



SECRETARY

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 9, 2017

COMMISSION VOTING RECORD

DECISION ITEM: SECY-16-0068

TITLE: INTERIM ENFORCEMENT POLICY FOR OPEN PHASE
 CONDITIONS IN ELECTRIC POWER SYSTEMS FOR
 OPERATING REACTORS

The Commission acted on the subject paper as recorded in the Staff Requirements Memorandum (SRM) of March 9, 2017.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

A handwritten signature in blue ink, appearing to read "Annette Vietti-Cook", written over a horizontal line.

Annette L. Vietti-Cook
Secretary of the Commission

Enclosures:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Svinicki
Commissioner Baran
Commissioner Burns
OGC
EDO
PDR

VOTING SUMMARY – SECY-16-0068

RECORDED VOTES

| | <u>APPROVED</u> | <u>DISAPPROVED</u> | <u>ABSTAIN</u> | <u>NOT PARTICIPATING</u> | <u>COMMENTS</u> | <u>DATE</u> |
|----------------|-----------------|--------------------|----------------|------------------------------|-----------------|-------------|
| Chrm. Svinicki | | X | | | X | 02/27/17 |
| Cmr. Baran | X | | | | X | 08/24/16 |
| Cmr. Burns | | X | | | X | 01/31/17 |

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: CHAIRMAN SVINICKI

SUBJECT: SECY-16-0068: INTERIM ENFORCEMENT POLICY
FOR OPEN PHASE CONDITIONS IN ELECTRIC
POWER SYSTEMS FOR OPERATING REACTORS

Approved Disapproved Abstain Not Participating

COMMENTS: Below Attached None



SIGNATURE

02/27/17

DATE

Entered on "STARS" Yes No

**Chairman Svinicki's Comments on SECY-16-0068
Interim Enforcement Policy for Open Phase Conditions in
Electric Power Systems for Operating Reactors**

I disapprove the staff's request to establish an Interim Enforcement Policy (IEP) for the purpose of exercising enforcement discretion for purported noncompliance with NRC requirements and nonconformance with design criteria during the pendency of licensee implementation of actions to address an open phase condition (OPC). The premise of an exercise of enforcement discretion is that there is an underlying, legally binding requirement from which relief is being sought. Such a circumstance has not been established to exist in this case. Consequently, I disapprove the staff's request.

Based on an examination of an event which occurred at the Byron site in 2012, the Institute for Nuclear Power Operations (INPO) issued a Level 2 INPO Event Report (IER), which required industry response by August 2012. As a result of the IER and in response to NRC Bulletin 2012-01, industry's Chief Nuclear Officers approved a formal initiative to address OPCs. This initiative, similar to other voluntary industry initiatives recognized by the NRC, represents a formal commitment by nuclear power plant licensees to address the OPC design vulnerability for operating reactors and active new reactor plant designs. These actions, which are scheduled to be completed by December 31, 2018, resolve the OPC design vulnerability to the technical satisfaction of the NRC staff and mitigate the risk potentially posed by an OPC below the level at which further regulatory action could be justified.

As the staff acknowledges, for some licensees, compliance with the current licensing basis does not require that the design of the electric power system consider all potential OPCs in offsite power sources. Despite this circumstance, all licensees have nevertheless committed to implementing the interim compensatory measures and plant modifications under the voluntary initiative. Most salient to the Commission's consideration of this matter, however, is the staff's failure to establish an underlying, legally binding requirement from which relief is being, or needs to be, sought.

In view of the Commission's recent consideration of similar matters, and the resulting backfitting guidance to agency staff cautioning against an overly permissive interpretation of the terms "omission" and "mistake of fact" for determining issues of compliance or non-compliance, this issue should not be construed as a matter of compliance with the General Design Criteria (GDC). Since adequate protection is presumptively assured by demonstrated compliance with the regulations and the requirements of each license, and licensees have further mitigated the risk through the industry initiative, reasonable assurance of adequate protection is established. In light of the resultant low safety significance of the issue, the staff has not successfully demonstrated that redefining the scope of the GDCs to include the OPC would prove cost-justified. Hence, under OGC's guidance and consistent with the Commission's direction on backfitting, the staff could not invoke compliance with the GDCs as a basis for enforcement action on this issue. If the GDCs cannot be invoked as the basis of non-compliance, there exists no basis for the interim enforcement policy. Simply put, if licensees can demonstrate compliance with their licenses, it is reasonable to conclude that there is no regulatory gap remaining to be addressed.

