Group C

FOIA/PA NO: 2014-0317

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E LAMAR BLVD
ARLINGTON, TX 76011-4511

EA-14-008

Jeremy Browning, Site Vice President
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333
Russellville, AR 72802-0967

SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 - FINAL SIGNIFICANCE DETERMINATION OF TWO YELLOW FINDINGS AND NOTICE OF VIOLATION; NRC INSPECTION REPORT 05000313/2014008 AND 05000368/2014008

Dear Mr. Browning:

This letter provides you the final results of our significance determination of the preliminary Red and Yellow findings identified in NRC Inspection Report 05000313/2013012; 05000368/2013012 (ML14083A409) dated March 24, 2014. A detailed description of the findings is contained in Section 4OA3.9 of that report. The findings are associated with the March 31, 2013, Unit 1 stator drop that affected safety-related equipment on both units.

At your request, a Regulatory Conference was held on May 1, 2014, to further discuss your views on this issue. During the meeting, your staff described your assessment of the significance of the findings, the corrective actions taken to resolve it, and the root-cause evaluation of the findings. Specifically, for Unit 1, you described four methods of recovery, which would affect the overall significance of the event. Three of these methods related to the restoration of power to the 4160V safety-related electrical buses. The fourth recovery method discussed the restoration of the 480V electrical bus to provide makeup water to the plant from the borated water storage tank.

The timelines your staff presented for the restoration of power using these methods were each less than the 4.8 days time to core uncovery limitation in the event power to the safety-related buses were lost coincident with the stator drop event. Taking into account these recovery actions, your staff indicated that the significance of the Unit 1 finding should be characterized as having low-to-moderate safety significance (White). This is based on the change in core damage probability for the performance deficiency is 4.8×10^{-6}. A copy of your presentation provided at this meeting is attached to the summary of the Regulatory Conference (ML14128A512) dated May 9, 2014.

C/

For Unit 2, your staff discussed the restoration of the 2A2 safety-related 4160kV electrical bus by using three procedurally directed methods. The methods encompassed restoration of power from the alternate ac diesel generator, and procedurally cross tie the 2A3 and 2A4 buses to supply power. Taking into account these recovery actions, your staff indicated that the significance of the Unit 2 finding should be characterized as having low-to-moderate safety significance (White). This is based on the change in conditional core damage probability for the performance deficiency is 1.8×10^{-6}.

After considering the information developed during the inspection and the information you provided at the Regulatory Conference, we have concluded that the risk significance of each finding is appropriately characterized as Yellow, substantial safety significance, for both Units 1 and 2. Our evaluation of the risk significance of each inspection finding is provided in Enclosure 2 of this letter.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified Yellow findings. Such appeals will be considered to have merit only if they meet the criteria given in Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region IV, 1600 E. Lamar Blvd., Arlington, TX 76011-4511.

The NRC has also determined that the failure to follow procedure to ensure that that a temporary lift assembly was designed to support the projected load and to perform a 125 percent load test for the projected load is a violation of Title 10 of the Code of Federal Regulations (CFR) 50, Appendix B, Criteria V, "Instructions, Procedures and Drawings," as cited in the attached Notice of Violation. In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with Yellow findings for Unit 1 and 2.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

Because plant performance at the Arkansas Nuclear One facility has been determined to be beyond the licensee's response column of the NRC's Reactor Oversight Process Action Matrix, as the result of the Yellow significance for both Units 1 and 2 of the subject findings, the NRC will use the Action Matrix to determine the most appropriate NRC response to the finding's significance. We will notify you, by separate correspondence, of that determination.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Comment [JTM1]: Acourding to the wording in this letter above, a response is required.

Sincerely,

Marc L. Dapas
Regional Administrator

Dockets: 50-313; 50-368
Licenses: DPR-51; NPF-6

Enclosures:
1. Notice of Violation
2. Final Significance Determination

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

Marc L. Dapas
Regional Administrator

Dockets: 50-313; 50-368
Licenses: DPR-51; NPF-6

Enclosures:
1. Notice of Violation
2. Final Significance Determination

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DOCUMENT NAME: S:\RAS\ACES\ENFORCEMENT_EA CASES - OPEN\ANO - multiple violations - stator drop flooding\Final Action\EA-14-008_ANO Stator Drop_Final.doc
ADAMS ACCESSION NUMBER:

☐ SUNSI Review By:		ADAMS ☑ Yes ☐ No	☑ Publicly Available ☐ Non-Publicly Available		☑ Non-Sensitive ☐ Sensitive		Keyword:
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OFFICE	DD:DRP	D:DRP	OE	NRR	RA		
NAME	TPruett	KKennedy			MLDapas		
SIGNATURE							
DATE	06/ /14	06/ /14					

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Letter to Jeremy Browning from Marc L. Dapas dated June , 2014

SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 - FINAL SIGNIFICANCE DETERMINATION OF TWO YELLOW FINDINGS AND NOTICE OF VIOLATION; NRC INSPECTION REPORT 05000313/2014008 AND 05000368/2014008

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NOTICE OF VIOLATION

Entergy Operations Inc.
Arkansas Nuclear One, Units 1 and 2

Docket: 05-313, 05-368
License: DRP-51, NPF-6
EA-14-008

During an NRC inspection conducted on July 15, 2013, through February 10, 2014, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures or drawings.

Quality Procedure EN-MA-119, "Material Handling Program," Section 5.2[7], "Temporary Hoisting Assemblies," Step (a) states, in part, that vendor supplied temporary overhead cranes or supports, winch-driven hoisting or swing equipment, and other assemblies are required to be designed or approved by engineering support personnel. The design is required to be supported by detailed drawings, specifications, evaluations, and/or certifications.

Quality Procedure EN-MA-119, "Material Handling Program," Section 5.2[7], "Temporary Hoisting Assemblies," Step (b) states, in part, that the assembly shall be designed for at least 125 percent of the projected hook load and should be load tested and held for at least 5 minutes at 125 percent of the actual load rating before initial use. The assembly shall be load tested in all configurations for which it will be used.

Contrary to the above, on March 31, 2013, the licensee did not accomplish the stator lift and move, an activity affecting quality, as prescribed by documented instructions and procedures. Specifically:

A. The licensee approved a design for the temporary hoisting assembly that was not supported by detailed drawings, specifications, evaluations, and/or certifications. The licensee failed to identify the load deficiencies in vendor Calculation 27619-C1, "Heavy Lift Gantry Calculation," and the incorrectly sized component in the north tower structure of the temporary hoisting assembly. In addition, the temporary hoisting assembly was not designed for at least 125 percent of the projected hook load.

