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2CAN081202

August 14, 2012

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Request for Extension of Enforcement Discretion
Arkansas Nuclear One – Unit 2
Docket No. 50-368
License No. NPF-6

References:

1. Entergy letter dated March 27, 2012, "License Amendment Request to Adopt NFPA-805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition)" (2CAN031201) (ML 12087A113)

2. NRC letter dated May 25, 2012, "Supplemental Information Needed for Acceptance of Requested Licensing Action Re: License Amendment Request to Adopt National Fire Protection Association Standard 805" (TAC No. ME8282) (ML 121380395) (2CNA051202)

3. Entergy letter dated July 10, 2012, "Supplemental to License Amendment Request to Adopt NFPA-805 Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition)" (2CAN071202)

4. NRC letter dated July 28, 2011, "Arkansas Nuclear One, Units 1 and 2 – Commitment to Submit a License Amendment Request to Transition to 10 CFR 50.48(c), National Fire Protection Association Standard NFPA 805, and Request to Extend Enforcement Discretion" (TAC Nos. ME6691 and ME6692) (ML 112030193) (0CNA071107)

5. Staff Requirements Memorandum SECY-12-0031, "Enforcement Alternatives for Sites that Indicate Additional Time Required to Submit Their License Amendment Requests to Transition to 10 CFR 50.48(c) National Fire Protection Association Standard 805," dated February 24, 2012 (ML12025A349)

Dear Sir or Madam:

By letter dated March 27, 2012 (Reference 1), Entergy Operations, Inc. (Entergy) proposed to amend Renewed Facility Operating License No. NPF-6 for Arkansas Nuclear One, Unit 2 (ANO-2). This letter requested Nuclear Regulatory Commission (NRC) review and approval for adoption of a new fire protection licensing basis which complies with the requirements in 10 CFR 50.48(a), 10 CFR 50.48(c), and the guidance in Regulatory Guide 1.205, "Risk-Informed Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants." The letter described the methodology used to demonstrate compliance with, and transition to, National Fire Protection Association 805, and includes regulatory evaluations, probabilistic risk assessment, change evaluations, proposed modifications for non-compliances, and supporting attachments.

By letter dated May 25, 2012 (Reference 2), the NRC informed Entergy that supplemental information would be required to support completion of the NRC's acceptance review.

A draft of the supplemental information was presented to NRC staff members during public meetings held June 12 and 13, 2012, and June 29, 2012. A follow-up call with members of the NRC staff also occurred on July 2, 2012, where the NRC requested documentation of Entergy's intent to address fire modeling revisions that would further support the requested supplemental information. As a result, discussion related to future fire modeling revisions was provided with the supplemental information, including a regulatory commitment to provide additional information by November 2, 2012.

Based on the above meetings and communications, Entergy submitted the supplemental information on July 10, 2012 (Reference 3). By teleconference on August 9, 2012, the NRC informed Entergy that, based on the need for additional information to allow NRC to complete its review of the ANO-2 license application request, the NRC could not complete the acceptance review at this time. Because the acceptance review cannot be completed, an extension of enforcement discretion previously granted for ANO-2 fire protection issues (Reference 4) is necessary. Given that additional time is required to understand the NRC concerns and incorporate an acceptable response into a revised submittal, Entergy requests an extension of enforcement discretion for fire protection issues until July 15, 2013.

Entergy commits to submit an ANO-2 License Amendment Request (LAR) implementing 10 CFR 50.48(c) prior to July 15, 2013 (see Enclosure 2 of this letter). Per the enforcement discretion policy, once the request is submitted and accepted, the enforcement discretion would then continue until the NRC dispositions the LAR.

By letter dated May 25, 2012 (Reference 2), the NRC outlined justification that would be required for an extension of enforcement discretion should Entergy be unable to provide sufficient supplemental information in a timely fashion that would support NRC acceptance of the LAR. Enclosure 1 to this letter contains information necessary to meet the Reference 2 requirements for enforcement discretion application.

Entergy requests the NRC issue a Confirmatory Order approving the requested enforcement discretion extension for ANO-2 as permitted by Reference 5.

Should you have any questions concerning this letter, or require additional information, please contact Stephenie Pyle at 479-858-4704.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on August 14, 2012.

Sincerely,

ORIGINAL SIGNED BY CHRISTOPHER J. SCHWARZ

CJS/dbb

Enclosures:

1. Enforcement Policy Requirements for Fire Protection Issues – 10 CFR 50.48(c)
2. List of Regulatory Commitments

cc: Mr. Elmo E. Collins
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Enclosure 1 to

2CAN081202

Enforcement Policy Requirements for Fire Protection Issues – 10 CFR 50.48(c)

Enforcement Policy Requirements for Fire Protection Issues – 10 CFR 50.48(c)

In accordance with Section 9.1, "Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," of the NRC Enforcement Policy, dated July 12, 2011, and NRC letter to Entergy Operations, Inc. (Entergy) dated May 25, 2012, “Supplemental Information Needed for Acceptance of Requested Licensing Action Re: License Amendment Request to Adopt National Fire Protection Association Standard 805” (ML 121380395), Entergy is providing the following justification in support of extending the current enforcement discretion period for fire protection issues for Arkansas Nuclear One, Unit 2 (ANO-2) as described in the cover letter to this Enclosure. The required information stated below is excerpted from the aforementioned NRC letter dated May 25, 2012. Key information associated with Entergy’s NFPA 805 transition process is included in italics.

1. Schedule of the key transition activities and major milestones for achieving the proposed new date including:

   a. The preliminary design of specific plant modifications used to reduce site risk.

      The preliminary design of specific plant modifications that are necessary to support the ANO-2 transition to NFPA 805 is included in Attachment 1 of this Enclosure. This information was previously presented to the NRC as described in the cover letter to this Enclosure. Physical modifications are generally in the scoping phase at this time; however, the modification design phase includes verification by key ANO NFPA 805 project team personnel to ensure the final design meets the risk-based requirements credited in the ANO-2 NFPA 805 transition process.

   b. Identification of all required NFPA 805 operator recovery actions.

      Operator recovery actions are provided in Attachment 2 of this Enclosure. This information was previously presented to the NRC as described in the cover letter to this Enclosure. Although some unscreened scenarios have not yet been resolved, the ANO-2 NFPA 805 transition process is not expected to identify any additional operator recovery actions will be required.

   c. Identification of all the NFPA 805 recovery action risk.

      Recovery action risk is included in Attachment 3 of this Enclosure. This information was previously presented to the NRC as described in the cover letter to this Enclosure. The risk associated with these recovery actions is conservatively calculated within the context of the Fire Area in which they are credited.

   d. Completion of the subsequent fire risk evaluations, sensitivity analyses, and formulation of the LAR.

      The fire risk evaluations and any necessary sensitivity analyses have been completed. The open items recently identified by the NRC with regard to the ANO-2 NFPA 805 submittal are not expected to require changes to the fire risk evaluations or sensitivity analyses. However, the scope of the open items is not yet clearly understood.

In light of the above, Entergy expects to submit the ANO-2 LAR by July 15, 2013. To account for unforeseen circumstances that may arise over this time period that could have a significant, currently undefined impact on the timing of the ANO-2 LAR. Therefore, Entergy requests an extension of enforcement discretion until July 15, 2013. Nevertheless, Entergy intends to submit the ANO-2 LAR as soon as possible, based on continuing interface with NRC personnel to support this effort.

2. Transition status should also identify and describe the additional progress that will be made in the following areas between the original ANO-2 LAR submittal date and the proposed new submittal date:

   a. Classical fire protection transition.

   b. Nuclear safety performance criteria transition.

   c. Defining and installing transition modifications.

   A summary of the ANO-2 NFPA 805 transition schedule over the requested enforcement discretion extension period is provided in Attachment 4 of this Enclosure. Note that the uncertainties described above and accommodation of the ANO-1 NFPA 805 submittal can affect the schedule. Issues that have been raised on ANO-2 will need to be addressed for ANO-1 and will be resolved separately. The schedule is continuously updated to reflect necessary changes in start and finish dates and to reflect current plans.