Going forward, the staff should verify that licensees have appropriately implemented the voluntary initiative, consistent with their commitments to do so. Once verified, the associated NRC Bulletin should be closed. Finally, should the Commission elect to invite the staff to recast its approach to the resolution of the OPC vulnerability as a matter of adequate protection, the staff's request to revisit the issue must be justified by a risk-informed backfit evaluation, consistent with the current guidance on such matters issued by the Office of General Counsel.


Chairman Svinicki

02  /17

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: Commissioner Baran

SUBJECT: SECY-16-0068: INTERIM ENFORCEMENT POLICY
FOR OPEN PHASE CONDITIONS IN ELECTRIC
POWER SYSTEMS FOR OPERATING REACTORS

Approved Disapproved Abstain Not Participating

COMMENTS: Below Attached None

Entered in STARS

Yes

No



Signature

8/24/16

Date

Commissioner Baran's Comments on SECY-16-0068, "Interim Enforcement Policy for Open Phase Conditions in Electric Power Systems for Operating Reactors"

On January 30, 2012, an operating event at Unit 2 of Byron Station revealed a significant design vulnerability that exists at every nuclear power plant in the country, except Seabrook Station. The electrical power in nuclear power plants is distributed using three phase alternating current (AC) systems. That day at Byron, a single phase was lost between the offsite electric transmission system and the onsite electric distribution system. This is referred to as an "open phase condition." When this occurs, "the remaining intact phases continue to provide power, resulting in a power supply to downstream components that is 'unbalanced' among the phases."¹ The components are not designed to handle this. The unbalanced voltage conditions at Byron affected the redundant engineered safety feature buses, which power the most important safety systems in the unit. As a result, the open phase condition at Byron "led to the tripping of equipment required for normal plant operations and safe shutdown."²

The underlying design vulnerability is that the electrical system protection scheme was not designed to detect and isolate an open phase condition. Because the unbalanced offsite electrical system remained connected to the buses, onsite AC sources, such as emergency diesel generators, were prevented from actuating to provide balanced safety-related power to the buses. As the NRC's 2012 bulletin explains, "This situation resulted in neither the onsite nor the offsite electric power system being able to perform its intended safety functions (i.e., to provide electric power to the ESF buses with sufficient capacity and capability to permit functioning of structures, systems, and components important to safety)."³

At Byron, the control room operators diagnosed the problem in about eight minutes and manually tripped breakers to disconnect the buses from the unbalanced offsite power source. The emergency diesel generators then started automatically and restored power to the buses. Had the operators failed to diagnose the open phase condition in a timely manner, a small break loss-of-coolant accident could have resulted within minutes.⁴ Equipment relied on for safe shutdown could have overheated and been unavailable for a period of time. This was a close call. The plant benefitted from a quick and effective operator response that day.

There is no disagreement that the Byron event exposed a significant design vulnerability of safety significance. Prior to the Byron event, no one had recognized the potential impact of an open phase condition vulnerability. Once this condition was identified and understood, about a dozen previous operating events that occurred at power plants in the United States, South Africa, Spain, Canada, Sweden, and the United Kingdom since 2001 were linked to open phase conditions.

To address this vulnerability, the NRC staff has determined that licensees need to implement design solutions to automatically (1) detect open phase conditions, (2) initiate an

¹ Nuclear Energy Institute, *Regulatory Summary Document (Issues Related to Open Phase Conditions)* (Mar. 22, 2016) at 1.

² SECY-16-0068 at 4.

³ *NRC Bulletin 2012-01. "Design Vulnerability in Electric Power System": Summary Report* (Jul. 27, 2012) at 4.

⁴ SECY-16-0068 at 2. The open phase condition could have led to the disabling of components used to cool the reactor coolant pump seals. A small break loss-of-coolant accident, or LOCA, could have resulted from the heating up and resulting degradation of the seals, which could each leak approximately 20 gallons of reactor coolant water per minute.

alarm in the control room, and (3) transfer plant electrical loads to onsite power systems in a timely manner, when necessary. On October 9, 2013, the Nuclear Energy Institute informed NRC that the industry's Chief Nuclear Officers were formally committing to address this design vulnerability. The industry has committed to complete actions to resolve this issue by December 31, 2018.

General Design Criterion (GDC) 17 requires nuclear power plants to have an offsite and onsite electric power system with adequate capacity and capability to ensure the functioning of structures, systems, and components important to safety in the event of anticipated operational occurrences and postulated accidents. For plants designed before the 1971 promulgation of GDC 17, the principal design criteria in the updated final safety analysis report provide analogous requirements. These are binding regulatory requirements. In addition, 10 CFR 50.55a(h)(2) and (3) provide design criteria for all protection systems, including electric power protection systems.

