50-368

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 2, 1999

Mr. C. Randy Hutchinson
Vice President, Operations ANO
Entergy Operations, Inc.
1448 S. R. 333
Russellville, AR 72801

SUBJECT: CORRECTION TO AMENDMENT NOS. 195 AND 196 (TAC NOS. M99336 AND MA3602)

Dear Mr. Hutchinson:

On December 29 and December 31, 1998, the Commission issued Amendment Nos. 195 and 196, respectively, to Facility Operating License No. NPF-6 for the Arkansas Nuclear One, Unit No. 2. Amendment No. 195 modifies the Technical Specifications (TSs) in response to your application dated July 28, 1997 (2CAN079702). This amendment modifies the actions associated with TS Table 3.3-1, Table 3.3-3, and Bases 3/4.3. Amendment No. 196 modifies the TSs in response to your application dated September 17, 1998 (2CAN099805). This amendment modifies the actions associated with TS 3/4.10.3, Table 2.2-1, Table 3.3-1, Table 3.3-3, Table 3.3-4, Bases 2.2.1, and Bases 3/4.3.

After issuance, it was discovered that a conflict was created with selected TS pages that were revised in both amendments. Specifically, certain TS pages issued with Amendment No. 196 did not reflect the changes that had been made with issuance of Amendment No. 195.

In addition, the wrong revision overleaf page (B 3/4 3-1) was issued in Amendment No. 196.

Also, in the cover letter and safety evaluation for Amendment No. 196, the power limits for the removal of the bypass permissives for the core protection calculator generated trips and the high logarithmic power level trip were represented in a manner different from what was stated in the TS pages. Specifically, the values in the safety evaluation were stated in terms of 10E-2 percent power and 10E-4 percent power and were intended to be consistent with the values in the TS which were stated in terms of 10^{-2}% and 10^{-4}% power. This had been identified as a source of confusion.

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Enclosed are the corrected pages; TS Page 3/4 3-14, TS Page B 3/4 3-1, TS Page B 3/4 3-1a, TS Page B 3/4 3-1b, TS Page B 3/4 3-1c, that reflect combined approval of Amendment Nos. 195 and 196 which are being reissued.

We regret any inconvenience this may have caused you.

Sincerely,

ORIGINAL SIGNED BY:

M. Christopher Nolan, Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosures: As stated

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M. Christopher Nolan

M. Christopher Nolan, Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosures: As stated

cc w/encls: See next page

cc:

Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-199

Director, Division of Radiation
Control and Emergency Management
Arkansas Department of Health
4815 West Markham Street, Slot 30
Little Rock, AR 72205-3867

Winston & Strawn
1400 L Street, N.W.
Washington, DC 20005-3502

Manager, Rockville Nuclear Licensing
Framatone Technologies
1700 Rockville Pike, Suite 525
Rockville, MD 20852

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
P. O. Box 310
London, AR 72847

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

County Judge of Pope County
Pope County Courthouse
Russellville, AR 72801

Vice President, Operations Support
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, MS 39205

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	2/Bus	1/Bus	2/Bus	1, 2, 3	9
b. 460 volt Emergency Bus Undervoltage (Degraded Voltage)	1/Bus	1/Bus	1/Bus	1, 2, 3	9
8. EMERGENCY FEEDWATER (EFAS)					
a. Manual (Trip Switches)	2 sets of 2 per S/G	2 sets of 2 per S/G	2 sets of 2 per S/G	1, 2, 3, 4	9
b. SG Level and Pressure (A/B) - Low and ΔP (A/B) - High	4/SG	2/SG	3/SG	1, 2, 3, 4	10,11
c. SG Level (A/B) - Low and No S/G Pressure - Low Trip (A/B)	4/SG	2/SG	3/SG	1, 2, 3, 4	10,11
d. ESFAS Logic					
1. Matrix Logic	6	1	3	1, 2, 3, 4	12
2. Initiation Logic	4	2	4	1, 2, 3, 4	9
e. Automatic Actuation Logic	2	1	2	1, 2, 3, 4	13

TABLE NOTATION

(a) Trip function may be bypassed in this MODE when pressurizer pressure is below 400 psia; bypass shall be automatically removed before pressurizer pressure exceeds 500 psia.

