



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION I  
2100 RENAISSANCE BOULEVARD, SUITE 100  
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

April 27, 2021

Mr. David Rhoades  
Senior Vice President  
Exelon Generation Company, LLC  
President and Chief Nuclear Officer  
Exelon Nuclear  
4300 Winfield Rd  
Warrenville, IL 60555

SUBJECT: R.E. GINNA NUCLEAR POWER PLANT, LLC – TEMPORARY INSTRUCTION  
2515/194 INSPECTION REPORT 05000244/2021011

Dear Mr. Rhoades:

On April 8, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at R.E. Ginna Nuclear Power Plant, LLC and discussed the results of this inspection with Mr. Paul Swift, Site Vice President and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

X /RA/  
\_\_\_\_\_

Signed by: Glenn T. Dentel  
Glenn T. Dentel, Chief  
Engineering Branch 2  
Division of Operating Reactor Safety

Docket No. 05000244  
License No. DPR-18

Enclosure:  
As stated

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SUBJECT: R.E. GINNA NUCLEAR POWER PLANT, LLC – TEMPORARY INSTRUCTION  
2515/194 INSPECTION REPORT 05000244/2021011 DATED APRIL 27, 2021

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ADAMS ACCESSION NUMBER: ML21112A050

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**U.S. NUCLEAR REGULATORY COMMISSION  
Inspection Report**

Docket Number: 05000244

License Number: DPR-18

Report Number: 05000244/2021011

Enterprise Identifier: I-2021-011-0007

Licensee: Exelon Nuclear

Facility: R.E. Ginna Nuclear Power Plant, LLC

Location: Ontario, New York

Inspection Dates: April 05, 2021 to April 08, 2021

Inspectors: F. Arner, Senior Reactor Analyst  
M. Patel, Senior Reactor Inspector

Approved By: Glenn T. Dentel, Chief  
Engineering Branch 2  
Division of Operating Reactor Safety

Enclosure

## **SUMMARY**

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a Temporary Instruction 2515/194 Inspection at R.E. Ginna Nuclear Power Plant, LLC, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

### **List of Findings and Violations**

No findings or violations of more than minor significance were identified.

### **Additional Tracking Items**

None.

## INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

### OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

#### 2515/194 - Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01)

The inspectors reviewed the licensee's implementation of the "Nuclear Energy Institute Voluntary Industry Initiative," (ADAMS Accession No. ML19163A176) dated June 6, 2019. This included reviewing how the licensee used the risk-informed alarm-only approach to protect from an OPCs.

#### Inspection of the Licensee's Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01) (1 Sample)

- (1) Exelon selected the open phase detection system designed and manufactured by Schweitzer Engineering Laboratories (SEL), as the design vendor for the open phase condition system at Ginna Nuclear Power Plant.

Ginna Nuclear Power Plant has two independent offsite sources (34.5kV) which provide power via the station auxiliary buses to the appropriate 4 kV safeguard buses. The open phase detection system is designed to protect the offsite power sources from a loss of phase scenario. Four SEL relays were installed to provide detection and alarm capability for open phase conditions associated with the 12A and 12B Transformer, 7 Transformer, and 6 Transformer. The relays are wired to provide main control room annunciation if a loss of one or two phase conditions is detected or if the associated relays are non-functional. The associated 115 kV substation control houses (Station 13A) also contain annunciation window panels that provide trouble alarms for the relays.

In lieu of automatic open phase protective actions, Exelon implemented an alarm only strategy which relies on proper operator actions to diagnose and respond to an open

phase condition. At the end of this inspection the SEL relays were monitoring the associated power sources and would provide main control room annunciation if a loss of one or two phase conditions was detected or if a relay was non-functional.

