



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BLVD., SUITE 100  
KING OF PRUSSIA, PA 19406-2713

April 17, 2014

EA-13-247

Mr. Joseph E. Pacher  
Site Vice President  
R.E. Ginna Nuclear Power Plant, LLC  
Constellation Energy Nuclear Group, LLC  
1503 Lake Road  
Ontario, New York 14519

**SUBJECT: FINAL SIGNIFICANCE DETERMINATION FOR A WHITE FINDING WITH ASSESSMENT FOLLOW-UP AND NOTICE OF VIOLATION [NRC INSPECTION REPORT NO. 05000244/2014009] – R.E. GINNA NUCLEAR POWER PLANT, LLC**

Dear Mr. Pacher:

This letter provides you the final significance determination for the preliminary White finding discussed in the U.S. Nuclear Regulatory Commission (NRC) letter dated February 14, 2014, and enclosed Inspection Report Number 05000244/2013005 (ML14045A214)<sup>1</sup>. This letter also transmits the follow-up NRC assessment of Constellation Energy Nuclear Group, LLC (CENG) performance at the R.E. Ginna Nuclear Power Plant (Ginna), which supplements the NRC annual assessment letter issued on March 4, 2014 (ML14058A777).

The finding involved the failure by CENG to assure prompt identification and correction of conditions adverse to quality concerning two cable penetrations between manhole 1 and battery room 'B' at Ginna which were not hydrostatically sealed as required. Specifically, CENG failed to promptly correct the improperly sealed penetrations, a significant adverse condition, in May 2013 following identification and to take timely action in early September 2013 when CENG was presented with evidence challenging its May 2013 evaluation of the non-conforming condition. The original need to hydrostatically seal these penetrations developed after the site's design basis flood height was changed during the NRC Systematic Evaluation Program (SEP) in 1983. As a result, certain extreme, low likelihood Deer Creek flooding scenarios could have resulted in flooding of both battery rooms, eventually resulting in the loss of all alternating current (AC) and direct current (DC) power with no capability for using installed plant equipment for decay heat removal. CENG restored compliance on October 4, 2013, when the subject penetrations were hydrostatically sealed.

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<sup>1</sup> Designation in parentheses refers to an Agency-wide Documents Access and Management System (ADAMS) accession number. Documents referenced in this letter are publicly-available using the accession number in ADAMS.

The February 14, 2014, NRC letter included an offer for CENG to attend a regulatory conference or reply in writing to provide its position on the facts and assumptions the NRC used to arrive at the finding and its safety significance. In a letter dated March 14, 2014 (ML14078A030), CENG provided a written response to the NRC's preliminary determination. In the response, CENG agreed with the finding, and discussed actions taken and planned to directly or indirectly address the issue. CENG also presented information pertaining to a new analysis of the Deer Creek flooding flow rate at which site power would be impacted and initial results of a root cause analysis of the issue. A summary of the information provided by CENG in its March 14, 2014, letter, and the NRC response, is provided in Enclosure 1.

The NRC carefully considered the information developed during the inspection and the information provided by CENG in its March 14, 2014, response. The change in core damage frequency (CDF) estimates ranged from Green, a finding of very low safety significance, to Yellow, a finding of substantial safety significance. The uncertainty in the input assumptions contributed to there being a wide range of potential outcomes. The input assumptions were varied to represent a range of potential values for flood frequency and likelihood of successful flood protection actions. The staff considered these results, in combination with other factors, and concluded that the finding was appropriately characterized as White. As described in Inspection Report Number 05000244/2013005, this determination was based on the staff's risk evaluation, performed using NRC Inspection Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria." You have 30 calendar days from the date of this letter to appeal the staff's determination of significance for the identified White finding. Such appeals will be considered to have merit only if they meet the criteria given in the NRC Inspection Manual Chapter 0609, Attachment 2. An appeal must be sent in writing to the Regional Administrator, Region I, 2100 Renaissance Boulevard, King of Prussia, PA 19406.

With respect to the supplemental NRC assessment of CENG performance at Ginna, as a result of this White finding in the Mitigating Systems Cornerstone, the NRC has assessed Ginna to be in the Regulatory Response column of the NRC Action Matrix, retroactive to the fourth calendar quarter of 2013. Therefore, we plan to conduct a supplemental inspection using Inspection Procedure 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," when CENG staff notify us of their readiness for this inspection. This inspection is conducted to provide assurance that the root cause and contributing causes of any performance issues are understood, the extent of condition is identified, and the corrective actions are sufficient to prevent recurrence.