(b) An SIAS signal is first necessary to enable CSAS logic.

(c) Remote manual not provided for RAS. These are local manuals at each ESF auxiliary relay cabinet.

ACTION STATEMENTS

ACTION 9 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

ACTION 10 - With the number of channels OPERABLE one less than the Total Number of Channels, operation in the applicable MODES may continue provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour. If the inoperable channel is bypassed for greater than 48 hours, the desirability of maintaining this channel in the bypassed condition shall be reviewed at the next regularly scheduled PSC meeting in accordance with the QA Manual Operations. The channel shall be returned to OPERABLE status prior to startup following the next COLD SHUTDOWN.

If an inoperable Steam Generator ΔP or RWT Level - Low channel is placed in the tripped condition, remove the inoperable channel from the tripped condition within 48 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

With a channel process measurement circuit that affects multiple functional units inoperable or in test, bypass or trip all associated functional units as listed below.

Process Measurement Circuit	Functional Unit Bypassed
1. Containment Pressure - NR	Containment Pressure - High (RPS) Containment Pressure - High (ESFAS) Containment Pressure - High-High (ESFAS)
2. Steam Generator 1 Pressure	Steam Generator 1 Pressure - Low Steam Generator 1 ΔP (EFAS 1) Steam Generator 2 ΔP (EFAS 2)
3. Steam Generator 2 Pressure	Steam Generator 2 Pressure - Low Steam Generator 1 ΔP (EFAS 1) Steam Generator 2 ΔP (EFAS 2)
4. Steam Generator 1 Level	Steam Generator 1 Level - Low Steam Generator 1 Level - High Steam Generator 1 ΔP (EFAS 1)
5. Steam Generator 2 Level	Steam Generator 2 Level - Low Steam Generator 2 Level - High Steam Generator 2 ΔP (EFAS 2)

3/4.3.1 and 3/4.3.2 PROTECTIVE AND ENGINEERED SAFETY FEATURES (ESF) INSTRUMENTATION

The OPERABILITY of the protective and ESF instrumentation systems and bypasses ensure that 1) the associated ESF action and/or reactor trip will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available for protective and ESF purposes from diverse parameters.

The OPERABILITY of these systems is required to provide the overall reliability, redundancy and diversity assumed available in the facility design for the protection and mitigation of accident and transient conditions. The integrated operation of each of these systems is consistent with the assumptions used in the accident analyses.

The surveillance requirements specified for these systems ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability. The triannual channel functional testing frequency is to be performed on a STAGGERED TEST BASIS.

The RPS Matrix Logic channels and the Initiation Logic channels are listed as separate functional units in Table 3.3-1 and are grouped together in the corresponding surveillance Table 4.3-1 as a single functional unit listed as Reactor Protection System (RPS) Logic. The RPS Logic contains six Matrix Logic channels and four Initiation Logic channels. For surveillance testing purposes, the RPS Logic is considered to have four channels or n=4 with respect to STAGGERED TEST BASIS. The associated triannual CHANNEL FUNCTIONAL TESTING requirements are performed during the individual channel PPS test. The six RPS Matrix Logic channels are divided up for testing purposes as follows: Matrix AB is tested with channel A, matrices BC and BD are tested with channel B, matrices AC and CD are tested with channel C, and matrix AD is tested with channel D. This testing methodology is supported by the analysis that was performed to extend the surveillance interval to the triannual frequency and also satisfies the STAGGERED TEST BASIS requirements for the RPS Matrix Logic channels.

Table 4.3-2 requires the Automatic Actuation Logic channels for each of the associated ESFAS functional units to have a CHANNEL FUNCTIONAL TEST performed on a triannual frequency on a STAGGERED TEST BASIS. These testing requirements also apply to the six ESFAS Matrix Logic channels and the four ESFAS Initiation Logic channels. For surveillance testing purposes, the ESFAS Matrix Logic channels and the ESFAS Initiation Logic channels are considered to have four channels or n=4 with respect to STAGGERED TEST BASIS. The ESFAS Matrix Logic channels are divided up for testing purposes like the RPS Matrix Logic channels. This testing methodology is supported by the analysis that was performed to extend the surveillance interval to the triannual frequency and also satisfies the STAGGERED TEST BASIS requirements for the ESFAS Matrix Logic channels.