B. The licensee failed to perform a load test in all configurations for which the temporary hoisting assembly would be used.

As a result, on March 31, 2013, while lifting and transferring the main generator stator, the temporary overhead crane collapsed causing the 525-ton stator to fall on and extensively damage portions of the plant, including safety-related equipment.

Comment [JTM2]: It is not clear to me that safety related equipment was damaged by the load drop. Risk significant (e.g., 4kv buses A1, A2, 2A1 and 2A2) equipment was damaged. Certainly, safety related equipment was unessarily challenged by the load drop.

This violation is associated with a Yellow (Unit 1) and a Yellow (Unit 2) significance determination finding.

Pursuant to the provisions of 10 CFR 2.201, Entergy Operations, Inc., is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region IV, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-14-008" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved.

Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information.

If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this day of June 2014

Arkansas Nuclear One Dropped Stator
Final Significance Determination

During the regulatory conference held on August 18, 2010, your staff described your assessment of the significance of the finding for each unit. Specifically, your staff discussed differences for Units 1 and 2 that existed between the NRC's preliminary significance determination and Arkansas Nuclear One's risk assessment. The differences for each unit were evaluated and are discussed below.

Unit 1

1. Your staff had a time to boil of 12 hours and a time to core uncovery of 115 hours verses NRC values of 11 hours and 96 hours, respectively.

   We determined that the change in the time to boil had no impact on the risk evaluation. Using the 115 hours for time to core uncovery, the total conditional core damage probability was reduced from 3.8E-4 to 2.6E-4.

2. Your staff described three success paths to recover offsite power and that during the event, Entergy Operations, Inc., personnel had made a temporary electrical connection between the switchyard and the safety buses and tested that connection within 4.4 days of the event initiation, contrary to the NRC using 6 days in our preliminary risk analysis. As part of the analysis, your staff developed an estimated recovery of approximately 97 percent.

   Comment [JTM3]: While this sentence is accurate, it is not necessary. I suggest deleting.

   After reviewing the information that you supplied during the regulatory conference, we agreed that the recovery of offsite power was feasible within the time to core uncovery; however, at the time of the event, these plans were only conceptually designed and there were no engineering packages, work plans, or detailed instructions. The reliability of these success paths could not be demonstrated and, could not be quantitatively evaluated using approved NRC methods. Therefore, the analysts qualitatively determined that the licensee had a 90 percent probability of restoring offsite power before core uncovery. Using this probability of success further reduced the risk to an estimated value of 6E-5.

3. Your staff also described a success path to restore power to the borated water recirculation pump for reactor coolant system makeup.

   We determined that this was in affect another method of restoration of offsite power, so no additional credit was warranted. See Item 2 above for the basis for the estimated risk value of 6E-5.

Unit 2

1. Your staff described changes in your model of record to account for operator actions specifically related to the load shed breakers on bus 2A2. This change added a non-recovery probability for operators to manually manipulate the breakers should the breaker fail to operate automatically.

   We reviewed the SPAR model and determined that the human error probability of operators failing to manually align bus 2A2 to offsite power under conditons following the stator drop

was already incorporated in the preliminary significance determination. The analysts determined that the extreme environmental conditions of debris and water surrounding the switchgear area after the load drop event and the increased stress level of operations personnel used for restoration would further complicate recovery. Taking these factors into account will only increase the probability of non-recovery of bus 2A2. Therefore, the analysts determined that no additional reduction of the human error probability to the preliminary significance determination for manual recovery of bus 2A2 load shed breakers was warranted.

Comment [JAC4]: We don't want to give the licensee the impression that we've modeled the stator drop.

2. Your staff described that the alternate ac diesel generator and the bus 2A9 supply to Unit 2 busses were damaged but available and that the operators would have used the diesel generator in the event of a station blackout since they were unaware of any damage to bus 2A9.

   Comment [JTM5]: The buses were in fact damaged. But they were usable.

   We determined that the plant staff was aware of the potential damage and that the operators at both units would have been notified of damage to bus 2A9 requiring, at least, investigation before using the alternate ac diesel generator. We determined that investigation and testing of the bus condition by maintenance personnel would take longer than the time to core damage following a postulated station blackout. It was determined that no recovery credit should be applied to short (1 hour) core damage sequences; however, the analysts did provide recovery credit for the 8-hour sequences, which reduced the conditional core damage probability to 1.2 E-5.

3. Your staff described that the ability to cross-tie the 4160Vac buses was available to the operators and not credited in the analysis.

   We determined that the cross-tie of the 4160Vac buses was irrelevant to the final results since having one energized vital bus is already considered electrical success and additional recovery to power the other vital bus would have a minimal impact.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E LAMAR BLVD
ARLINGTON, TX 76011-4511

EA-14-008

Jeremy Browning, Site Vice President
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333
Russellville, AR 72802-0967

SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 - FINAL SIGNIFICANCE DETERMINATION OF TWO YELLOW FINDINGS AND NOTICE OF VIOLATION; NRC INSPECTION REPORT 05000313/2014008 AND 05000368/2014008

Dear Mr. Browning:

This letter provides you the final significance determination of the preliminary Red and Yellow findings identified in NRC Inspection Report 05000313/2013012; 05000368/2013012 (ML14083A409), dated March 24, 2014. A detailed description of the findings is contained in Section 4OA3.9 of that report. The findings are associated with the March 31, 2013, Unit 1 stator drop that affected safety-related equipment on both units.

At your request, a Regulatory Conference was held on May 1, 2014, to further discuss your views on these findings. A copy of your presentation provided at this meeting is attached to the summary of the Regulatory Conference (ML14128A512), dated May 9, 2014. In your presentation on the risk significance of the event related to Unit 1, you described four recovery actions that plant personnel could have implemented to establish and maintain cooling to the reactor core in the event that the emergency diesel generators were not able to supply power to the 4160V electrical buses. Three of these methods involved restoring power to 4160V safety-related electrical buses from other sources. The fourth recovery method involved providing temporary 480V ac power to a borated water recirculating pump, and establishing a source of water to the reactor from the borated water storage tank.

Based on your staff's evaluation of the probability of success of the four recovery actions, and the amount of time that existed to restore cooling to the core, your staff concluded that the change in core damage probability was 4.8×10^{-6}. As a result, you concluded that the inspection finding should be characterized as White, low-to-moderate safety significance.

