attributes to Assess the Effectiveness of Corrective Actions
05000331/2014009-04	URI	Failure To Update the Updated Final Safety Analysis Report

### Closed

05000331/2014009-01	NCV	Inadequately Performed Drawing Revision Related to CAPR
05000331/2014009-02	NCV	Incomplete Corrective Actions To Prevent Recurrence
05000331/2014009-03	NCV	Failure to Establish EFR Attributes to Assess the Effectiveness of Corrective Actions

## **LIST OF DOCUMENTS REVIEWED**

The following is a partial list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

### **Drawings**

M012-024, Diesel Driven Fire Pump Engine Wiring Diagram, Revision 6  
68A01-0443, Schematic Wiring Diagram for Model 68 Control, Revision 4  
APED-E51-2757-007, Woodward Governor Wiring Diagram Reactor Core Isolation Cooling, Revision 4  
APED-E51-2757-017, Mounting Panels, Revision 3  
APED-E51-009(5), RCIC Instrumentation Circuit, Revision 32  
BECH-E879, Connection Diagram RCIC and HPCI Turbine Control Boxes, Revision 16  
BECH-M124, P&ID Reactor Core Isolation Cooling System (Steam Side), Revision 61  
BECH-M124, P&ID Reactor Core Isolation Cooling System (Steam Side), Revision 60  
BECH-M124, P&ID Reactor Core Isolation Cooling System (Steam Side), Revision 59  
BECH-M122, P&ID High Pressure Coolant Injection System (HPCI) Steam Side, Revision 63  
BECH-M122, P&ID High Pressure Coolant Injection System (HPCI) Steam Side, Revision 62

### **Condition Reports**

AR 1973003, "DNA – NSPEO Exhibits an Excellent Questioning Attitude," June 19, 2014  
AR 1922402, "B ESW HBD022 Extent of Condition," November 21, 2013  
AR 1912828, "Unexpected Alarm 1C40 J-2," October 16, 2013  
AR 1925496, "Results of Troubleshooting on Diesel Fire Pump Engine," December 6, 2013  
AR 1931545, "Error Causing Rework on Diesel Fire Pump – EC 270405," January 8, 2014  
AR 1968719, "Track Improvements to Chemistry Procedures," May 29, 2014  
AR 1898931, "RCIC Turbine Trip During Surveillance," August 22, 2013  
CR 18555032, "'A' SBDG Lube Oil Heat Exchanger Gasket Failure," March 8, 2013\*  
CR 1934710, "Collective Review for Commonalities: SBDG Lube Oil Leak and RCIC Failure – NRC White Findings," March 15, 2014  
CR 1898931, "RCIC Turbine Trip During STP 3.5.3-02," August 22, 2013  
AR 1941562, "Fleet Assessment of Issues with Regulatory Impact Since 2011," February 17, 2014  
AR 1914671, "NOS Perform a MOR on the RCIC Speed Indicator Failure," October 23, 2013  
AR 1861167, "Inadequate Use of Industry OE in Maintenance Planning," March 29, 2013  
CR 1947460, "Utilize Lesson Learned Information for Model Work Orders," March 11, 2014  
CR 1973426, "CR Closure Documentation Not Complete," June 20, 2014  
CR 1939332, "INPO AFI OR.2-1 Organizational Effectiveness," February 7, 2014  
CR 1748776, "Trend NRC Findings in H.1.a," March 26, 2012  
CR 1934713, "Potential Trend in Cross Cut Aspects," January 21, 2014  
CR 1959184, "DNA Management Review of Risk-Significant Critical Component Work Orders – E/S2406," April 17, 2014  
CR 1959185, "DNA Management Review of Risk-Significant Critical Component Work Orders – V13-0121," April 17, 2014

CR 1959186, "DNA Management Review of Risk-Significant Critical Component Work Orders – E51-K2510-A1," April 17, 2014

CR 1959188, "DNA Management Review of Risk-Significant Critical Component Work Orders – Test SBDG Cables," April 17, 2014

CR 1959189, "DNA Both Diesels on Same Work Order," April 17, 2014

CR 1959241, "DNA Maintenance Runs Following Major System Week Maintenance," April 17, 2014

