



NUCLEAR ENERGY INSTITUTE

Stephen Geier
Tamatha Womack
Kirk Robbins

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NEI/Industry Comments - Draft OPC Temporary Instruction

Overview

- SRM – SECY 16-0068
- General Section Comments
- Technical Comments
- OPC Installation Status

Summary

- Background information in initial sections is generally comprehensive and accurate
- NRC Actions discussing SRM should be focused on verification by the NRC staff that licensees have appropriately implemented the VII, consistent with their commitments to do so
- Voluntary Industry Initiative (Part 1) Section 03.01 is generally consistent with the VII
- Information Collection (Part 2) Section 03.02 significantly deviates from VII
- Comments provided are examples; industry plans to provide additional detailed comments

COMMISSIONER DIRECTION IN SRM AND SRM VOTE SHEETS

SRM – SECY 16-0068 Direction

- “...the staff should verify that licensees have appropriately implemented the voluntary industry initiative.” (VII)
- “If the staff determines that a licensee does not adequately address potential OPCs [*under the industry initiative*]...the staff should consider the appropriate regulatory mechanism to impose the necessary requirements to protect against OPCs...”
- “...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.”
- ‘Once satisfactory implementation of the technical resolution has been verified for each licensee, the associated NRC Bulletin should be closed. The staff should update the ROP to provide periodic oversight of industry's implementation of the OPC initiative.’

Chairman Svinicki

- “This initiative...represents a formal commitment by nuclear power plant licensees to address the OPC design vulnerability... 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.*”
- Staff should verify licensees have appropriately implemented the VII.
- Once verified, the associated NRC Bulletin should be closed.

Commissioner Burns

- Licensees have prudently committed to implementing interim compensatory measures and plant modifications under the VII.
- The staff intends to review these voluntarily implemented measures and modifications.
- 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.”

GENERAL SECTION COMMENTS

Objective Comment – Page 1

Existing: (01.01) “To verify that licensees have appropriately implemented the Nuclear Energy Institute (NEI) voluntary industry initiative (VII) *and that licensee’s updated their licensing basis documents to reflect the detection and protection schemes.*”

Comment: The wording suggests additional expectations on updating the licensing basis from what is in the SRM. The SRM states: “...updating the licensing basis to reflect the need to protect against OPCs.”

Modify to be consistent with the VII and the SRM:

...(VII) *including updating the licensing basis to discuss the design features and analyses related to the effects of, and protection for, any open phase condition design vulnerability.*

Objective Comment – Page 1

Existing: (01.02) “To gather the information necessary for NRR staff to determine whether *the modifications implemented in response to the VII address potential vulnerability to OPCs.*”

Comment: The SRM endorsed the VII as adequate to address OPCs. The SRM states that “the staff should verify that licensees have appropriately implemented the voluntary industry initiative”. The evaluation of modifications being implemented in response to the VII as being adequate to address OPCs should focus on whether they meet the criteria in the VII.

Modify to:

To gather the information necessary for NRR staff to determine whether *the licensees appropriately implemented the VII to address potential OPCs.*

General Guidance, Page 8, 3rd paragraph

Existing: “The NRR staff will review inspection results including the information collected in Section 03.02 of this TI to determine if the *VII adequately addressed potential OPCs**. *The analysis results will be used to identify potential policy issues associated with the VII that must be communicated to Commission*, as directed by Staff Requirements Memorandum SECY-16-0068.”

Comment: The SRM directed the staff to verify “that licensees have appropriately implemented the voluntary industry initiative”. The adequacy of the VII to address potential OPCs is not within the scope of the inspection per the SRM. Additionally, the SRM states that only if “disagreement arise between the staff and the industry during implementation of the VII, and the related issues have policy implications, the staff should promptly raise such issues to the Commission for resolution.”

