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2CAN090502

September 19, 2005

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

SUBJECT: License 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

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests the following amendment for Arkansas Nuclear One, Unit 2 (ANO-2). Entergy proposes to amend Technical Specification (TS) 3.6.2.1 "Containment Spray System" to allow a one-time extension of the allowable outage time (AOT) for the Containment Spray System (CSS) from 72 hours to a maximum of 7 days to be used once for each train or at most two times during fuel cycles 18 and 19. The proposed change is intended to provide flexibility in scheduling CSS maintenance activities, reduce refueling outage duration, and improve the availability of CSS components important to safety during plant shutdowns.

This letter provides a deterministic assessment of the proposed change as well as risk informed information as set forth in Regulatory Guide (RG) 1.177. This submittal also considers the Combustion Engineering Owners Group Joint Applications Report (JAR) for Modifications to the Containment Spray System Technical Specifications (CE NPSD-1045-A) dated March 2000.

The proposed change has been evaluated in accordance with 10 CFR 50.91(a)(1) using criteria in 10 CFR 50.92(c) and it has been determined that this change involves no significant hazards considerations. The bases for these determinations are included in Attachment 1. The proposed change to the ANO-2 TS 3.6.2.1 is contained in Attachment 2. Entergy has also provided Facts and Observations of the ANO-2 risk model which is contained in Attachment 4.

The proposed change includes new commitments as summarized in Attachment 3. The NRC has granted TS changes for other plants that allow extending the AOT to greater than 72 hours.

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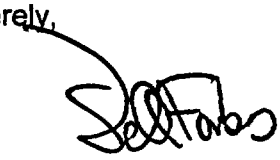
The next ANO-2 refueling outage is scheduled for the fall of 2006. Entergy desires approval of this amendment by March 31, 2006 to support performing the desired maintenance activities prior to the outage. Although this request is neither exigent nor emergency, your prompt review is requested. If you 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 September 19, 2005.

Sincerely,



JSF/DM

Attachments:
1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. List of Regulatory Commitments
4. Facts and Observations from Peer Review of ANO-2 PSA Model

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Attachment 1

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Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-6 for Arkansas Nuclear One, Unit 2 (ANO-2).

The proposed change will revise Technical Specification (TS) 3.6.2.1, "Containment Spray System" to provide a one-time extension of the allowable outage time (AOT) for the Containment Spray System (CSS) to be used once for each train or at most two times during fuel cycles 18 and 19. This will allow greater flexibility and more efficient planning of CSS maintenance and testing activities during unit operation. The changes will also reduce plant refueling outage duration and improve the availability of CSS components important to safety during refueling outages.

The next ANO-2 refueling outage is scheduled for the fall of 2006. Entergy desires approval of this amendment by March 31, 2006 to support performance of the planned maintenance activities prior to the refueling outage.

2.0 PROPOSED CHANGE

Currently, the Action statement for ANO-2 TS 3.6.2.1 requires restoration of an inoperable CSS to an OPERABLE status within 72 hours. If restoration of the CSS cannot be accomplished in the allowable time, the unit shall be placed in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Entergy proposes to modify the current Action with the following note:

> Note 1: For fuel cycles 18 and 19, each train of the containment spray system may be removed from service for up to 7 days or one train may be removed from service two times. The 7-day allowance may be applied only twice.

Cycle 19 ends in the spring of 2008.

3.0 BACKGROUND

The requested changes are sought to provide needed flexibility in the performance of selected corrective and preventative maintenance activities during power operations. The approval of the proposed change will allow the following:

- An increased flexibility in the scheduling and performance of maintenance activities.
- A reduction in the number of individual entries into limiting conditions for operation Action statements by providing sufficient time to perform related maintenance tasks within a single entry.
- Better control of resource allocation. During outage maintenance windows, plant personnel and resources are spread across a large number and wide variety of maintenance tasks. Allowing on-line maintenance gives the plant the flexibility to focus dedicated resources on the CSS maintenance.
- Improved availability of CSS components important to safety during shutdown modes.

Currently, maintenance activities are performed on CSS component during refueling outages. These activities are worked around the clock and can take several days, depending largely upon the amount of corrective or preventative maintenance. Vendor recommended inspections and maintenance activities may take longer.

Containment Heat Removal Systems

The Containment Heat Removal System (CHRS) consists of the CSS and the Containment Cooling System (CCS). The CHRS functions to rapidly reduce the containment pressure and temperature after a postulated loss of coolant accident (LOCA) or Main Steam Line Break (MSLB) accident by removing thermal energy from the containment atmosphere. The CHRS also assists in limiting off-site radiation levels by reducing the pressure differential between the containment atmosphere and the outside atmosphere, thereby reducing the driving force for leakage of fission products from the containment.