The NRC has also determined that the finding involved a violation of Title 10 of the *Code of Federal Regulations* (10 CFR) 50, Appendix B, Criterion XVI, "Corrective Action," as cited in the Notice of Violation (Notice) included as Enclosure 2. The circumstances surrounding the violation were described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding. The NRC has concluded that the information regarding: (1) the reason for the violation; (2) the interim and long term corrective actions already taken and planned to correct the violation and prevent recurrence; and, (3) the date when full compliance was achieved, is already adequately addressed on the docket in NRC Inspection Report 05000244/2013005, in your letter dated March 14, 2014, and in this letter. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position.

J. Pacher

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room located at NRC Headquarters in Rockville, MD, and from the NRC's Agency-wide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions regarding this matter, please contact Mr. Daniel Schroeder, Chief, Projects Branch 1, Division of Reactor Projects in Region I, at (610) 337-5262.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. M. Dean', with a long horizontal flourish extending to the right.

William M. Dean  
Regional Administrator

Docket No. 50-244  
License No. DPR-18

Enclosures: As stated

cc w/encl: Distribution via ListServ

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room located at NRC Headquarters in Rockville, MD, and from the NRC's Agency-wide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Should you have any questions regarding this matter, please contact Mr. Daniel Schroeder, Chief, Projects Branch 1, Division of Reactor Projects in Region I, at (610) 337-5262.

Sincerely,

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William M. Dean  
Regional Administrator

Docket No. 50-244  
License No. DPR-18

Enclosures: As stated

cc w/encl: Distribution via ListServ

ML14107A080

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OFFICE	RI/ORA	RI/DRP	RI/DRS	RI/DRP	RI/ORA
NAME	M McLaughlin/ MMM*	D Schroeder/ DLS*	R Lorson/ RKL	M Scott/ MLS*	B Klukan/ BMK*
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OFFICE	RI/ORA	OE	NRR		RI/RA
NAME	B Bickett/ BAB*	L Casey via email	C Sanders via email		W Dean/
DATE	4/03/14	4/16/14	4/11/14		04/17/2014

\* See previous concurrence page

## ENCLOSURE 1

### NRC RESPONSE TO INFORMATION PROVIDED IN THE CONSTELLATION ENERGY NUCLEAR GROUP (CENG) LETTER DATED MARCH 14, 2014

#### SUMMARY OF INFORMATION PROVIDED BY CENG

CENG presented information pertaining to the flood level at which the battery rooms would be flooded. Specifically, CENG indicated that, in response to this issue, it developed a new computer model to evaluate flooding impacts. According to CENG, the model demonstrated such flooding would occur at a higher Deer Creek flow rate than had been assumed by the NRC (based on information previously provided by CENG). Whereas CENG had previously calculated that the manhole would flood at 18,000 cubic feet per second (cfs) and offsite power would be lost at 21,000 cfs, CENG now determined that the manhole would not flood below 20,000 cfs, and offsite power would not be lost below 26,000 cfs.

CENG also acknowledged the complexity of estimating extreme flood frequencies, due to the significant uncertainties of inputs and methods involved as well as the limited availability of optimal methods. CENG documented its intent to record estimated local stream flow information for Deer Creek and to continue exploring future risk assessment technology developments for further evaluation of flood hazard impacts at the site. In addition, CENG presented information about plant modifications in progress involving additional mitigating equipment being installed at Ginna in response to NRC requirements stemming from the Fukushima event and fire protection initiatives. The equipment will provide additional methods for maintaining adequate core cooling in the event of the loss of all alternating current (AC) and direct current (DC) power. Finally, CENG provided a summary of its ongoing root cause analysis of this issue which determined one of the causes of the performance deficiency was the perception that most site staff did not believe the Deer Creek could possibly flood to a level that would impact site equipment, based on how it looks under normal conditions.

#### NRC RESPONSE

The NRC staff reviewed CENG's written response and considered the information presented. Based upon all the information presented, the NRC staff concluded that the risk assessment for this issue should remain low to moderate safety significance (WHITE).

1) The NRC considered the methodologies presented in the CENG Letter in the preliminary Risk Assessment.

As discussed in Inspection Report 05000244/2013005, the NRC staff reviewed and considered the various modeling methodologies proposed by CENG staff. Each of these methods had a high level of uncertainty; and the results were highly dependent upon several assumptions, such as which surrogate streams were selected or omitted, and the underlying probability distribution used for extrapolation purposes. Also, despite the additional 30 years of flood information, there was no technical basis to determine that the proposed methodologies were more accurate than the approaches previously used for estimating floods, such as the 1983 Systematic Evaluation Program review; Ginna's 1997 Individual Plant Examination For External Events report (prepared in accordance with NUREG-1407); CENG's Fukushima Lessons-Learned

Recommendation 2.3, Flooding Walkdown, 50.54(f) response submittal to the NRC on November 27, 2012 (ML12335A029); and Ginna's Updated Final Safety Analysis Report. The NRC staff evaluated this issue using NRC Inspection Manual Chapter 0609 Appendix M, "Qualitative Decision Making Attributes for NRC Management Review," which allowed the staff to take into account the wide range of uncertainty and to consider the results of all available methodologies to arrive at a risk-informed conclusion.

