Thomas Mogren
Manager – Engineering Services

R.E. Ginna Nuclear Power Plant, LLC
1503 Lake Road
Ontario, New York 14519-9364

585.771.5208
585.771.3392 Fax

Thomas.Mogren@cengllc.com

CENG
a joint venture of
Constellation Energy · EDF

August 16, 2012

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

ATTENTION: Document Control Desk

SUBJECT: **R.E. Ginna Nuclear Power Plant**
Docket No. 50-244

ECCS 30-Day Report for the Thermal Conductivity Degradation Impact on R.E. Ginna Large Break Loss of Coolant Accident Analaysis with ASTRUM

In accordance with 10CFR50.46(a)(3)(ii), R.E. Ginna Nuclear Power Plant, LLC (R.E. Ginna) is submitting this 30-day report for Emergency Core Cooling System (ECCS) analysis performed by Westinghouse Electrical Company. The 30-day report is associated with the application of the Westinghouse large break loss of cooling accident (LBLOCA) evaluation model. Enclosure 1 describes the ECCS evaluation model changes and errors for the LBLOCA. Enclosure 2 provides the Peak Clad Temperature Assessment Sheet. Reanalysis of the Small Break Loss of Coolant Accident (SBLOCA) was not performed.

In accordance with 10 CFR 50.46, Ginna will conduct a re-analysis following the approval by the NRC of a revised LBLOCA evaluation model, with explicit treatment of thermal conductivity degradation (TCD), if the model used for the impact of TCD in this 30-day report is determined to be non-conservative with respect to the new approved model.

Should you have any questions regarding this matter, please contact Mr. Thomas Harding at (585) 771-5219 or Thomas.HardingJr@cengllc.com.

Very truly yours,

Thomas Mogren

Enclosure 1: Description of ECCS Model Changes
Enclosure 2: LBLOCA Peak Clad Temperature Assessment Sheet

cc: W. M. Dean, NRC
M. C. Thadani, NRC
Resident Inspector, NRC

A002
NRR

ENCLOSURE 1

Description of ECCS Model Changes

Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown

Background

Fuel pellet thermal conductivity degradation (TCD) and peaking factor burndown were not explicitly considered in the R.E. Ginna Large Break Loss-of-Coolant Accident (LBLOCA) Analysis of Record (AOR). The Nuclear Regulatory Commission (NRC) Information Notice 2011-21 (Reference 1) notified addressees of recent information obtained concerning the impact of irradiation on fuel thermal conductivity and its potential to cause significantly higher predicted peak clad temperature (PCT) in realistic emergency core cooling system (ECCS) evaluation models. This evaluation provides an estimated effect of fuel pellet TCD and peaking factor burndown on the PCT calculation for the ECCS at R.E. Ginna. This change represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451 (Reference 2).

Affected Evaluation Model

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

A quantitative evaluation as discussed in Reference 3 was performed to assess the PCT effect of TCD and peaking factor burndown with other considerations of burnup on the R.E. Ginna LBLOCA analysis and concluded that the estimated PCT impact is +230°F for 10 CFR 50.46 reporting purposes. The peaking factor burndown included in the evaluation is provided in Tables 1, 2, and 3. Constellation and its vendor, Westinghouse Electric Company LLC, utilize processes which ensure that the LOCA analysis input values conservatively bound the as-operated plant values for those parameters.

Table 1: FDH Burndown Considered in the Evaluation of TCD

Rod Burnup (MWD/MTU)	FDH[(1)(2)]
0	1.72
30,000	1.72
34,000	1.60
60,000	1.40
62,000	1.40

(1) Includes uncertainties.
(2) Hot assembly average power uses same burndown, since it is a function of FDH.

Table 2: Steady State FQ Burndown Considered in the Evaluation of TCD

Rod Burnup (MWD/MTU)	FQ Steady-State[1]
0	2.0
28,000	2.0
32,000	1.80
60,000	1.45
62,000	1.45

(1) Does not include uncertainties.

Table 3: Transient FQ Burndown Considered in the Evaluation of TCD

Rod Burnup (MWD/MTU)	FQ Transient[1]
0	2.600
28,000	2.600
32,000	2.340
60,000	1.885
62,000	1.885

(2) Includes uncertainties.

