

**From:** Brian Mann <Brian.Mann@excelservices.com>  
**Sent:** Friday, September 07, 2018 2:14 PM  
**To:** Cusumano, Victor; Honcharik, Michelle  
**Cc:** TSTF; GEIER, Stephen; mitchel.mathews@exeloncorp.com  
**Subject:** Industry Analysis of Whether Open Phase Condition Equipment Requirements Should be Included in the Technical Specifications  
**Attachments:** Inclusion of Open Phase Condition Equipment Requirements in the TSR2.pdf

Vic and Michelle,

As we discussed at the August 9 TSTF/NRC meeting, the NRC staff is planning a public meet to discuss the results of their inspections of licensee Open Phase Condition (OPC) modifications. We understand that the Electrical Branch is preparing materials to be shared with the industry prior to the meeting, and one of the questions is why OPC requirements were not included in the Technical Specifications. To assist you in your preparations for that meeting, we are providing the industry analysis of the issue.

At the request of the NEI Open Phase Condition Task Force (OPCTF), the TSTF prepared an analysis of whether OPC equipment requirements meet any of the criteria to be included in the TS. The analysis was reviewed and accepted by the PWROG and BWROG Licensing Committees and the NEI OPCTF, and approved by the TSTF. (The OPC issue is not applicable to AP1000 plants due to design differences.)

The majority of plants are addressing the OPC concern by adding equipment to the station offsite power transformer. If an OPC is detected, the transformer is disconnected from the Emergency Safety Feature (ESF) busses. The existing ESF undervoltage function actuates to start the onsite power sources, sequence loads, etc. As discussed in the paper, this OPC equipment does not meet any of the requirements to be included in the TS, as the existing TS undervoltage instrumentation performs the safety function. None of the other switchyard trips are discussed in the TS or the TS Bases.

Some plants are adding new instruments that interface directly with the ESF actuation logic, bypassing the existing undervoltage function. Those plants have submitted amendments to add the OPC instrumentation to the TS.

On a side note, on the last page of the paper, it states that licensees may want to modify the TS Bases to make clear than an operable offsite circuit has three operable phases. We created a "T" traveler for that purpose (TSTF-556-T, "Modify TS 3.8.1 and TS 3.8.2 Bases to Address an Open Phase Condition.") It adds the phrase "all three phases of..." before references to offsite circuits in a few places and revises the Bases of SR 3.8.1.1 (which states, "Verify correct breaker alignment and indicated power availability for each [required] offsite circuit.") to make clear it means the breakers and power for all three phases. Not many plants have adopted it because they said it was obvious and their operators already understand an operable offsite circuit has three active phases. We don't see that as an issue.

Should you have any questions on the paper, we'd be happy to discuss it. We'll keep you informed of what we hear about the upcoming meeting.

Brian

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