The aforementioned May 25, 2012, NRC letter also requested Entergy ensure the following transition-related information remains available, on-site, for NRC staff review:

   a. Listing of all fire protection-related non-compliances and the related compensatory measures for those non-compliances.

   b. Documentation ensuring each Operator Manual Action put in place as a compensatory measure is feasible and reliable, in accordance with the guidance in Regulatory Issue Summary 2005-07, "Compensatory Measures to Satisfy the Fire Protection Program Requirements," dated April 19, 2005 (ADAMS Accession No. ML042360547).

   c. A description of the physical modifications performed, if any, to address existing fire protection issues and non-compliances.

   The above information is available, on-site, for NRC staff review.

Attachments

1. ANO-2 NFPA 805 Modifications
2. ANO-2 NFPA Operator Recovery Actions
3. ANO-2 Recovery Action Risk
4. ANO-2 Transition Status

Attachment 1

ANO-2 NFPA 805 Modifications

S. Plant Modifications and Items to be Completed During Implementation

Table S-1, Plant Modifications, provided below includes a description of the modifications along with the following information:

- A problem statement,
- Risk ranking of the modification,
- An indication if the modification is currently included in the FPRA,
- Compensatory measure in place, and
- A risk-informed characterization of the modification and compensatory measure.

The following ranking legend should be used when reviewing the table:

- High = Modification which would have an impact on FPRA and affect multiple Fire Areas.
- Med = Modification which would have an impact on FPRA and affect individual Fire Areas, or include IN 92-18 modifications.
- Low = Modification which would have no or insignificant impact on risk.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-1	Med (PRA)	2	In Fire Area HH, a separation issue was identified on the EFW valves 2CV-1026-2 and 2CV-1076-2. During a fire induced circuit failure the feedwater valves may be impacted by a fire in Fire Zone 2096-M. LAR Source: Attachment C (NEI-04-02 Table B-3) Section for EFW Valves 2CV-1026-2 and 2CV-1076-2 in Fire Area HH Risk Summary	ANO plans to relocate interposing relays and affected cables associated with 2CV-1026-2 and 2CV-1076-2 from Fire Area HH, Fire Zone 2096-M, to the adjacent room in Fire Area G, Fire Zone 2098-C. Circuits for 2CV-1026-2 and 2CV-1076-2 are currently routed through Fire Area G and no new impacts will be generated by this modification.	Yes	Yes	This modification is specifically credited from a PRA perspective. Modification reduces the risk in Fire Area HH of a fire induced circuit failure for EFW valves 2CV-1026-2 and 2CV-1076-2 in Fire Zone 2096-M. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-2	High (PRA)	2	In Fire Area JJ, a separation issue was identified that impacts the DC power cables control wiring on both trains. If a fire event occurred, this could result in the loss of equipment that would otherwise be available. Additional considerations are potential spurious operations at switchgear 2A-3 that may result in a loss of power to the safety bus. Switchgear/ EFW Valves / LAR Source: Attachment C (NEI-04-02 Table B-3) VFDR(s) 2A-3 — JJ-04 2A-308 — JJ-04 2A-309 — JJ-04 2CV-1036-2 — JJ-01 2CV-1075-1 — JJ-01 Attachment C (NEI-04-02 Table B-3) Fire Area JJ Risk Summary components: 2A-3, 2A-308, 2A-309, 2A-310, 2B-6, 2CV-1036-2, 2CV-1075-1, 2CV-4816, and 2CV-4817.	ANO plans to modify the circuits as described to eliminate impacts in Fire Area JJ associated with these components. 2A-3, 2A-308, 2A-309, and 2A-310 – The red train 125V DC panel 2D-23 that supplies control power for 2A-3 and 2B-5 is planned for relocation to Fire Area MM from Fire Area JJ. Control power cables are planned to be rerouted using embedded conduits from Fire Area MM to Fire Area II to avoid Fire Areas JJ and SS. This allows post-fire control of 2A-3 bus from the control room. 2CV-1036-2 – Auxiliary relays 2CR1036A, B, C, and D are currently installed in MCC 2B-61 and are planned to be relocated to MCC 2B-63. This would eliminate cables that are routed through Fire Area JJ associated with this valve. This eliminates a loss of 2CV-1036-2 due to a fire in Fire Area JJ. *(continued)*	Yes	Yes	This modification is specifically credited from a PRA perspective and affects multiple fire areas. The modification limits the risk of a potential spurious operation and a loss of DC power to safety bus for switchgear 2A-3 due to a fire induced circuit failure. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-2				2CV-1075-1 – The reroute of DC control power to bus 2A-3 and load-center 2B-5 listed above assures MCC 2B-53 remains available to power this valve. Control cables from 2C-17 to MCC 2B-53 are planned to be rerouted using an embedded conduit between Fire Area G and II to avoid Fire Areas JJ, SS, and TT. New dedicated fuses are planned to be installed in 2C-17 for 2CV-1075-1 control relays so that failure of cables in scheme 2S113 will not impact 2CV-1075-1. 2B-6 – Cables are planned to be rerouted to control room panel 2C33-2 from 2B-6 using an embedded conduit between Fire Zone 2100-Z to the cable spreading room Fire Area G. This eliminates an impact in Fire Area JJ. 2CV-4816 & 2CV-4817 – A reroute of cable 2I016N is planned by using embedded conduit C4080 that is located between Fire Area G (cable spreading room) to Fire Area EE-L. Cable 2I016N is also planned to be separately fused in panel C-09 to prevent failure due to a loss of cable 2I016P. This eliminates circuit impacts in Fire Areas TT, JJ, and EE-U.			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-3	High (PRA)	2	In Fire Area MM, fire induced circuit failure could impact DC power cables feeding circuit breakers at switchgear 2A-1, 2A-2, 2H-1, and 2H-2. The failure of 2A-1 and 2A-2 could prevent alignment to an offsite power source. The failure of 2H-1 and 2H-2 could prevent tripping the reactor coolant pumps (RCPs) from the control room. Switchgear / LAR Source: Attachment C (NEI-04-02 Table B-3) VFDR(s) 2A-1: JJ-04 2H-1: JJ-03, MM -04, SS-03 2H-2: JJ-03, MM -04, SS-03 Attachment C (NEI-04-02 Table B-3) globally credits DC power modification to 2A-1, 2A-2, 2H-1, and 2H-2 in the performance based Risk Summary for all fire areas.	ANO plans to install backup DC control power to switchgear 2A-1, 2A-2, 2H-1 and 2H-2 with automatic transfer capability in the event the normal DC control power source is lost. The new backup DC power source will be located completely within Fire Area B-2 in proximity to the switchgear either on elevation 372' or below at elevation 354'. This eliminates impacts to switchgear DC control power due to a fire in any other ANO-2 fire area and allows tripping of the RCPs in those areas. Inclusive in this modification will be changes to the control power circuits for switchgear 2H-1 and 2H-2 to allow tripping the RCPs in a scenario where a fire originates internally to a switchgear cubicle. This design will prevent fire damage to a load cubicle from disabling the ability to trip the line breakers and remove power to the RCPs. The opposite scenario where fire damages the line breakers would not prevent the RCP load breakers from being tripped. This modification will require the line and load breakers to be separately fused and fed as described: *(continued)*	Yes	Yes	This modification is specifically credited from a PRA perspective and affects multiple fire areas. Modification to install an alternate DC power source reduces the risk of a fire induced circuit failure to the DC power cables feeding RCP circuit breakers 2H-1 and 2H-2 which could prevent tripping the RCPs from the control room. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-3				2H-1 – Internal DC control wiring jumpers will be removed to isolate the line and load cubicles. The DC control power for line breakers 2H-13, 2H-14, and 2H-15 will be isolated from the DC control power for the load breakers 2H-10, 2H-11, and 2H-12. 2H-2 – Internal DC control wiring jumpers will be removed to isolate the line and load cubicles. The DC control power for line breakers 2H-23, 2H-24, and 2H-25 will be isolated from the DC control power for the load breakers 2H-20, 2H-21, and 2H-22.			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-4	High (PRA)	2	In Fire Area TT, a separation issue was identified that impacts the power cables for EFW, chemical and volume control system (CVCS), and service water (SW) components 2B-5, 2CV-0789-1, 2CV-1036-2, 2CV-1075-1, 2CV-4816, 2CV-4817, and 2P-7B in the fire PRA model. EFW/ CVCS/SW Components — LAR Source: Attachment C (NEI-04-02 Table B-3) VFDR(s) 2CV-1036-2 — TT-01 2CV-1075-1 — TT-01 2P-7B — TT-01 2CV-0789-1 — TT-01 2CV-4816 — TT-02 2CV-4817 — TT-02 2B-5 — TT-03 Note: This modification is also discussed in Item S1-2 for Fire Area JJ. Modification resolves impacts in both fire areas.	ANO plans to modify the circuits as described to eliminate impacts in Fire Area TT associated with these components. 2CV-1036-2 – Auxiliary relays 2CR1036A, B, C, and D are currently installed in MCC 2B-61 and are planned to be relocated to MCC 2B-63. This would also eliminate cables that are routed through Fire Area TT associated with this valve. This eliminates a loss of 2CV-1036-2 due to a fire in Fire Area TT. 2CV-1075-1 – Cables for this valve between panels 2C-39 to 2C-17 that are currently routed through Fire Area TT are planned to be rerouted to remain exclusively in the cable spreading room. Control cables from 2C-17 to MCC 2B-53 are planned to be rerouted using an embedded conduit between Fire Area G and II to avoid Fire Areas JJ, SS, and TT. New dedicated fuses are planned for installation in 2C-17 for 2CV-1075-1 control relays so that failure of cables in scheme 2S113 will not impact 2CV-1075-1. *(continued)*	Yes	Yes	This modification is specifically credited from a PRA perspective and affects multiple fire areas. The modification reduces the risk of a fire induced circuit failure for EFW/CVCS/SW components and power cables (2B-5, 2CV-0789-1, 2CV-1036-2, 2CV-1075-1, 2CV-4816, 2CV-4817, and 2P-7B) in Fire Area TT. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-4				2P-7B – Cables for this pump between panels 2C-39 to 2C-17 that are currently routed through Fire Area TT are planned to be rerouted to remain exclusively in the cable spreading room. New conduits are also planned to be installed. 2CV-0789-1 – Cables for this valve between panels 2C-39 to 2C-17 that are currently routed through Fire Area TT are planned to be rerouted to remain exclusively in the cable spreading room. Control cables from 2C-17 to MCC 2B-53 are planned to be rerouted using an embedded conduit between Fire Area G and II to avoid Fire Areas JJ and SS. 2CV-4816 & 2CV-4817 – A reroute of cable 2I016N is planned by using embedded conduit C4080 that goes between Fire Area G (cable spreading room) to Fire Area EE-L. Cable 2I016N is also planned to be separately fused in panel C-09 to prevent failure due to a loss of cable 2I016P of cable. This eliminates circuit impacts in Fire Areas TT, JJ, and EE-U. *(continued)*			2B-5 – Cables for this load center between panels 2C-39 to 2C-33-1 that are currently routed through Fire Area TT are planned to be rerouted to remain exclusively in the cable spreading room.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-4				2B-5 – Cables for this load center between panels 2C-39 to 2C-33-1 that are currently routed through Fire Area TT are planned to be rerouted to remain exclusively in the cable spreading room.			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-5	High (PRA)	2	In Fire Area SS, a fire induced circuit failure could impact the DC power on both trains resulting in the loss of the following components. LAR Source: Attachment C (NEI-04-02 Table B-3) Switchgear: 2A-3 VFDR(s): SS-01 Attachment C (NEI-04-02 Table B-3) Fire Area SS Risk Summary components 2A-4, 2A-409, 2B-6, 2A-308, 2A-309, 2A-310, 2CV-0789-1, 2CV-1040-1, 2D-27, 2K-4A, 2P-16A, 2P-36A, 2PIS-0789-1, 2SV-0724-1, 2SV-2809-1, 2SV-2810-1, and 2SV-2811.	ANO plans to modify the circuits as described to eliminate impacts in Fire Area SS associated with these components. 2A-3 and 2A-310 – The red train 125V DC panel 2D-23 that supplies control power for 2A-3 and 2B-5 is planned to be relocated from Fire Area JJ to Fire Area MM. Control power cables are planned to be rerouted using embedded conduits from Fire Area MM to Fire Area II to avoid Fire Areas JJ and SS. This allows post-fire control of 2A-3 bus from the control room. 2A-4, 2A-409, & 2B-6 – Cables are planned to be rerouted to control room panel 2C33-2 from 2A-4 and 2B-6 using an embedded conduit between Fire Zone 2100-Z to the cable spreading room Fire Area G. This eliminates an impact in Fire Zone 2097-X and Fire Area JJ. *(continued)*	Yes	Yes	This modification is specifically credited from a PRA perspective and affects multiple fire areas. The modification reduces the risk of a fire induced circuit failure that could result in the loss of DC power for both trains. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-5				The 125V DC control power from 2D-24 to 2A-4 is planned to be rerouted using a new conduit to avoid an impact against cables G2D2404A and B in Fire Zone 2097-X. 2CV-0789-1 & 2PIS-0789-1 – The power cable for 2PIS-0789-1 (for 2CV-0789-1) is planned to be re-routed using an embedded conduit from Fire Area G to Fire Area II to avoid Fire Area SS. 2CV-1040-1 – This valve is not directly impacted but is failed due to a loss of AC. The red train 125V DC panel 2D-23 that supplies control power for 2A-3 and 2B-5 is planned to be relocated from Fire Area JJ to Fire Area MM. Control power cables are planned to be routed using embedded conduits from Fire Area MM to Fire Area II to avoid Fire Areas JJ and SS. This assures 2CV-1040-1 will have a source of power and eliminates an impact in Fire Area SS. *(continued)*			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-5				2A-308, 2A-309, 2D-27, 2K-4A, 2P-16A, 2P-36A, 2SV-0724-1, 2SV-2809-1, 2SV-2810-1, and 2SV-2811 – The cables associated with these components are planned to be re-routed to avoid Fire Area SS by using embedded conduits and as required the installation of a new raceway in Fire Area B-2 directly under Fire Area SS on elevation 372'. The new raceway in Fire Area B-2 is planned to be installed above the vertical zone of influence for any postulated fire source. This eliminates impacts for 2A-308, 2A-309, 2D-27, 2K-4A, 2P-16A, 2P-36A, 2SV-0724-1, 2SV-2809-1, 2SV-2810-1, and 2SV-2811 in Fire Area SS.			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-6	Med (92-18)	2	Motor Operated Valves (MOVs) listed below will be modified to meet requirements per IN 92-18. The NPO assessment determined that any one of the RCS drop line valves can fail in a closed and unrecoverable position resulting in a loss of SDC. MOVs (IN 92-18) / LAR Source: Attachment D (NEI-04-02 Table F-1) VFDR(s) 2CV-5038-1 — NPO-RCS-SDC 2CV-5084-1 — NPO-RCS-SDC 2CV-5086-2 — NPO-RCS-SDC	ANO plans to modify the control circuit for 2CV-5038-1 to prevent spurious closure. This is planned to be similar to the inhibit circuit modification on CV-1275 for ANO-1. Procedural controls to secure power by opening breakers are planned to be implemented for 2CV-5084-1 and 2CV-5086-2.	No	Yes	The NPO modification reduces the risk of fire induced MOV circuit failures (hot shorts, open circuits and short to ground). This MOV modification can prevent a non-recoverable position failure resulting in the loss of shutdown cooling. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-7	Med (PRA)	2	MOVs listed below will be modified to meet requirements per IN 92-18. The four EFW discharge valves and two EFW pump steam supply valves can fail in a closed and unrecoverable position. LAR Source: Attachment C (NEI-04-02 Table B-3) Section for EFW MOVs 2CV-1075-1, 2CV-1076-2, 2CV-1036-2, 2CV-1039-1, 2CV-0340-2, and 2CV-0205-2 in Fire Area G Risk Summary	ANO plans to modify the control circuit for MOVs 2CV-1075-1, 2CV-1076-2, 2CV-1036-2, 2CV-1039-1, 2CV-0340-2, and 2CV-0205-2 to prevent fire induced spurious closing from the main control room, Fire Area G. This will be accomplished by separating the cable conductors, inclusive of internal panel wiring, that can cause spurious valve closing and protecting them with grounded metallic raceway and the use of grounded metallic barriers. This will prevent contact with potentially energized conductors from both intracable and intercable hot shorts. MOV 2CV-1075-1 control cables R2B53J2C and R2B53J2N that enter panel 2C-17 or 2C-39 from floor penetrations have been identified as the cables of concern applicable to this modification. MOV 2CV-1076-2 control cables G2D26C1D, G2D26C1E, and G2D26C1L that enter panel 2C-16 or 2C-40 from floor penetrations have been identified as the cables of concern applicable to this modification. *(continued)*	Yes	Yes	This modification is specifically credited from a PRA perspective. The modification reduces the risk of fire induced MOV circuit failures (hot shorts, open circuits and short to ground). This MOV modification can prevent a non-recoverable position failure. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-7				MOV 2CV-1036-2 control cable G2B63H1E that enters panel 2C-40 from a floor penetration has been identified as the cable of concern applicable to this modification. MOV 2CV-1039-1 control cable R2D27B2E that enters panel 2C-39 from a floor penetration has been identified as the cable of concern applicable to this modification. MOV 2CV-0340-2 control cable G2D26B1E that enters panel 2C-16 from a floor penetration has been identified as the cable of concern applicable to this modification. MOV 2CV-0205-2 control cables G2D26C2C, G2D26C2E, and G2D26C2F that enter panel 2C-16 or 2C-18 from floor penetrations have been identified as the cables of concern applicable to this modification.			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-8	Med (PRA)	2	In Fire Area B-3, spurious opening of MOV 2CV-4698-1 pressurizer low temperature – overpressure (LTOP) relief can result from a fire in motor control center (MCC) 2D-27. LAR Source: Attachment C (NEI-04-02 Table B-3) Section for Fire Area B-3 Risk Summary	ANO plans to modify the control circuit for 2CV-4698-1 to prevent fire induced spurious opening in Fire Area B-3. This will be accomplished by separating the cable conductors, inclusive of internal panel wiring, that can cause spurious opening and protecting the conductors with a grounded metallic raceway and the use of grounded metallic barriers. This will prevent contact with potentially energized conductors from both intracable and intercable hot shorts. Control cable R2D27A3J that enters MCC 2D-27 from a floor penetration has been identified as the cable of concern applicable to this modification.	Yes	Yes	This modification is specifically credited from a PRA perspective. The modification in Fire Area B-3 to install flexible metallic conduit protects the valve control cable in MCC 2D-27 which reduces the risk of fire induced circuit failures (such as spurious opening). This modification can prevent a non-recoverable position failure. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-9	Med (PRA)	2	In Fire Area G, spurious opening of valves 2CV-1002 (in cabinet 2C02), 2CV-1052 (in cabinet 2C02), 2CV-0714-1 (in cabinet 2C17), and 2CV-4698-1 (in cabinet 2C09) can result from a fire in the control room. LAR Source: Attachment C (NEI-04-02 Table B-3) Section for MOVs 2CV-1002, 2CV-1052, 2CV-0714-1, and 2CV-4698-1 in Fire Area G Risk Summary	ANO plans to modify the control circuit for MOVs 2CV-1002, 2CV-1052, 2CV-0714-1, and 2CV-4698-1 to prevent fire induced spurious opening in the main control room, Fire Area G. This will be accomplished by separating the cable conductors, inclusive of internal panel wiring, that can cause spurious valve opening and protecting the conductors with a grounded metallic raceway and the use of grounded metallic barriers. *(continued)*	Yes	Yes	This modification is specifically credited from a PRA perspective. The modification in Fire Area G to install flexible metallic conduit protects the valves control cable which reduces the risk of fire induced circuit failures (such as spurious opening). This modification can prevent a non-recoverable position failure. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-9				This will prevent contact with potentially energized conductors from both intracable and intercable hot shorts. MOV 2CV-1002 control cable G2B63A3D that enters panel 2C-02 from a floor penetration has been identified as the cable of concern applicable to this modification. MOV 2CV-1052 control cable R2B53D3D that enters panel 2C-02 from a floor penetration has been identified as the cable of concern applicable to this modification. Valve 2CV-0714-1(2SV-0714-1) control cable R2S066E that enters panel 2C-17 from a floor penetration has been identified as the cable of concern applicable to this modification. MOV 2CV-4698-1 control cable R2D27A3J that enters panel 2C-09 from a floor penetration has been identified as the cable of concern applicable to this modification.			