CR 1962255, "DNA Management Review of Risk-Significant Critical Component Work Orders – Loop 'A' Pre-Modification Flow," April 29, 2014

CR 1973431, "DNA Risk-Significant Work Order 40234807-01 Management Review," June 20, 2014

CR 1973433, "DNA Risk-Significant Work Order 40267915-01 Management Review," June 20, 2014

CR 1973435, "DNA Risk-Significant Work Order 40273586-02 Management Review," June 20, 2014

CR 1973635, "DNA Management Review of Risk-Significant Critical Component Work Order – 1X004," June 22, 2014

CR 1973859, "DNA - Ops Supervision Questions PM Frequency," June 23, 2014

CR 1969676, "DNA – Failure to Use ESD Protection," June 3, 2014

CR 1968970, "DNA – RFP OE Review," May 30, 2014

CR 1973093, "DNA – Outage Work Order Modified Without SRO Informed," June 19, 2014

CR 1972519, "DNA – Nuclear Safety Outage OPDRV Risk," June 17, 2014

CR 1971003, "DNA – Work Instructions Insufficiently Detailed," June 9, 2014

CR 1968579, "DNA – Switchyard High Risk Work Postponed Due to SBDG Work," May 28, 2014

CR 1968272, "DNA – Potential Work Conflict Avoided," May 27, 2014

CR 1958117, "DNA – Operating Crew Decision Making Related to HPCI Maintenance," April 14, 2014

CR 1973002, "DNA – Delay 'D' Well Clearance Until End of Shift," June 19, 2014

CR 1973003, "DNA – NSPEO Exhibits an Excellent Questioning Attitude," June 19, 2014

CR 1973984, "DNA – Delayed Secondary Containment Door During New Fuel," June 23, 2014

CR 1976622, "95002 Extension Paperwork Not Completed," July 7, 2014

CR 1728378, "Methodology to Detect and Identify Battery Cell Lids," January 26, 2012

CR 1623363, "Results of CA 1611062 on Core Thermal Power 8-Hour Average for January 21<sup>st</sup>," February 24, 2011

CR 1643412, "Opening MO-1044 Changed Reactivity," April 20, 2011

CR 1851409, "Process Adherence," February 23, 2013

CR 1964074, "1Q2014 Engineering PAR MAI – OE from NRC Findings," May 6, 2014

CR 1892263, "POD Not Performed for GBC001 Piping Based on GBC002 Inspection," July 25, 2013

CR 1958615, "Fuse Request Identifies Incorrect Fuses for Clearance," April 16, 2014

CR 1947447, "Water Damaged Cables Present a Significant Challenge to the Site," March 11, 2014

CR 1958367, "Missed Vendor Manual Revision for EC 274306 (Generator Rewind)," April 15, 2014

CR 1931706, "B FPC Mod EC 276600 Missed Instrument AC System Interrelationship," January 8, 2014

CR 1931545, "Error Causing Rework on Diesel Fire Pump – EC 270405," January 8, 2014

CR 1930636, "EC 278848 DCP Description Lack of Detail on Affected Systems," January 2, 2014

CR 1945507, "Possible Missed Surveillance; Half of STP 3.4.5-03 Not Completed," March 4, 2014

CR 1956840, "14EXEOF – Knowledge Base Verse Rule Base Performance Gaps," April 10, 2014

CR 1934671, "Incorrect Marking of N/A in Work Orders for New RFP Offload," January 21, 2014

CR 1966392, "STP 3.1.3-01 Unable to Be Completed Due to A/B RBMs Inoperable," May 17, 2014

CR 1956032, "MTE Check-In Process Different Than Described in Procedure," April 8, 2014

AR 1957370, "Ineffective Implementation of First Time Quality Process," April 11, 2014

CR 1689406, "Improvement Efforts in SM Review of PODs," September 23, 2011

CR 1680752, "Prompt Operability Determination Quality," August 25, 2011

CR 1689062, "NRC Finding - Inadequate Operability Determinations," September 22, 2011

CR 1967772, "CRs/WRs Not Being Identified as Potential Operator Burdens," May 23, 2014

CR 1973298, "Request Training on Control of Ops Burdens/Ops Focus Items," June 19, 2014