The CHRS is designed so that either both trains of the CSS, or one train of CSS and one train of CCS will provide adequate heat removal to attenuate the post-accident pressure and temperature conditions imposed upon the containment following a LOCA or MSLB.

The CSS also provides for iodine removal from the containment atmosphere by a combination of boric acid spray and a buffered pH solution. Therefore, at least one CSS must be in operation following a LOCA.

Containment Spray System

The CSS consists of two separate loops of equal capacity and is independently capable of meeting CHRS requirements. Each loop consists of a containment spray pump, shutdown cooling heat exchanger, spray header, isolation valves, and the necessary piping, instrumentation and controls. The loops are supplied with borated water from a common Refueling Water Tank (RWT).

The CSS is automatically actuated by a Containment Spray Actuation Signal (CSAS) from the Engineered Safety Features Actuation System (ESFAS). Upon system activation, the containment spray pumps are started and deliver boric acid to the respective spray headers. The spray headers are located at the highest possible level in the containment to maximize heat and iodine removal. Each header conforms to the shape of the containment dome. The headers are located outside of and above the movable missile shield, and contain 131 spray nozzles each. During normal plant operation CSS piping is maintained full of water from the RWT to elevation 505 feet, 0 inches (minimum) in the 6-inch diameter risers within containment. When low level is reached in the RWT, the Recirculation Actuation Signal (RAS) automatically transfers the containment spray pump suction to the containment sump by opening the recirculation line valves and closing the RWT outlet and pump minimum flow recirculation valves.

During recirculation, water which has collected in the containment sump flows by gravity to the CSS pumps which return it to the containment spray headers via the shutdown cooling (SDC) heat exchangers. As the water passes through the SDC heat exchangers heat is rejected to the Service Water System (SWS). Following the switchover of suction to the containment sump, the sump solution will contain boric acid and trisodium phosphate dodecahydrate (TSP-C). This

mixture of boric acid and TSP-C will remove and retain fission product iodine as it is recirculated through the CSS and continue to remove post-accident energy.

Containment Cooling System

The CCS consists of two trains which function to reduce temperature and pressure following any postulated LOCA. Each loop consists of two cooling units, each of which discharges into a separate distribution plenum. Intake during normal operation is through a duct network which is common to all four units. The two distribution plenums are also connected to a duct network which distributes the discharge of the cooling units to different areas in the containment. The SWS supplies cooling water to the cooling units during post-accident operation.

A detailed description of the CHRS, CSS, and CCS can be found in the ANO-2 Safety Analysis Report (SAR), sections 6.2.2 and 6.2.3.

Joint Application Report (CE NPSD-1045-A)

The Combustion Engineering Owners Group submitted a Joint Applications Report (JAR) to the NRC for review in April 1998 to allow an extension of the AOT to seven days for one CSS train. By letter dated December 21, 1999, the NRC granted approval of the request.

The JAR provides generic information supporting the proposed AOT changes, as well as the necessary plant specific information to demonstrate the impact of these changes on an individual plant basis. The evaluation includes a consideration of the risk associated with "at power," "transition," and "shutdown" operations. The assessment contained in the JAR is applicable to this submittal.

4.0 TECHNICAL ANALYSIS

Entergy has evaluated the proposed changes using traditional engineering analyses as well as a risk-informed approach as set forth in Regulatory Guide (RG) 1.177, *An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications.* RG 1.177 prescribes an acceptable approach for requesting TS changes that go beyond current staff positions, especially for those such as relaxation of AOTs or surveillance test intervals. These evaluations and conclusions are also consistent with the guidance of RG 1.174, *An Approach For Using Probabilistic Risk Assessment In Risk Informed Decisions on Plant-Specific Changes to The Licensing Basis.*

4.1 Deterministic Assessment of the CSS AOT Extension

The function of the CSS is to ensure that containment depressurization and cooling capability will be available in the event of a loss of coolant accident (LOCA). The CSS also provides a mechanism for removing iodine from the containment atmosphere. Following a LOCA or MSLB, at least one train of CSS must operate to ensure iodine removal. When performing maintenance activities on either train of the CSS, the redundant CSS train and the CCS will be protected.

4.1.1 Defense in Depth

The design and operation of the CSS is not being modified as a result of the proposed change. However, the proposed change will allow flexibility when a system can be removed from service to perform maintenance activities. The amount of time a single train of the CSS can be removed from service only affects the period of time that a single train of the CSS may be unavailable and not the design requirements or philosophy of the system.

