**[Registered Entity Name –Canadian Entities only]**

**NERC ID: [NCRXXXXX]**

**VAR-002-4.1 - Generator Operation for Maintaining Network Voltage Schedules, R1 and R3**

**1st Quarter 2023 Self-Certification**

# Instructions

1. Populate the cover page by adding your entity’s name and NERC identification number.
2. Complete thetasks listed under **Assessment Guidance**.
3. Log into **WebCDMS** and complete your self-certification response.
4. Submit via the MRO EFT Encrypted [FTP2](https://FTP2.midwestreliability.org) Site:
	1. This completed Worksheet; and
	2. The completed workbook **VAR-002-4.1\_R1\_R3\_Testing\_Workbook.xlsx**; and
	3. All specific evidence files referenced within each document. Please make sure to use unique file names for each evidence file submitted, and identify within all response(s) which specific evidence files support each conclusion made. These references and the use of unique file names helps facilitate and expedite MRO’s review of the Self-Certification work that has been performed.
	4. Any internal control information related to the Reliability Standard and Requirement in scope with supporting documentation of the objective(s), design, and implementation of the internal control(s).

# Purpose:

## To ensure generators provide reactive support and voltage control, within generating Facility capabilities, in order to protect equipment and maintain reliable operation of the Interconnection.

## Applicability:

# 4.1. Generator Operator

# 4.2. Generator Owner

# Scope

**VAR-002-4.1 - Generator Operation for Maintaining Network Voltage Schedules, R1**

***R1.*** The Generator Operator shall operate each generator connected to the interconnected transmission system in the automatic voltage control mode (with its automatic voltage regulator (AVR) in service and controlling voltage) or in a different control mode as instructed by the Transmission Operator unless: 1) the generator is exempted by the Transmission Operator, or 2) the Generator Operator has notified the Transmission Operator of one of the following:

- That the generator is being operated in start-up,1 shutdown,2 or testing mode pursuant to a Real-time communication or a procedure that was previously provided to the Transmission Operator; or

- That the generator is not being operated in automatic voltage control mode or in the control mode that was instructed by the Transmission Operator for a reason other than start-up, shutdown, or testing.

***M1.*** *The Generator Operator shall have evidence to show that it notified its associated Transmission Operator any time it failed to operate a generator in the automatic voltage control mode or in a different control mode as specified in Requirement R1. If a generator is being started up or shut down with the automatic voltage control off, or is being tested, and no notification of the AVR status is made to the Transmission Operator, the Generator Operator will have evidence that it notified the Transmission Operator of its procedure for placing the unit into automatic voltage control mode as required in Requirement R1. Such evidence may include, but is not limited to, dated evidence of transmittal of the procedure such as an electronic message or a transmittal letter with the procedure included or attached. If a generator is exempted, the Generator Operator shall also have evidence that the generator is exempted from being in automatic voltage control mode (with its AVR in service and controlling voltage).*

**VAR-002-4.1 - Generator Operation for Maintaining Network Voltage Schedules, R3**

***R3.*** Each Generator Operator shall notify its associated Transmission Operator of a status change on the AVR, power system stabilizer, or alternative voltage controlling device within 30 minutes of the change. If the status has been restored within 30 minutes of such change, then the Generator Operator is not required to notify the Transmission Operator of the status change.

***M3.*** *The Generator Operator shall have evidence it notified its associated Transmission Operator within 30 minutes of any status change identified in Requirement R3. If the status has been restored within the first 30 minutes, no notification is necessary.*

Assessment Guidance

**VAR-002-4.1 - Generator Operation for Maintaining Network Voltage Schedules**

1. Follow the instructions in **Tab 1** of the workbook file **VAR-002-4.1\_R1\_R3\_Testing\_Workbook.xlsx.** The generators for which you have compliance responsibility will be referred to in this worksheet and the workbook as “applicable” generating units in the following steps.
2. Select a random sample from the total population of applicable generating units identified in Tab 1, using the following sampling logic (a random sample may be selected using statistical functions available in Microsoft Excel, through use of RAT-STATS <https://oig.hhs.gov/compliance/rat-stats/index.asp>, or other statistical tool). Use the sample result to populate **Tab 2**.
	1. Randomly sample eight of your applicable generator units if your total population is nine or greater;
	2. If eight or fewer total applicable generator units exist in the population, select the entire population.

Fill in Table 1 with the evidence of the sampling process used, including:

Evidence of the sampling process or tool utilized to create the sample (e.g. what are your samples and how are they created).

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| **Table 1: Sampling of Tab 1** |
| **File Contents** | **File Name / Page(s)** |
| **Statistical Function Output** |  |
| **Comments** |  |

1. Follow the instructions in **Tab 2** of file **VAR-002-4.1\_R1\_R3\_Testing\_Workbook.xlsx** Note that the following methodology has been developed by MRO in order to produce a final population of dates and times for which evidence of R1 compliance will be reviewed:
* The selected date is the 10th of the month for each of the 12 months that are within the monitoring period of 10/1/2021 through 9/30/2022.
* The selected times occurring on each date (10th of the month) are 1am, 6am, 1pm, and 6pm

Note: For each of your applicable generating units, there will be 48 times identified for each generator for the next round of sampling. For example, if you have one applicable generating unit, the sampling population will have (1 X 48) = 48 total times. If you have eight applicable generating units, the sampling population will have (8 X 48) = 384 total times.