CR 1967624, "FI2509 Indicated 395 GPM During RCIC Operability Test," May 23, 2014

CR 19 67794, "DNA-Margin To RCIC Technical Specification Flow Requirement Is Low," May 23, 2013

CR 1971819, "Instrument Accuracy Accounted For In RCIC Flow Rate STP," June 12, 2014

CR 1912546, "INPO IER L3-13-47 Automatic Reactor Scram," October 16, 2013

CR 1916413, "INPO IER L3-13-50 Failure Of Feedwater Pump Coupling Results," October 30, 2013

CR 1917104, "INPO IER L3-13-51 Long-Standing Equipment Problems," November 1, 2013

CR 1933905, "INPO IER L3-14-1 Improper Setpoints Lead To Generator Trip," January 17, 2014

CR 1935184, "INPO IER L3-14-2 Improper Control And Monitoring Chemistry," January 22, 2014

CR 1935682, "INPO IER L3-14-3 Control Room Over Dilutes Reactor Coolant," January 24, 2014

CR 1938543, "INPO IER L3-14-4 Maintenance Oversight Shortfalls Contribute," February 5, 2014

CR 1942438, "INPO IER L3-14-6 – Manual Scram Following Loss Of Level," February 20, 2014

AR 00591504, "Torque Value Not Documented on MDS," November 02, 2010

AR 00597738, "Leak at Insulation on East End of 1E001A Feedwater Heater," November 30, 2010

AR 01821747, "Negative Trend Noted RE: RFO 23 Maintenance Work Docs," June 28, 2013

AR 01861167, "Inadequate Use of Industry OE Maintenance Planning," March 2013

AR 01955777, "WO40241069 Missing Information for 1E053A2," April 10, 2014

AR 01963694, "95002 Review: TCV3273B Body to Piping Flange Torque," May 5, 2014

AR 01964039, "MD-042 Minimum Required Gasket Seating Stress Incorrect," May 06, 2014

AR 01965893, "95002 Review: RFO24 WO 40255207 HPCI Spool-piece," May 14, 2014

AR 01966427, "1E053A As-Found Torque Values During Heat Exchanger Maintenance," June 5, 2014

AR 01966429, "DNA 1E53A1 & 1E53A2 Fixed End Channel HD Cover Plate Pitting," May 17, 2014

AR 01967872, "1E053B As-Found Torque Values Heat Exch Maintenance"

AR 01967898, "Lantern Ring for 1E53B3 has a ¼" Gap," May 25, 2014

AR 01938068, "GENERA-F010-01 – Mechanical Inspection," February 3, 2014

CR 1884388, "RCIC Turbine Speed Indicator SI2457 Reading 1200 rpm Shutdown," August 21, 2013

CR 1898931, "RCIC Turbine Trip During Surveillance," August 22, 2013

CR 1899180, "Failed Resistor Found When Troubleshooting RCIC Turbine Trip," August 24, 2013

CR 1944745, "SBLC System Leak Discovered," March 1, 2014

CR 1945469, "SBLC Single Pump Inoperable Question," March 4, 2014

CR 1948703, "Diesel Fire Pump Did Not Start in Manual B," March 16, 2014

CR 1949711, "MH105 Was Found with Water Over the Cables," March 19, 2014

CR 1949769, "MH107 Was Found with Water Over the Cables," March 19, 2014

CR 1952121, "Initial RCIC ESW Flow Less Than Required Value for NS540002A," March 27, 2014

CR 1953029, "TRS-1945 Point #7 (Fuel Pool Temperature) Indication Lost," March 30, 2014

CR 1953207, "Unexpected Alarm 1C094 (A-4) Jacket Cooling Temperature Low," March 31, 2014

CR 1955859, "HPCI Booster Pump Outboard Bearing Oil Level LOOS," April 8, 2014

CR 1957057, "LITS4540 'B' Level Indicator Spiking Downscale," April 11, 2014

CR 1958122, "DNA – Operating Crew Actions Resulting from Yarway Indication," April 14, 2014

CR 1958783, "Missed LCO Entries for Remote Shutdown Panel Functions," April 16, 2014

CR 1961465, "DNA – HPCI STPs May Contain an Incorrect Pump Discharge Pressure," April 25, 2014