The CSS and the CCS work together to rapidly reduce the containment pressure and temperature following a LOCA. With a single train of CSS unavailable, containment heat removal is accomplished with the combination of one train of CSS and one train of CCS. With a single train of CSS unavailable, the post-accident fission product removal function can be performed by the available CSS train. System redundancy, independence, and diversity are not affected by the proposed change.

The proposed TS change allows additional time for maintenance on the CSS. This will result in the ability to perform more extensive maintenance activities on-line versus during shutdown. There is no data or basis to conclude that performing on-line maintenance on the CSS will impact the containment barrier, common cause failure mechanisms, or increase the likelihood of human errors.

4.1.2 Safety Margins

The operability of the CSS is consistent with the initial condition assumptions of the accident analyses. The initial condition assumptions were based on maintaining at least one CSS operable during accident conditions.

4.2 Evaluation of Risk Impact

To assess the overall impact on plant safety, a probabilistic safety analysis (PSA) was performed consistent with the guidance specified in RG 1.177. The change in average Core Damage Frequency (CDF) and average Large Early Release Frequency (LERF) resulting from the increased AOT for a single train of the CSS was evaluated. This evaluation included consideration of the Maintenance Rule (a)(4) Program established pursuant to 10 CFR 50.65 to control performance of other potentially high-risk tasks during a single CSS train outage and consideration of specific compensatory measures to minimize risk. All of these elements were included in a risk evaluation performed using the three-tiered approaches suggested in RG 1.177, as follows:

Tier 1, PSA Capability and Insights
Tier 2, Avoidance of Risk Significant Plant Configurations, and
Tier 3, Risk-Informed Configuration Risk Management

Evaluation of each of these tiers is provided in this section.

4.2.1 Tier 1: PSA Capability and Insights

Tier 1 is an evaluation of the impact on plant risk of the proposed change as expressed by the change in CDF, the incremental conditional change in core damage probability (ICCDP), and when appropriate, the change in LERF and the incremental conditional large early release probability (ICLERP).

Containment Spray System Evaluation Assumptions

A CSS train was assumed to be the piping and components from the CSS pump suction isolation valve (2BS-2A / 2BS-2B) to the spray header (inclusive). Each CSS train includes a CSS pump and its associated shutdown cooler heat exchanger. The flow path to the minimum recirculation valve was also included.

Internal Events

A quantitative estimate of the impact of extending the current CS AOT from 3 days (72 hours) to 7 days on CDF was performed using the ANO-2 PSA Model, 4p00. This model is an at-power Level-1 internal events risk model. The model includes the risk associated with the Anticipated Transients Without Scram (ATWS) scenarios and the interfacing system loss of coolant accidents (ISLOCAs). The model does not address the risk associated with "external events," including: seismic events; internal and external floods; high winds; tornadoes; or transportation and nearby facility accidents. The model was developed specifically for use in meeting the Mitigating System Performance Index (MSPI) requirements and the one-time CSS AOT extension. It covered the significant open model issues relevant to MSPI and the CSS AOT; however, the model documentation is currently incomplete. Also, participation in the expert panel review was limited to PSA personnel. Therefore, the request for the CSS AOT extension was limited to a one-time extension.

In order to assess the risk impact of extending the current CSS AOT, a quantitative assessment of the Level-1 risk included in the ANO-2 PSA model and a qualitative assessment of other Level-1 risk contributors were performed. In addition, a qualitative assessment of the Level-2 risk was performed. The insights generated in the ANO-2 Individual Plant Examination (IPE) and the ANO-2 IPE of external events (IPEEE) were used to support the qualitative assessments. The overall change in CDF due to a 7 day AOT does not contribute significantly to the ANO-2 CDF.

As the ANO-2 PSA model is a Level-1 model, it does not provide a quantitative estimate of the impact of extending the current CCS AOT on the ANO-2 LERF. Since the ICCDP values were numerically smaller than ICLERP acceptance criteria, the ICLERP values were conservatively assumed to equal the ICCDP values. ICCDP, the change in CDF, and the change in LERF were calculated per the guidance in RG 1.177 for the CSS AOT extension. The results of the risk evaluation and the present annual average internal events and external CDF and LERF values are presented in Table 1 below and compared to the risk significance criteria from RG 1.174.