The measurement of response time at the specified frequencies provides assurance that the protective and ESF action function associated with each channel is completed within the time limit assumed in the accident analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable.

Response time may be demonstrated by any series of sequential, overlapping or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either 1) in place, onsite or offsite test measurements or 2) utilizing replacement sensors with certified response times.

Plant Protective System (PPS) logic is designed for operation as a 2-out-of-3 logic, although normally it is operated in a 2-out-of-4 mode.

The RPS Logic consists of everything downstream of the bistable relays and upstream of the Reactor Trip Circuit Breakers. The RPS Logic is divided into two parts, Matrix Logic, and Initiation Logic. Failures of individual bistables and their relays are considered measurement channel failures.

The ESFAS Logic consists of everything downstream of the bistable relays and upstream of the subgroup relays. The ESFAS Logic is divided into three parts, Matrix Logic, Initiation Logic, and Actuation Logic. Failures of individual bistables and their relays are considered measurement channel failures.

Matrix Logic refers to the matrix power supplies, trip channel bypass contacts, and interconnecting matrix wiring between bistable relay cards, up to, but not including the matrix relays. Matrix contacts on the bistable relay cards are excluded from the Matrix Logic definition since they are addressed as part of the measurement channel.

Initiation Logic consists of the trip path power source, matrix relays and their associated contacts, all interconnecting wiring, and the initiation relays (including contacts).

ESFAS Actuation Logic consists of all circuitry housed within the Auxiliary Relay Cabinets (ARCs) used to house the ESF Function; excluding the subgroup relays, and interconnecting wiring to the initiation relay contacts mounted in the PPS cabinet.

For the purposes of this LCO, de-energization of up to three matrix power supplies due to a single failure, such as loss of a vital instrument bus, is to be treated as a single matrix channel failure, providing the affected matrix relays de-energize as designed to produce a half-trip. Although each of the six matrices within an ESFAS Function (e.g., SIAS, MSIS, CSAS, etc.) uses separate power supplies, the matrices for the different ESFAS Functions share power supplies. Thus, failure of a matrix power supply may force entry into the Condition specified for each of the associated ESFAS Functional Units.

Table 3.3-3 Action 10 allows for continued operation in the applicable MODES with the number of channels OPERABLE one less than the Total Number of Channels provided the inoperable channel is placed in the bypassed or tripped condition within 1 hour.

If an inoperable Steam Generator ΔP or Refueling Water Tank (RWT) Level - Low channel is placed in the tripped condition, it must be removed from the tripped condition within 48 hours or the plant must be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. This condition is limited to 48 hours because of the single failure vulnerability that exists with one of the Steam Generator ΔP or RWT Level - Low channels in the trip condition.

Operation with a channel of Steam Generator ΔP (EFAS 1 or EFAS 2) in the tripped condition renders EFAS susceptible to single failure scenarios. With a channel of Steam Generator ΔP in trip, certain single failures concurrent with a MSIS actuation can result in initiation of EFW to a faulted Steam Generator. Other single failures can result in failure of automatic control of Steam Generator level and could allow Steam Generator overfill. Placing a channel of Steam Generator ΔP in the tripped condition is acceptable for up to 48 hours because operating experience has demonstrated the low probability of the above single failure scenarios to occur.

Operation with a channel of RWT Level - Low in the tripped condition renders the RAS susceptible to a single failure scenario. With a channel of RWT Level - Low in trip, concurrent with the injection phase of a valid SIAS actuation, and a single failure of another RWT Level - Low channel would result in a RAS Actuation. These sequence of events would cause the ECCS suction to be shifted from the RWT to the containment sump prematurely. Placing a channel of RWT Level - Low in the tripped condition is acceptable for up to 48 hours because operating experience has demonstrated the low probability of the above single failure scenario to occur.

Table 3.3-3 Action 11 allows for continued operation in the applicable MODES with the number of channels OPERABLE one less than the Minimum Channels OPERABLE requirement, provided the following conditions are satisfied; One of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour, and all functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition. An inoperable channel may be placed in the trip condition to allow another channel to be bypassed for testing or repair purposes.