CR 1961479, "DNA – RCIC STP Min Pump Discharge Pressure <CAL-M91-011," April 25, 2014

CR 1961841, "DNA – Determine the Effect on Emergency Service Water Operability," April 28, 2014

CR 1961911, "Compensatory Measures for Two TSAs Not Flagged as Such," April 28, 2014

CR 1962329, "DNA – Inaccurate IOD Write-up for CR 1960587 Identified by NRC," April 29, 2014

CR 1962415, "Mock 95002-Enhance ODI-008 Revision 23, Step 6.7.4," April 29, 2014

CR 1962977, "Mock 95002 Insp: Closure Book for CA 1898931-15 Needs Revision," May 1, 2014

CR 1962985, "Mock 95002 Enhance CA 1898931-30 Closure Book," May 1, 2014

CR 1962992, "Mock 95002 Insp: Closure Book for CA 1898931-16 Needs Revision," May 1, 2014

CR 1963381, "DNA – 1A202 Failed to Close," May 2, 2014

CR 1963691, "TRM Surveillance Requirements Not Performed," May 5, 2014

CR 1964851, "Canceling OP-AA-100-1000-10000," May 9, 2014

CR 1964875, "NRC Question on Use of TS 3.0.3 and the TRM," May 9, 2014

CR 1965755, "Have Not Placed 1D44 In-Service Since January 2013," May 14, 2014

CR 1966478, "1K016A Found Not Running, Cold to the Touch," May 18, 2014

CR 1967624, "FI2509 Indicated 395 gpm During RCIC Operability Test," May 23, 2014

CR 1968702, "EN-AA-203-1001 Operability Determinations/Functionality Assessment Needs Revision," May 29, 2014

CR 1969105, "1G31 LOP Found Not Running," May 31, 2014

CR 1970711, "Entered AOP 410 for High River Bed Elevation (>726 Feet)," June 6, 2014

CR 1971248, "DNA – BECH-E511<10> Errors," June 10, 2014

CR 1971293, "Received 1Y11 Trouble Alarm During STP 3.8.7-01," June 10, 2014

CR 1971501, "TLCO Times for Fire Detection andSuppressions Challenged," June 11, 2014

CR 1971819, "Instrument Accuracy Accounted for in RCIC Flow Rate in STP 3.5.3-02," June 12, 2014

CR 1973305, "AOP 902 'Flood' Entry Due to Cedar River Water Level," June 12, 2014

CR 1973573, "Evaluate Added 1C-080 as an Operator Burden," June 21, 2014

CR 1973649, "Unable to Complete STP 3.8.4-01," June 22, 2014



## **NRC Identified**

AR 1974538, "DNA – QHSA Showed Gap Not to be Procedure Quality," June 25, 2014  
AR 1974484, "Trend in NRC Performance Indicator Reporting Errors," June 25, 2014  
AR 1974115, "CDE SSFF Note Not Published," June 24, 2014  
AR 1973857, "MSPI EDG UA Not Revised Following NRC Finding," June 23, 2014  
AR 1976712, "RCIC RCE Delta Between Executive Summary and the Report Text, July 7, 2014  
AR 1975999, "RCIC RCE Effectiveness Review Forms," July 2, 2014  
AR 1977346, "Failure to Address Compliance with NFPA 20 Battery Requirements in Functionality Assessment 1931545," July 10, 2014  
AR 1977415, "Nuclear Safety Culture Review Did Not Completely Address Individual Accountability Aspect 0.1.A," July 10, 2014  
AR 1977427, "No Effectiveness Reviews for the Common Themes Identified Under the Collective Review," July 10, 2014  
AR 1976943, "Effectiveness Reviews for the Two White Findings Focused on the Root Causes and not on the Corrective Actions to Prevent Recurrence," July 8, 2014  
AR 01888074 GENERA-F010-01 – 1E053A2 (B2) Flange Inspection, July 9, 2014  
AR 01973977, Insulation on MO-2405I  
AR 01973992, 95002 Inspection: 1E053A1 Gasket Observation by the NRC, June 24, 2014  
AR 01974810, CAPR (Action 13) from SBDG Not Fully Implemented  
AR 01974911, GMP-MECH-01 Attachment 1 Not Attached to Work Orders, June 26, 2014  
AR 01975318, GENERA-F010-01 – 1E053A2 (B2) Flange Inspection, June 30, 2014  
AR 01976210, 95002: POD 1973992 Gasket Swell, July 3, 2014  
AR 01976912, 95002: MD-042: Remove Leak Criteria Steps, July 8, 2014  
AR 01976939 95002: Enhancements to GENERA-F010 Section W, July 8, 2014  
AR 01977083, 95002: MA-AA-100 Review, July 9, 2014  
CR 1975999, "95002: RCIC RCE Effectiveness Review Forms," July 2, 2014  
CR 1976300, "Provide Training on the Proper Use of SR 3.0.3 and TSR 3.0.3," July 3 2014  
CR 1976563, "NRC 95002: Revise ODI-008 with Additional Requirement," July 7, 2014  
CR 1976712, "RCIC RCE Delta between Executive Summary and the Report Text," July 7, 2014  
CR 1976943, "Effectiveness Reviews for the Two White Findings Focused on the Root Causes and Not on the Corrective Actions to Prevent Recurrence," July 8, 2014  
CR 1977172, "Degraded Cornerstone Inspection-HPCI/RCIC P&ID Accuracy," July 9, 2014  
CR 1976963, "EN-AA-203-1001 Operability Determinations/Functionality Assessment Needs Revision to Delete Reference to Cancelled OP-AA-100-1000-10000," July 8, 2014