The NRC staff is asking the Commission to approve a proposed Interim Enforcement Policy for open phase conditions. The Interim Enforcement Policy would authorize the staff to exercise discretion and refrain from taking enforcement action for noncompliance with these specific regulatory requirements. The proposed enforcement discretion would be contingent on licensees completing the actions outlined in the Interim Enforcement Policy. Under the Policy, within 30 days, if they have not already done so, licensees would be required to implement compensatory measures, enter the noncompliance in the corrective action program, and perform an operability determination. Within 60 days, licensees would be required to establish a schedule for completing corrective actions "within a time frame commensurate with the safety significance of the condition." Within 12 months, licensees would be required to submit a license amendment request for any necessary plant modifications. By January 30, 2019, licensees would be required to complete all necessary plant modifications to address the open phase condition vulnerability.

Frankly, I was initially skeptical about providing enforcement discretion through the end of 2018. That is a long time to give licensees to fully address this significant design vulnerability. However, I have concluded that this is an acceptable approach for several reasons.

First, every plant has already implemented compensatory measures to enhance safety until the issue is fully resolved. These measures typically involve operator training, periodic checks by operators on electrical phase status, and modified alarm response procedures to help operators quickly diagnose and respond to open phase conditions. The Institute of Nuclear Power Operations verified that these compensatory measures are in place and effective. Guided by a Temporary Instruction that will be issued shortly after the issuance of the Interim Enforcement Policy, NRC inspectors also will inspect and confirm the adequacy of the compensatory measures.

Second, under the Interim Enforcement Policy, the NRC staff will have the authority to ensure that licensee implementation schedules appropriately reflect the safety significance of the vulnerability at particular plants. This ensures that the NRC staff continues to have the ability to determine "whether the licensee is making reasonable efforts to complete corrective actions promptly."

Third, although the final deadline for completing corrective actions is more than two years away, many plants are on schedule to finish the necessary modifications much earlier. To

date, 27 units have installed design solutions that are operating in either monitoring mode or fully functional, with an additional nine units expected to complete installation by the end of the year. When I visited Three Mile Island Unit 1 in April, I had an opportunity to see such a system firsthand. Designs at another 17 units are essentially complete, and that new equipment should be installed and functioning by the end of 2017. With compliance being achieved on a rolling basis, most plants will not wait until the end of 2018 to fully address the open phase condition vulnerability.

For these reasons, I approve publication of the Interim Enforcement Policy in the *Federal Register*, subject to the attached edits. I want to briefly highlight two proposed edits to the draft Interim Enforcement Policy. First, I propose changing the date by which all required modifications must be complete from January 30, 2019, to January 1, 2019. As licensees have known about this design vulnerability since 2012 and have formally committed to complete the work by December 31, 2018, I see no reason to provide an extra month of enforcement discretion. Second, I propose deleting two sentences in the draft Interim Enforcement Policy that relate to the staff's backfit analysis. I propose this edit not because I have backfit concerns, but because the reference to the staff's Documented Evaluation is unnecessary. There is no need to address this particular backfit issue at this time; the current licensing basis of each plant will be confirmed by the NRC staff under the Temporary Instruction. Based on the frequency of occurrence and safety significance of open phase conditions, there is actually a strong case to be made that a regulatory requirement to address this design vulnerability is necessary for reasonable assurance of adequate protection of public health and safety.

I appreciate the willingness of a number of concerned NRC employees to express their views through the agency's 2.206 petition process. I found their perspectives helpful as I considered the proposed Interim Enforcement Policy.

NUCLEAR REGULATORY COMMISSION

[NRC-20YY-XXXX]

**Interim Enforcement Policy for an Open Phase Condition Design Vulnerability in
Electric Power Systems for Operating Reactors**

AGENCY: Nuclear Regulatory Commission.

ACTION: Policy statement; revision.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing an interim Enforcement Policy that allows the NRC staff (the staff) to exercise enforcement discretion for:

1. Certain noncompliances with the requirements specified in the technical specifications (TSs) for "Electrical Power Systems," (typically TS Section 3.8);
2. Certain noncompliances with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 17, "Electric Power Systems," and certain nonconformances with analogous principal design criteria specified in the updated final safety analysis report (UFSAR)¹ as well as noncompliances with the design criteria for protection systems

¹ In the Staff Requirements Memorandum for SECY-92-223, dated September 18, 1992 (ADAMS Accession No. ML003763736), the Commission decided not to apply the GDC to plants with construction permits issued prior to May 21, 1971. Pre-GDC plants were evaluated on a plant specific basis and are presumed to comply with the intent of the GDC because those licenses were granted using comparable evaluation criteria reflected in the FSAR.

under 10 CFR 50.55a(h)(2) or 10 CFR 50.55a(h)(3), as specified in the facility's licensing basis.

