	© ISO New England Inc. 2023	Procedure: Perform and Process a Real-Time AVR Audit
	Process Name: Monitor Resource Performance	Revision Number: 1.5
	Procedure Number: RTMKTS.0180.0056	Effective Date: June 14, 2023
	Procedure Owner: Michael Jaeger	Review Due Date: June 14, 2025
	Approved By: Manager, Operations Analysis and Integration	


SOP- RTMKTS.0180.0056

Perform and Process a Real-Time AVR Audit

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1. Objective

The objective of this procedure is to monitor and document the real time performance of Generator Automatic Voltage Regulators (AVRs).

2. Background


ISO New England Operating Procedure No. 12 - Voltage and Reactive Control (OP-12) requires each generating unit to have an AVR operating in the automatic voltage control mode unless exempted from this criteria through the process detailed in Master/Local Control Center Procedure No. 8 - Coordination of Generator Voltage Regulator and Power System Stabilizer Outages (M/LCC 8). An audit of real time AVR performance, coupled with real time AVR status telemetry, provides the Operations Support Services, Real Time Support (OSS RTS) group and the Reliability and the Operations Compliance (ROC) group with verification that each Generator AVR is operating as expected.

3. Responsibilities

NOTE


Any NERC Certified System Operator, certified at the RC level, has the authority to take action(s) required to comply with NERC Reliability Standards.

1. The Transmission Operations Technical Studies (TOTS) Analyst is responsible for implementing this procedure.
 - A. Performing a historical audit on AVR performance in accordance with this procedure.
 - B. Providing the AVR audit results to the OSS RTS group for review.
 - C. Gathering additional audit data for generating units, as necessary.
 - D. Providing appropriate data to the ROC group, as necessary.
2. The OSS RTS group is responsible for:
 - A. Reviewing the AVR audit results provided by the TOTS analyst.
 - B. Providing feedback to the TOTS analyst regarding AVR audit results.
 - C. Communicating with Market Participants regarding AVR audit results.
 - D. Providing technical assistance to the ROC group, as necessary.

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4. Controls

1. Only a TOTS personnel authorized by Manager, TOTS, have access to the AVR auditing software required to perform the AVR audit analysis.
2. When directed by Manager, Real Time Studies, the OSS RTS group performs the detailed review of audit results.

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5. Instructions


5.1 Perform the Real Time AVR Performance Audit

1. In the first week of each month, or more frequently as needed, the TOTS Analyst shall use the AVR audit software to perform a historical AVR performance audit by performing the following:

NOTE

The operating start date of the monthly audit should be the day of the previous month prior to the audit initiation with the maximum actual load observed, unless otherwise agreed upon with Manager, Real-Time Studies.

- A. Obtain the peak load day of the previous month from Forecasting Office to use as the date of the audit.
- B. Using the AVR software AVR Audit Software3.xlsm located at \\isofilpd1\tso\AVR_Audit\, perform the following:
 - (1) Verify any excluded units are appropriate.
 - (2) Select the Update button to initiate audit
 - (3) Enter the date to be audited
 - (4) Save the AVR audit results in the appropriate folder
 - (5) Open the “Charts” tab and perform a visual analysis of each Generator shown, comparing the Generator reactive output response to changes in voltage throughout the day.
 - (6) Determine whether any Generator(s) should be forwarded to Manager, Real-Time Studies, for further analysis.

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5.2 Real Time AVR Performance Audit Under-Performance Actions

1. When requested by Manager, Real-Time Studies, the TOTS Analyst shall obtain additional data for a Generator, by performing the following query:
 - A. Query the Analysis database, “UCM AVR Asset Data” for the month and Generator under review.
 - (1) Select days when the specific Generator was online.
 - (2) Open PI worksheet, “Unit mmddyy”, located in the AVR Audit folder on the Isofilpd1\ts0\ shared drive.
 - a. Enter the appropriate PI tags, selecting MW, MVAR, KV and UCM for the unit to be audited and the desired dates
 - b. Run the query
 - B. Inform the Manager, Real-Time Studies indicating that the specified Generator additional AVR Audit results are available for review.

NOTE

Audit results should be saved on the shared drive:

- \\Isofilpd1\ts0\AVR_Audit\AVR_Audit_Data


5.3 Real-Time AVR Performance Audit Follow-up Actions

1. If further review or discussion of a poorly performing AVR is required, the TOTS Analyst shall consider scheduling a meeting with the TOTS, OSS RTS and ROC groups and perform the following:


NOTE

The timeframe for Lead Market Participant response will be determined on a case-by-case basis.

- A. If any Generator AVR appears to **not** be performing appropriately, initiate contact with the Lead Market Participant using the Unit AVR Verification Letter Template.docx, located in the AVR Audit folder on the Isofilpd1\ts0\ shared drive.
- B. As necessary, follow up with telephone call to the Lead Market Participant for discussion and clarification
- C. Monitor participant actions regarding the AVR audit results.
- D. Continue to monitor AVR performance and progress on corrective action(s) taken to resolve the matter.

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2. If the matter of a poorly performing AVR **cannot** be resolved, the Manager, TOTS, in consultation with the Manager, Real-Time Studies shall perform the following:
 - A. Refer the matter to the ROC group
 - B. Provide the appropriate documentation to the ROC group.

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6. Performance Measures

1. This procedure is properly followed as evidenced by the following:
 - Monthly queries run as directed
 - Each potentially deficient Generator is contacted
 - Plan of action determined and followed for each deficient Generator identified

7. References

NERC Reliability Standard VAR-002 - Generator Operation for Maintaining Network Voltage Schedules


ISO New England Operating Procedure No. 12 - Voltage and Reactive Control (OP-12)

ISO New England Operating Procedure No. 14 - Technical Requirements for Generators, Demand Response Resources, Asset Related Demands and Alternative Technology Regulation Resources (OP-14)

Master/Local Control Center Procedure No. 8 - Coordination of Generator Voltage Regulator and Power System Stabilizer Outages (M/LCC 8)

8. Revision History

Rev. No.	Date	Reason	Contact
0	03/05/14	Initial draft procedure	Thomas Hultine
1	06/01/15	Administrative changes to modify footers and headers; Headers, modified version and changed Procedure Owner; Globally modified grammar for all directed actions to use present tense verbs; Step 5.1.1.B, modifies by adding path of Auditing Software; NOTE following 5.2.1.B, minor modifications;	Michael Jaeger
1.1	09/30/15	Biennial review completed by procedure requiring no changes; Made administrative changes required to publish a Minor Revision;	Michael Jaeger
1.2	07/19/17	Biennial review completed by procedure owner requiring no changes; Made administrative changes required to publish a Minor Revision (including: updated as applicable for organizational changes made due the SOS group no longer existing and: added required corporate document identity to all footes);	Michael Jaeger
1.3	06/27/19	Biennial review completed by procedure owner requiring no changes; Made administrative changes required to publish a Minor Revision (including correcting OP-14 title in Section 7);	Michael Jaeger
1.4	06/17/21	Biennial/Periodic review performed requiring no changes with the exception of approver title change.	Michael Jaeger

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Rev. No.	Date	Reason	Contact
1.5	06/14/23	Biennial review completed by procedure owner requiring no intent changes; Changed Approved by to Manager, OAI; Made administrative changes required to publish a Minor Revision.	Michael Jaeger

9. Attachments

None