## **Work Orders**

WO 40267572, Revise Cable Run from Batteries to Engine following Unexpected Alarm During Performance of the Monthly STP  
WO 40292240, Replace RCIC Dropping Resistor per EC 280828  
WO 40251156-01, "1VHX091: MA Clean Cooling Fins and Adjust Belts as Required"  
WO 40219720-01, "1P072: Change Oil and Inspect Pump"  
WO 40250954-01, "1K11H: Inspect Gearbox Cell and Bolting"  
WO 40278912-04, "1G031: Perform Manual Engine Barring After Maintenance"  
WO 40221594-01, "1S220(30-39): Replace N2 Charging Connection and Fitting Cap"  
WO 40308290, "PS6930A: Dedicate/Replace Switch"  
WO 40283049-04, "CV3319: Deluge #10 Yard Pipe Inspection and PMT"  
WO 40251902-01, "SUS64.01, 1C113B, Inspect HFA51 Relay Coils (Non-Safety Related)"

WO 40243714-01, "1H236: Perform Inspection Prior to RFO"  
 WO 40243715-01, "1S1136: Inspect Auxiliary Bridge General Structure"  
 WO 1337310-01, "1B3431, Replace 'Forward' Contactor Cover"  
 WO 40247300-01, "1E053A1 Re-Torque And Gasket Change Out"  
 WO 40247301-01, "1E053A3 Re-Torque And Gasket Change Out"  
 WO 40247296-01, "1E053B1 Re-Torque And Gasket Change Out"  
 WO 40247299-01, "1E053B3 Re-Torque And Gasket Change Out"  
 WO 40132324, "Disassemble Clean and Inspect and Reassemble 1E220C"  
 WO 40132858, "1E53A2: Mech Replace Lube Oil Cooler Tube Bundle"  
 WO 40144589, "1E220DL Disassemble Clean and Inspect and Reassemble"  
 WO 40220934, "1E53A2: 50-60 DPM Leak on 1G-31 Lube Oil Heat Exchanger"  
 WO 40241069, "Remove 1E053A2 For Inspection Per Root Cause"  
 WO 40247296, "1E053B1 Re-Torque and Gasket Changeout"  
 WO 40247298, "1E053B2 Re-Torque and Gasket Changeout"  
 WO 40247299, "1E053B3 Re-Torque and Gasket Changeout"  
 WO 40247300, "1E053A1 Re-Torque and Gasket Changeout"  
 WO A82248, "1G-31 Lube Oil Cooler Heat Exchanger"  
 WO A74304, "Disassemble and Inspect Butterfly Valve"  
 WO 40247301, "1E053A3 Re-Torque and Gasket Changeout"  
 WO 40310673, "1E053A2 Replace Lube Oil Cooler Fixed Head Gaskets"

