NRC 2001-022 10 CFR 50.46

April 25, 2001

Document Control Desk
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555-0001
Ladies/Gentlemen:

DOCKETS 50-266 AND 50-301
ECCS EVALUATION MODEL CHANGES, 10 CFR 50.46
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

As required by 10 CFR 50.46(a)(3)(ii), Nuclear Management Corporation, LLC (Licensee) is submitting this annual report of changes to, and errors discovered in, emergency core cooling system (ECCS) evaluation models for Point Beach Nuclear Plant (PBNP) Units 1 and 2. This letter provides a summary of ECCS evaluation model changes and errors identified since our previous annual report dated August 25, 2000. Model changes include changes to the large break loss of coolant accident (LOCA) model and the small break LOCA model. A summary of the changes is provided below, with additional details and a summary of peak cladding temperature (PCT) margin provided in Attachment 1.

As a result of the introduction of the new Westinghouse 422 Vantage+ (422V+) fuel product into the reactor cores at PBNP, there has been a change in the analyses of record for the large and small break LOCA. The transition to the new analysis occurred with the start of Cycle 25 for Unit 2 in the fall of 2000. Therefore, PCT margin utilization tables are provided for both sets of analyses for Unit 2. Unit 1 will transition to the new LOCA analyses with the start of Cycle 27 in the spring of 2001.

Large Break LOCA Evaluation Model

There are no changes or errors to the SECY UPI Large Break LOCA identified for PBNP Units 1 and 2 since the last reporting period. This Evaluation Model was the analysis of record for Unit 1 during the entire reporting period, and for Unit 2 prior to the start of Cycle 25 in the fall of 2000.

Beginning with Unit 2 Cycle 25, the Large Break LOCA Evaluation Model was changed to the Best Estimate LOCA (BELOCA) methodology. A decay heat uncertainty error in the BELOCA methodology was reported by Westinghouse in February of 2001 which resulted in a 4° F PCT penalty.

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Small Break LOCA Evaluation Model

For PBNP Units 1 and 2, a NOTRUMP mixture level tracking/region depletion error was identified resulting in a 13° F PCT penalty.

These changes are described in more detail in Attachment 1. Please contact us, if you have any questions or require additional information.

Sincerely,

T. J. Webb
Licensing Director

Attachment

cc: NRC Regional Administrator
NRC Resident Inspector
NRC Project Manager
PSCW

ECCS EVALUATION MODEL CHANGES AND ERRORS

Large Break LOCA Evaluation Model

The large break LOCA analysis for PBNP Unit 1 was performed utilizing the SECY UPI Large Break Evaluation Model. The current analysis of record resulted in a limiting peak clad temperature (PCT) of 2028° F for the Appendix K calculation. Safety evaluations and other assessments of PCT margin have been incurred such that the current estimated cumulative PCT is 2185° F. No changes have been identified for this model since the last 10 CFR 50.46 report.

The large break LOCA analysis for PBNP Unit 2 also used the SECY UPI Large Break Evaluation Model for most of the subject reporting period. Beginning with Unit 2 Cycle 25, the Large Break LOCA Evaluation Model was changed to the Best Estimate LOCA (BELOCA) methodology. It was determined that an error existed in the calculation of the decay heat uncertainty in the Monte Carlo code used for calculation of the 95th percentile PCT for the BELOCA. The error resulted in a 4° F penalty in the PCT. The PCT in the analysis of record is 2028° F, and the assessed PCT is therefore 2032° F. Note that the BELOCA Evaluation Model will become the analysis of record for Unit 1 with the start of Cycle 27 in the spring of 2001.

Small Break LOCA Evaluation Model

The small break LOCA (SBLOCA) analyses for PBNP Unit 1 was performed utilizing the NOTRUMP computer code. The current analysis of record resulted in a limiting PCT of 809° F for the four inch cold-leg break. Safety evaluations and other assessments of PCT margin have been incurred such that the current estimated cumulative PCT is 1209° F, which includes the 13° F NOTRUMP penalty described below.

The small break LOCA analysis for PBNP Unit 2 also used the NOTRUMP methodology and results as described in the above paragraph for most of the subject reporting period. However, reanalysis of the SBLOCA was performed for the fuel upgrade program to the 422V+ fuel product. The revised analysis demonstrated a PCT of 1046° F for the three inch cold-leg break as the most limiting case. A permanent model assessment of 13° F has been incurred (as described below) since the last 10 CFR 50.46 report so that the current estimated cumulative PCT is 1059° F for Unit 2.

