Entergy

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2CAN020602

February 28, 2006

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

SUBJECT: Supplement to Amendment Request
to Allow One-Time Extension of Containment Spray System
Allowable Outage Time
Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

REFERENCE: 1. Entergy Letter to the NRC dated September 19, 2005 License Amendment Request to Allow One-Time Extension of Containment Spray System Allowable Outage Time (2CAN090502)

Dear Sir or Madam:

By letter (Reference 1), Entergy Operations, Inc. (Entergy) proposed a change to the Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specifications (TSs) to amend TS 3.6.2.1 "Containment Spray System." The proposed change will allow a one-time extension of the allowable outage time (AOT) for the Containment Spray System from 72 hours to a maximum of 7 days and may be used once for each train or at most two times during fuel cycles 18 and 19.

On December 13, 2005, Entergy and members of your staff held a call to discuss the need for additional information. As a result of the call, six questions were determined to need formal response. Entergy's response is contained in Attachment 1.

There are no technical changes proposed. The original no significant hazards consideration included in Reference 1 is not affected by any information contained in the supplemental letter. Upon approval, Entergy requests a 60 day implementation period.

There are new commitments contained in this letter as reflected in Attachment 2, which also includes the commitment made in Reference 1.

A001

If you have any questions or require additional information, please contact Dana Millar at 601-368-5445.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 28, 2006.

Sincerely,

Thomas A. Marlow

TAM/DM

Attachments:
1. Response to Request for Additional Information
2. List of Regulatory Commitments

cc: Dr. Bruce S. Mallett
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
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Arlington, TX 76011-8064

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U. S. Nuclear Regulatory Commission
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4815 West Markham Street
Little Rock, AR 72205

Attachment 1

To

2CAN020602

Response to Request for Additional Information

Response to Request for Additional Information Related to the ANO-2 License Amendment Request to Allow One-Time Extension of Containment Spray System Allowable Outage Time

Based on the telephone conference call held on December 13, 2005, concerning a one-time allowable outage time (AOT) extension for the containment spray system (CSS) for Arkansas Nuclear One, Unit 2 (ANO-2), a formal response to the following questions has been requested.

Question 1

The licensee's submittal indicates that the ANO-2 probabilistic risk assessment (PRA) is not capable of addressing large early release frequency (LERF) and incremental conditional large early release probability (ICLERP). Please describe how the submittal is acceptable without explicitly addressing these metrics. The response needs to explain why the licensee's approach is (or is modified to be) acceptable for each of the tiers of review identified in RG 1.177 (i.e., Tier 1, 2, and 3).

Response 1

Managing the core damage metrics within the guidance limits of Regulatory Guide (RG) 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis* and RG 1.177, *An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications* will result in managing the large early release metrics (LERF and ICLERP) within the guidance limits. For (ANO-2) the LERF is less than 10% of the ANO-2 core damage frequency (CDF) values for all accident scenarios except Steam Generator Tube Rupture (SGTR) and intersystem loss of coolant accident (ISLOCA). The SGTR and ISLOCA scenarios are small contributors to the overall risk, i.e., < 0.7% and < 0.001% of the total internal events CDF. This result applies to Tier 1, 2, and 3 when evaluating and managing the risk associated with the proposed CSS AOT extension, given that containment integrity is not challenged during a CSS outage.

Question 2

The licensee's submittal states that the ANO-2 PRA does not address fires. During extended AOTs, fires can be a significant risk contributor since equipment/train redundancy is reduced during these intervals. Please describe the fire risks associated with the subject AOT one-time extension. This response should include an evaluation (quantitative or qualitative) of the licensee's current fire risk/vulnerability analyses to identify the potential impact of fires during the subject AOT one-time extension and establishment of appropriate controls/compensatory measures (e.g., fire watches, no test/maintenance on redundant train of containment sprays or other risk-important equipment, etc.) to ensure the availability of adequate mitigation capability during the interval.

Response 2

The removal of a CSS train from service could increase the fire risk in two ways: (1) the maintenance could elevate the probability of a fire in the areas affected by the subject CSS train maintenance (e.g., hot work near the affected CSS pump); and (2) the maintenance will elevate the risk importance of equipment on the opposite Emergency Safeguards Features (ESF) train.

Regarding the first, as stated in the original submittal, existing ANO fire prevention procedures and training programs will minimize an increase in the probability of a fire. Also as stated in the original submittal, when performing maintenance activities on either train of the CSS, the redundant CSS train and the containment cooling system (CCS) will be protected (i.e., no testing or maintenance activities will be allowed).