## **Procedures**

AD-AA-103, "Nuclear Safety Culture Program," Revision 3  
 AD-AA-103, "Nuclear Safety Culture Program," Revision 5  
 PI-AA-100-1005, "Root Cause Analysis," Revision 9  
 PI-AA-205, "Condition Evaluation and Corrective Action," Revision 25  
 PI-AA-100-1006, "Common Cause Evaluation," Revision 6  
 PI-AA-100-1007, "Apparent Cause Evaluation," Revision 8  
 PI-AA-100-1008, "Condition Evaluation," Revision 5  
 EN-AA-203-1001, "Operability Determinations/Functionality Assessments," Revision 16  
 OP-AA-100-1000-10000, "Initial Screening Checklist," Revision 0  
 PI-AA-101, "Self-Assessment and Benchmarking Program," Revision 14  
 PI-AA-207, "Trend Coding and Analysis," Revision 8  
 PI-AA-207-1000, "Station Self-Evaluation and Trending Analysis," Revision 1  
 PI-AA-207-1000-10000, "Performance Improvement Trending Analysis Tools," Revision 1  
 EN-AA-105-1000, "PRA Configuration Control and Model Maintenance," Revision 1  
 OP-AA-108, "Oversight and Control of Operator Burdens," Revision 2  
 WM-AA-201, "Work Order Identification, Screening, and Validation Process," Revision 15  
 ACP 1408.7, "Control of Permanent Plant Instrumentation," Revision 21  
 MD-066, "Work Order Review Process," Revision 0  
 MA-AA-202-1001, "First Time Quality," Revision 2  
 MA-AA-203, "Work Order Planning Process," Revision  
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 ACP 1410.2, "LCO Tracking And Safety Function Determination Program," Revision 32  
 OP-AA-102-1003, "Guarded Equipment," Revision 5  
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DAEC-SC-PD-03, "O-Rings, Gaskets, Packing and Thread Sealants," Revision 0  
 GENERA-F010-01, "1E053A2 (B2) Flange Inspection," Revision 4  
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 MA-AA-100-1011, "Equipment Troubleshooting," Revision 0  
 EN-AA-203-1001-F04, "NAMs AR Operability Notes Worksheet," Revision 0  
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 MA-AA-100, "Conduct of Maintenance," Revision 6  
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 MA-AA-203-1001, "Work Order Planning," Revision 1  
 MD-042, "Bolting Practices," Revision 12  
 MD-062, "Maintenance Directive – Work Order Tasks," Revision 2  
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 MD-062, "Parts Planning Guide PPG-03, O-Rings, Gaskets, Packing and Thread Sealants," Revision 0  
 WM-AA-100-1000, "Work Activity Risk Management," Revision 1  
 PI-AA-205, "Condition Evaluation and Corrective Action," Revision 25  
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 PI-AA-100-1005, "Root Cause Analysis," Revision 9  
 PI-AA-102, "Operating Experience Program," Revision 7  
 PI-AA-102-1002, "Internal Operating Experience," Revision 6  
 QUAL-SC100, "Environmental Service Conditions Analysis," Revision 9  
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 [Severe Accident Management Procedure] SAMP 703, "RCIC Operation Following Loss of Electrical Power," Revision 5

### **Other**

DD-1, Nuclear Generation Division Discipline Design Standards, Piping and Instrumentation Diagrams, June 6, 1997  
 Engineering Change 280828, Replace RCIC Dropping Resister, Revision 0  
 Quick Hit #1934710, Perform Procedure Effectiveness Review of Radiation Protection and Chemistry, May 29, 2014  
 Missed Opportunity Determination – Reactor Core Isolation (MOR 2013-31), December 11, 2013  
 Quick-Hit Assessment Report #1935538-03, "Operations Concerns/Focus Process"  
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 Quick-Hit Assessment Report #1944634, "QHSA of First Time Quality Implementation," May 30, 2014  
 SART #1765526, "Quick Hit Assessment of Admin Procedure In Hand Days"  
 POD 01971819-01, "Instrument Accuracy Accounted For In RCIC Flow Rate In STP 3.5.3-02,"  
 EC 280622-01, "1E053A(B) Channel Head Cover Bolt Torque Evaluation"  
 EC 281435-01, "1E053A(B) Torque Specifications"  
 EC 280622, 1E053A(B) Channel Head Cover Bolt Torque Evaluation, April 21, 2014  
 EC 281435, 1E053A(B) Torque Specifications, April 21, 2014  
 EC 280933, 1E053B1/1E053B2 Thread Engagement Issue ("B" EDG 1G021), February 17, 2014  
 Management Review Committee (MRC) Agenda, April 3, 2014