C12

In your presentation on the risk significance of the event related to Unit 2, you described three procedurally directed recovery strategies that plant personnel could have implemented to restore electrical power in the event that power was lost to vital electrical buses. These strategies involved supplying power from the Startup 2 transformer, or the alternate ac diesel generator to electrical buses, and connecting the vital 4160V buses to supply power to equipment. Based on your staff's evaluation of the probability of success of these three procedurally directed recovery strategies, your staff concluded that the change in conditional core damage probability was 1.8×10^{-6}. As a result, you concluded that this inspection finding should also be characterized as White, low-to-moderate safety significance.

After considering the information developed during the inspection and the information you provided at the Regulatory Conference, we have concluded that the risk significance of each finding is appropriately characterized as Yellow, substantial safety significance, for both Units 1 and 2. Our evaluation of the risk significance of each inspection finding is provided in Enclosure 2 of this letter.

You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified Yellow findings. Such appeals will be considered to have merit only if they meet the criteria given in Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region IV, 1600 E. Lamar Blvd., Arlington, TX 76011-4511.

The NRC has also determined that the failure to follow procedures to ensure that a temporary lift assembly was designed to support the projected load and to perform a 125 percent load test for the projected load is a violation of Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B, Criteria V, "Instructions, Procedures and Drawings," as cited in the attached Notice of Violation. In accordance with the NRC's Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with Yellow findings for Units 1 and 2.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC's review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

Because plant performance at the Arkansas Nuclear One facility has been determined to be beyond the "Licensee Response Column" of the NRC's Reactor Oversight Process Action Matrix, as the result of Units 1 and 2 Yellow significance findings, the NRC will use the Action Matrix to determine the most appropriate NRC response to the findings' significance. We will notify you, by separate correspondence, of that determination.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

Marc L. Dapas
Regional Administrator

Dockets: 50-313; 50-368
Licenses: DPR-51; NPF-6

Enclosures:
1. Notice of Violation
2. Final Significance Determination

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Sincerely,

Marc L. Dapas
Regional Administrator

Dockets: 50-313; 50-368
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1. Notice of Violation
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ADAMS ACCESSION NUMBER:

☐ SUNSI Review By:		ADAMS ☑ Yes ☐ No	☑ Publicly Available ☐ Non-Publicly Available		☑ Non-Sensitive ☐ Sensitive		Keyword:
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Letter to Jeremy Browning from Marc L. Dapas dated June 20, 2014

SUBJECT: ARKANSAS NUCLEAR ONE, UNITS 1 AND 2 - FINAL SIGNIFICANCE DETERMINATION OF TWO YELLOW FINDINGS AND NOTICE OF VIOLATION; NRC INSPECTION REPORT 05000313/2014008 AND 05000368/2014008

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Gloria.Hatfield@nrc.gov;
Jenny.Weil@nrc.gov;

NOTICE OF VIOLATION

Entergy Operations Inc.
Arkansas Nuclear One, Units 1 and 2

Docket: 05-313, 05-368
License: DRP-51, NPF-6
EA-14-008

During an NRC inspection conducted between July 22, 2013, and February 10, 2014, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures or drawings.

Quality Procedure EN-MA-119, "Material Handling Program," Section 5.2[7], "Temporary Hoisting Assemblies," Step (a) states, in part, that vendor supplied temporary overhead cranes or supports, winch-driven hoisting or swing equipment, and other assemblies are required to be designed or approved by engineering support personnel. The design is required to be supported by detailed drawings, specifications, evaluations, and/or certifications.

Quality Procedure EN-MA-119, "Material Handling Program," Section 5.2[7], "Temporary Hoisting Assemblies," Step (b) states, in part, that the assembly shall be designed for at least 125 percent of the projected hook load and should be load tested and held for at least 5 minutes at 125 percent of the actual load rating before initial use. The assembly shall be load tested in all configurations for which it will be used.

Contrary to the above, on March 31, 2013, the licensee did not accomplish the Unit 1 main turbine generator stator lift and move, an activity affecting quality, as prescribed by documented instructions and procedures. Specifically:

A. The licensee approved a design for the temporary hoisting assembly that was not supported by detailed drawings, specifications, evaluations, and/or certifications. The licensee failed to identify the load deficiencies in vendor Calculation 27619-C1, "Heavy Lift Gantry Calculation," and the incorrectly sized component in the north tower structure of the temporary hoisting assembly. In addition, the temporary hoisting assembly was not designed for at least 125 percent of the projected hook load.

B. The licensee failed to perform a load test in all configurations for which the temporary hoisting assembly would be used.

As a result, on March 31, 2013, while lifting and transferring the Unit 1 main turbine generator stator, the temporary overhead crane collapsed causing the 525-ton stator to fall on and extensively damage portions of the plant, affecting safety-related equipment.

This violation is associated with a Yellow (Unit 1) and a Yellow (Unit 2) significance determination finding.

Pursuant to the provisions of 10 CFR 2.201, Entergy Operations, Inc., is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region IV, and a copy to the NRC resident inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-14-008" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved.

Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information.

If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated this 20 day of June 2014

Arkansas Nuclear One Dropped Stator
Final Significance Determination

During the regulatory conference held on May 1, 2014, your staff described ~~your~~ their assessment of the significance of the finding for each unit. Specifically, your staff discussed differences for Units 1 and 2 that existed between the NRC's preliminary significance determination and Arkansas Nuclear One's risk assessment. The differences for each unit were evaluated and are discussed below.

Unit 1

1. Your staff specified a time to boil of 12 hours and a time to core uncovery of 115 hours versus NRC values of 11 hours and 96 hours, respectively.

   We determined that the change in the time to boil had minimal impact on the risk evaluation. Using the 115 hours for time to core uncovery, the total conditional core damage probability was reduced from 3.8×10^{-4} to 2.6×10^{-4}.

2. Your staff described three success paths to recover offsite power, and that during the actual event, Entergy Operations, Inc., personnel were successful in establishing a temporary electrical connection between the switchyard and the 4160V safety buses within 4.4 days of the event initiation, contrary to the NRC using 6 days in our preliminary risk analysis. As part of their analysis, your staff developed an estimated probability of successful recovery of ~~approximately~~ 97 percent.