Some closely related errors were discovered in how NOTRUMP deals with the stack mixture level transition across a node boundary in a stack of fluid nodes. First, local mass and energy errors can occasionally be generated when a fluid mixture level crosses a node boundary due to a phenomenon known as "level hang". When level hang occurs, the flow for a given time step is reset and becomes inconsistent with the matrix solution of the momentum equation for an excessive period of time. Second, it was discovered that the code was not properly updating metal node temperatures when a fluid node empties or refills. These errors affect all code versions up to and including NOTRUMP version 37.0. The nature of this error leads to a bounding 13° F increase of the calculated PCT for all standard Evaluation Model applications.

LARGE BREAK PEAK CLADDING TEMPERATURE MARGIN UTILIZATION FOR SECY UPI LARGE BREAK

PBNP Units 1 and 2*:

A.	Analysis of Record (2/91)	PCT =	2028° F
	Combined SSE and LOCA Events	ΔPCT =	10° F
B.	Prior Permanent ECCS Model Assessments	ΔPCT =	62° F
C.	10 CFR 50.59 Safety Evaluations	ΔPCT =	85° F
D.	2000 10 CFR 50.46 Model Assessments (none)	ΔPCT =	0° F
E.	Temporary ECCS Model Issues (none)	ΔPCT =	0° F
F.	Other Margin Allocations (none)	ΔPCT =	0° F
Licensing Basis PCT + Margin Allocations		**PCT =**	**2185° F**

*Applicable to Unit 2 through the end of Cycle 24.

LARGE BREAK PEAK CLADDING TEMPERATURE MARGIN UTILIZATION FOR BELOCA

PBNP Unit 2*:

A.	Analysis of Record (11/2000)	PCT =	2028° F
B.	Prior Permanent ECCS Model Assessments (none)	ΔPCT =	0° F
C.	10 CFR 50.59 Safety Evaluations (none)	ΔPCT =	0° F
D.	2000 10 CFR 50.46 Model Assessments		
	1. MONTECF Decay Heat Uncertainty Factor	ΔPCT =	4° F
E.	Temporary ECCS Model Issues (none)	ΔPCT =	0° F
F.	Other Margin Allocations (none)	ΔPCT =	0° F
Licensing Basis PCT + Margin Allocations		**PCT =**	**2032° F**

*Applicable to Unit 2 beginning with Cycle 25.

SMALL BREAK PEAK CLADDING TEMPERATURE MARGIN UTILIZATION
(Four Inch Cold Leg)

PBNP Unit 1 and Unit 2*:

A.	Analysis of Record (7/88)	PCT =	809° F
B.	Prior Permanent ECCS Model Assessments	ΔPCT =	57° F
C.	10 CFR 50.59 Safety Evaluations	ΔPCT =	330° F
D.	2000 10 CFR 50.46 Model Assessments 1. NOTRUMP Mixture Level Tracking/Region Depletion Errors	ΔPCT =	13° F
E.	Temporary ECCS Model Issues (none)	ΔPCT =	0° F
F.	Other Margin Allocations (none)	ΔPCT =	0° F
Licensing Basis PCT + Margin Allocations		**PCT =**	**1209° F**

*Applicable to Unit 2 through the end of Cycle 24.

SMALL BREAK PEAK CLADDING TEMPERATURE MARGIN UTILIZATION
(Three Inch Cold Leg)

PBNP Unit 2*:

A.	Analysis of Record (11/2000)	PCT =	1046° F
B.	Prior Permanent ECCS Model Assessments (none)	ΔPCT =	0° F
C.	10 CFR 50.59 Safety Evaluations (none)	ΔPCT =	0° F
D.	2000 10 CFR 50.46 Model Assessments 1. NOTRUMP Mixture Level Tracking/Region Depletion Errors	ΔPCT =	13° F
E.	Temporary ECCS Model Issues (none)	ΔPCT =	0° F
F.	Other Margin Allocations (none)	ΔPCT =	0° F
Licensing Basis PCT + Margin Allocations		**PCT =**	**1059° F**

*Applicable to Unit 2 beginning with Cycle 25.