This interim enforcement policy applies to operating power reactor licensees resolving open phase condition (OPC) design vulnerabilities within each plant's electrical power system. The offsite power OPC design vulnerability, which was identified through a January 2012 Byron Station and other operating events, ~~was~~-is that the existing protective relay schemes for the engineered safety features (ESF) buses were not designed to detect a degraded offsite power source due to an OPC and automatically transfer the ESF buses to the onsite power system.

DATES: This policy revision is effective [INSERT DATE OF PUBLICATION]. The NRC is not soliciting comments on this revision to its Enforcement Policy at this time.

ADDRESSES: Please refer to Docket ID [NRC-20YY-XXXX](#) when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web site:** Go to <http://www.regulations.gov> and search for Docket ID [NRC-20YY-XXXX](#). Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS accession number for each

document referenced in this document (if that document is available in ADAMS) is provided the first time that a document is referenced.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

The NRC maintains the [Enforcement Policy](#) on its Web site at <http://www.nrc.gov>; select "Public Meetings and Involvement," then "Enforcement," and then "Enforcement Policy." The Enforcement Policy is available in ADAMS under Accession No. ML15029A148.

FOR FURTHER INFORMATION CONTACT: Robert Fretz, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-1980; e-mail: Robert.Fretz@nrc.gov.

SUPPLEMENTARY INFORMATION:

Background

On January 30, 2012, an operating event at Byron Station, Unit 2, revealed a design vulnerability where an OPC in the plant's offsite power supply caused a loss of certain safety functions powered by the site's alternating current (AC) electric power systems. [Offsite AC power from the transmission network is delivered to a power plant through a three-phase electrical power distribution system.](#) The loss of these safety functions [at Byron Station](#) occurred because the electric power system's protection scheme was unable to detect and isolate the loss of a single [electrical](#) phase between the transmission network and the onsite power distribution system. The resulting degraded and unbalanced voltage conditions on redundant ESF buses led to the [tripping-unanticipated unavailability](#) of equipment required for

normal plant operations and safe shutdown. The inability of the electric power protection scheme to detect an OPC and automatically transfer power from the ~~affected-degraded~~ electric power system allowed the degraded offsite power system to remain connected to ESF buses, and prevented ~~other~~ the emergency onsite AC sources (e.g., emergency diesel generators) from starting and powering these buses. As a result, certain equipment required for safe operations remained powered by the degraded offsite AC power source and were put in jeopardy ~~to~~ of either relying on internal safety features to lock-out and protect the vulnerable components or risking damage from overheating. Furthermore, equipment relied on for safe shutdown was also at risk of being unavailable for a period of time outside the plant's accident analysis, even after restoration of an operable power source.

As a result of the Byron Station event, the staff issued NRC Information Notice 2012-03, "Design Vulnerability in Electric Power System," dated March 1, 2012 (ADAMS Accession No. ML120480170), to inform licensees of the circumstances at Byron Station as well as describe the events at other plants involving a similar offsite power OPC design vulnerability.

On July 27, 2012, the staff issued NRC Bulletin 2012-01, "Design Vulnerability in Electric Power System" (ADAMS Accession No. ML12074A115), and requested information from licensees about the operating configuration and the ability of protection schemes for ESF buses to detect and automatically respond to an OPC. The NRC staff reviewed the licensees' responses to NRC Bulletin 2012-01 and prepared a summary report dated February 26, 2013 (ADAMS Accession No. ML13052A711).

In addition to these generic communications, the NRC staff has been working with nuclear industry representatives, and licensees for operating and new reactors to resolve the

OPC issue. These outreach activities have included numerous public meetings held between March 2012 and January 2015.

On October 9, 2013, the Nuclear Energy Institute (NEI) notified the NRC (ADAMS Accession No. ML13333A147) that the industry's Chief Nuclear Officers approved a formal initiative to address OPCs, and that the initiative represented a formal commitment among nuclear power plant licensees to address the OPC design vulnerability for operating reactors. The current schedule to complete actions to resolve the OPC design vulnerability under this initiative is December 31, 2018 (see NEI letter dated March 16, 2015, ADAMS Accession No. ML15075A455 and attachment, ML15075A456).

The NRC staff provided a response to the industry's initiative, including its ~~planned~~ preferred open phase isolation system (OPIS), in a letter to NEI dated November 25, 2014 (ADAMS Accession No. ML14120A203). The staff noted that the capability of the onsite power system to permit functioning of structures, systems, and components (SSCs) may depend on successful operation of OPIS, and that the proposed solution needs to fully address GDC 17 or the principal design criteria specified in each plant's UFSAR. The staff also communicated functional criteria for demonstrating compliance with existing regulatory requirements.