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-10	Med (PRA)	2	In Fire Area B-4 an incipient fire detection system is not installed in control element drive mechanism (CEDM) room panels 2C-70, 2C-71, 2C-72, 2C-73, and 2C-80. However an early warning fire detection system in accordance with NFPA 72, Fire Alarm Detection Code, is required by the PRA in accordance with FRE CALC-09-E-0008-05. LAR Source: Attachment C (NEI-04-02 Table B-3) Section for CEDM Room Panels 2C-70, 2C-71, 2C-72, 2C-73, and 2C-80 in Fire Area B-4 Risk Summary	ANO plans to provide a modification in the CEDM room in Fire Area B-4 to install incipient detection in cabinets 2C-70, 2C-71, 2C-72, 2C-73, 2C-80, and 2C-409. Fire detection signal cable is planned to be routed from each air sampling detector to the control room fire panel 2C-343-3.	Yes	Yes	This modification is specifically credited from a PRA perspective. The early warning fire detection system modification in Fire Area B-4 reduces the risk of a fire induced circuit and equipment failures that could result in the loss of CEDM room panels 2C-70, 2C-71, 2C-72, 2C-73, 2C-80, and 2C-409. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.
S1-11	High (PRA)	2	At ANO the availability of feedwater to ANO-2 SGs was identified as an issue by PRA. Also identified by PRA was ANO's inability to perform high risk and time sensitive actions, such as control of auxiliary feedwater (AFW), outside of the ANO-2 Control Room. LAR Source: Attachment C (NEI-04-02 Table B-3) Fire Area G Risk Summary and VFDR G-01	ANO plans to install a new AFW pump in ANO-1 capable of feeding one of the ANO-2 SGs. The AFW would be designed to meet or exceed the flow requirements of ANO-2 Emergency Feedwater (EFW) Pump 2P-7B (380 gpm @ 1100 psig). The new pump, controls and motor operated valves would be designed to be installed in ANO-1. The preferred source of suction for the new pump is planned to be from ANO-1. *(continued)*	Yes	Yes	The AFW modification is specifically credited from a PRA perspective to provide a reliable additional source of feedwater. The local control panel modification is specifically credited from a PRA perspective to provide an alternate means to perform required actions outside the ANO-2 Control Room. This modification reduces the risk of not being able to perform necessary operator actions to shutdown the plant, if either Control Room can't be manned. *(continued)*

