

ENCLOSURE 4**GE-MNGP-AEP-3304R1, ENCLOSURE 4****NEDC-33435 CORRECTED PAGES****NON-PROPRIETARY**

The following pages to NEDC-33435 are modified/added based on this enclosure:

Old Page Number	Replace with New Page Number	Instructions
--	CPS-1	Insert prior to pg. 1-1
1-12	1-12	
9-11	9-11	--
9-14	9-14	--
--	9-14A	Insert after pg. 9-14
9-15	9-15	--
9-20	9-20	--
9-32	9-32	--
9-33	9-33	--
9-34	9-34	--
--	9-34A	Insert after pg. 9-34
--	9-34B	Insert after pg. 9-34A

12 pages follow

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NON-PROPRIETARY INFORMATION

Corrected Page Summary

Page	Section/Table/ Figure	Corrections
1-10	Table 1-1	Corrected the version of the ODYN computer code used for transient analysis from 09 to 10.
1-12	Table 1-1 Notes	Corrected status of NRC review of NEDE-32906P Supplement 3 to add the approved "A" version.
9-11	9.3.1.2	Corrected status of NRC review of NEDE-32906P Supplement 3
9-14 to 9-15	9.3	Corrected description of limiting ATWSI events
9-20	Table 9-5	Adds data for most limiting events, 2RPT and TTWBP. Also adds sequence of events tables for 2RPT and TTWBP.
9-32	Figure 9-12	Changed to multiple plots adding detail for 2RPT
9-33	Figure 9-13	Changed to multiple plots adding detail for TTWBP
9-34	Figure 9-14a	Detail added for limiting ATWSI event.
9-34A	Figure 9-14b	Detail added for limiting ATWSI event.
9-34B	Figure 9-14c	Detail added for limiting ATWSI event.

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- (14) The TRACG04 code is not approved by the NRC for long-term ATWS calculations including ATWS with depressurization and ATWS with core instability. However, TRACG04 is used as a best-estimate code, while ODYN remains as the licensing basis code for ATWS consistent with the NRC SE for NEDC-33006P. The use of TRACG04 for the best-estimate TRACG ATWS analysis is also consistent with the NRC SE for NEDC-33006P. TRACG02, the predecessor code to TRACG04, is approved by the NRC for application to ATWS overpressure transients in NEDE-32906P Supplement 1-A, "TRACG Application for Anticipated Transient Without Scram," November 2003. TRACG04 has been approved by the NRC for application to ATWS overpressure transients in NEDE-32906P Supplement 3-A, "Migration to TRACG04 / PANAC11 from TRACG02 / PANAC10 for TRACG AOO and ATWS Overpressure Transients," April 2010.
- (15) TRACG02 remains the licensing basis code for DSS-CD applications consistent with the NRC SE for NEDC-33147P. The TRACG02 licensing topical report NEDC-33147P-A, Rev. 2 is only applicable to DSS-CD methodology. The Monticello plant-specific amplitude discriminator setpoint is based on TRACG02 evaluations. TRACG04 is not approved by the NRC for DSS-CD stability applications and is only used as a best-estimate code to confirm the generic Minimum Critical Power Ratio (MCPR) margin demonstrated by TRACG02 for plant-specific application.

9.3.1.2 Anticipated Transients without Scram (Best-Estimate Calculation)

Monticello Emergency Operating Procedures (EOPs) require depressurization during an ATWS event when the suppression pool temperature reaches the HCTL. As a result, M+LTR SER Limitation and Condition 12.18.a requires that a best-estimate TRACG ATWS analysis must be performed for Monticello because hot shutdown was not achieved prior to reaching the HCTL based on the licensing basis ODYN calculation.

The best-estimate TRACG ATWS analysis was performed to demonstrate that the ATWS acceptance criteria are met for an ATWS event initiated in the MELLLA+ operating domain with depressurization explicitly modeled. The best-estimate TRACG ATWS analysis accounts for plant parameters and Monticello EOP actions, including water level control strategy and emergency depressurization. The best-estimate TRACG ATWS analysis modeled in-channel water rod flow in accordance with M+LTR SER Limitation and Condition 12.24.1. The calculation was performed using the latest NRC-approved neutronic and thermal-hydraulic codes TGBLA06/PANAC11 and TRACG04 (Reference 23).

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M+LTR SER Limitation and Condition 12.19 requires that a plant-specific ATWS instability calculation be performed to demonstrate that Monticello EOP actions, including boron injection and water level control strategy, effectively mitigate an ATWS event with large power oscillations in the MELLLA+ operating domain. The plant-specific ATWS instability calculation was (1) based on the peak reactivity exposure condition, (2) modeled the plant-specific configuration important to the ATWS instability response, and (3) used the regional mode nodalization scheme. M+LTR SER Limitation and Condition 12.23.5 requires that the power density be less than 52.5 MWt/Mlbm/hr. For Monticello, the plant-specific maximum power-to-flow ratio at rated power and minimum core flow is 43.5 MWt/Mlbm/hr, which meets the requirement. The plant-specific TRACG calculation modeled in-channel water rod flow in accordance with M+LTR SER Limitation and Condition 12.24.1. The plant-specific ATWS instability calculation was performed using the latest neutronic and thermal-hydraulic codes TGBLA06/PANAC11 and TRACG04, which is NRC approved for AOO and ATWS overpressure transients applications (Reference 23).

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The results of the plant-specific TRACG ATWS instability calculation are provided in Table 9-5. Figures 9-12 through 9-14c show the mitigating effect of decreasing water level and boron injection on the core and bundle response to the ATWS instability events.

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The results of the plant-specific TRACG ATWS instability calculation meet the ATWS acceptance criteria. Therefore, the Monticello response to an ATWS with core instability event initiated in the MELLLA+ operating domain is acceptable. Monticello EOP actions, including boron injection and water level control strategy, effectively mitigate an ATWS event with large power oscillations in the MELLLA+ operating domain.

Table 9-5a Key Results for ATWS with Core Instability Analysis from MELLLA+ Operating Domain

ATWS Acceptance Criteria	TTWBP	2RPT	Design Limit
Peak Vessel Pressure (psig) ¹	[[Not limiting	1500
Peak Suppression Pool Temperature (°F)		Not limiting	281
Peak Containment Pressure (psig)]]	Not limiting	56.0
Peak Cladding Temperature (°F)	Not limiting	[[2200
Peak Local Cladding Oxidation (%) ²	Not limiting]]	17

Notes:

1. The TRACG calculation of peak vessel pressure is based on one SRV OOS.
2. [[

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Table 9-5b Sequence of Events for ATWS with Core Instability Analysis from MELLLA+ Operating Domain - TTWBP

Event	Time (sec)
Turbine trip	0
Reactor water level reduction begins	90
SLCS is initiated	120
Boron solution enters reactor pressure vessel	[[]]

Table 9-5c Sequence of Events for ATWS with Core Instability Analysis from MELLLA+ Operating Domain – 2RPT

Event	Time (sec)
Two recirculation pump trip	0
Manual scram fails	~60
SLCS is initiated	280
OPRM scram fails	[[
Core power oscillation amplitude reaches 25%	
Reactor water level reduction is initiated	
Boron solution enters reactor pressure vessel]]

Figure 9-12 [[

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Figure 9-13 [[

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Figure 9-14a [[

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Figure 9-14b [[

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Figure 9-14c [[

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