Modify to:

...collected in Section 03.02 of this TI to determine if the *licensees appropriately implemented the VII to address potential OPCs*. *The results of the evaluation will be used to identify if disagreements exist between the staff and the industry during implementation of the VII and, if such issues have potential policy implications, the issues need to be communicated to the Commission for resolution.*

General Guidance, Page 8, 4th paragraph

Existing: “If NRR/DE/EEOB staff determines after *analyses of initial inspection results that there are no policy issues and the plant modifications implemented in response to the VII are appropriate, the remaining plants will then be inspected only for section 03.01 of this TI to validate the adequacy of OPC detection and protection schemes implemented at remaining plants.* This TI may be updated to incorporate lessons learned from the initial inspections.”

Comment: The SRM directed the staff to verify “that licensees have appropriately implemented the voluntary industry initiative”. The adequacy of the VII to address potential OPCs, other than ensuring the associated plant modifications meet the VII criteria, is not within the scope of the inspection per the SRM.

Modify to:

If NRR/DE/EEOB staff determines after *evaluation of initial inspection results that the VII has been appropriately implemented and that the associated plant modifications meet the VII criteria, the remaining plants will then be inspected only for section 03.01 of this TI to verify that the VII was appropriately implemented at remaining plants.* This TI may be updated to incorporate lessons learned from the initial inspections.

03.01 VII, Page 9, 1st paragraph

Existing: *“* In particular, the analysis would focus on the residual difference between the level of safety provided by implementation of the VII and the current staff position for OPC protection described in Branch Technical Position 8-9, “OPEN PHASE CONDITIONS IN ELECTRIC POWER SYSTEM,” and the existing licensing bases for electric power systems specified in Chapter 8 of the UFSAR.”*

Comment: Reference to BTP 8-9 and any analysis of differences between the VII and BTP 8-9 is not appropriate within the inspection scope. The industry and the VII have not committed to the guidance within BTP 8-9 nor was it intended to apply to the operating fleet. The SRM directed that the inspection verify the implementation of the VII and accepted the VII as adequate to address OPCs. Evaluation of the VII for different criteria from what is contained within the VII is outside the scope of the SRM. Thus, any reference to or analysis involving BTP 8-9 within this TI is not appropriate.

Recommended action: *Delete this paragraph and the page 8 reference.*

03.02 Information Collection, Page 11, 1st paragraph

Existing: “The information collected as part of the initial inspections should enable NRR/DE/EEOB staff to determine whether *the modifications implemented in response to the VII are appropriate and meet the existing plant-specific licensing basis/regulatory requirements for electric power systems (onsite and offsite).*”

Comment 1: The SRM states that “the staff should verify that licensees have appropriately implemented the voluntary industry initiative”. Given that the Commission has determined that there is no nonconformance with regulatory requirements, and the VII reflects the industry’s voluntary action to address a new vulnerability, the evaluation of modifications being implemented in response to the VII should be focused on whether they meet the criteria in the VII.

Comment 2: The action relative to the license basis should not be an assessment of meeting the “existing license basis”, but should only include the following per the SRM: “... updating the licensing basis to reflect the need to protect against OPCs.”

03.02 Information Collection, Page 11, 1st paragraph

Comment 3: The information gathering is being performed to support closure of the NRC Bulletin 2012-01. The SRM states the following: “Once satisfactory implementation of the technical resolution has been verified for each licensee, the associated NRC Bulletin should be closed.” Thus, the SRM directs that once the VII has been verified as implemented at each station, then the Bulletin can be closed.

Modify to:

The information collected as part of the initial inspections should enable NRR/DE/EEOB staff to determine whether *the industry appropriately implemented the VII to address potential OPCs, the associated plant modifications meet the VII criteria, and that the plant-specific licensing basis/regulatory requirements has been updated to reflect the need to protect against OPCs. Once satisfactory implementation of the technical resolution has been verified for each licensee, NRC Bulletin 2012-01 will be closed.*

TECHNICAL COMMENTS

TI Comment Summary – Section 03.02

- Minimize information gathering (Part 2 - Section 03.02) to points of value consistent with verifying licensees have appropriately implemented the VII
- Simplify inspectors checklist to include:
 - Identification/documentation of potential consequences to ESF equipment function (calculation or design)
 - Identification of credible station OPC's
 - Identification of any gaps in UFSAR to address open phase events. If no gap determined, identification of existing sections that cover the open phase event