Table 1 – CDF Results

Risk Metric	Nominal CDF (/rx-yr)	Preventative Maintenance		Corrective Maintenance	
		A Train CDF (/rx-yr)	B Train CDF (/rx-yr)	A Train CDF (/rx-yr)	B Train CDF (/rx-yr)
Internal Floods	1.0E-07	1.0E-07	1.4E-07	1.0E-07	1.4E-07
Seismic	6.6E-07	6.6E-07	6.6E-07	6.6E-07	6.6E-07
Other	5.0E-07	5.1E-07	7.1E-07	5.1E-07	7.2E-07
Total Non-Modeled	1.3E-06	1.3E-06	1.5E-06	1.3E-06	1.5E-06
Total Modeled (Note 1)	5.2E-06	5.3E-06	7.4E-06	5.3E-06	7.4E-06
TOTAL	6.4E-06	6.5E-06	8.9E-06	6.6E-06	9.0E-06

Note 1: This includes ATWS and ISLOCA.

Table 2 provides the results of the risk assessment performed for the extension of the CSS AOT from 3 days to 7 days.

Table 2 – 7 day AOT ICCDP Results

Risk Metric	Preventative Maintenance		Corrective Maintenance	
	A Train	B Train	A Train	B Train
ICCDP – Modeled (Note 1)	1.8E-09	4.2E-08	2.8E-09	4.3E-08
ICCDP – Non-Modeled	2.1E-10	4.9E-09	3.2E-10	5.0E-09
TOTAL	2.0E-09	4.7E-08	3.1E-09	4.8E-08
Increase from 3 day AOT	1.1E-09	2.7E-08	1.8E-09	2.7E-08

Note 1: This includes ATWS and ISLOCA.

Preventative maintenance (PM) is defined as planned maintenance evolutions not precipitated by equipment failure. It is assumed that PM is planned such that plant risk is minimized consistent with the requirements of the Maintenance Rule (10 CFR 50.65(a)(4)). Consistent with this definition, during CSS PM activities, it is assumed that common cause failure (CCF) contributors that affect both trains of the CSS are not applicable and that testing and maintenance (T&M) activities on other plant equipment are minimized. Thus, for the CSS PM calculations, CSS CCF basic events were set to zero.

Corrective maintenance (CM) is defined as emergent maintenance evolutions precipitated by equipment failure. Because CM is not planned, it is assumed that the plant risk may be elevated due to plant conditions that existed when the subject equipment failure occurred. Consistent with this definition, during CSS CM, it was assumed that CCF contributors that affect the CSS train are elevated due to the failure that leads to the CM and that nominal values for T&M are applicable.

As stated above it was assumed that no T&M that affects the reliability of the train associated with the operable CSS train will be scheduled during the CSS out of service time. Only minimal T&M activities will be allowed regardless of what the cause of the CSS failure is (i.e., PM or CM).

Any T&M activity that renders a redundant component inoperable would result in a plant shutdown as required by TS 3.0.3.

External Events

As mentioned previously, the ANO-2 PSA Model 4p00 does not address risk associated with external events, including seismic events, internal floods, internal fires and other external events (i.e., high winds and external flooding). Nor does the model address risk associated with High and Medium Energy Line Breaks (HELBs and MELBs). A qualitative analysis was performed to assess the risk impact of these events on extending the current CSS AOT. The calculated CDF results are reflected in Table 1, above. Table 2, above, provides a summary of the ICCDP for external events, labeled as ICCDP – Non-Modeled.

Note that the numerical results presented in Tables 1 and 2 above include the effect of seismic events, internal floods, and other external events (i.e., high winds and external flooding), but not internal fires. The existing ANO-2 fire risk analysis is currently an update of the ANO-2 Individual Plant Examination for External Events (IPEEE) analysis. This analysis uses the NRC-approved Fire Induced Vulnerability Evaluation (FIVE) methodology. As a vulnerability analysis, the purpose of this IPEEE fire analysis was to identify plant-specific "vulnerabilities" to internal fires, not to provide a realistic estimate of the fire CDF. Given the mechanical and administrative fire protection features implemented at ANO-2, it is judged unlikely that a dominant plant risk sequence can arise as a result of a fire directly attributable to work on the out-of-service CSS train. Fire prevention is accomplished through various procedures and training programs. While performing maintenance activities on a single train of the CSS, the current procedures and training programs provide assurance that transient combustibles and hot-work are controlled in such a manner that fire events in the following areas will be minimized: (1) any High Pressure Safety Injection (HPSI) train, (2) the containment cooling system, and (3) the operable CSS. The HPSI pump is included because it is an important risk mitigating component.