Regarding the second, based on the small increase in the internal events risk during the CSS extended AOT outages, the dominant fire risk vulnerabilities are expected to be similar to those for nominal plant conditions. These were identified in the ANO-2 Individual Plant Examination for External Events (IPEEE) submittal (Entergy letter to the NRC dated May 31, 1996 (0CAN059609)). Insights provided in the IPEEE submittal can be used to reduce these fire risks. These include:

- adherence to the administrative procedural controls that govern hot work and transient combustibles, and
- ensuring the ignition source probability is as low as possible in the Turbine Building to maintain the availability of off-site power which will be accomplished by posting an hourly roving fire watch in that area. A roving fire watch will also be posted in other risk significant areas which include: the operable CSS train, the CCS, the high pressure safety injection (HPSI) system, both emergency feedwater (EFW) trains, and the auxiliary feedwater (AFW) system.

The 2nd bullet above is included as a new commitment as identified in Attachment 2.

Question 3

In the licensee's submittal, the licensee relies on their configuration risk management program (CRMP) to address the Tier 2 aspects, without performing any evaluations (qualitative or quantitative). This reliance on the CRMP is more appropriate for the Tier 3 evaluation, which ensures that adequate programs and procedures are in place for identifying risk-significant plant configurations and taking appropriate actions to avoid such configurations. Whereas the Tier 3 evaluation ensures the CRMP is adequate when maintenance is about to commence, the Tier 2 evaluation is meant to be an early evaluation to identify and preclude potentially high-risk plant configurations that could result if equipment, in addition to that associated with the proposed license amendment, are taken out of service simultaneously, or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. The Tier 2 evaluation needs to identify, as part of the licensee's submittal, potentially high-risk plant configurations that need to be precluded, which typically results in licensees establishing compensatory measures/commitments to ensure these configurations are precluded. Please identify for the subject AOT one-time extension, any high-risk plant configurations that may occur and the compensatory measures/commitments the licensee is implementing to ensure these configurations do not occur during the AOT one-time extension.

Response 3

As noted in Response 2, based on the small increase in the internal events risk during the CSS extended AOT outages, the dominant risk contributions during these outages are similar to those for nominal plant conditions. Thus, no high-risk plant configurations occur during these outages that are unique to the outage.

Since there is a slight increase in the importance of the containment cooling function (i.e., provided by the other CSS train and by the CCS) and in the steam generator heat removal function (provided by the EFW and AFW system) during the CSS train extended AOT, no preventative maintenance or testing will be performed that would render the operable CSS train, the CCS, the HPSI system, either EFW train, or the AFW system inoperable.

Question 4

In Section 8 of the NRC safety evaluation, dated December 21, 1999, on the CE joint application report CE-NPSD-1045-A, the NRC concluded, in part, that "... licensees' submittals shall discuss implementation of procedures that prohibit entry into an extended CSS AOT for scheduled maintenance purposes if external event conditions or warnings are in effect." Please discuss the procedures (and/or commitments) implemented at ANO-2 to prohibit entry into an extended CSS AOT if external event conditions or warnings are in effect. In addition, please discuss how ANO-2 has (or will) addressed the factors identified in Section 7 of the NRC safety evaluation, particularly, the concerns of CSS maintenance implications for the shutdown cooling system (SDCS) maintenance and operations.

Response 4

ANO-2 will not commence maintenance activities on the CSS for an extended AOT if any of the following conditions exist:

- Seismic Event (earthquake) as indicated by the earthquake trigger or noticeable abnormal vibrations in major structures
- Tornado watch or warning for Pope, Yell, Logan, or Johnson counties is in effect
- Tornado is sighted locally
- Loss of Dardanelle Reservoir is forecast
- Flooding or forecasted flooding of Lake Dardanelle

The above is included as a new commitment as identified in Attachment 2.

Section 7 of the NRC safety evaluation for CE-NPSD-1045-A includes the following in relationship to CSS maintenance implications for the SDCS maintenance and operations:

- "Since the CEOG advocates on-line maintenance of both the SDCS and the CSS, it is important that "at power" maintenance of these systems is not scheduled for the same time because the SDC pumps are credited as backup to the CSS pumps in supporting the containment spray function. Similarly, the maintenance of the CSS pumps in the lower modes of operations should be performed so that at least one CSS pump remains operable as a backup to the SDC pumps."

- "The risk impact of the LCO configuration is dependent on which component of the CSS is affected. If the SDC heat exchanger is removed from service, one train of the SDCS and the CSS train that uses the affected SG are lost. If, however, the LCO configuration is caused by the removal of a CSS pump, the affected train can still be operational if a SDC pump can be aligned to the affected train."

The SDC pump is not credited as a backup for the CSS pump at ANO-2. The SDC pumps cannot be aligned to provide the function of the CSS. However, the CSS can be aligned to provide the SDC function when the reactor coolant system pressure is less than 50 psig. Therefore, "at power" maintenance activities of these systems is not limited as long as the associated Technical Specifications are met and the requirements of the maintenance rule (10 CFR 50.65(a)(4)) are satisfied. The AOT extension only applies during Modes 1, 2, and 3. Maintenance activities on the SDC or CSS systems during the SDC mode of operations are controlled by procedure to ensure adequate system redundancy is maintained and meet the requirements of 10 CFR 50.65(a)(4).