Section 03.02 Section a.4 (OPC Detection and Alarm Scheme)

Existing

Identify the sensitivity of the detection schemes to detect *OPCs under all operating electrical system configurations and plant loading conditions for which the offsite power supplies are required to be operable in accordance with plant TSSs.*

Modify to

Identify the sensitivity of the detection scheme(s) to detect *OPCs that prevent the functioning of connected important-to-safety SSCs under credited operating electrical system configurations and plant loading conditions.*

Section 03.02 Section a.6 (OPC Detection and Alarm Scheme)

Existing

Identify *if the detection and alarm circuits are independent of actuation (protection) circuits. Identify the safety classification of the detection and alarm circuits (safety or non-safety). If the detection, alarm and actuation circuits are non-Class 1E, identify if there is any interface with Class 1E systems. Document the licensee's technical basis for installing a non-Class 1E scheme.*

Modify to

Identify *the safety classification of the detection and alarm circuits (Class 1E or non-Class 1E). Confirm non-Class 1E circuits are not used to replace existing Class 1E circuits.*

Section 03.02 Section b.4 (OPC Protection Scheme)

Existing

Identify any design features considered by the licensee to prevent common cause failures.

Modify to

Delete the reference to common cause failures.

Section 03.02 Section b.5 (OPC Protection Scheme)

Existing

Identify the number of channels provided per offsite power source and if there is independence between channels and sensors.

Modify to

Confirm independence of protection scheme(s) between credited offsite power sources.

Section 03.02 Section b.8 (OPC Protection Scheme)

Existing

For plants using non-Class 1E protection schemes, identify whether the licensee considered *a failure of the non-class 1E actuation circuits coupled with a single failure of Class 1E bus to determine whether it would result in loss of safety function(s) of ESF systems. Note that non-Class 1E systems are not credited in the safety analysis for mitigating design basis accidents and anticipated operational occurrences.*

Modify to

For plants using non-Class 1E protection schemes, identify whether the licensee considered *an OPC coupled with a single failure of the of Class 1E bus to determine whether it would result in loss of safety function(s) of ESF systems outside of current licensing basis.*

Section 03.02 Section b.9 (OPC Protection Scheme)

Existing

Identify the criteria that have been used by the licensee to verify power quality issues caused by OPCs, such as unbalanced voltages and currents, sequence voltages and currents, *phase angle shifts, and harmonic distortion* could adversely affect redundant ESF buses. Also, identify the industry standards used to develop the acceptance criteria.

Modify to

Identify the criteria that have been used by the licensee to verify power quality issues caused by OPCs, such as unbalanced voltages and currents, sequence voltages and currents that could adversely affect redundant ESF buses. Also, identify the industry standards used to develop the acceptance criteria.

Section 03.02 Section c.1 (UFSAR Updates)

Existing:

Identify whether the licensee has documented *the plant-specific analysis and documentation that established the resolution of the OPC design vulnerability, including the failure mode analysis performed.*

Modify to:

Identify whether the licensee has documented *the specific need to protect against an open phase event. If no specific changes/additions were required, confirm existing documentation includes wording that would include the open phase event.*

COMMENTS SUMMARY

Summary Points

- TI needs to be reworked to ensure consistency with SRM direction
- TI Section 03.02 Information Gathering includes expectations that are not consistent with VII and the SRM
- Comments provided are examples; industry plans to provide additional detailed comments

PLANT STATUS – OPC INSTALLATION SURVEY RESULTS

OPC Installation Status

Installation Status	Number of Units
Installation complete (trip enabled)	2
Installation complete (monitoring mode)	37
Installation partially completed	13
Installation planned in 2017	19
Installation planned in 2018	22
Installation scheduled post-2018	1
Installation Not Required	3
Installation N/A due to near-term Plant Shutdown (Interim measures remain in place)	2

NOTE: Results from mid-2017 OPC survey are preliminary