

Beaver Valley TI 2515/194 Inspection Documentation Request

Please provide the following documentation (Items 1 – 16) to the lead inspector prior to the onsite inspection date, preferably no later than September 2, 2021. Whenever practical, please provide copies electronically. Lead inspector contact information is below:

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Note: This inspection will consist of TI-194, Revision 2, Section 03.01, parts (a) and (c).

For Beaver Valley Unit 1 & Beaver Valley Unit 2:

1. Copies of any modification packages, including 10 CFR 50.59 evaluations if performed, for the implementation of your Open Phase Condition (OPC) solution.
2. Copies of changes to the Updated Final Safety Analysis Report (UFSAR), which discuss the design features for any Open Phase Condition design vulnerability.
3. Engineering analysis which demonstrates OPC detection circuits are sensitive enough to identify an OPC for credited loading conditions (high and low transformer loading).
4. Engineering analysis which demonstrates OPC design/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.
5. Identify whether Open Phase Isolation System (OPIS) detection and alarm components are maintained in accordance with station procedures or the maintenance program, and that periodic tests, calibrations, setpoint verifications or inspections (as applicable) have been established.
6. Copies of Alarm Response Procedures that demonstrate operator response to detection of an Open Phase Condition.
7. Copies of Operator Training Lesson Plans for Operator response to an Open Phase Condition, and documentation of the frequency the training is given to Licensed and Non-Licensed Operators.
8. Copies of recent Operator Logs that show:
 - How often Voltages and/or Currents are logged under normal operating conditions on all 3 phases of the credited Unit offsite power sources.
 - How often Voltages and/or Currents are logged under normal operating conditions on all 3 phases of the Unit credited 4kV safety related buses.

- How often Voltages and/or Currents are logged under abnormal operating conditions on the offsite power source(s) and the 4kV safety related buses.

Abnormal conditions include conditions of reduced reliability, such as only one credited offsite power source is available or a credited Emergency Diesel Generator is not available.

- How often switchyard walkdowns are performed under normal and reduced reliability conditions.
 - How often operator logs are taken on Open Phase Condition equipment in the plant.
9. Most recent copy of NEI 19-02 evaluation, and 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
10. Most recent copy of any HRA evaluations for your proposed or existing operator actions in procedures used to identify and mitigate open phase conditions.
- Include timing information for any operator actions.
 - Please discuss any sensitivity analyses performed, and the results. Also, discuss any assumptions made which bound the sensitivity analysis.
11. If recovery is assumed as part of the basis in the PRA analysis for impacted electric equipment, then please provide the following:
- System load flow calculations, protective coordination, failure mode and consequence analyses associated with restoration of equipment to perform the required functions.
 - Provide evaluations associated PRA credited loads which demonstrates that the 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 required Operator Manual Actions (OMAs).
 - 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.
 - 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).
12. Copy of Top 100 Core Damage Frequency (CDF) cutsets, and copy of Top 50 OPC Large Early Release Frequency (LERF) cutsets.

13. Copy of any CRs related to the OPC system on Beaver Valley Unit 1, 2018 – present.
14. Copy of any CRs related to the OPC system on Beaver Valley Unit 2, 2018 – present.
15. Copy of the following CRs from the Jan. 2020 OPC inspection: CR-2020-00263, CR-2020-00585, CR-2020-00586, CR-2020-00708, CR-2020-00732.
16. Copy of OPC self-assessment performed prior to inspection, if performed.

Please provide the following documentation to the inspector when onsite:

17. A brief presentation describing the Beaver Valley Unit 1 and Unit 2 electric power system design, and typical electrical transmission and distribution system alignments.
 - Presentation should include the OPC design scheme to detect, alarm, and actuate any bus transfer of the electric power distribution system.
 - Please schedule the overview shortly after the entrance meeting.
18. Plant layout and equipment drawings that identify:
 - The physical plant locations of major electrical equipment used in your open phase condition solution.
 - The locations of detection and indication equipment used in the open phase condition sensing circuits.
 - *Note:* Whenever practical, please provide electronic and paper copies. Drawings should be size ANSI “C” or “D”, such that all details are legible.
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).

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