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," General Design Criterion (GDC) 17, "Electric Power Systems," establishes requirements for the design of nuclear power plant electric power systems for which a construction permit application was submitted after the Commission published the GDC in 1971, requiring ~~in part~~, that:

An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other

system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences, and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents...

GDC 17 also requires, ~~in part~~, that:

Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.

For current operating power plants designed before the promulgation of GDC 17, the UFSAR sets forth design criteria analogous to GDC 17² which requires, ~~in part~~, that plants have an offsite and an onsite electric power system with adequate capacity and capability to ensure the functioning of structures, systems, and components important to safety in the event of anticipated operational occurrences and postulated accidents.

While the NRC understands that nuclear power plant licensees have committed to take certain actions to resolve the OPC design vulnerability under the industry initiative, the staff maintains that the potential for OPCs occurring in offsite power sources must be considered in the electric power system design as a part of the current licensing basis (CLB) for nuclear power plants, and is necessary to comply with GDC 17 or conform to the analogous design criteria in the UFSAR, as well as comply with the design criteria for protection systems under 10 CFR 50.55a(h)(2) or 10 CFR 50.55a(h)(3) and 10 CFR 50.36, "Technical Specifications," associated with an OPC.

² Additional information can be found in NRC Bulletin 2012-01, "Design Vulnerability in Electric Power System": Summary Report (ADAMS Accession No. ML13052A711)

The NRC and licensees at ~~all~~ nuclear plants have understood that electrical faults, in general, are credible failure mechanisms and that open-circuit faults (i.e., OPCs), in particular, can occur on one, two, or all three phases of an electrical power system. However, because the design vulnerability involving certain offsite power OPCs was not previously recognized, licensees may not have considered all potential OPC scenarios in complying with GDC 17 or conforming to the analogous principal design criteria in the UFSAR, as well as complying with the design criteria for protection systems under ~~§§ 10-CFR-50.55a(h)(2) or 10-CFR 50.55a(h)(3)~~. As a result, the potential for offsite power OPCs and their associated design vulnerabilities was not specifically identified as an issue during the licensing reviews of the current operating nuclear power plants. Therefore, these plants may not have been designed to detect and mitigate the consequence of an OPC in its electric power systems and, thus, may not be in compliance with GDC 17 or in conformance with the applicable principal design criteria in the UFSAR, as well as in compliance with ~~§§ 10-CFR-50.55a(h)(2) or 10-CFR-50.55a(h)(3)~~.

The NRC staff has determined that compliance with regulatory requirements and conformance with comparable licensing basis provisions may be established if each licensee addresses the design issue based on the plant-specific electric power system design, design basis loading conditions, and electrical system operating configuration for normal, abnormal, and accident conditions.

If a licensee determines that its electric power system is not in compliance with GDC 17 or the design criteria for protection systems under ~~§§ 10-CFR-50.55a(h)(2) or 10-CFR 50.55a(h)(3)~~ and ~~10-CFR-50.36~~, or is not in conformance with the analogous UFSAR principal design criteria, as described in the CLB, an operability determination must be performed. To be considered operable, the required initiation times necessary to meet the specified safety functions in GDC 17 or the analogous design criteria in the UFSAR, and other requirements

must account for the detection and transfer of offsite power circuits with an OPC to the onsite power system.

When evaluating the effect of a degraded or nonconforming condition on an SSC's capability to perform any of its specified safety functions, a licensee may decide to implement compensatory measures as an interim action until final corrective action to resolve the condition is completed. Compensatory measures may be used to maintain or enhance an operable but degraded or nonconforming SSC's capability to perform its specified safety functions and may also be used to restore inoperable SSCs to an operable but degraded or nonconforming status.³

If a licensee is actively resolving OPC design vulnerabilities and meets the criteria described in Interim Enforcement Policy (IEP) 9.3, "Enforcement Discretion for Electric Power System Open Phase Condition Design Vulnerability," the NRC will normally exercise enforcement discretion for noncompliances with GDC 17 and the TS section for "Electrical Power Systems" (typically TS Section 3.8) associated with "AC Sources-Operating" and "AC Sources-Shutdown," and nonconformances with analogous design criteria in the UFSAR, as well as noncompliances with the protection systems requirements under [§§ 10-CFR 50.55a\(h\)\(2\)](#) or [10-CFR 50.55a\(h\)\(3\)](#).