The risk analyses addressed both the impact associated with the removal of the CSS pump and the removal of SDC heat exchanger, i.e., the risk assessment assumed that the CSS pump and its associated SDC heat exchanger were unavailable during each CSS train outage.

Question 5

In Section 6.4 of the CE joint application report CE-NPSD-1045-A, compensatory measures are discussed. Please discuss how ANO-2 has (or will) addressed the identified compensatory measures, and the need for any additional contingency actions that may be necessary.

Response 5

The response to question 6 reflects that long term heat removal can be accomplished with either one of two CSS pumps or two of the four containment cooling units. Therefore, ANO-2 has diverse means of containment heat removal.

Section 6.4 of CE-NPDS-1045-A includes the following suggested compensatory measures, which Entergy commitments to implement:

1. While performing maintenance on the CSS train components, do not disable other components that are used for the containment heat removal. (Note: this is redundant to the commitment made in the original submittal and will replace that commitment.)
2. Prior to performing maintenance on one CSS equipment train, assure that the backup train is properly aligned and would be expected to perform its function if required.
3. Conduct a briefing with appropriate plant personnel to ensure that they are aware of the impact associated with unavailable components and flowpaths.
4. If a maintenance action or repair is to be performed, pre-stage parts and tools to minimize outage time.
5. Consider actions which could be taken to return the affected train to functional use, if not full operability, if the need arises or plan for backup systems (e.g., containment fan coolers) to be available.

6. In repairing and/or testing components (particularly valves), define the appropriate valve position (open/closed) that provides the greater level of safety and "if practical" establish that position for the repair.

Items 1 through 6 above are included as new commitments as identified in Attachment 2.

Question 6

In the CE joint application report CE-NPSD-1045-A, ANO-2 is shown to have a high conditional core damage frequency, but in the licensee's current submittal the risks are identified as being acceptable. Please describe the PRA modeling, plant, and operational changes that are the significant contributors to this change in quantitative results.

Response 6

Analysis performed after issuance of Combustion Engineering (CE) joint application report, CE-NPSD-1045-A, has allowed the success criterion for long term heat removal function during recirculation mode in the ANO-2 PSA model to be revised from:

> (One of two Containment Spray pumps AND heat removal via one of two SDC heat exchangers) OR (heat removal via two of four Containment Cooling units AND one of two Containment Spray pumps without heat removal via one of two SDC heat exchangers).

to

> (One of two Containment Spray pumps AND heat removal via one of two SDC heat exchangers) OR (heat removal via two of four Containment Cooling units).

This revised success criterion essentially removes the need for a CSS pump (essentially to mix the containment atmosphere) for long term heat removal if two containment cooling units are available for containment cooling. The revision greatly reduces the calculated risk importance of CSS.

Attachment 2

To

2CAN020602

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies those actions committed to by 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 (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
Section 6.4 of CE-NPDS-1045-A includes the following suggested compensatory measures, which Entergy commitments to implement: 1. While performing maintenance on the CSS train components, do not disable other components that are used for the containment heat removal. 2. Prior to performing maintenance on one CSS equipment train, assure that the backup train is properly aligned and would be expected to perform its function if required. 3. Conduct a briefing with appropriate plant personnel to ensure that they are aware of the impact associated with unavailable components and flowpaths. 4. If a maintenance action or repair is to be performed, pre-stage parts and tools to minimize outage time. 5. Consider actions which could be taken to return the affected train to functional use, if not full operability, if the need arises or plan for backup systems (e.g., containment fan coolers) to be available. 6. In repairing and/or testing components (particularly valves), define the appropriate valve position (open/closed) that provides the greater level of safety and "if practical" establish that position for the repair.		x	

List of Regulatory Commitments (continued)

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
ANO-2 will not commence maintenance activities on the CSS for an extended AOT if any of the following conditions exist: • Seismic Event (earthquake) as indicated by the earthquake trigger or noticeable abnormal vibrations in major structures • Tornado watch or warning for Pope, Yell, Logan, or Johnson counties is in effect • Tornado is sighted locally • Loss of Dardanelle Reservoir is forecast • Flooding or forecasted flooding of Lake Dardanelle		x	
When performing maintenance activities on either train of the CSS, the redundant CSS train and the containment cooling system (CCS) will be protected (i.e., no testing or maintenance activities will be allowed).		x	
Ensuring the ignition source probability is as low as possible in the Turbine Building to maintain the availability of off-site power will be accomplished by posting an hourly roving fire watch in that area. A roving fire watch will also be posted in other risk significant areas which include: the operable CSS train, the CCS, the high pressure safety injection (HPSI) system, both emergency feedwater (EFW) trains, and the auxiliary feedwater (AFW) system.		x	