4.2.2 Tier 2, Avoidance of Risk Significant Plant Configurations

The avoidance of risk significant plant configurations identifies the potentially high risk configurations that could exist if equipment in addition to that associated with the TS change is concurrently taken out of service or other risk significant operational factors such as concurrent system or equipment testing are involved. This ensures that appropriate restrictions are placed on dominant risk significant configurations that would be relevant to the proposed TS change.

A Configuration Risk Management Program (CRMP) is in place at ANO in accordance with ANO's commitment for compliance with 10 CFR 50.65, particularly with respect to paragraph (a)(4). The program provides assurance that risk significant plant equipment configurations are precluded or minimized when plant equipment is removed from service. When a single CSS train is removed from service, increases in risk posed by potential combinations of equipment out of service will be managed in accordance with the CRMP.

4.2.3 Tier 3, Risk Informed Configuration Risk Management

Consistent with 10 CFR 50.65(a)(4), and as indicated above, ANO has developed a CRMP. This program is a proceduralized risk-informed assessment process to manage the risk associated with planned and unplanned plant maintenance activities. The program ensures that

the risk impact of out of service equipment is appropriately evaluated prior to performing a planned maintenance activity and soon after entering into an emergent maintenance condition. Procedures and guidelines have been developed that govern this process. These documents require an integrated (i.e., both quantitative and qualitative) review of maintenance activities to identify risk significant plant equipment outage configurations. This review is required both during the work management process and for emergent conditions during normal plant operation. Appropriate consideration is given to equipment unavailability, operational activities such as testing or load dispatching, and weather conditions. This program includes provisions for performing a configuration dependent assessment of the overall impact on risk of proposed plant configurations prior to, and during, the performance of maintenance activities that remove equipment from service. Risk is re-assessed if an equipment failure/malfunction or emergent condition produces a plant configuration that has not been previously assessed.

The quantitative ANO CRMP risk assessment is performed to ensure that the activity does not pose any unacceptable risk due to modeled internal events contributors. The qualitative ANO CRMP assessment addresses a broad range of areas, including trip or transient potential, reactivity mis-management potential, redundant equipment availability, containment integrity, cross unit impact, red train-green train separation, fire, flooding, and severe weather contingencies.

For planned activities, an assessment of the risk of the activities on plant safety is performed prior to the scheduled work. The assessment includes the following considerations:

- Maintenance activities that affect redundant structures, systems, and components (SSCs) that provide backup for the same function are minimized.

- The potential for planned activities to cause a plant transient are reviewed and work on SSCs that would be required to mitigate the transient are avoided.

- For Maintenance Rule Program High Risk Significant SSCs, the impact of the planned activity on the unavailability performance criteria is evaluated.

Emergent work is reviewed by Planning and Scheduling and Operations to ensure that it does not invalidate the assumptions made during the schedule development process. Prior to starting any work, the work scope and schedule are critically reviewed to assure that nuclear safety and plant operations are consistent with the expectations of management.

The ANO Fire Hazards Analysis requirements and procedures provide sufficient assurance that risk is minimized when removing equipment such as the CSS from service.

The Fire Protection Program uses a three tiered approach:

1. Preventing fires from starting
2. Detecting fires promptly, suppressing them quickly, and therefore limiting fire damage;
3. Designing plant safety systems so that a fire which does start will not ultimately prevent essential plant safety functions from being accomplished.

Fire prevention is accomplished through various procedures and training programs. As with current maintenance practices, any fire protection preventative measures that are required to be

implemented during CSS maintenance activities will be established. In addition, the fire-related compensatory measures noted above are expected to further reduce the plant risk due to fire.

4.3 PRA Quality

The ANO-2 Individual Plant Examination (IPE) model was developed by ANO Safety Analysis Design Engineering personnel with support from Science Applications International Corporation (SAIC) (now Data Systems & Solutions (DS&S)), other Design Engineering groups, and Operations. As part of the IPE development process, an expert panel review was performed on the results. This panel was composed of experienced personnel from these groups. In addition, Engineering and Research, Incorporated (ERIN) performed an external review of the IPE model and results.

The ANO-2 PSA model has been updated several times since the IPE in an effort to maintain it consistent with the as-built/as–operated plant, to incorporate improved thermal hydraulic results, and to incorporate PSA methodology improvements. The updates have involved a cooperative effort involving both Entergy personnel and PSA consultant support. In each of the updates, all of the elements of the PSA were independently reviewed and revised, as appropriate. The PSA model and results have been maintained as controlled documents.