This interim policy recognizes that the corrective actions and compensatory measures implemented by licensees have sufficiently reduced the risk associated with an offsite power OPC, and provide reasonable assurance of adequate protection of public health and safety. The interim compensatory measures include, but are not limited to, operator awareness [through](#)

³ NRC Inspection Manual Chapter 0326, Section 07.03

[electrical power distribution electrical phase checks each shift](#) and procedure modifications [to assist operators with diagnosing an OPC based on currently available indications](#).

The NRC will keep this interim policy in place until January 30¹, 2019, unless specified otherwise. Licensees shall comply with all other requirements, as applicable, unless explicitly replaced or amended in the Enforcement Policy.

The NRC recognizes that, for some licensees, compliance with the CLB does not require that the design of the electric power system consider all potential OPCs in offsite power sources, and that these licensees have nevertheless committed to implementing interim compensatory measures and plant modifications under the industry initiative. In the event that the actions taken by a licensee to correct the OPC design vulnerability do not adequately address potential OPCs that might occur in offsite power sources by the date committed to under the industry's initiative (December 31, 2018), the NRC staff may consider implementing plant-specific backfits in accordance with 10 CFR 50.109, "Backfitting." ~~The staff has reviewed the backfitting issue and has prepared a Documented Evaluation (ADAMS Accession No. ML15254A208) that supports the conclusion that the consideration of potential OPCs in offsite power sources is necessary to bring a facility into conformance with the licensee's written commitments. This evaluation further supports updating the CLB for operating nuclear reactors, on a plant-specific basis, to require that the electric power systems meet GDC 17 or the analogous principal design criteria specified in the UFSAR, and other applicable regulatory requirements, assuming all potential OPCs in offsite power.~~

Accordingly, the NRC has revised its Enforcement Policy to read as follows:

Interim NRC Enforcement Policy

9.3 Enforcement Discretion for Electric Power System Open Phase Condition Design Vulnerability

This section sets forth the interim Enforcement Policy (IEP) that the NRC will follow to exercise enforcement discretion for certain noncompliances with the requirements specified in the technical specification (TS) section for “Electrical Power Systems” (typically Section 3.8) and action statement(s) associated with “AC Sources-Operating” and “AC Sources-Shutdown” which would require a reactor shutdown or prevent a reactor startup if a licensee is unable to come into conformance within the Limiting Condition for Operation (LCO) TS completion times for the applicable TS Condition. Enforcement discretion would also be exercised for noncompliance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, “General Design Criteria for Nuclear Power Plants,” General Design Criterion (GDC) 17, “Electric Power Systems,” and nonconformance with analogous design criteria in the updated final safety analysis report (UFSAR) for a plant, as well as noncompliance with design criteria for protection systems under 10 CFR 50.55a(h)(2) or 10 CFR 50.55a(h)(3). This interim policy is applicable to operating power reactor licensees resolving offsite power open phase condition (OPC) design vulnerabilities within each plant’s electrical power system. Power reactor licensees **intending who have notified the NRC in accordance with 10 CFR 50.82(a)(1)(i) of an intent** to cease power operations and begin decommissioning activities before January 30¹, 2019, need only perform the immediate actions listed below.

If the licensee determines that the electric power system is not in compliance with GDC 17 or the design criteria for protection systems under ~~§§ 10-CFR-50.55a(h)(2)~~ or ~~10-CFR 50.55a(h)(3)~~, or is not in conformance with the analogous UFSAR principal design criteria, as described in the licensee’s current licensing basis, an operability determination must be

performed. If the licensee concludes that the electrical power system is inoperable, the licensee must perform the required action(s) of applicable TS(s) until the LCO(s) can be met. In certain instances, a licensee may not meet the LCO(s) and the associated required action(s) within the completion time allowed by TS, and would be required to enter a shutdown action statement or prevented from restarting the facility.

Under this IEP, the NRC will normally not take enforcement action for an [OPC-related](#) violation of TSs associated with “Electric Power Systems” (i.e., “AC Sources-Operating” and “AC Sources-Shutdown”), noncompliance with GDC 17, or nonconformance with analogous principal design criteria in the UFSAR, as well as noncompliance with the design criteria for protection systems under [§§ 10-CFR-50.55a\(h\)\(2\)](#) or [10-CFR-50.55a\(h\)\(3\)](#), if the licensee implements the following actions:

Corrective Actions

a. Immediate Actions

If not already performed, within 30 days of issuance of the IEP, the licensee must:

1. Enter the noncompliance with GDC 17 or the design criteria for protection systems under 10 CFR 50.55a(h)(2) or 10 CFR 50.55a(h)(3), or the nonconformance with the UFSAR principal design criteria, into the corrective action program;
2. Perform an operability determination to evaluate the effect of the noncompliance with GDC 17 or the design criteria for protection systems under 10 CFR 50.55a(h)(2) or 10 CFR 50.55a(h)(3), or the nonconformance with the UFSAR principal design criteria;

3. Implement compensatory measures as an interim action until final corrective action to resolve the nonconforming condition is completed; and
4. Assess and manage plant risk related to maintenance and surveillance activities in accordance with 10 CFR 50.65(a)(4).

b. Short Term Actions

If not already performed, the licensee must:

1. Within 60 days of the issuance of this IEP, establish a schedule for completing a corrective action for the structures, systems and components (SSCs) determined to be degraded or nonconforming within a time frame commensurate with the safety significance of the condition in accordance with 10 CFR Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion XVI, "Corrective Action." This schedule is subject to NRC inspection.
2. Within 12 months of the issuance of this IEP, the licensee shall submit [requests for](#) license amendments, in accordance with 10 CFR 50.90, if plant modifications necessary to meet its licensing basis require NRC prior-approval in accordance with 10 CFR 50.59 (e.g., changes to the TSs).

Although this IEP provides discretion from immediate action such as shutting down the plant as detailed above, in determining whether the licensee is making reasonable efforts to complete corrective actions promptly, the NRC will consider safety significance, the effects on operability, the significance of the degradation, and what is necessary to implement the corrective action. The NRC may also consider the time needed for design, review, approval, or procurement of the repair or modification; the availability of specialized equipment to perform

the repair or modification; and whether the plant must be in hot or cold shutdown to implement the actions. If the licensee does not resolve the degraded or nonconforming condition or does not appropriately justify a longer completion schedule, the staff would conclude that corrective action has not been timely and would consider taking enforcement action. Factors that should be considered are (1) the identified cause, including contributing factors and proposed corrective actions, (2) existing conditions and compensatory measures, including the acceptability of the schedule for repair and replacement activities, (3) the basis for why the repair or replacement activities will not be accomplished prior to restart after a planned outage (e.g., additional time is needed to prepare a design/modification package or to procure necessary components), and (4) review and approval of the schedule by appropriate site management and/or oversight organizations⁴.

c. Long Term Actions

By January 30¹, 2019, the licensee must complete all required plant modifications, including implementation, testing, and placing into operation, necessary to ensure that the electric power systems comply with GDC 17, the analogous principal design criteria in the UFSAR regarding all potential OPCs in offsite power sources, and 10 CFR 50.55a(h) for protection systems.

1. Facility modifications must satisfy all design standards consistent with the plant's current licensing basis (e.g., for an OPC, a non-Class 1E circuit should not preclude the onsite electrical power system from being able to perform its safety function given a single failure in the onsite power system).

⁴ NRC Inspection Manual Chapter 0326, Section 07.02

2. The OPC should be automatically detected and alarmed in the main control room under all operating electrical system configurations and loading conditions.
3. If offsite power circuits are degraded due to an OPC, the ESF protection schemes should be able to automatically transfer power sources to the onsite power system within the time frames assumed in the accident analysis and without actuating any protective devices, given a concurrent design basis event.
4. TS Surveillance Requirements and LCOs for equipment used for mitigation of OPC should be consistent with the operability requirements specified in the existing plant TSs.

If a noncompliance with GDC 17 or the design criteria for protection systems under 10 CFR 50.55a(h)(2) or 10 CFR 50.55a(h)(3), or a nonconformance with the UFSAR principal design criteria, results in SSCs being declared inoperable, the inoperability should not serve as the basis for suspending the performance of required surveillance tests or maintenance activities, nor as the basis for preventing the change of modes (e.g., shutting-down or restarting the reactor), under this interim policy. Licensees shall comply with all other requirements, as applicable.

This interim policy will remain in place until January 30¹, 2019, unless specified otherwise.

PROCEDURAL REQUIREMENTS:

Paperwork Reduction Act Statement

This policy statement does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget, approval numbers 3150-0010 and 3150-0136.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

Congressional Review Act

This interim enforcement policy is a rule as defined in the Congressional Review Act (5 U.S.C. §§ 801-808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

Dated at Rockville, Maryland, this day of 2016.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,
Secretary of the Commission.