References

1. NRC Information Notice 2011-21, McGinty, T. J., and Dudes, L. A., "Realistic Emergency Core Cooling System Evaluation Model Effects Resulting From Nuclear Fuel Thermal Conductivity Degradation," December 13, 2011. (NRC ADAMS # ML 113430785)
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.
3. LTR-NRC-12-27, Letter from J. A. Gresham (Westinghouse) to NRC, "Westinghouse Input Supporting Licensee Response to NRC 10 CFR 50.54(f) Letter Regarding Nuclear Fuel Thermal Conductivity Degradation (Proprietary/Non-Proprietary)," March 7, 2012.
4. NF-RG-12-45, Information Regarding the R.E. Ginna Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peak Factor Burndown Including Analysis Input Changes, July 19, 2012

Evaluation of Design Input Changes

Background

To demonstrate compliance with the 10 CFR 50.46(b)(1) acceptance criterion concerning peak cladding temperature (PCT) when explicitly considering fuel pellet thermal conductivity degradation (TCD) and peaking factor burndown in the R.E. Ginna Large Break Loss-of-Coolant Accident (LBLOCA) analysis, a design input value was revised. This input change is not a change to the approved 2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM. The updated input for R.E. Ginna is:

- Reduction in Steady-State FQ

Constellation and its vendor, Westinghouse Electric Company LLC, utilize processes which ensure that the LOCA analysis input values conservatively bound the as-operated plant values for those parameters.

This item represents a change in plant configuration or associated set points, distinguished from an evaluation model change in Section 4 of WCAP-13451 (Reference 2).

Affected Evaluation Model

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

A quantitative evaluation as discussed in Reference 1 was performed to estimate an overall PCT change due to changes in design input parameters. The evaluation concluded that the estimated PCT impact of the design input change is -96°F for 10 CFR 50.46 reporting purposes.

References

1. LTR-NRC-12-27, Letter from J. A. Gresham (Westinghouse) to NRC, "Westinghouse Input Supporting Licensee Response to NRC 10 CFR 50.54(f) Letter Regarding Nuclear Fuel Thermal Conductivity Degradation (Proprietary/Non-Proprietary)," March 7, 2012.
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.
3. NF-RG-12-45, Information Regarding the R.E. Ginna Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peak Factor Burndown Including Analysis Input Changes, July 19, 2012

ENCLOSURE 2

LBLOCA Peak Clad Temperature Assessment Sheet

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: R. E. Ginna
Utility Name: Constellation Generation Group
Revision Date: 7/17/2012

Analysis Information

EM:	ASTRUM (2004)	**Analysis Date:**	3/18/2005	**Limiting Break Size:**	Split
FQ:	2.6	**FdH:**	1.72		
Fuel:	422 Vantage +	**SGTP (%):**	10		
Notes:	Uprate to 1811 MWt (inclusive of calorimetric uncertainty) Effective beginning Cycle 33, Mixed Core OFA & 422 V+				

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1870**	**1**	**(a)**
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . HOTSPOT Fuel Relocation Error	37	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Evaluation of Design Input Changes	-96	3	(b,c)
C. 2012 ECCS MODEL ASSESSMENTS			
1 . Evaluation of Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	230	3	(b)
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2041		

* It is recommended that the licensee determine if these PCT allocations should be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . RGE-05-32, "Transmittal of Input to Boron Concentration Increase and LOCA Methodology Change Tech Spec Amendment Submittal," April 2005.

2 . LTR-LIS-07-388, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for R. E. Ginna," June 2007.

3 . NF-RG-12-45, "Information Regarding the R.E. Ginna Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown Including Analysis Input Changes," July 2012.

Notes:

(a) Transition cycles containing OFA fuel are bounded by the analysis for 422 V+ fuel.

(b) These assessments are coupled via an evaluation of burnup effects which include thermal conductivity degradation, peaking factor burndown, and design input changes. These assessments explicitly include the HOTSPOT Fuel Relocation Error correction.

(c) Design input change was a reduction in steady-state FQ from 2.1 to 2.0.