If an inoperable Steam Generator ΔP or RWT Level - Low channel is placed in the tripped condition, it must be removed from the tripped condition within 48 hours or the plant must be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. This condition is limited to 48 hours because of the single failure vulnerability that exists with one of the Steam Generator ΔP or RWT Level - Low channels in the trip condition.

The LCOs for the RPS and the ESFAS instrumentation systems require the OPERABILITY of the bypass permissive removal channels. These LCOs require the automatic bypass removal feature of all four operating bypass channels to be OPERABLE for each of the RPS and ESFAS functions with an operating bypass in the MODES addressed in the specific LCO for each function. The operating bypasses required by these LCOs are the Pressurizer Pressure - Low, the CPC (DNBR - Low and LPD - High), and the Logarithmic Power Level - High trips. All four automatic bypass removal channels must be OPERABLE to ensure that none of the four RPS and ESFAS channels are inadvertently bypassed. The automatic removal feature of the operating bypasses is required to be verified during surveillance testing and are not required to be verified during plant maneuvering.

The bypass term in the RPS and ESFAS LCOs applies to the automatic operating bypass removal feature and not the PPS trip channel bypass feature. If the bypass enable function is failed so as to prevent entering a bypass condition, operation may continue. In the case of the Logarithmic Power Level - High trip, the absence of a bypass will limit maximum power to below the trip setpoint.

Tables 3.3-1 notation (a) and 2.2-1 notation (1) allow the Logarithmic Power Level - High trip to be manually bypassed when above 10^{-4}% logarithmic power to allow the reactor to be brought to power during a reactor startup. The operating bypass is manually initiated in all four logarithmic power channels when the plant conditions do not warrant this trip protection and the operating bypass permissive has been enabled. The bistable design ensures that the CPC trips will be automatically enabled when the Logarithmic Power Level - High trip can be manually bypassed. The Logarithmic Power Level - High trip operating bypass is automatically removed before the logarithmic power level decreases below 10^{-4}% power.

Tables 3.3-1 notation (c) and 2.2-1 notation (5) allow the CPC trips to be manually bypassed below 10^{-2}% logarithmic power. The operating bypass effectively removes the CPC trips from the RPS. This allows closure of the reactor trip circuit breakers and thus enabling the CEA operation necessary for a plant startup. The operating bypass is manually initiated in all four CPC channels when the plant conditions do not warrant this trip protection and the operating bypass permissive has been enabled. The bistable design ensures that the Logarithmic Power Level - High trip will be automatically enabled when the CPC trips can be manually bypassed. The CPC operating bypass is automatically removed before the logarithmic power level exceeds 10^{-2}% power.

The bistable for the operating bypasses for the CPC and Logarithmic Power Level - High trips is required to be set within the two decade range allowed by Table 3.3-1 notations (a) and (c) and Table 2.2-1 notations (1) and (5). These limits provide the bistable with the appropriate range to account for the bistable hysteresis and to provide margin for the applicable uncertainties. Regardless of the actual bistable setpoint within the two decade band, the single bistable design ensures that either the CPC or the Logarithmic Power Level - High trips are available to provide reactor trip protection. During testing pursuant to Special Test Exception 3.10.3, the bistable setpoint for these operating bypasses is increased to automatically remove the CPCs from bypass before the logarithmic power level exceeds 1% power.

Tables 2.2-1 notation (2), 3.3-1 notation (b), 3.3-3 notation (a), and 3.3-4 notation (1) allow the Pressurizer Pressure - Low function to be manually bypassed below 400 psia when the operating bypass permissive has been enabled. The margin between the pressurizer pressure and the setpoint is maintained $\leq$ 200 psia as pressurizer pressure is reduced during controlled plant cooldowns. This allows for controlled depressurization of the RCS while still maintaining an active trip setpoint until the trip is no longer needed to protect the plant. Since the Pressurizer Pressure - Low bistable is shared with RPS, SIAS, and CCAS an inadvertent actuation of these systems due to low pressurizer pressure is prevented while bypassed. The Pressurizer Pressure - Low bypass is required to be automatically removed before RCS pressure exceeds 500 psia. The difference between the 400 psia allowance for the manual bypass and 500 psia automatic bypass removal feature allows for the bistable hysteresis.