CAL-M07-010, "Calculation of Maximum Emergency Diesel Generator Room Temperature-Attachment 5," Revision 1  
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[Functionality Assessment] FA 1964875, "NRC Question on Use of TS 3.0.3 and the TRM," May 9, 2014  
DAEC Operations, "Self-Evaluation and Trending Analysis Report for 4<sup>th</sup> Quarter 2013," January 28, 2014  
DAEC Operations, "Self-Evaluation and Trending Analysis Report for 1<sup>st</sup> Quarter 2014," April 30, 2014  
DAEC [System Description] SD-150, "Reactor Core Isolation Cooling System," Revision 7  
DAEC NOS [Daily Quality Summary] DQS, "Reactor Core Isolation Cooling (RCIC) Root Cause Evaluation (RCE) 95002 Review," April 22, 2014  
PDA OPS 60083, 2014-01L, "Immediate Operability Determinations-Continuing Training Lesson Plan," Revision 0

## LIST OF ACRONYMS USED

ADAMS	Agencywide Document Access Management System
AR	Action Request
ARP	Annunciator Response Procedure
CAP	Corrective Action Program
CAPR	Corrective Action to Prevent Recurrence
CC	Contributing Cause
CCA	Common Cause Analysis
CE	Condition Evaluation
CFR	Code of Federal Regulations
CR	Condition Report
DRP	Division of Reactor Projects
EFR	Effectiveness Review
EPRI	Electric Power Research Institute
FA	Functionality Assessment
FP	Fire Protection
HPCI	High Pressure Coolant Injection
IMC	Inspection Manual Chapter
INPO	Institute of Nuclear Power Operations
IOD	Immediate Operability Determination
IP	Inspection Procedure
IR	Inspection Report
I&C	Instrument and Control
LO	Lube Oil
MRC	Management Review Committee
NAMs	Nuclear Asset Management System
NCV	Non-Cited Violation
NOS	Nuclear Oversight
NOV	Notice of Violation
NRC	U.S. Nuclear Regulatory Commission
OE	Operating Experience
PARS	Publicly Available Records
POD	Prompt Operability Determination
PRA	Probabilistic Risk Assessment
P&ID	Pipe and Instrumentation Drawing
QHSA	Quick Hit Self- Assessment
RC	Root Cause
RCIC	Reactor Core Isolation Cooling
RCE	Root Cause Evaluation
ROP	Reactor Oversight Process
SCAQ	Significant Condition Adverse to Quality
SBDG	Standby Diesel Generator
SCWE	Safety Conscience Work Environment
SDP	Significance Determination Process
SRA	Senior Reactor Analyst
SRO	Senior Reactor Operator
SSC	System, Structure, or Component
STP	Surveillance Test Procedure
TS	Technical Specification

UFSAR	Final Safety Analysis Report
URI	Unresolved Item
VIO	Violation
WO	Work Order

T. Vehec

-3-

informed by a separate letter of the results of that assessment and any changes to the baseline inspection schedule that will be made to allow the NRC to evaluate the long-term effectiveness of your corrective actions for the two risk-significant issues that are the subject of this inspection report and your actions to address the lower level issues that were identified.

Based on the results of this inspection, three NRC-identified findings of very low safety significance (Green) that involved violations of NRC requirements were identified. However, because of their very low safety significance, and because these issues were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) in accordance with Section 2.3.2 of the NRC Enforcement Policy.

If you contest the subject or severity of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at the Duane Arnold Energy Center. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region III, and the NRC Resident Inspector at the Duane Arnold Energy Center.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter and its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

Anne T. Boland, Director  
Division of Reactor Projects

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Letter to T. Vehec from A. Boland dated August 29, 2014

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FOLLOW-UP LETTER

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