   Comment [gew1]: Delete approximately - actual value of 96.977%

   After reviewing the information that ~~you~~ your staff provided during the regulatory conference, we agreed that the recovery of offsite power was feasible within the time to core uncovery. It is important to note that there was an extended period of time before core uncovery would occur and this was the primary reason that we determined you could recover offsite power with a high chance of success. Accordingly, we determined that a 90 percent probability of success for recovering electrical power best reflects the broader spectrum of possible scenarios that could be present during a station blackout where the environmental conditions would be degraded; fewer personnel would be available to respond based on the escalation of emergency action level classification; and, a higher level of stress would be imposed on those planning, implementing, testing, and approving the new and non-procedural modifications for recovering offsite power. Using this high probability of success, we determined that the risk estimate should be reduced to 6×10^{-5}.

3. Your staff also described a success path to restore power to the borated water recirculation pump for reactor coolant system makeup.

   During the conference, your staff indicated that temporary 480V power could be supplied to the borated water recirculation pump and water could be supplied to the reactor from the borated water storage tank; however, your staff discussed that restoration of the 4160V buses would be the priority because of the varied equipment that could be powered and used to keep the core covered. Although at the regulatory conference, your staff presented power restoration to the borated water recirculation pump ~~this~~ as a potential success path to establishing makeup water to the reactor, they indicated that this option was not evaluated, during the event. ~~As in the three options discussed above,~~ Similar to the

three success paths for recovering offsite power referenced above, temporary power cables would have to be run from an offsite power source into the plant in order to energize the 480V bus associated with the borated water recirculation pump. ~~Similar issues related to station blackout conditions would occur (e.g., lighting, temperature, flood water) and impact those individuals attempting this path to restore power.~~ This evolution would need to be conducted during challenging adverse plant conditions associated with flood water accumulation from a ruptured fire protection header, as well as reduced lighting and elevated room temperatures resulting from a station blackout. These adverse plant conditions in our view, would affect the probability of success in pursuing this this path to provide for reactor coolant system makeup. Consequently, we determined that this was affectively another method of restoring offsite power, so no additional credit was warranted. See Item 2 above for the basis for the estimated risk value of 6×10^{-5}.

In summary, we reduced our Unit 1 preliminary risk assessment to 6×10^{-5} (Yellow) because we determined a high likelihood of success (90 percent) existed for recovering electrical power based on the time available to complete those actions prior to core uncovery.

Unit 2

Your staff stated during the regulatory conference, that there were three methods of restoring vital power to risk-important equipment that were not credited by the NRC in the preliminary significance determination:

1. Your staff ~~described~~ indicated that Switchgear 2A2, while not powered throughout the event, was always capable of being restored via the Startup 2 transformer. Additionally, your staff stated that changes in your probabilistic risk model of record were made to account for operator actions specifically related to the load shed breakers on 4160V Bus 2A2. This change added a non-recovery probability for operators to manually manipulate the breakers should they fail to operate automatically.

   We reviewed the NRC's ~~SPAR~~standardized plant analysis risk model and determined that operators aligning Bus 2A2 to offsite power (Startup 2 transformer) and the human error probability of operators failing to align 4160V Bus 2A2 to offsite power under conditions following the stator drop were already incorporated into our preliminary significance determination. The environmental conditions of debris and water surrounding the switchgear area after the load drop event and the increased stress level of operations personnel could complicate recovery. Taking these factors into account would increase the probability of non-recovery of 4160V Bus 2A2. Therefore, we determined that no additional reduction of the human error probability ~~to the preliminary significance determination for additional~~ recovery of 4160V Bus 2A2 ~~or the~~involving manual action to manipulate the associated load shed breakers, relative to the human error probability used in our preliminary significance determination, was warranted.

2. Your staff ~~described~~indicated that the alternate ac diesel generator and the 4160V Bus 2A9 supply to Unit 2 buses were damaged, but available throughout the event. Your staff also stated that Unit 2 control room operators would have used the alternate ac diesel generator in the event of a station blackout because they were unaware of any damage to 4160V Bus 2A9.

   We determined that plant staff ~~was~~ were aware of the potential damage to 4160V Bus 2A1,

Comment [gew2]: Leave as is, most likely open is correct, but we don't know any of the details of the changes to the licensee's model.

Comment [gew3]: Need Marc to check this section. I had a hard time determining where all of the edits fit.

located next to Bus 2A9, and operators at both units would have been notified of damage to 4160V Bus 2A9, in accordance with site procedures. This is partly based on the fact that Unit 1 operators were aware of the damage to alternate ac diesel generator output electrical connections to Bus 2A9 for Unit 1, and that Procedure 2104.037, "Alternate AC Diesel Generator Operations," contains a number of steps to notify and coordinate with Unit 1 prior to starting and loading the alternate ac diesel generator. We believe that the Unit 1 operators would have informed the Unit 2 operators of the damage to electrical buses. We further concluded that ~~this would have led to~~ it was reasonable to assume that the Unit 2 operators would have requested an investigation of the bus condition before using the alternate ac diesel generator. We determined that investigation, repair, and/or testing of the bus condition by maintenance personnel would have taken longer than the time to core damage following a postulated station blackout with failure of the turbine-driven emergency feedwater pump. Therefore, no recovery credit was applied to short (1 hour) core damage sequences. However, we did determine that applying recovery credit for 8-hour sequences would reduce the conditional core damage probability to 1.2×10^{-5} (Yellow).

3. Your staff ~~described~~ indicated that the ability to cross-tie vital 4160V Buses 2A3 and 2A4 was available to the operators and not credited in the NRC's preliminary significance determination.

   We determined that the ability to cross-tie the 4160V vital buses would not significantly impact the final results. In the dominant accident sequence, having one energized vital bus was already considered "electrical success," and any additional electrical system recovery to power the opposite vital bus would have a minimal impact on the overall risk assessment result.

In summary, we concluded that our Unit 2 preliminary risk assessment of 2.8×10^{-5} (Yellow) appropriately ~~determined~~ characterized the risk significance of the finding and that the information presented at the regulatory conference did not appreciably change the final risk determination.

Werner, Greg

From: Werner, Greg
Sent: Monday, June 23, 2014 8:53 AM
To: Tannenbaum, Anita
Cc: Werner, Greg; Young, Cale; Melfi, Jim
Subject: Marc's Call with Jeremy Browning and Signing of ANO Final Sig Determination Ltr

Importance: High

Good Morning Again,

Please let me know once Marc has signed the ANO final significance determination letter and when he has completed his call with Jeremy Browning. We have some actions that need to be done after Marc completes both of those tasks.

