

From: [Pinson, Brandon](#)
To: [Rector, Matthew K.:\(Exelon Nuclear\)](#)
Cc: [Arner, Frank](#); [Rutenkroger, Scott](#)
Subject: NRC Request for Information - Peach Bottom TI-2515/194 Open Phase Condition
Date: Tuesday, February 2, 2021 3:28:00 PM
Attachments: [OPC RFI PeachBottom2021.pdf](#)

Good Afternoon Mr. Rector,

I will be the lead inspector for the upcoming TI 2515/194 (Open Phase Condition) inspection at Peach Bottom. The on-site inspection is scheduled for the week of March 22, 2021. As of right now, the plan is to perform some portions of the inspection on-site (i.e. walkdowns, simulator, etc.) while portions that can be performed remotely, will be. Additionally, Frank Arner (Senior Reactor Analyst – Region 1) will be assisting me with the inspection.

Attached you will find a request for information needed in order to complete the inspection. Please note that some of the information is requested prior to the on-site week, while other information can be provided when we arrive.

I will give you a call tomorrow to touch base, and discuss logistics/any questions you may have.

Thanks!

Brandon Pinson

TI 2515/194 Inspection Documentation Request

Please provide the following documentation (Items 1 – 15) to the lead inspector prior to the onsite inspection date, preferably no later than March 12, 2021. Whenever practical, please provide copies electronically. Please provide an index of the requested documents which includes a brief description of the document and the numerical heading associated with the request (i.e., where it can be found in the list of documents requested).

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1. Copies of any calculations, analyses, and/or test reports performed to support the implementation of your open phase condition (OPC) solution. If, in your implementation, OPCs are not detected and alarmed in the control room please include documentation that:
 - a. Demonstrates the OPC will not prevent functioning of important-to-safety SSCs; AND
 - b. Detection of an OPC will occur within a short period of time (e.g., 24 hours).
2. Copies of any modification packages, including 10 CFR 50.59 evaluations if performed, used for or planned for the implementation of your OPC solution.
3. Copies of periodic maintenance, surveillance, setpoint calibration, and/or test procedures implemented or planned, for your OPC solution.
4. Copies of your licensing basis changes to Updated Final Safety Analysis Report (UFSAR) and/or Technical Specifications (TS), or equivalent, as applicable, which discuss the design features and analyses related to the effects of, and protection for, any open phase condition design vulnerability. If these documents have not been updated, provide documentation of your plans to do so.
5. Copies of any procurement specifications and acceptance testing documents related to the installation of your OPC solution.
6. Copies of any site training the inspector will need to accomplish to gain access to areas with, or planned, major electrical equipment used in your OPC solution (i.e. switchyard).
7. Provide documentation showing that with an OPC occurrence and no accident condition signal present, either:
 - a. An OPC does not adversely affect the function of important-to-safety SSCs, OR
 - b. TS LCOs are maintained or the TS actions are met without entry into TS LCO 3.0.3 AND
 - i. Important-to-safety equipment is not damaged by the OPC, AND
 - ii. Shutdown safety is not compromised

8. With OPC occurrence and an accident condition signal present:
 - a. Provide documentation showing that automatic detection and actuation will transfer loads required to mitigate postulated accidents to an alternate source and ensure that safety functions are preserved, as required by the current licensing bases, OR
 - b. Provide documentation showing that all design basis accident acceptance criteria are met with the OPC, given other plant design features. Accident assumptions must include licensing provisions associated with single failures. Typically, licensing bases will not permit consideration of the OPC as the single failure since this failure is a non-safety system.
9. If OPC actuation circuits are required, provide documentation that demonstrates continued coordination with the other protective devices in both the offsite electrical system (within Peach Bottom's area of responsibility) and the onsite electrical systems.
10. Copies of documentation or testing that demonstrates your OPC solution minimizes spurious actuation or mis-operation in the range of voltage imbalance normally expected in the transmission system that could cause undesired separation from an operable off-site power source.
11. Copies of any PRA evaluations for your plant response to an open phase condition. Include Event Trees and Fault Trees developed/used as part of your analysis
12. Copies of any HRA evaluations for your proposed or existing operator actions in procedures used to identify and mitigate open phase conditions. Ensure you include timing information for any operator actions.
13. Summary and discussion about the plant PRA model for an OPC. Include your Human Reliability Analysis (HRA). Please discuss any sensitivity analyses performed, and the results. Also, discuss any assumptions made which bound the sensitivity analysis.
14. If recovery is assumed as part of the basis in the PRA analysis for impacted electric equipment, then provide the following:
 - a. System load flow calculations, protective coordination, and failure mode and consequence analyses associated with restoration of equipment to perform the required functions.
 - b. Provide evaluations associated ESF/PRA credited loads which demonstrates that the ESF/PRA credited loads would not be damaged during the time delay between detection of an OPC by the control room operators and completion of the operator actions.
 - c. Provide an analysis/calculation of the maximum unbalance seen on ESF buses at all voltage levels and provide documents associated with existing relays that are used to protect the equipment from unbalanced power quality issues and potential consequences.

- d. Provide time analysis associated with the recovery of the tripped equipment and provide recovery actions/procedures (fuse replacement, restoring large motors, restarting stalled or degraded electrical equipment).

15. Copies of any self-assessment(s) performed in preparation for this inspection

Please provide the following documentation to the inspector when onsite. Whenever practical, please provide copies electronically, except for drawings. Drawings should be provided as paper copies of sufficient size (ANSI "C" or "D") such that all details are legible.

- 16. A brief presentation describing your electric power system design and typical electrical transmission and distribution system alignments; OPC design schemes installed to detect, alarm and actuate; bus transfer schemes; and maintenance and surveillance requirements. This presentation should be a general overview of your system. Please schedule the overview shortly after the entrance meeting.
- 17. Plant layout and equipment drawings for areas that identify: (a) the physical plant locations of major electrical equipment used in your open phase condition solution; (b) the locations of detection and indication equipment used in the open phase condition sensing circuits.

Please set up the follow evolutions/access for the inspector when onsite:

- 18. Access to locations in which open phase condition equipment is installed or planned (i.e. switchyard, relay room(s), etc.)
- 19. An operator walkthrough of your OPC response procedures. Include any control room time critical operator actions (use of the simulator may be the preferred method).
- 20. A discussion of the timeline and consequences of an extended duration unbalanced voltage condition and how it may affect electric equipment, if OPC is not automatically isolated.

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