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-11				The discharge piping is planned to be routed through the ANO-1 and ANO-2 Turbine Buildings to ANO-2 Auxiliary Building Rooms 2081 and 2084 for the tie-ins to the EFW System piping. The AFW tie-ins are planned to discharge into the ANO-2 EFW downstream of all EFW injection valves to ensure a single area fire does not disable AFW. The AFW pump would be designed to have the capability to be operated from the ANO-2 Control Room and locally in ANO-1. The design will ensure electrical isolation from Control Room functions to prevent a fire in the ANO-2 Control Room from affecting local control of AFW components. The AFW pump and associated motor operated valves would be designed to be powered by diverse ANO-1 non-safety related power sources to prevent a single failure from disabling equipment operation. The AFW pump would be designed to include controls and monitoring instrumentation to ensure proper water flow to the SGs. The local controls and monitoring instrumentation are planned to be located in ANO-1, powered from ANO-1 sources and have backup DC power.			Also, the local control panel modification reduces the risk of availability issue with of feedwater supply to the ANO-2 SGs. Manual actions are credited in fire areas that contain redundant safe shutdown equipment. These actions have been demonstrated feasible and are therefore considered adequate compensatory measures until compliance can be achieved by transitioning to a 10CFR50.48(c) licensing basis.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-12	Med (PRA)	2	In Fire Area B-3, excessive temperatures have been identified in Fire Zone 2091-BB following a loss of ventilation. LAR Source: Attachment C (NEI-04-02 Table B-3) Fire Area B-3	ANO plans to modify the control wiring for fans 2VEF-63 and 2VEF-64 to isolate the control room and allow the local controls to override a "stop" signal generated from within Fire Area G, either from handswitch positioning or fire-induced circuit damage. This eliminates fire impacts in Fire Area G and assures either 2VEF-63 or 2VEF-64 will remain available except for a fire in Fire Area B-3, Fire Zone 2091-BB.	Yes	No	This modification supports a basic assumption from a PRA perspective.
S1-13	Med (PRA)	2	In Fire Area MM, excessive temperatures have been identified in Fire Zone 2099-W following a loss of ventilation. LAR Source: Attachment C (NEI-04-02 Table B-3) Fire Area MM	ANO plans to provide a modification to fire door DR 265 to allow normally open positioning with automatic closure features in the event of a fire. This allows natural circulation to prevent long term room overheating impact on equipment located in Fire Zone 2099-W, West DC Equipment Room, by allowing an opening to Fire Zone 2109-U, Corridor, in Fire Area JJ.	Yes	No	This modification supports a basic assumption from a PRA perspective.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-14	Low (Code)	C	With regard to NFPA 50A, Gaseous Hydrogen Systems, code non-compliance issues were identified in the Hydrogen Gas Bottle Storage Room related to inadequate vent piping and room ventilation. The hydrogen storage room light switch was identified as not meeting Article 501 for Class I, Division II locations of the National Electric Code (NEC). LAR Source: Attachment A (NEI-04-02 Table B-1) Section 3.3.7.1	ANO plans to provide a modification to move the hydrogen bottles and manifold from the Hydrogen Gas Bottle Storage Room to a concrete slab located outside this room and open to atmosphere. This addresses hydrogen ventilation concerns and eliminates the need for electrical upgrades.	No	No	The subject hydrogen gas system bottle storage area is not credited by the PRA. This modification will be completed to meet NFPA 805 code requirements.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-15	Med (PRA)	C	NFPA 805 non-compliance issues were encountered when smaller fire areas were defined such that multiple walls, dampers, penetration seals, and doors were credited and used in the PRA model as rated fire barriers in the NRC regulatory basis for NFPA 805. Multiple walls and doors barriers will require upgrading to comply with NFPA 805. LAR Source: Attachment A (NEI-04-02 Table B-1) Section 3.11.2	ANO plans to provide an adequate-for-the-hazard evaluation and if necessary a modification to upgrade fire barrier walls, dampers, penetration seals, and doors to rated barriers for those barriers credited for deterministic compliance and subsequently credited in the Fire PRA analysis. These barriers have been previously identified as NRC regulatory basis to ensure compliance with NFPA 805 and have compensatory measures established. The barriers to be addressed as identified by EC-1956 are 2005-2, 2005-3, 2067-4, 2082-3, 2091-1, 2091-2, 2091-3, 2091-4, 2107-4, 2110-2, 2110-4, 2110-7, 2112-2, 2112-8, 2112-10, 2133-5, 2133-6, 2147-8, 2148-4, 2148-5, 2149-5, 2152-2, 2154-2, 2154-3, 2154-5, 2158-10, 2224-2, 2224-3, 2228-10, 2239-4, 2239-5, 2256-4, 2256-5, 2256-6, 2256-8, 2134-1, and 2155-1.	Yes	Yes	This modification will be completed to meet NFPA 805 code requirements. In accordance with station directives, compensatory measures per OP-1003.014 have been established as appropriate.

Table S-1 Plant Modifications

Item	Rank	Unit	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
S1-16	Low (Code)	C	NFPA 10 non-compliance issues (such as incorrect number of fire extinguishers for travel distance, incorrect type and size for the hazard area) were identified with ANO portable fire extinguishers. LAR Source: Attachment A (NEI-04-02 Table B-1) Section 3.7	ANO plans to provide a modification to resolve the NFPA 10 code deficiencies identified in CALC-ANOC-FP-09-00009. In general, this modification would involve portable fire extinguisher physical relocation, substitution of existing extinguishers, and documentation updates to reflect these plant changes. The results will ensure the proper number of fire extinguishers to meet travel distance requirements in coverage areas, adequately sized fire extinguishers, and the correct type of extinguisher that is rated for the fire hazard in each area.	No	No	The subject fire extinguishers are not credited in the FPRA. This modification will be completed to meet NFPA 805 code requirements.

Attachment 2

ANO-2 NFPA Operator Recovery Actions

Table G-1 – Recovery Actions and Activities

Fire Area	Component	Component Description	Actions	VFDR	RA/PCS
B-2	2A-309	2A-3 SUPPLY BREAKER	De-energize DC Control Power to 2A-309 at 2A-3, 2A-309 located in Fire Area II, Fire Zone 2101-AA. Then verify open/ manually open 2A-309 in Fire Area II, Fire Zone 2101-AA.	N/A	RA
B-2	2P-32A 2P-32B 2P-32C 2P-32D	REACTOR COOLANT PUMP	Call dispatcher to isolate transformers 2X-03 (SU-3) and X-04 (SU-2).	B2-03	RA
B-3	2CV-0789-1	EFW PUMP 2P-7B CONDENSATE SUCTION VALVE	De-energize 2CV-0789-1 at panel 2B-5, breaker 2B-514, located in Fire Area II, Fire Zone 2101-AA. Verify open/ manually open 2CV-0789-1 in Fire Area FF, Fire Zone 2025-JJ.	B3-01	RA
B-4	2P-32A	REACTOR COOLANT PUMP	Manually trip 2P-32A at breaker 2H-11, local panel 2H-1, in Fire Area B-2, Fire Zone 2200-MM.	B4-01	RA
B-4	2P-32B	REACTOR COOLANT PUMP	Manually trip 2P-32B at breaker 2H-21, local panel 2H-2, in Fire Area B-2, Fire Zone 2200-MM.	B4-01	RA
B-4	2P-32C	REACTOR COOLANT PUMP	Manually trip 2P-32C at breaker 2H-22, local panel 2H-2, in Fire Area B-2, Fire Zone 2200-MM.	B4-01	RA
B-4	2P-32D	REACTOR COOLANT PUMP	Manually trip 2P-32D at breaker 2H-12, local panel 2H-1, in Fire Area B-2, Fire Zone 2200-MM.	B4-01	RA
EE-L	2CV-1075-1	2P-7B DISCHARGE TO SG-B	Locally open EFW discharge valve following power failure. 2CV-1075-1 located in Fire Area GG, Fire Zone 2081-HH.	EE-L-01	RA
EE-L	2CV-1036-2	2P-7B DISCHARGE TO SG-B	Locally open EFW discharge valve following power failure. 2CV-1036-2 located in Fire Area GG, Fire Zone 2081-HH.	N/A	RA
EE-U	2CV-1026-2 2CV-1076-2	EFW VALVE	Locally open EFW discharge valve following power failure. 2CV-1026-2 located in Fire Area EE-L, Fire Zone 2084-DD. 2CV-1076-2 located in Fire Area GG, Fire Zone 2081-HH.	N/A	RA
EE-U	2EFW-5A 2EFW-5B	EFW VALVE	Open Manual Valves 2EFW-5A&B to Divert 2P-7A Flow to B Discharge Line Following Fire Damage to 2P-7A motor operated valves (MOVs). 2EFW-5A located in Fire Area FF, Fire Zone 2025-JJ. 2EFW-5B located in Fire Area CC, Fire Zone 2024-JJ.	N/A	RA