2) The result of the CENG's new computer modeling of Deer Creek flooding impacts on the site did not significantly change the NRC's risk assessment.

The NRC used a qualitative approach to reach a risk-informed conclusion, in this case, and the basis for that decision was not changed by the new information. Additionally, the analysis used for CENG's new detailed computer model referenced in CENG's March 14th letter, as well as the computer model itself, were not provided to the NRC for review. As such, the NRC was not able to fully evaluate the validity of the new information as a basis for the NRC Significance Determination for this issue. The results of this model showed that higher Deer Creek flow rates were needed to both initiate flooding of manhole #1 and cause offsite power to be lost, as compared to earlier analysis by both the NRC and the licensee. However, the staff did consider the new information qualitatively, in line with the approach followed in the NRC Inspection Manual Chapter 0609 Appendix M mentioned in item 1 above. Because the revised flow rates were similar to those used in the staff's assessment and given the uncertainties in the event frequency and the fact the updated initiating event Deer Creek flow rates are still bounded by the site design basis flood limits, the NRC's overall risk assessment was not changed.

3) Root Cause Analysis Insights:

As described in enclosure 1 of CENG's March 14<sup>th</sup> letter, the NRC recognizes that CENG's root cause analysis has identified that their staff did not appreciate the flooding risk potential from Deer Creek, which appears to be based on normal daily observations. It should be pointed out that recent operating experience from flooding events at other sites indicate that events of lesser intensity than the design bases flood can impact the site conditions significantly and unexpectedly, while still being considered highly unlikely given the observed record. The NRC also identified that, following periods of high precipitation, access across the personnel bridge leading to the training center has been restricted due to high water in Deer Creek. This was observed as recently as December 23, 2013. A proper understanding and implementation of the design bases is essential in maintaining safe operations. The NRC will review CENG's completed Root Cause Analysis; extent of cause and extent of condition reviews, and the corrective actions developed as part of its supplemental inspection to ensure that proper focus and evaluations of events within the design basis are properly addressed by CENG.

ENCLOSURE 2  
NOTICE OF VIOLATION

Constellation Energy Nuclear Group, LLC.  
R.E. Ginna Nuclear Power Plant

Docket No. 50-244  
License No. DPR-18  
EA-13-247

During an NRC inspection conducted from October 1 – December 31, 2013, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected.

Contrary to the above, between 1983 and October 4, 2013, measures established by CENG were not sufficient to assure that a significant condition adverse to quality involving a non-conformance in two cable penetrations at Ginna between manhole 1 and battery room 'B' was promptly identified and corrected. Specifically, CENG failed to identify the need to hydrostatically seal two cable penetrations between manhole 1 and battery room 'B' after the site's design basis flood height was changed during the NRC Systematic Evaluation Program in 1983, promptly correct the significant adverse condition in May 2013 when the condition was identified, and take timely action in early September 2013 when CENG was presented with evidence challenging its May 2013 evaluation related to manhole 1 and the improperly sealed penetrations. As a result, until October 4, 2013, various extreme, low likelihood Deer Creek flooding scenarios could have resulted in flooding both battery rooms; the safety function of the 125 volt DC station batteries could have been lost during floods greater than 18,000 cubic feet per second (cfs); and the loss of the DC system could have led to an eventual loss of all AC power to the site with no capability for using installed plant equipment for decay heat removal or inventory control during floods greater than 21,000 cfs.

This violation is associated with a White SDP finding.

The NRC has concluded that the information regarding: (1) the reason for the violation; (2) the corrective actions taken and planned to correct the violation and prevent recurrence; and, (3) the date when full compliance was achieved, is already adequately addressed on the docket in NRC Inspection Report 05000244/2013005, in your letter dated March 14, 2014, and in the letter transmitting this Notice of Violation (Notice). Therefore, you are not required to respond to this Notice. However, if the description therein does not accurately reflect your corrective actions or your position you are required to submit a written statement or explanation pursuant to 10 CFR 2.201. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation – EA-13-247," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406, and a copy to the NRC Resident Inspector at R.E. Ginna Nuclear Power Plant, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room and from the NRC's Agency-wide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction. If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 19.11, CENG may be required to post this Notice within two working days of receipt.

Dated this 17th day of April, 2014.