Thanks,
Greg

C13

Werner, Greg

From: Berger, Lynn
Sent: Tuesday, June 24, 2014 8:24 AM
To: Werner, Greg; Maier, Christi; Browder, Rachel
Subject: Dapas' edits
Attachments: Marc Dapas edits for Stator drop.pdf

C/4

Arkansas Nuclear One Dropped Stator
Final Significance Determination

During the regulatory conference held on May 1, 2014, your staff described ~~your~~ their assessment of the significance of the finding for each unit. Specifically, your staff discussed differences for Units 1 and 2 that existed between the NRC's preliminary significance determination and Arkansas Nuclear One's risk assessment. The differences for each unit were evaluated and are discussed below.

Unit 1

1. Your staff specified a time to boil of 12 hours and a time to core uncovery of 115 hours versus NRC values of 11 hours and 96 hours, respectively.

   We determined that the change in the time to boil had minimal impact on the risk evaluation. Using the 115 hours for time to core uncovery, the total conditional core damage probability was reduced from 3.8×10^{-4} to 2.6×10^{-4}.

2. Your staff described three success paths to recover offsite power, and that during the actual event, Entergy Operations, Inc., personnel were successful in establishing a temporary electrical connection between the switchyard and the safety buses within 4.4 days of the event initiation, contrary to the NRC using 6 days in our preliminary risk analysis. As part of ~~the~~ their analysis, your staff developed an estimated probability of successful recovery of ~~approximately~~ 97 percent.

   After reviewing ~~the~~ information that ~~you~~ your staff provided during the regulatory conference, we agree ~~d~~ that the recovery of offsite power was feasible within the time to core uncovery. It is important to note that there was an extended period of time before core uncovery would occur and this was the primary reason that we determined you could recover offsite power with a high chance of success. Accordingly, we determined that a 90 percent probability of success for recovering electrical power best reflects the broader spectrum of possible scenarios that could be present during a station blackout where the environmental conditions would be degraded; fewer personnel would be available to respond based on the escalation of emergency action level classification; and, a higher level of stress would be imposed on those planning, implementing, testing, and approving the new and non-procedural modifications for recovering offsite power. Using this high probability of success, we determined that the risk estimate should be reduced to 6×10^{-5} (Yellow).

3. Your staff also described a success path to restore power to the borated water recirculation pump for reactor coolant system makeup.

   During the conference, your staff indicated that temporary 480V power could be supplied to the borated water recirculation pump and water could be supplied to the reactor from the borated water storage tank; however, your staff discussed that restoration of the 4160V buses would be the priority because of the varied equipment that could be powered and used to keep the core covered. Although your staff presented ~~this~~ as a potential success path to establishing makeup water to the reactor, they indicated that this option was not evaluated, during the event. ~~As in the three options discussed above~~, temporary power cables would have to be run from an offsite power source into the plant. ~~Similar issues~~

related to station blackout conditions would occur (e.g., lighting, temperature, flood water) and impact those individuals attempting this path to restore power. We determined that this was affectively another method of restoring offsite power, so no additional credit was warranted. See Item 2 above for the basis for the estimated risk value of 6 x 10^{-5}.

In summary, we reduced our preliminary risk assessment to 6 x 10^{-5} (Yellow) because we determined a high likelihood of success (90 percent) existed for recovering electrical power based on the time available to complete those actions prior to core uncovery.

Unit 2

Your staff stated that there were three methods of restoring vital power to risk-important equipment that were not credited by the NRC in the preliminary significance determination:

1. Your staff described that Switchgear 2A2, while not powered throughout the event, was always capable of being restored via the Startup 2 transformer. Additionally, your staff stated that changes in your probabilistic risk model of record were made to account for operator actions specifically related to the load shed breakers on 4160V Bus 2A2. This change added a non-recovery probability for operators to manually manipulate the breakers should they fail to operate automatically.

   We reviewed the NRC's SPAR model and determined that operators aligning Bus 2A2 to offsite power (Startup 2 transformer) and the human error probability of operators failing to align 4160V Bus 2A2 to offsite power under conditions following the stator drop were already incorporated into our preliminary significance determination. The environmental conditions of debris and water surrounding the switchgear area after the load drop event and the increased stress level of operations personnel could complicate recovery. Taking these factors into account would increase the probability of non-recovery of 4160V Bus 2A2. Therefore, we determined that no additional reduction of the human error probability to the preliminary significance determination for additional recovery of 4160V Bus 2A2 of the associated load shed breakers was warranted.

2. Your staff described that the alternate ac diesel generator and the 4160V Bus 2A9 supply to Unit 2 buses were damaged, but available throughout the event. You also stated that Unit 2 control room operators would have used the alternate ac diesel generator in the event of a station blackout because they were unaware of any damage to 4160V Bus 2A9.

   We determined that plant staff was aware of the potential damage to 4160V Bus 2A1, located next to Bus 2A9, and operators at both units would have been notified of damage to 4160V Bus 2A9, in accordance with site procedures. We further concluded that this would have led to an investigation of the bus condition before using the alternate ac diesel generator. We determined that investigation, repair, and/or testing of the bus condition by maintenance personnel would have taken longer than the time to core damage following a postulated station blackout with failure of the turbine-driven emergency feedwater pump. Therefore, no recovery credit was applied to short (1 hour) core damage sequences. However, we did determine that applying recovery credit for 8-hour sequences would reduce the conditional core damage probability to 1.2 X 10^{-5} (Yellow).

indicated

3. Your staff ~~described~~ that the ability to cross-tie vital 4160V Buses 2A3 and 2A4 was available to the operators and not credited in the NRC's preliminary significance determination.

   We determined that the ability to cross-tie the 4160V vital buses would not significantly impact the final results. In the dominant accident sequence, having one energized vital bus was already considered "electrical success", and any additional electrical system recovery to power the opposite vital bus would have a minimal impact on the overall risk assessment result.

In summary, we concluded that our preliminary risk assessment of 2.8 x 10^{-5} (Yellow) appropriately ~~determined~~ the risk significance of the finding and that the information presented at the regulatory conference did not appreciably change the final risk determination.

characterized

with respect to Unit 2

Werner, Greg

From: Young, Cale
Sent: Tuesday, June 24, 2014 10:13 AM
To: R4TSB-AA
Cc: Werner, Greg; Melfi, Jim
Subject: ANO meeting summary supplement
Attachments: ANO Meeting Summary Supplement.docx

Please place the attached meeting summary supplement into concurrence. This meeting summary supplements the previous ANO reg conference meeting summary that is referenced in the letter. If it can be put into ADAMS under the same accession number, that would probably be a good idea. If it has to go in as a separate document, then maybe the two documents can be linked somehow. We are attempting to obtain an electronic copy of the conference transcript, which will be the enclosure to this letter.