1. Select a random sample from the total population (using the total “Population No.”) of times for all applicable generators listed in the **Tab 2** columns, as outlined in Table 2 below which is based on the NERC ERO Sampling Handbook. These sample results will be used to populate **Tab 3** of the workbook.

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| **Table 2: NERC** **ERO Sampling Handbook** **Sample Population Guidelines** |
| **Dependent Population of Elements** | **Using Statistical Sampling**  |
| Under 100 (1 or 2 applicable generators) | 23 Samples  |
| 100 or more (3 or more applicable generators) | 29 Samples  |

Note: For example, if you have two applicable generating units, your total dependent population of elements (total Population No.) will be 96 (see cell D54 in VAR-002-4\_R1\_R3\_Testing\_Workbook.xlsx). From your total population of 96, you would randomly sample 23 samples.

Fill in Table 3 with the evidence of the sampling process used, including:

Evidence of the sampling process or tool utilized to create the sample (e.g. what are your samples and how are they created).

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| **Table 3: Sampling of Tab 2**  |
| **File Contents** | **File Name / Page(s)** |
| **Statistical Function Output** |  |
| **Comments** |  |

1. To test for compliance with R1, follow the instructions in **Tab 3** of file **VAR-002-4.1\_R1\_R3\_Testing\_Workbook.xlsx** by populating **Tab 3** with each of the sampled times in Row 10, following the example rows. Please list evidence files in Columns D, F, and H to support the answers to the questions in Columns C, E, and G.
2. To test for compliance with R3, follow the instructions in **Tab 4** of the file **VAR-002-4.1\_R1\_R3\_Testing\_Workbook.xlsx** by populating **Tab 4** with all of the status changes for each of the sampled generating units, and populate Columns B through G as shown in the column headings.
3. Please provide and describe process(es) and internal controls (e.g. processes, tools, applications, tracking, training, etc.) your organization has designed and implemented to help ensure that compliance with R1 is met. Include any applicable entity-wide internal controls, together with standard and requirement-specific internal controls, to help ensure compliance and operational risks are reduced for R1.

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| **Table 4: R1 processes and internal controls** |
| **File Contents** | **File Name / Page(s)** | **Date** | **Version** |
| **Documented Process(es)** |  |  |  |
| **Internal Controls Documents** |  |  |  |
| **Comments and Description** |  |

1. Please provide and describe process(es) and internal controls (e.g. processes, tools, applications, tracking, training, etc.) your organization has designed and implemented to help ensure that compliance with R3 is met. Include any applicable entity-wide internal controls, together with standard and requirement-specific internal controls, to help ensure compliance and operational risks are reduced for R3.

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| **Table 5: R3 processes and internal controls** |
| **File Contents** | **File Name / Page(s)** | **Date** | **Version** |
| **Documented Process(es)** |  |  |  |
| **Internal Controls Documents** |  |  |  |
| **Comments and Description** |  |

1. Does the evidence provided meet all elements of the requirement **R1**?

☐ Yes, respond “Compliant” for R1 to the Self-Certification in WebCDMS. Include a comment summary and upload supporting documentation to the [FTP2](https://FTP2.midwestreliability.org) server.

☐ No, respond “Not Compliant” for R1 to the Self-Certification in WebCDMS. Include a comment summary based on potential issues and upload supporting documentation to the [FTP2](https://FTP2.midwestreliability.org) server.

☐ Do not own, respond “Do Not Own” for R1 to the Self-Certification in WebCDMS. Include comments supporting the “Do Not Own” response and upload supporting documentation to the [FTP2](https://FTP2.midwestreliability.org) site.

☐ Do not meet the applicability requirements of the full standard, respond “Not Applicable” for R1 to the Self-Certification in WebCDMS. Include comments supporting the “Not Applicable” response and upload supporting documentation to the [FTP2](https://FTP2.midwestreliability.org) server. This response should not be used if the circumstance within the standard or requirement language did not happen. This response should only be used if the requirement or standard is not applicable at all to the entity (such as not registered for the function).

1. Does the evidence provided meet all elements of the requirement **R3**?

☐ Yes, respond “Compliant” for R1 to the Self-Certification in WebCDMS. Include a comment summary and upload supporting documentation to the [FTP2](https://FTP2.midwestreliability.org) server.

☐ No, respond “Not Compliant” for R1 to the Self-Certification in WebCDMS. Include a comment summary based on potential issues and upload supporting documentation to the [FTP2](https://FTP2.midwestreliability.org) server.

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# Document Submittals

MRO requires copies of the following be submitted with the self-certification response:

1. This completed worksheet;
2. All files as detailed in Tables 1, 3, 4, and 5; and
3. Completed **VAR-002-4.1\_R1\_R3\_Testing\_Workbook.xlsx** and all referenced evidence files

Please make sure to use unique file names for each evidence file submitted, and identify within your responses to the steps above which specific evidence files support each conclusion made. These references and the use of unique file names helps facilitate and expedite MRO’s review of the Self-Certification work that has been performed.

All other data related to the registered entity’s analysis and self-certification response are to be retained for at least 180 days after the submission date. MRO staff may request submission of additional information at a later date to verify accuracy of self-certification submittals.