Table G-1 – Recovery Actions and Activities

Fire Area	Component	Component Description	Actions	VFDR	RA/PCS
G	2CV-1016-1	SG-A TO BLOWDOWN TANK 2T-67 MOV	Manually trip 2CV-1016-1 at breaker 2D-2301 and 2D-2401, local panel 2D-23 and 2D-24 in Fire Area JJ Fire Zone 2109-U, to isolate blowdown.	G-01	RA
G	2CV-1066-1	SG-B TO BLOWDOWN TANK 2T-67 MOV	Manually trip 2CV-1066-1 at breaker 2D-2301 and 2D-2401, local panel 2D-23 and 2D-24 in Fire Area JJ Fire Zone 2109-U, to isolate blowdown.	G-01	RA
G	2CV-4816	LETDOWN THROTTLE CV	Locally vent air from the actuator for 2CV-4816 to fail the valve closed in Fire Area EE, Fire Zone 2084-DD.	G-01	RA
G	2CV-4817	LETDOWN THROTTLE CV	Locally vent air from the actuator for 2CV-4817 to fail the valve closed in Fire Area EE, Fire Zone 2084-DD.	G-01	RA
G	2P-32A	REACTOR COOLANT PUMP	De-energize DC Control Power to 2P-32A at 2H-11 located in Fire Area B-2, Fire Zone 2200-MM. Then verify tripped/ manually trip 2H-11 in Fire Area B-2, Fire Zone 2200-MM.	G-01	RA
G	2P-32B	REACTOR COOLANT PUMP	De-energize DC Control Power to 2P-32B at 2H-21 located in Fire Area B-2, Fire Zone 2200-MM. Then verify tripped/ manually trip 2H-21 in Fire Area B-2, Fire Zone 2200-MM.	G-01	RA
G	2P-32C	REACTOR COOLANT PUMP	De-energize DC Control Power to 2P-32C at 2H-22 located in Fire Area B-2, Fire Zone 2200-MM. Then verify tripped/ manually trip 2H-22 in Fire Area B-2, Fire Zone 2200-MM.	G-01	RA
G	2P-32D	REACTOR COOLANT PUMP	De-energize DC Control Power to 2P-32D at 2H-12 located in Fire Area B-2, Fire Zone 2200-MM. Then verify tripped/ manually trip 2H-12 in Fire Area B-2, Fire Zone 2200-MM.	G-01	RA
G	2P-89B*	HIGH PRESSURE SAFETY INJECTION (HPSI) PUMP	Locally operate breaker 2A-406 to prevent start of HPSI pump	G-01	RA
G	2P-60B*	LOW PRESSURE SAFETY INJECTION (LPSI) PUMP	Locally operate breaker 2A-405 to prevent start of LPSI pump	G-01	RA
G	2P-35B*	CONTAINMENT SPRAY PUMP	Locally operate breaker 2A-404 to prevent start of Containment Spray Pump	G-01	RA

Table G-1 – Recovery Actions and Activities

Fire Area	Component	Component Description	Actions	VFDR	RA/PCS
G	2CV-5630-1 2CV-5631-2*	RWT OUTLET VALVES	Close both RWT outlet valves locally	G-01	RA
G	2CV-4920-1 2CV-4921-1*	BORIC ACID MAKEUP TANK (BAMT) GRAVITY FEED VALVES	Open both BAMT Gravity Feed valves locally	G-01	RA
G	2CV-4873-1*	VOLUME CONTROL TANK (VCT) OUTLET VALVE	Close VCT outlet valve locally	G-01	RA
G	2T-1*	PRESSURIZER HEATERS	Turn OFF and operate pressurizer heaters as necessary	G-01	RA
G	2P-36A/B/C*	CHARGING PUMPS	Stop and operate Charging pumps locally	G-01	RA
G	2K-4B*	EMERGENCY DIESEL GENERATOR #2 (EDG #2)	Place EDG #2 in LOCKOUT locally	G-01	RA
G	2A-4*	4160V VITAL POWER SWITCHGEAR	De-energize 2A-4 locally to prevent spurious operation/energize 2A-4 to restore power to vital equipment	G-01	RA
G	2B-6*	480V VITAL POWER LOAD CENTER	De-energize 2B-6 locally to prevent spurious operation / energize 2B-6 to restore power to vital equipment	G-01	RA
G	2D-24*	125V DC VITAL POWER (2C-108 / EDG #2 ENGINE START SOLENOIDS & EXCITATION CABINET, 4160V VITAL POWER SWITCHGEAR, 480V VITAL POWER, AND RCS HIGH POINT VENT VALVES)	De-energize DC control power (2D-24 breakers 2, 4, 6, 8, 9, 10) to support EDG #2 (2SV-2829-2, 2SV-2830-2, 2SV-2831, and 2E-21), 2A-4, and 2B-6 local control, and de-energize DC control power to fail close RCS high point vent valves (2SV-4636-2, 2SV-4668-2, 2SV-4670-2)	G-01	RA
G	2CV-4840-2*	CHARGING HEADER ISOLATION	Locally verify open Charging header isolation	G-01	RA
G	2CV-1504-2*	EDG #2 SERVICE WATER OUTLET	Locally verify open EDG #2 Service Water outlet	G-01	RA
G	2CV-4950-2*	RWT SUCTION VALVE	Verify RWT suction valve open for Charging capability if necessary	G-01	RA

Table G-1 – Recovery Actions and Activities

Fire Area	Component	Component Description	Actions	VFDR	RA/PCS
G	2P-4C*	SERVICE WATER PUMP	Align Loop 2 Service Water header locally	G-01	RA
G	2CV-0795-2*	EFW PUMP 2P-7A SUCTION MOV	Verify open 2P-7A Condensate suction MOV locally	G-01	RA
G	TBD	NEW AUXILIARY FEEDWATER (AFW) PUMP	Start and align AFW pump	G-01	RA
GG	2CV-0789-1	EFW PUMP 2P-7B CONDENSATE SUCTION	De-energize 2CV-0789-1 at panel 2B-53, breaker 2B-53D2, located in Fire Area B-3, Fire Zone 2091-BB. Verify open/ manually open 2CV-0789-1 in Fire Area FF, Fire Zone 2025-JJ.	N/A	RA
JJ	2A-113	2A-1 SUPPLY BREAKER	De-energize DC Control Power to 2A-113 at 2A-1 located in Fire Area B-2, Fire Zone 2200-MM. Verify closed/manually close 2A-113 in Fire Area B-2, Fire Zone 2200-MM.	JJ-04	RA
JJ	2A-309	2A-3 SUPPLY BREAKER	De-energize DC Control Power to 2A-309 at 2A-3 located in Fire Area II, Fire Zone 2101-AA. Verify closed/manually close 2A-309 in Fire Area II, Fire Zone 2101-AA.	JJ-04	RA
JJ	2CV-1036-2 2CV-1075-1	2P-7B DISCHARGE TO SG-B	Locally open EFW discharge valve following power failure. 2CV-1075-1 and 2CV-1036-2 located in Fire Area GG, Fire Zone 2081-HH.	JJ-01	RA
JJ	2CV-5649-1	CONTAINMENT SUMP SUCTION ISOLATION	De-energize 2CV-5649-1 at panel 2B-52, breaker 2B-52G3, located in Fire Area DD, Fire Zone 2040-JJ. Verify open/ manually open 2CV-5649-1 in Fire Area AA, Fire Zone 2007-LL (action performed in conjunction with 2CV-5650-2).	N/A	RA
JJ	2CV-5650-2	CONTAINMENT SUMP SUCTION ISOLATION	De-energize 2CV-5650-2 at panel 2B-62, breaker 2B-62G3, located in Fire Area HH, Fire Zone 2073-DD. Verify open/ manually open 2CV-5650-2 in Fire Area AA, Fire Zone 2007-LL (action performed in conjunction with 2CV-5649-1).	N/A	RA
JJ	2PIS-0789	EFW PUMP 2P-7B CONDENSATE SUCTION	De-energize and manually open 2CV-0789-1 prior to starting an EFW pump.	N/A	RA
JJ	2P-7B	EFW PUMP	Manually start 2P-7B at switchgear, breaker 2A-311 located in Fire Area II, Fire Zone 2101-AA.	JJ-01	RA