Thanks
Cale Young

C15

EA 14-008

Jeremy Browning, Site Vice President
Arkansas Nuclear One
Entergy Operations, Inc.
1448 SR 333
Russellville, AR 72802-0967

SUBJECT: SUPPLEMENT TO THE ARKANSAS NUCLEAR ONE UNIT 1 DROPPED STATOR REGULATORY CONFERENCE MEETING SUMMARY

Dear Mr. Browning:

On May 1, 2014, members of the U.S. Nuclear Regulatory Commission (NRC) staff met with representatives of the Arkansas Nuclear One facility to discuss the apparent violation affecting both units related to the drop of the Unit 1 main generator stator as documented in NRC Inspection Report 05000313;368/2013012, issued on March 24, 2014 (ML14083A409). The focus of the regulatory conference was a discussion on the safety significance of the finding. The discussion included Unit 1 mitigating actions focusing on the use of temporary power to recover the electrical buses and Unit 2 procedural electrical power recovery actions.

In a meeting summary (ML14128A512) issued on May 9, 2014, it was noted that the regulatory conference was transcribed, and that a copy of the transcription would be made available and placed into the NRC's Agencywide Documents Access and Management System (ADAMS). A copy of this transcript is provided as an enclosure to this letter.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's ADAMS. ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (The Public Electronic Reading Room).

Sincerely,

Gregory E. Werner, Chief
Project Branch E
Division of Reactor Projects

Docket Nos.: 50-313, 50-368
License Nos.: DPR-51, NPF-6

Enclosure: ANO Unit 1 Stator Drop Regulatory Conference Transcript

C1U

Electronic distribution by RIV:
Regional Administrator (Marc.Dapas@nrc.gov)
Deputy Regional Administrator (Kriss.Kennedy@nrc.gov)
Acting DRP Director (Troy.Pruett@nrc.gov)
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ROPreports

DOCUMENT NAME: R: Reactors\ANO\2014\ANO Meeting Summary supplement
ADAMS ACCESSION NUMBER: [*Accession Number*]

SUNSI Rev Compl.	☐Yes ☐ No	ADAMS	☑Yes ☐ No	Reviewer Initials	JFM1
Publicly Avail.	☐Yes ☐ No	Sensitive	☐Yes ☐ No	Sens. Type Initials	JFM1

PE:DRP/E	BC:DRP/E				
JMelfi	GWerner				

OFFICIAL RECORD COPY

Werner, Greg

From: Martin, Barbara
Sent: Friday, June 27, 2014 11:36 AM
To: Young, Cale
Subject: FW: Corrected Nuclear Regulatory Conference with Entergy Operations, Inc. - Job No. 18996
Attachments: Nuclear Regulatory Conference with Entergy Operations, Inc. Cond.pdf; Nuclear Regulatory Conference with Entergy Operations, Inc.pdf; Nuclear Regulatory Conference with Entergy Operations, Inc..ptx

Importance: High

fyi

From: Martin, Barbara
Sent: Friday, June 27, 2014 10:33 AM
To: Melfi, Jim
Cc: Werner, Greg
Subject: FW: Corrected Nuclear Regulatory Conference with Entergy Operations, Inc. - Job No. 18996
Importance: High

Jim,

Here is the corrected copy of the transcript from the May 1 meeting.

Barbara

From: Merit Court Reporters Production Department [mailto:production@merittexas.com]
Sent: Monday, June 09, 2014 12:16 PM
To: Martin, Barbara
Subject: Corrected Nuclear Regulatory Conference with Entergy Operations, Inc. - Job No. 18996

As requested, attached please find your corrected e-transcript and PDF copy of the Nuclear Regulatory Conference with Entergy Operations, Inc. taken on May 1, 2014.

If we can be of further assistance, please let us know.

TO OPEN THE .PTX TRANSCRIPT: Download the free RealLegal E-Transcript Viewer from the following location: http://www.reallegal.com/software.asp Each RealLegal E-Transcript includes built-in virus protection as well as condensed and word index printing capabilities.

Thank you.

Kay Cole
Production Coordinator

Merit Court Reporters LLC
Production Department
817-336-3042
production@merittexas.com

C17

Werner, Greg

From: Young, Cale
Sent: Friday, June 27, 2014 12:37 PM
To: Lackey, Dana
Cc: Melfi, Jim; Martin, Barbara; Werner, Greg
Subject: RE: ANO meeting summary supplement
Attachments: FW: Corrected Nuclear Regulatory Conference with Entergy Operations, Inc. - Job No. 18996

Here are the files for the enclosure. There are two pdf files, and a third attachment with a "ptx" extension. I don't know what that third one is. Does not appear to be a usable file. Maybe just go with the two pdfs. Thanks!

From: Lackey, Dana
Sent: Wednesday, June 25, 2014 2:09 PM
To: Young, Cale
Subject: RE: ANO meeting summary supplement

Ok, thanks Cale!

From: Young, Cale
Sent: Wednesday, June 25, 2014 1:55 PM
To: Lackey, Dana; Holder, Phyllis; R4TSB-AA; Werner, Greg; Melfi, Jim
Subject: RE: ANO meeting summary supplement

We are working on obtaining an electronic version of the transcript to be enclosed. I've been advised that we may be able to get it on Friday. Will let you know.

From: Lackey, Dana
Sent: Tuesday, June 24, 2014 1:32 PM
To: Holder, Phyllis; Young, Cale; R4TSB-AA; Werner, Greg; Melfi, Jim
Subject: RE: ANO meeting summary supplement

Cale, this would need to be a new ADAMS number since the other doc has been declared. I'm thinking it could be packaged with the previous summary, which would cross-reference the documents.
Also, the transcript enclosure is not attached:)

Please advise..thanks!

Dana

From: Holder, Phyllis
Sent: Tuesday, June 24, 2014 1:25 PM
To: Young, Cale; R4TSB-AA; Werner, Greg; Melfi, Jim
Subject: FW: ANO meeting summary supplement

Hi Dana,

c/8

Please review, edit, and prepare for concurrence the attached ANO Meeting Summary Supplement.

Thank you,

Phyllis

From: Young, Cale
Sent: Tuesday, June 24, 2014 10:13 AM
To: R4TSB-AA
Cc: Werner, Greg; Melfi, Jim
Subject: ANO meeting summary supplement

Please place the attached meeting summary supplement into concurrence. This meeting summary supplements the previous ANO reg conference meeting summary that is referenced in the letter. If it can be put into ADAMS under the same accession number, that would probably be a good idea. If it has to go in as a separate document, then maybe the two documents can be linked somehow. We are attempting to obtain an electronic copy of the conference transcript, which will be the enclosure to this letter.