RESPONSE SHEET

TO: Annette Vietti-Cook, Secretary

FROM: Commissioner Burns

SUBJECT: SECY-16-0068: INTERIM ENFORCEMENT POLICY
FOR OPEN PHASE CONDITIONS IN ELECTRIC
POWER SYSTEMS FOR OPERATING REACTORS

Approved _____ Disapproved X Abstain _____ Not Participating _____

COMMENTS: Below _____ Attached X None _____

Entered in STARS

Yes X

No _____



Signature

31 January 2017

Date

**Commissioner Burns's Comments on SECY-16-0068
Interim Enforcement Policy for Open Phase Conditions
in Electric Power Systems for Operating Reactors**

The staff is requesting Commission approval of an Interim Enforcement Policy (IEP), to allow the staff to exercise enforcement discretion for potential noncompliances with NRC requirements and potential nonconformances with design criteria specified in licensees' updated final safety analysis reports while licensees address design vulnerabilities associated with an open phase condition (OPC). The staff views this as appropriate because licensees have taken corrective actions and implemented compensatory measures that have sufficiently reduced the risk associated with an offsite power OPC. The staff has determined that these actions provide reasonable assurance of adequate protection of public health and safety in the short term.

Having reviewed the staff's recommendation and given it careful consideration in light of other information I have subsequently received, I believe that a decision about whether enforcement discretion is necessary is premature. The premise of an exercise of enforcement discretion is that there is an underlying, legally binding requirement from which relief is being sought. In my view, the staff has not made a convincing case that such a requirement currently exists with respect to the open phase condition. As the staff noted, operating reactor licensees stated in their responses to Bulletin 2012-01 the protection system relays were not designed specifically to detect a single-phase OPC in a three-phase AC power system because this vulnerability was not considered in the original plant design, nor was the condition understood by NRC at the time these designs were reviewed and approved. In fact, in SECY-16-0068, the staff recognized that, for "some licensees," compliance with the current licensing basis likely does not require that the design of the electric power system consider all potential OPCs in offsite power sources. Furthermore, particularly in light of recent guidance from the Office of the General Counsel (OGC) cautioning against overreliance on the General Design Criteria and an overly broad interpretation of the terms "omission" and "mistake of fact" for determining compliance, more work would need to be done to establish a regulatory basis for compelling current operating licensees to address the OPC issue as a matter of compliance. The staff's Documented Evaluation prepared to support potential future backfits and referenced in SECY-16-0068 also does not address OGC's recent guidance.

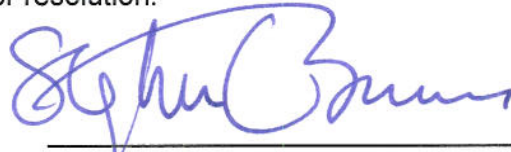
Nevertheless, both the NRC staff and the industry acknowledge the importance of addressing the issue from a safety perspective. Licensees have prudently committed to implementing interim compensatory measures and plant modifications under the proposed voluntary industry initiative. The staff intends to review these voluntarily implemented measures and modifications. These are sensible actions, and I appreciate the efforts of both the staff and industry to expeditiously address the issue. I expect the staff and industry to continue down the path to resolution in a timely manner.

The Commission is therefore left with the fundamental question of what further actions it should take as the regulator, at this time. It is difficult for the Commission to answer that question, because the basic analytical building blocks normally developed by the staff have not been provided for the Commission to make an informed decision. Therefore, although I disapprove the adoption of a policy on enforcement discretion in this instance as premature and potentially unnecessary, there is enough evidence that the lack of protection from OPCs is a safety issue that should not be left unaddressed.

Given the current situation, however, I am comfortable with letting the voluntary initiative proceed with oversight by the staff. However, as part of this oversight, if the staff determines

that a licensee does not adequately address potential OPCs under the industry initiative, including updating the licensing basis to reflect the need to protect against OPCs, the staff should consider the appropriate regulatory mechanism to impose the necessary requirements to protect against OPCs. In doing so, the staff should first determine whether additional action to address OPCs for that licensee is indeed a matter of compliance with its current licensing basis. If not, the staff should consider whether regulatory action is necessary for adequate protection of public health and safety. If this is the case, then the staff should invoke the adequate protection exception to the backfit rule (10 CFR 50.109(a)(4)(ii)). If the staff does not believe this is a matter of adequate protection, then the staff should consider whether application of the compliance exception to the backfit rule is appropriate, taking into account the recent OGC guidance on backfitting. Alternatively, the staff would need to perform a backfit analysis to determine if protection from OPCs represents a substantial increase in the overall protection of the public health and safety that is cost-justified.

The staff should provide the Commission with a notation vote paper if this situation arises for any licensee or licensees, with options, including the staff's recommended path forward. In addition, if disagreements arise between the staff and the industry during implementation of the voluntary industry initiative, and the related issues have policy implications, the staff should promptly raise such issues to the Commission for resolution.



Stephen G. Burns
31 January 2017