The CEOG PSA peer review, which was modeled after the industry peer review process described in Nuclear Energy Institute report NEI 00-02, *Probabilistic Risk Assessment (PRA) Peer Review Process Guidance*, was conducted on the ANO-2 PSA model in February 2002. The peer review report identified a number of Facts and Observations (F&Os) with an "A level" or "B level" of significance in the ANO-2 PSA model. A description of and impact of each of the remaining open "A and B level" F&Os on the CSS AOT risk assessment is included in Attachment 4.

4.4 Conclusion

The proposed extension of the CSS AOT is acceptable based upon a risk informed assessment. The assessment concludes that the increase in plant risk is small and consistent with the guidance contained in RG 1.177.

Maintenance during power operation can improve overall CSS availability and should result in reducing shutdown risk by increasing the availability of the CSS components important to safety during refueling outages.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements/Criteria

The proposed changes have been evaluated to determine whether applicable regulations and requirements continue to be met. The conformance discussion for General Design Criteria (GDC) is provided in Section 3.1 of the ANO-2 Safety Analysis Report (SAR). Entergy has determined that the proposed changes do not require any exemptions or relief from regulatory requirements, other than the TS, and do not affect conformance with any GDC differently than described in the SAR.

5.2 No Significant Hazards Consideration

Entergy Operations, Inc. (Entergy) proposes to change the Arkansas Nuclear One, Unit 2 (ANO-2) Technical Specifications (TSs) to permit an extension of the allowable outage time (AOT) for the containment spray system (CSS) from 72 hours to 7 days to be used once for each train or at most two times during fuel cycles 18 and 19. Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, *"Issuance of amendment,"* as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed TS change does not affect the design, operational characteristics, function or reliability of the CSS.

   The CSS is primarily designed to mitigate the consequences of a Loss of Coolant Accident (LOCA) or Main Steam Line Break (MSLB). The requested change does not affect the assumption used in the deterministic LOCA or MSLB analyses.

   The duration of a TS AOT is determined considering that there is a minimal possibility that an accident will occur while a component is removed from service. A risk informed assessment was performed which concluded that the increase in plant risk is small and consistent with the guidance contained in Regulatory Guide 1.177.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change does not involve a change in the design, configuration, or method of operation of the plant that could create the possibility of a new or different kind of accident. The proposed change extends the AOT currently allowed by the TS to 7 days.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No.

   The Containment Heat Removal System (CHRS) consists of the CSS and the Containment Cooling System (CCS). The CHRS functions to rapidly reduce the containment pressure and temperature after a postulated LOCA or MSLB accident by removing thermal energy from the containment atmosphere. The CHRS also assists in limiting off-site radiation levels by reducing the pressure differential between the

containment atmosphere and the outside atmosphere, thereby reducing the driving force for leakage of fission products from the containment.

The CHRS is designed so that either both trains of the CSS, or one train of CSS and one train of CCS will provide adequate heat removal to attenuate the post-accident pressure and temperature conditions imposed upon the containment following a LOCA or MSLB.

The proposed change includes administrative controls that will be established to ensure one train of CSS and one train of CCS will be available during the extended CSS AOT.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.3 Environmental Considerations

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

Attachment 2

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Proposed Technical Specification Changes (mark-up)

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION, COOLING, AND pH CONTROL SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the RWT on a Containment Spray Actuation Signal (CSAS) and automatically transferring suction to the containment sump on a Recirculation Actuation Signal (RAS). Each spray system flow path from the containment sump shall be via an OPERABLE shutdown cooling heat exchanger.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours (Note 1) or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.

2. Verifying that the system piping is full of water from the RWT to at least elevation 505' (equivalent to > 12.5% indicated narrow range level) in the risers within the containment.

b. Verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head when tested pursuant to the Inservice Testing Program.

Note 1: For fuel cycles 18 and 19, each train of the containment spray system may be removed from service for up to 7 days or one train may be removed from service two times. The 7-day allowance may be applied only twice.

Attachment 3

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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	
No Test & Maintenance that affects equipment reliability associated with the operable CSS train or CCS will be scheduled during the CSS out of service time.		x	