## INSPECTION RESULTS

Observation: Temporary Instruction 2515/194 - Section 03.01(a) and (c) Results	2515/194
<p>Based on discussions with Exelon staff, review of design and testing documentation, and walkdowns of installed equipment, the inspectors had reasonable assurance that Exelon is appropriately implementing the voluntary industry initiative at Ginna Nuclear Power Plant. The inspectors verified the following criteria:</p>	
<p><u>Detection, Alarms and General Criteria</u></p>	
<ol style="list-style-type: none"> <li>1. [03.01(a)(1)] Open phase conditions are detected and alarmed in the control room.</li> <li>2. [03.01(a)(2)] In scenarios where automatic detection may not be possible due to very low or no load conditions, or when transformers are in a standby mode, automatic detection will occur as soon as loads are transferred to the standby source. Additionally, where automatic detection is not reliable, Exelon has established monitoring requirements on a per shift basis, to look for evidence of an open phase condition.</li> <li>3. [03.01(a)(3)] The open phase condition design and protective schemes minimize misoperation or spurious action in the range of voltage unbalance normally expected in the transmission system that could cause separation from an operable off-site power source. Additionally, Exelon has demonstrated that the actuation circuit design does not result in lower overall plant operation reliability.</li> <li>4. [03.01(a)(4)] No Class-1E circuits were replaced with non-Class-1E circuits in this design.</li> <li>5. [03.01(a)(6)] The open phase condition detection and alarm components are maintained in accordance with Exelon's procedures or maintenance program, and periodic tests, calibrations setpoint verifications or inspections (as applicable) have been established.</li> </ol>	
<p><u>Use of Risk-Informed Evaluation Method</u></p>	
<ol style="list-style-type: none"> <li>1. [03.01(c)(1)] The plant configuration matched the changes made to the probabilistic risk assessment model to address an open phase condition, and the logic of the probabilistic risk assessment model changes is sound.</li> <li>2. [03.01(c)(2)] The procedures which validate that the open phase condition alarm would identify the proper indication to validate the open phase conditions at all possible locations</li> <li>3. [03.01(c)(3)] Observations associated with procedure(s) and operator actions required to respond to an open phase condition alarm and potential equipment trip match the Human Reliability Analysis.</li> <li>4. [03.01(c)(4)] Assumptions listed in the NEI 19-02 Appendix A evaluation and the sensitivity analyses listed in Section 5 of the evaluation.</li> <li>5. [03.01(c)(5)] Assumptions, procedures, operator actions and Exelon's analyses specified above are consistent with the plant-specific design and licensing basis and/or the as-built, as-operated plant including:             <ol style="list-style-type: none"> <li>a. Initiating events considered in the analysis</li> </ol> </li> </ol>	

- b. Boundary conditions specified in Attachment 1 of the NEI Voluntary Industry Initiative, Revision 3
- c. Operating procedures for steps taken to recover equipment assumed tripped/locked out or damaged due to the open phase conditions (or use of alternate equipment)
- d. Where recovery was assumed in the probabilistic risk assessment analysis for tripped electric equipment, restoration of the equipment was based on analyses that demonstrate that automatic isolation trips did not result in equipment damage

## **EXIT MEETINGS AND DEBRIEFS**

The inspectors verified no proprietary information was retained or documented in this report.

- On April 8, 2021, the inspectors presented the Temporary Instruction 2515/194 Inspection results to Mr. Paul Swift, Site Vice President and other members of the licensee staff.

**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
2515/194	Corrective Action Documents Resulting from Inspection	04414808	2021 NRC OPC Inspection Enhancement Opportunity	
		04414942	NRC OPIS Inspection - 0/100 and 100/0 Alignment Enhancement	
		04415435	PRA model error impacting limited RCP scenarios	
	Engineering Changes	ECP-19-000423	Permanently maintain the Open Phase Isolation System (OPIS) in an alarm-only configuration per Revision 3 of the NEI Voluntary Industry Initiative (VII)	Revision 0
	Engineering Evaluations	DA-EE-14-001	GINNA Offsite Power System Open Phase EMTP Analysis	Revision 0
		G1-MISC-008	GINNA Time Sensitive Operator Actions	Revision 2
		G1-MISC-018	GINNA Open Phase Condition Evaluation	Revision 1
	Procedures	AR-PPCS-12AOPD	12A Open Phase Detection	Revision 4
		AR-PPCS-12BOPD	12B Open Phase Detection	Revision 4
		AR-PPCS-6T767OPD	6T767 Open Phase Detection	Revision 6
		AR-PPCS-7TOPD	7T Open Phase Detection	Revision 5