Thanks
Cale Young

Werner, Greg

From: Werner, Greg
Sent: Monday, July 07, 2014 7:58 AM
To: Miller, Geoffrey; Loveless, David
Cc: Circle, Jeff; Tindell, Brian; Young, Matt; Fairbanks, Abin; Werner, Greg; Young, Cale; Melfi, Jim
Subject: Revised Responses to ANO Questions on Final Significance Determination Letter
Attachments: Responses to ANO final significance questions.docx

Importance: High

Geoff and David,

In talking with Cale last Thursday afternoon, I know he was working with you both to come up with answers to questions posed by ANO on the final significance determination letter. I modified his responses to the questions slightly. I'm checking with Troy to see when he needs our responses back to him so he can call ANO.

Greg

C19

Responses to Licensee Questions re: Stator Drop Final Significance Determination

Refer to marked excerpts from Enclosure 2 of final significance letter:

1. Page 1 highlighted excerpt. We believe the licensee is asking: how would each of the three aspects indicated, associated with a postulated SBO condition, be different than the conditions that actually existed for the event?

- Degraded environmental conditions: ~~We are not saying that~~ the environmental conditions associated with an SBO condition ~~would necessarily~~could be worse than the conditions that existed associated with the event that occurred ~~(aside from maybe lack of lighting??)~~- lack of lighting, HVAC not working, and other support systems not available. We are saying that the condition of interest in the analysis would be an SBO in which structural damage to the turbine building and affected systems/components would complicate the recovery actions. For example, due to increased urgency if the EDGs would not have functioned during the event, cables to restore offsite power would have been routed through the plant area (structures and components) that had been damaged due to the event, presenting additional challenges.
- Fewer personnel available for response: Additional otherwise-available personnel/resources would be dedicated to restoring/recovering EDGs during an SBO scenario. If a station blackout existed for longer than 15 minutes, then the EAL classification would have been an SAE, resulting in many people that were available during this event, not being available because of accountability requirements. This would be an additional complication/condition that would require personnel resources.
- Higher level of stress on personnel implementing actions: If the EDGs had not functioned during the event, the stress level imposed on those personnel involved with attempted recovery of power would be higher due to increased urgency to recover some kind of electrical power before the onset of core damage.

2. Page 2 highlighted excerpt in top paragraph references flood water accumulation as being a challenging factor for the activity of providing temporary cables to restore power to a 480V bus that supplies the borated water recirculation pump. We believe the licensee is stating that there was no internal flood water accumulation in the specific area that would affect this activity.

Our statement is not suggesting that there would be direct flood water accumulation in the specific area of this activity, but rather that this postulated activity would have to be conducted in the face of applicable challenging adverse plant conditions that were a result of fire protection header internal flooding in various (other) area(s) of the plant. The flood water accumulation need not be in that specific immediate area in order to cause adverse challenging plant conditions that would affect the accomplishment of the activity. As with any event, the ERO is challenged as conditions in the plant deteriorate. This requires the ERO to shift focus from the main concern and has to assess, prioritize, and make plans to address/correct multiple issues during the event.

3. Page 2 Unit 2 #1 highlighted phrase states that Switchgear 2A2 was not powered throughout the event. The licensee is stating that this switchgear was actually restored within a couple of hours.

We did not locate any objective evidence to support or refute the veracity of the statement. Geoff Miller searched through his records based on station log entries during the event. We do not believe we have any record that tells us when/if this bus was restored within the time frame claimed by the licensee. The letter indicates that we did give them recovery credit, so whether the bus was actually restored in short order or not does not matter to the analysis result.

4. Page 2 Unit 2 #1 second paragraph. We believe the licensee is stating that they do not believe the NRC modeled the recovery of Bus 2A2 appropriately. Specifically, the letter states that environmental conditions of debris and water in the switchgear area would complicate the recovery actions. The licensee is stating that recovery actions would be actions taken from the main control room, and would thus not be affected by environmental conditions. This recovery credit would make a difference in the risk result.

Given that operators knew that switchgear in the area of 2A2 was degraded/damaged and that internal flood water was in the area, we do not believe that operators would have taken actions (from the control room or otherwise) to restore the bus, without first doing some assessment as to the condition of the electrical equipment, including opening panels, checking for water intrusion, etc. Therefore, the restoration/recovery was complicated by adverse environmental conditions even though the actions would be taken from the control room.

5. Page 3 #3 highlighted sentence states that the ability to cross-tie Buses 2A3 and 2A4 would not significantly impact the final results of the analysis. The license is stating that this would significantly impact the risk results.

In the letter, we explain that having *either* bus energized was considered "electrical success" in the analysis. In our model, there was no dominant core damage sequence where it would matter whether the buses could be tied together. Therefore, the ability to tie them together *would not* have an appreciable impact on the overall risk result. In order to answer the licensee question, we may need to know why they believe it *would* make a difference.

Werner, Greg

From: Werner, Greg
Sent: Monday, July 07, 2014 9:09 AM
To: Loveless, David; Miller, Geoffrey
Cc: Circle, Jeff; Tindell, Brian; Young, Matt; Fairbanks, Abin; Young, Cale; Melfi, Jim
Subject: RE: Revised Responses to ANO Questions on Final Significance Determination Letter

I spoke with David and the writeup is accurate. We stated "that switchgear **in the area** of 2A2 was degrade/damaged." The breaker that blew up was in the vicinity of Bus 2A2.

From: Loveless, David
Sent: Monday, July 07, 2014 8:51 AM
To: Werner, Greg; Miller, Geoffrey
Cc: Circle, Jeff; Tindell, Brian; Young, Matt; Fairbanks, Abin; Young, Cale; Melfi, Jim
Subject: RE: Revised Responses to ANO Questions on Final Significance Determination Letter

Our response to Item 4 is wrong. Bus 2A2 was **not** degraded or damaged. It was in the area that had flood waters in the area.

I would add that we liberally credited recovery of Bus 2A2 (4×10^{-3}) given the water in the environment and its effect on Bus 2A1.