Attachment 4

2CAN090502

Facts and Observations from Peer Review of ANO-2 PSA Model

Facts and Observations from Peer Review of ANO-2 PSA Model

F&O	F&O Description	F&O Significance Level	Impact on CSS AOT Extension Risk Results
AS-03	OBSERVATION: Element AS / Sub-element: AS-5: The family of cutsets of the form %T14*DBT2DSCD11*DHF2D31BAP*PRY201002T*PRY201052T do not appear to be valid. The loss of 480VAC Bus 2B5 will result in the failure of the red 125 VDC bus following battery depletion. This is expected to occur at the 8 hr point (per Mike Lloyd). The loss of the 480VAC Bus 2B5 is assumed to result in a plant trip (another potential conservatism). The plant trip is assumed to cause the secondary safety relief valves to open. A safety relief valve on each header failed to close. This results in a MSIS actuation. This disables EFW, AFW, and MFW. At this point the operators could do any of the following to prevent core damage: Manually open the motor driven EFW pump valves, open valves 2CV-4740-2 & 4698-1 (prior to battery depletion), or recover green facility charging to the red facility bus. Given, the alternative of core damage it seems likely that operations will attempt one of these options.	A	The subject cutset and similar cutsets no longer occur in the ANO-2 PSA Model baseline CDF cutset results. Primarily, this is due to the removal of %T14 as a MSSV challenge. Thus, the modeling conservatism may still be present but no longer has a significant risk impact. And, thus this F&O has no impact on the conclusions of this risk assessment.
IE-03	OBSERVATION: Element IE / Sub-element IE-16, IE-3: Initiating Event Lost of Service Water %T7 is calculated as 1.95E-3 in Supplement 21 and is listed as 1.8E-03 in the model and in the Main document. No explanation could be found in any other supplement or the MCR database.	B	A sensitivity study in which the probability of event %T7 was increased from 1.8E-3 to 1.95E-3/rx-yr to account for this potential model error yielded about a 0.2% increase in the CSS Train B CM ICCDP (6.045E-06 to 6.057E-06), which is a limiting result. This small increase has no impact the conclusions of this risk assessment.

Facts and Observations from Peer Review of ANO-2 PSA Model

F&O	F&O Description	F&O Significance Level	Impact on CSS AOT Extension Risk Results
IE-04	OBSERVATION: Element IE / Sub-element IE-13, IE-14: Arkansas uses generic data is used to calculate IE frequencies. This prevents support system interdependencies from being captured. Plant specific models should be included to define and quantify initiating event frequencies where appropriate.	B	Plant-specific IE frequencies are currently used for several initiators which have high frequency values (i.e., observed at the plant); generic information is used of infrequent initiators. Bayes combining plant-specific experience with generic data for these infrequent initiators is expected to reduce the initiator frequencies for these infrequent initiators and thus is expected to reduce the CDF estimate. And, thus this F&O has no impact on the conclusions of this risk assessment.
AS-06	OBSERVATION: Element AS / Sub-element: AS-5: There is a potentially significant cutset that is not produced by the model: Loss of Off-site Power (LOOP) and common cause demand failure of the station batteries. It is understood that this cutset could be recovered with the Alternate AC diesel-generator. However, the contribution could be significant depending upon the quantification of the recovery.	B	This issue affects LOOP cutsets that appear equally in the three-day CSS AOT base-case and in the seven-day CSS AOT case. CSS does not have any unique dependencies on the station batteries. Furthermore, ANO-2 PSA Model 4p00 no longer contains battery demand failures only battery run failures. And, thus this F&O has no impact on the conclusions of this risk assessment.

Facts and Observations from Peer Review of ANO-2 PSA Model

F&O	F&O Description	F&O Significance Level	Impact on CSS AOT Extension Risk Results
SY-07	OBSERVATION (ID: SY-07) / Element SY / Sub-element SY-4, SY-7: Human failure event AHF2RWTLLA, mis-calibration of RWT level channels, causes failure of containment spray and failure of the SI minimum recirculation flow path to isolate. However, the failure is of one type only, that of failing RAS. There is a second failure mode that should be considered, mis-calibration causing premature RAS. This would cause CS and SI pump suction to swap to a dry containment sump. Also, this and numerous other ESFAS mis-calibrations are quantified at 1E-10. This is an extraordinarily low value.	B	A sensitivity study in which the probability of event HCC2HRWTCV (CCF HPSI RWT SUCTION FLOW PATH CHECK VALVES (2 OF 2) FAIL TO OPEN), which as a similar effect of AHF2RWTLLA in the model, was increased by the amount 1E-5 to account for a bounding high estimate of the subject common mis-calibration, yielded about a 1% increase in the CSS Train B CM ICCDP, which is a limiting result. This small increase has no impact the conclusions of this risk assessment. The 4p00 model has RWT mis-calibration probability of 1E-10 in event AHF2RWTLLA. The model does have two similar events that have much higher probabilities. The model has QHF2EFASVP, "FAILURE TO VERIFY AND CORRECT EFAS SIGNAL" with a value of 10%. It first appears in a 1E-11 cutset in the no-maintenance case & in the SDC HX B case. As its likelihood is relatively certain, cutsets that contain QHF2EFASVP are unlikely to become dominant plant risk cutsets, or even significant in the CSS AOT risk assessment. The model also has AHF2XRASVP which is "OPERATOR FAILS TO VERIFY RAS" with a 10% chance of failure. Due to the position of AHF2RWTLLA in the fault tree, AHF2XRASVP would appear in any cutset that might have AHF2RWTLLA. AHF2XRASVP first appears in 1E-11 cutsets in the base case and in the SDC HX B case. Combining AHF2XRASVP with AHF2RWTLLA is thus unlikely to become dominant plant risk cutsets, or even significant in the CSS AOT risk assessment.