Table G-1 – Recovery Actions and Activities

Fire Area	Component	Component Description	Actions	VFDR	RA/PCS
JJ	2P-89	HPSI PUMP	Locally close minimum flow recirculation valve for the HPSI pumps 2CV-5628-2 in Fire Area DD, Fire Zone 2040-JJ.	JJ-02	RA
MM	2A-113 2A-213	4.16KV SWITCHGEAR	Align offsite power to bus 2A-1 and 2A-2.	N/A	RA
MM	2CV-1025-1 2CV-1036-2 2CV-1075-1 2CV-1038-2	EFW VALVE	Locally open EFW discharge valves following fire induced control and power failure. 2CV-1025-1 and 2CV-1038-2 located in Fire Area EE-L, Fire Zone 2084-DD. 2CV-1075-1 and 2CV-1036-2 located in Fire Area GG, Fire Zone 2081-HH.	N/A	RA
OO	2CV-1470-1	SERVICE WATER (SW) TO 2P-4A	De-energize 2CV-1470-1 at panel 2B-54, breaker 2B-54E4, located in Fire Area II, Fire Zone 2101-AA. Verify open/ manually open 2CV-1470-1 in Fire Area OO, Fire Zone INTAKE. Note: Valve operator is installed external to the intake structure and not in the impacted area.	OO-1	RA
OO	2CV-1474-2	SW TO 2P-4C	De-energize 2CV-1474-2 at panel 2B-62, breaker 2B-62H3, located in Fire Area HH, Fire Zone 2073-DD. Verify open/ manually open 2CV-1474-2 in Fire Area OO, Fire Zone INTAKE. Note: Valve operator is installed external to the intake structure and not in the impacted area.	OO-1	RA
SS	2CV-1038-2	EFW FROM 2P-7B TO SG-A ISOLATION	De-energize 2CV-1038-2 at panel 2B-63, breaker 2B-63H3, located in Fire Area HH, Fire Zone 2096-M. Verify open/ manually open 2CV-1038-2 in Fire Area EE, Fire Zone 2084-DD.	SS-01	RA
SS	2CV-1425-1	AUXILIARY COOLING WATER (ACW) ISOLATION	De-energize 2CV-1425-1 at panel 2B-54, breaker 2B-54D5, located in Fire Area II, Fire Zone 2101-AA. Verify closed/ manually close 2CV-1425-1 in Fire Area OO, Fire Zone INTAKE.	SS-05	RA
SS	2CV-1470-1	SW TO 2P-4A	De-energize 2CV-1470-1 at panel 2B-54, breaker 2B-54E4, located in Fire Area II, Fire Zone 2101-AA. Verify open/ manually open 2CV-1470-1 in Fire Area OO, Fire Zone INTAKE.	SS-05	RA
SS	2EFW-802	2P-7A/B SUCTION FROM 2T-41A/B	Align EFW/AFW suction to QCST T-41B on low-low level in CST aligned to EFW/AFW (2T-41A or 2T-41B).	N/A	RA

Table G-1 – Recovery Actions and Activities

Fire Area	Component	Component Description	Actions	VFDR	RA/PCS
SS	2CV-1026-2 2CV-1037-1 2CV-1039-1 2CV-1076-2	EFW VALVE	Align DC operated valves prior to battery discharge. 2CV-1037-1 and 2CV-1026-2 located in Fire Area EE-L, Fire Zone 2084-DD. 2CV-1039-1 and 2CV-1076-2 located in Fire Area GG, Fire Zone 2081-HH.	N/A	RA
TT	2A-309	2A-3 SUPPLY BREAKER	De-energize DC Control Power to 2A-309 at 2A-3 located in Fire Area II, Fire Zone 2101-AA. Verify closed/manually close 2A-309 in Fire Area II, Fire Zone 2101-AA.	N/A	RA
TT	2CV-1036-2	EFW FROM 2P-7B TO SG-B ISOLATION	De-energize 2CV-1036-2 at panel 2B-63, breaker 2B-63H1, located in Fire Area HH, Fire Zone 2096-M. Verify open/ manually open 2CV-1036-2 in Fire Area GG, Fire Zone 2081-HH.	TT-01	RA
TT	2CV-1075-1	EFW FROM 2P-7B TO SG-B FLOW CONTROL VALVE	De-energize 2CV-1075-1 at panel 2B-53, breaker 2B-53J2, located in Fire Area B-3, Fire Zone 2091-BB. Verify open/ manually open 2CV-1075-1 in Fire Area GG, Fire Zone 2081-HH.	TT-01	RA

RA – Recovery Action PCS – Primary Control Station * – Defense in Depth Measure

Attachment 3 to

ANO-2 Recovery Action Risk

Table W-2 ANO-2 Fire Area Risk Summary

Fire Area	Area Description	NFPA 805 Basis	Fire Area CDF	Fire Area LERF	VFDR (Yes/No)	RAs	Fire Risk Eval. ΔCDF	Fire Risk Eval. ΔLERF	Additional Risk of RAs (CDF/LERF)
2MH01E	concrete manhole east	4.2.4.2	4.89E-09	4.93E-11	yes	no	4.89E-09	4.93E-11	n/a
2MH02E	concrete manhole east	4.2.4.2	5.09E-09	5.13E-11	yes	no	5.09E-09	5.13E-11	n/a
2MH03E	concrete manhole east	4.2.4.2	9.99E-08	2.65E-09	yes	no	-5.66E-06	-1.89E-07	n/a
2MH01W	concrete manhole west	4.2.3.2	8.10E-09	1.67E-10	no	n/a	n/a	n/a	n/a
2MH02W	concrete manhole west	4.2.3.2	8.10E-09	1.67E-10	no	n/a	n/a	n/a	n/a
2MH03W	concrete manhole west	4.2.3.2	9.23E-09	1.90E-10	no	n/a	n/a	n/a	n/a
AA	Fire Zone 2007-LL (“B” HPSI, LPSI, and Containment Spray Pump room and gallery)	4.2.4.2	1.52E-06	1.67E-8	yes	no	-9.70E-07	-3.22E-08	n/a
AAC	Fire Zones SBOD and 2MH12 (alternate AC diesel and nearby manhole)	4.2.3.2	5.12E-08	1.06E-9	no	n/a	n/a	n/a	n/a
Admin	administration building	4.2.3.2	n/a	n/a	no	n/a	n/a	n/a	n/a
B-2	miscellaneous turbine building fire compartments	4.2.4.2	5.41E-06	1.23E-07	yes	yes	-1.19E-04	-3.98E-06	1.22E-04/ 1.56E-06
B-3	Fire Zones 2091-BB, 2112-BB and 2183-J (electrical penetration rooms)	4.2.4.2	4.13E-07	1.32E-08	yes	yes	-1.96E-06	-6.49E-08	7.90E-09/ 1.90E-10
B-4	Fire Zone 2154-E (CEDM equipment room)	4.2.4.2	3.26E-06	3.61E-08	yes	yes	2.60E-07	-5.17E-08	4.86E-05/ 5.26E-07

Table W-2 ANO-2 Fire Area Risk Summary

Fire Area	Area Description	NFPA 805 Basis	Fire Area CDF	Fire Area LERF	VFDR (Yes/No)	RAs	Fire Risk Eval. ΔCDF	Fire Risk Eval. ΔLERF	Additional Risk of RAs (CDF/LERF)
B-5	Fire Zones 2149-B and 2158-F (stairwells 2001 and 2055)	4.2.3.2	4.06E-09	1.21E-10	no	n/a	n/a	n/a	n/a
B-6	Fire Zones 2006-LL, 2010-LL, 2011-LL, and 2014-LL (general access, C HPSI pump room, tendon gallery access, and A HPSI, LPSI and Containment Spray Pump room)	4.2.4.2	1.56E-06	1.70E-08	yes	no	3.00E-08	3.00E-10	n/a
CC	Fire Zone 2024-JJ (turbine-driven emergency feedwater pump room)	4.2.3.2	1.49E-09	3.85E-11	no	n/a	n/a	n/a	n/a
DD	Fire Zones 2019-JJ, 2032-JJ, 2040-JJ, and 2068-DD (boric acid condensate tank room, spent resin storage tank room, corridor, and hot machine shop)	4.2.4.2	2.45E-06	2.76E-08	yes	no	-2.85E-06	-9.64E-08	n/a
EE-L	Fire Zones 2055-JJ and 2084-DD (piping penetration rooms)	4.2.4.2	3.81E-07	7.53E-09	yes	yes	-7.89E-07	-2.64E-08	9.56E-07/ 3.12E-08
EE-U	Fire Zone 2111-T (lower south electrical penetration room)	4.2.4.2	2.03E-06	4.81E-08	yes	yes	-5.77E-06	-1.94E-07	1.54E-05/ 4.59E-07
FF	Fire Zone 2025-JJ (motor-driven emergency feedwater pump room)	4.2.3.2	1.15E-08	3.66E-10	no	n/a	n/a	n/a	n/a
G	Fire Zones 2199-G, 2119-H, 2136-I, 2137-I, 2150-C, 2098-C, and 2098-L (control room and other alternate shutdown areas)	4.2.4.2	2.64E-06	3.52-08	yes	yes	-2.65E-06	-9.78E-08	7.42E-05/ 1.64E-06