From: Werner, Greg
Sent: Monday, July 07, 2014 7:58 AM
To: Miller, Geoffrey; Loveless, David
Cc: Circle, Jeff; Tindell, Brian; Young, Matt; Fairbanks, Abin; Werner, Greg; Young, Cale; Melfi, Jim
Subject: Revised Responses to ANO Questions on Final Significance Determination Letter
Importance: High

Geoff and David,

In talking with Cale last Thursday afternoon, I know he was working with you both to come up with answers to questions posed by ANO on the final significance determination letter. I modified his responses to the questions slightly. I'm checking with Troy to see when he needs our responses back to him so he can call ANO.

Greg

Werner, Greg

From:	Beckford, Kaydian
Sent:	Tuesday, July 01, 2014 4:01 PM
To:	Casey, Lauren
Cc:	Kennedy, Kriss; Clark, Jeff; Werner, Greg; Bloodgood, Michael; Browder, Rachel; Hilton, Nick; Sanders, Carleen; Circle, Jeff; Mitman, Jeffrey; Glitter, Joseph; Weerakkody, Sunil; Montecalvo, Michael; Deese, Rick; Pruett, Troy; Vegel, Anton; Loveless, David; Campbell, Vivian; Wray, John
Subject:	EA-14-008-3, Entergy Operations, Inc., Arkansas Nuclear 1 & 2

Please follow the ADAMS link below for the distribution of EA-14-008-3.

View ADAMS P8 Properties ML14182A705
Open ADAMS P8 Document (EA-14-008-3, Entergy Operations, Inc., Arkansas Nuclear 1 & 2)

Thanks,

Kaydian N. Beckford,
Administrative Assistant to Roy Zimmerman
Office of Enforcement
Location/*Mailstop: *O-4A15A
Office #: (301)415-2741
Fax: (301)415-3431

Reduce your footprint. Print wisely.

C/11

EA Number: EA-2014-008

Case Information:

EA Number: EA-2014-008 **Status:** Open

Initiator: REGION IV **HQ Enf. Specialist/Coordinator:** Lauren Casey **Regional Enf. Specialist:** Rachel Browder **Regional Backup Specialist:** Christi Maier

Regional Division: DRP **Regional Contact:** Greg Werner **Date of Violation:** 03/31/2013 **Enforcement Type:** SDP

Pending Escalated Action: Yes **Timeliness Start Date:** 02/5/2014 **Timeliness Based On:** Inspection **Count in Timeliness Report:** Yes

License Type: Operating Reactor **License Number:** DRP-51 **Short Description:**
10 CFR 50, Appendix B, Criterion V failure to adequately review lifting rig calculation and load test, which resulted in Unit 1 main generator stator drop and damage to offsite power

Docket No. 05000313 **License Name:** Entergy Operations, Inc. **Plant Name:** Arkansas Nuclear 1

Docket No. 05000368 **License Name:** Entergy Operations, Inc. **Plant Name:** Arkansas Nuclear 2

Note Outside Organization associated with this case. Click here to add.

Facts:

10 CFR 50, Appendix B, Criterion V failure to adequately review lifting rig calculation and load test, which resulted in Unit 1 main generator stator drop and damage to offsite power.

Web Summary:

Actions - 1

Panel

Action Information:

Panel Number: 3

Region Participants: R. Deese, K. Kennedy, T. Pruett, J. Clark, T. Vegel, G. Werner, D. Loveless, M. Bloodgood, V. Campbell, R. Browder

OE Participants: L. Casey, N. Hilton, R. Zimmerman, J. Wray

Program Office Participants: C. Sanders, S. Morris, J. Circle, M. Reisifard, J. Mitman, J. Demers, J. Glitter, S. Wong, M. Montecalvo, S. Weerakkody, P. Barnford

Last Updated By: Browder, Rachel on 06/2/2014

Activities:

OE Approval :

Approved by: L. Casey
OE Approval: 07/1/2014

Last Updated By: Casey, Lauren on 07/1/2014

Panel Held :

Date: 05/29/2014

Last Updated By: Casey, Lauren on 05/30/2014

Strategy Form :

Strategy Form Number: 1

Violation Number: B

Violation: Part 50, Appendix B, Criterion V - Instructions, Procedures, and Drawings

Specific Issue (Violation) Description:
Title 10 of the Code of Federal Regulations (CFR) Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," states in part that "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures or drawings." Quality procedure EN-MA-119, "Material Handling Program," Section 5.2[7], "Temporary Hoisting Assemblies," Step (a) states, in part, that vendor

supplied temporary overhead cranes or supports, winch-driven hoisting or swing equipment, and other assemblies are required to be designed or approved by engineering support personnel. The design is required to be supported by detailed drawings, specifications, evaluations, and/or certifications. Quality procedure EN-MA-119, "Material Handling Program," Section 5.2[7], "Temporary Hoisting Assemblies," Step (b) states, in part, that the assembly shall be designed for at least 125 percent of the projected hook load and should be load tested and held for at least five minutes at 125 percent of the actual load rating before initial use. The assembly shall be load tested in all configurations for which it will be used. Contrary to the above, on March 31, 2013, the licensee did not accomplish the stator lift and move, an activity affecting quality, as prescribed by documented instructions and procedures. Specifically: a. The licensee approved a design for the temporary hoisting assembly that was not supported by detailed drawings, specifications, evaluations, and/or certifications. In addition, the temporary hoisting assembly was not designed for at least 125 percent of the projected hook load. The licensee failed to identify the load deficiencies in vendor Calculation 27619-C1 "Heavy Lift Gantry Calculation" and the incorrectly sized component in the north tower structure of the temporary hoisting assembly. b. The licensee failed to perform a load test in all configurations for which the temporary hoisting assembly would be used. As a result, on March 31, 2013, while lifting and transferring the main generator stator, the temporary overhead crane collapsed, causing the 525-ton stator to fall on and extensively damage portions of the plant, including safety-related equipment.

Date of Violation: 03/31/2013

[redacted]

[redacted]

SDP?: Yes

Cornerstone: Initiating Events

NOV: Yes

SL/Significance: Yellow

Considering CP or Enforcement Order?: No

[redacted]

CP?: No CP

[redacted]

[redacted]

Next Action: Issue Escalated NOV

Next Action Review: Program Office Concurrence Required

Other Action(s): Both OE and NRR will review and concur on the final action.

Remarks:

The panel discussed the qualitative factors involved in determining the final significance determination for Unit 2 and agreed that the qualitative factors supported a Yellow finding. The panel agreed with the region's recommendation to issue a Yellow final significance determination for Unit 1 and a Yellow final significance determination for Unit 2.

Last Updated By: Casey, Lauren on 05/30/2014