

Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385



APR 12 2001

Docket No. 50-423
B18383

RE: 10 CFR 50.46(a)(3)(ii)

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

Millstone Nuclear Power Station, Unit No. 3
2000 Annual Reporting of Changes to and Errors in
Emergency Core Cooling System Models or Applications

In accordance with 10 CFR 50.46(a)(3)(ii), Dominion Nuclear Connecticut, Inc. (DNC) hereby submits changes to and errors in the Emergency Core Cooling System (ECCS) evaluation models or applications of those models for Millstone Unit No. 3.

Based on notification received from Westinghouse dated March 6, 2001, this report covers changes to or errors in the Small Break Loss of Coolant Accident (SBLOCA) and Large Break Loss of Coolant Accident (LBLOCA) analyses performed for Millstone Unit No. 3 for the reporting year 2000. The following is a breakdown of the information provided in Attachment 1.

1. Westinghouse identified three errors in the LOCBART computer code relating to vapor film flow regime heat transfer, dispersed flow regime wall emissivity, and cladding emissivity. Correction of these errors resulted in the following changes in the LBLOCA Peak Cladding Temperature (PCT):

LOCBART Vapor Film Flow Regime Heat Transfer Error	9°F
LOCBART Dispersed Flow Regime Wall Emissivity Error	-12°F
LOCBART Cladding Emissivity Errors	6°F

2. Westinghouse identified several related errors in how the NOTRUMP code deals with mixture level transition across node boundaries in a stack of fluid nodes. Correction of these errors resulted in the following change in the SBLOCA PCT:

NOTRUMP Mixture Level Tracking/Region Depletion Errors 13°F

A001

3. Westinghouse identified the following additional errors or changes in the ECCS Evaluation models, applicable to Unit No. 3, which were evaluated to have a PCT impact of 0°F:

- a. BASH Isotherm Initialization Error
- b. BASH Implementation of LOCBART Corrections
- c. Inadequately Dimensioned Core Reflux Flow Link Error in NOTRUMP
- d. LOCBART Rod-to-Rod Radiation Error
- e. LOCBART NUREG-0630 Coding Errors
- f. NOTRUMP Core Heat Transfer Error
- g. SATAN6 Momentum Flux Logic Error
- h. SATAN6 Reactor Coolant Pump Logic Error
- i. Large Break LOCA Single Failure Assumption
- j. Simplified Isothermal Solution for LOCBART Subroutine RATE
- k. PAD 4.0 Implementation
- l. LOCBART Rod Internal Pressure Model Revisions
- m. Improved Code I/O and Diagnostics, and General Code Maintenance

Since these errors or changes have a PCT impact of 0°F, they will not be shown on the Margin Utilization Sheets provided in Attachment 1.

4. Considering the changes summarized in Attachment 1, the corrected PCTs for the limiting SBLOCA and LBLOCA remain below the 2200°F limit as defined by 10 CFR 50.46(b)(1).

DNC believes that this information satisfies the annual reporting requirements of 10 CFR 50.46(a)(3)(ii).

There are no regulatory commitments contained within this letter.

If you have any additional questions concerning this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.



Raymond P. Necci
Vice President - Nuclear Technical Services

Attachment (1)

cc: See next page

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

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Attachment 1

Millstone Nuclear Power Station, Unit No. 3

2000 Annual Reporting of 10 CFR 50.46 Margin Utilization

**2000 Annual Reporting of 10 CFR 50.46 Margin Utilization
Small Break LOCA**

Plant Name:	Millstone Unit No. 3
Utility Name:	Dominion Nuclear Connecticut, Inc. (DNC)

Analysis Information

EM:	NOTRUMP	Analysis Date:	06/90	Limiting Break Size:	3 Inches
FQ:	2.6	ΔH:	1.7		
Fuel:	Vantage 5H	SGTP (%):	10		
Notes:	None				

	<u>Clad Temp (°F)</u>	<u>Notes</u>
LICENSING BASIS		
Analysis of Record PCT	1891	

MARGIN ALLOCATIONS (Δ PCT)