Table W-2 ANO-2 Fire Area Risk Summary

Fire Area	Area Description	NFPA 805 Basis	Fire Area CDF	Fire Area LERF	VFDR (Yes/No)	RAs	Fire Risk Eval. ΔCDF	Fire Risk Eval. ΔLERF	Additional Risk of RAs (CDF/LERF)
GG	Fire Zones 2076-HH and 2081-HH (electrical equipment room and upper north and lower north piping penetration room)	4.2.4.2	1.03E-06	2.17E-08	yes	yes	-1.12E-05	-3.82E-07	2.93E-05/ 9.51E-07
HH	Fire Zones 2063-DD, 2072-R, 2073-DD, 2096-M, 2106-R, and 2107-N (sample room, VCT room, 2B-62 room, 2B-63 room, degasifier vacuum pump room, and corridor)	4.2.4.2	3.11E-06	4.65E-08	yes	no	-5.80E-07	-2.18E-08	n/a
II	Fire Zone 2101-AA (north switchgear 2A-3 room)	4.2.4.2	2.90E-06	9.31E-08	yes	no	-1.33E-04	-4.52E-06	n/a
JJ	Fire Zone 2109-U (corridor)	4.2.4.2	2.70E-06	7.97E-08	yes	yes	-3.78E-06	-1.21E-07	2.82E-04/ 3.27E-06
K	Fire Zones 16-Y and 2020-JJ (clean waste receiver tank room and boron holdup tank vault)	4.2.3.2	6.47E-10	1.44E-11	no	n/a	n/a	n/a	n/a
KK	Fire Zones 2093-P, 2114-I and 2115-I (south EDG room, EDG air intake room, and boric acid makeup tank room)	4.2.4.2	1.72E-07	5.22E-09	yes	no	ε	ε	n/a
L	Fire Zone TKVLT (diesel fuel storage vault)	4.2.3.2	1.86E-08	4.32E-10	no	n/a	n/a	n/a	n/a
MM	Fire Zones 2099-W and 2103-V (west DC equipment room and west battery room)	4.2.4.2	3.28E-06	7.85E-08	yes	yes	-2.06E-05	-7.94E-07	6.36E-05/ 1.81E-06

Table W-2 ANO-2 Fire Area Risk Summary

Fire Area	Area Description	NFPA 805 Basis	Fire Area CDF	Fire Area LERF	VFDR (Yes/No)	RAs	Fire Risk Eval. ΔCDF	Fire Risk Eval. ΔLERF	Additional Risk of RAs (CDF/LERF)
NN	Fire Zones 2032-K and 2033-K (containment building south side and containment building north side)	4.2.4.2	3.04E-06	7.76E-08	yes	no	ε	ε	n/a
OO	Intake Structure	4.2.4.2	1.62E-07	1.84E-09	yes	yes	1.62E-07	1.84E-09	1.72E-06/ 1.60E-08
QQ	Fire Zones 2094-Q and 2114-I (north EDG room and EDG air intake room)	4.2.3.2	3.98E-07	1.26E-08	no	n/a	n/a	n/a	n/a
SS	Fire Zones 2097-X, 2100-Z and 2102-Y (east DC equipment room, south switchgear room and east battery room)	4.2.4.2	2.81E-06	7.43E-08	yes	yes	-3.75E-05	-1.28E-06	2.48E-05/ 6.95E-07
TT	Fire Zone 2108-S (electrical equipment room)	4.2.4.2	2.86E-06	4.47E-08	yes	yes	-2.37E-05	-7.95E-07	1.16E-05/ 3.83E-07
YD	YARD	4.2.3.2	6.73E-07	1.28E-08	no	n/a	n/a	n/a	n/a
TOTAL			**4.30E-05**	**8.34E-07**			**-3.70E-04**	**-1.26E-05**	**6.74E-04/ 1.13E-05**

ε Indicative of an immeasurable change in risk from the impact of the VFDR on Fire PRA model.

Attachment 4

ANO-2 Transition Status

ANO-2 NFPA 805 Transition Project Post-LAR Submittal Schedule Overview

NFPA 805 Project Activity Name	***Start***	***Finish***
Clarification of and Resolve Three (3) NRC Identified LAR Deficiencies from August 9th Conference Call	On-going	11/2/2012
Finalize NFPA 805 LAR Update incorporating LAR deficiency corrections	11/5/2012	12/07/2012
Outside Expertise Review of ANO-2 Revised NFPA 805 LAR for Confirmation Prior to NRC Submittal	12/10/2012	02/15/2013
Procedure Development		
- Corporate Procedures (Design Engineering, Work Management, Outage Management, Training, Maintenance, Licensing, Operations, and Fire Protection) [~40 identified]	On-going	05/16/2013
- Site Fire Protection Procedures (Engineering, Operations, Maintenance, and Fire Protection) [~80 identified]	08/29/2013	03/24/2014
Training Program		
- Corporate Procedures Training	On-going	10/07/2013
- Site Procedures Training	10/25/2012	05/09/2014
Software Development (ARC-PLUS)	01/07/2013	04/02/2013
Attachment 'S' Implementation Items		
- S2-1 Monitoring Program	01/07/2013	07/12/2013
- S2-2 Flushing Procedure in Accordance with NFPA 15	01/14/2013	04/12/2013
- S2-3 Evaluation for NFPA 14 on Standpipe Hose Station Hanger(s)	01/21/2013	04/19/2013
- S2-4 Revise Procedure EN-DC-161 Control of Combustibles	Completed	01/27/2012
- S2-5 Revise Procedure(s) for NPO Transition	01/28/2013	07/26/2013
- S2-6 Revise OMA Procedures/Documents to include feasibility criteria for FAQ 07-0030	02/11/2013	08/16/2013
- S2-7 Develop/Revise Technical Documents/Procedures for NFPA 805 Licensing Basis	03/18/2013	11/22/2013
- S2-8 Revise NFPA 13 Documentation on Partial Suppression to Replace NRC Approved Exemption	01/14/2013	04/12/2013

NFPA 805 Project Activity Name	***Start***	***Finish***
Attachment 'S' Modification Scoping		
- S1-1 on EFW Valves in FA HH	03/06/2013	06/21/2013
- S1-2 on DC Power Cables in FA JJ	06/10/2013	09/27/2013
- S1-3 on Alternate AC Power Source for 2H-1 & 2H-2 in FA MM	07/25/2013	10/25/2013
- S1-4 on Cable Reroute in FA TT	04/23/2013	07/26/2013
- S1-5 on DC Power for Swgr in FA SS	09/11/2013	12/20/2013
- S1-6 on MOV's modification for IEN 92-18 issues (NPO)	09/06/2012	02/22/2013
- S1-7 on MOV's modification for IEN 92-18 (PRA Evaluation)	10/17/2012	03/15/2013
- S1-8 on Installing Flex Metal Conduit in FA B-3	11/28/2012	04/19/2013
- S1-9 on Mod Cable for MOV's in Various MCC's in FA G	01/24/2013	05/24/2013
- S1-10 on Incipient Fire Detection in FA B-4	On-going	03/01/2013
- S1-11 on Additional AFW Source to SG's	On-going	09/27/2013
- S1-12 on Mod Control Wiring for Fans in FA HH	On-going	02/22/2013
- S1-13 on Mod to Hold Open Fire Door DR265	09/03/2012	01/25/2013
- S1-14 on NFPA 50A Non-Compliance Corrections	On-going	11/23/2012
- S1-15 on Fire Barrier Upgrades	09/25/2012	09/20/2013
- S1-16 on NFPA 10 Non-Compliance Corrections	On-going	01/25/2013

Enclosure 2 to

2CAN081202

List of Regulatory Commitments

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Entergy Operations, Inc. (Entergy) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
Entergy will submit the License Amendment Request implementing 10 CFR 50.48(c) for Arkansas Nuclear One, Unit 2	✓		July 15, 2013