Facts and Observations from Peer Review of ANO-2 PSA Model

F&O	F&O Description	F&O Significance Level	Impact on CSS AOT Extension Risk Results
L2-05	OBSERVATION: Element L2 / Sub-element: L2-22, L2-23: The ANO-2 definition of LERF does not reflect the Emergency Actions Levels. The definition of "Early" that is used is based on time since vessel failure.	B	This is a Level-2 F&O issue; thus, there is no impact on the conclusions of this risk assessment, since LERF was assumed to equal CDF.
L2-06	OBSERVATION: Element L2 / Sub-element: L2-22: Arkansas selects the sequences to use to calculate LERF based on the Cesium and Iodine release fractions. Any sequence for which either the Cesium or the Iodine release fraction is greater than 10% is considered to be a large release sequence. Due to the uncertainties involved in determining release fractions and determining the actual source term released to the environment, a common practice is to also include the medium release sequences in the LERF calculation. A medium release sequence is any sequence for which either the Cesium or the Iodine release fraction is between 1% and 10%	B	This is a Level -2 F&O issue; thus, there is no impact on the conclusions of this risk assessment, since LERF was assumed to equal CDF.
L2-07	OBSERVATION Element L2 / Sub-element: L2-14: Containment Capability is analyzed under severe accident conditions for its survivability: The ANO-2 containment failure pressure was calculated only as point estimates at several locations (see Table E-1, Calc. No. 89-E-0048-31, Rev.0). Also, there is no indication as to the assumed containment temperatures at which those failure pressures (i.e., point estimates) were calculated. Typically the mechanical properties (e.g., yield stress and ultimate strength) of the containment steel liner degrade as the temperature in the containment increases. Hence, one would expect that the containment failure pressure should vary as a function of the containment temperature during the progression of a core-melt accident.	B	This is a Level-2 F&O issue; thus, there is no impact on the conclusions of this risk assessment, since LERF was assumed to equal CDF.

Facts and Observations from Peer Review of ANO-2 PSA Model

F&O	F&O Description	F&O Significance Level	Impact on CSS AOT Extension Risk Results
L2-08	OBSERVATION Element L2 / Sub-element: L2-15: Containment capacity is analyzed under severe accident conditions for its vulnerability. Both static and dynamic effects are included. The ANO-2 containment has a design pressure Pdesign = 54 psig. The ultimate failure has been estimated to be Pult = Pdesign x 2.8 = 54 x 2.8 = 151.2 psig ~ 151 psig. The 95th percentile as well as the 5th percentile have not been calculated (i.e., the containment fragility curve is not developed).	B	This is a Level-2 F&O issue; thus, there is no impact on the conclusions of this risk assessment, since LERF was assumed to equal CDF.
L2-09	OBSERVATION (ID: L2-09) / Element L2 / Sub element: L2-23: The LERF definitions use Emergency Action Levels (EAL) based if required; and the EAL based are documented: The ANO-2 calculation files (such as Calc. No. 89-E-0167-10, Rev. 0, page 4) associated with Level-II PRA define core-melt timing for the plant damage states as follows: V = very early to be between 0 and 30 minutes, E = early to be between 30 minutes to 2 hrs, and L = late as greater than 2 hours. Typically, Level-II PRAs define early release as core-melt accidents in which the containment failure occurs within approximately 4 hours of vessel breach. This definition is consistent with the Emergency Evacuation Plans where any evacuation within 4 hours is considered as early. This definition is consistent with the EPRI PSA Applications Guide. Also, the 4 hours definition was cited on Page 28 of Calc. File 01-E-0011-04, Rev. 0. Since ANP-2 considers late release to be greater than 2 hours, this could underestimate the LERF calculations.	B	This is a Level-2 F&O issue; thus, there is no impact on the conclusions of this risk assessment, since LERF was assumed to equal CDF.