A. Prior Permanent ECCS Model Assessments

1.	ECCS Evaluation Model Changes	27
2.	Effect of SI in Broken Loop	150
3.	Effect of Improved COSI (Condensation Model)	-150
4.	Drift Flux Flow Regime Errors	-13
5.	Average Rod Burst Strain	14
6.	Fuel Rod Burst Strain Limit	-14
7.	LUCIFER Error Corrections	-16
8.	Boiling Heat Transfer Correlation Error	-6
9.	Steam Line Isolation Logic Error	18
10.	Axial Nodalization, RIP Model Revision, and SBLOCTA Error Corrections Analysis	26
11.	NOTRUMP Specific Enthalpy Error	20
12.	SBLOCTA Fuel Rod Initialization Error	10
13.	MSSV 3% Setpoint Uncertainty Analysis	67
14.	AFW Purge Volume Error	17

B. 10 CFR 50.59 Safety Evaluations

1.	Increased Pressurizer Pressure Uncertainty	14
2.	Effect of ZIRLO Fuel Cladding	24
3.	Fuel Rod Crud	2
4.	Reduced Thermal Design Flow	12
5.	Fuel Reconstitution	1
6.	Revised T-hot Average Scaling	2

C. 2000 10 CFR 50.46 Model Assessments			
(Permanent Assessment of PCT Margin)			
1.	NOTRUMP Mixture Level Tracking/Region Depletion Errors	13	
D. Temporary ECCS Model Issues			
1.	None	0	
E. Other Margin Allocations			
1.	Burst and Blockage/Time in Life	183	(1), (3)
2.	Axial Offset Decrease to +20%	-135	
3.	Margin Recovery Benefit	-51	(2)
LICENSING BASIS PCT + MARGIN ALLOCATIONS		PCT =	2106

Notes:

- (1) This assessment is a function of Base PCT plus permanent margin allocation and as such will increase/decrease with margin allocation changes.
- (2) Margin Recovery Benefit based in part on plant-specific PCT calculations that identify margin in Model Assessments and Safety Evaluations reported in Sections "A" and "B".
- (3) Value includes previous Burst and Blockage/Time in Life penalty, SPIKE Correlation Revision penalty (1999 Annual Report), and consideration of new penalty due to Item C.1 (NOTRUMP Mixture Level Tracking/Region Depletion Errors).

**2000 Annual Reporting of 10 CFR 50.46 Margin Utilization
Large Break LOCA**

Plant Name:	Millstone Unit No. 3
Utility Name:	Dominion Nuclear Connecticut, Inc. (DNC)

Analysis Information

EM:	BASH	Analysis Date:	08/90	Limiting Break Size:	Cd=0.6
FQ:	2.6	FΔH:	1.7		
Fuel:	Vantage 5H	SGTP (%):	10		
Notes:	VH5/RFA				

	<u>Clad Temp (°F)</u>	<u>Notes</u>
LICENSING BASIS		
Analysis of Record PCT	1974	

MARGIN ALLOCATIONS (Δ PCT)

A. Prior Permanent ECCS Model Assessments		
1. LOCBART Spacer Grid Single-Phase Heat Transfer Error, LOCBART Zirc-Water Oxidation Error, and LOCBART Reanalysis of Limiting AOR Case (9/99)	41	(1)
B. 10 CFR 50.59 Safety Evaluations		
1. Increased Pressurizer Pressure Uncertainty	1	
2. Effect of ZIRLO Fuel Cladding	6	
3. Reactor Vessel Flange Radiation Shield	1	
4. Reduced Thermal Design Flow	12	
5. Fuel Reconstitution	1	
6. Revised T-hot Average Scaling	7	
7. Robust Fuel Assembly Fuel Features	48	
C. 2000 10 CFR 50.46 Model Assessments (Permanent Assessment of PCT Margin)		
1. LOCBART Vapor Film Flow Regime Heat Transfer Error	9	
2. LOCBART Dispersed Flow Regime Wall Emissivity Error	-12	
3. LOCBART Cladding Emissivity Errors	6	
D. Temporary ECCS Model Issues		
1. None	0	

E. Other Margin Allocations

1. Reanalysis of Limiting AOR Case

22

LICENSING BASIS PCT + MARGIN ALLOCATIONS

PCT = 2116

Notes:

- (1) The LOCBART reanalysis addressed the following issues: LOCBART Spacer Grid Single-Phase Heat Transfer Error and LOCBART Zirc-Water Oxidation Error. No prior rackup assessments were incorporated into the reanalysis.