

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Data Quality Control Process

For Section 1600 Data Request Applications

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RELIABILITY | ACCOUNTABILITY



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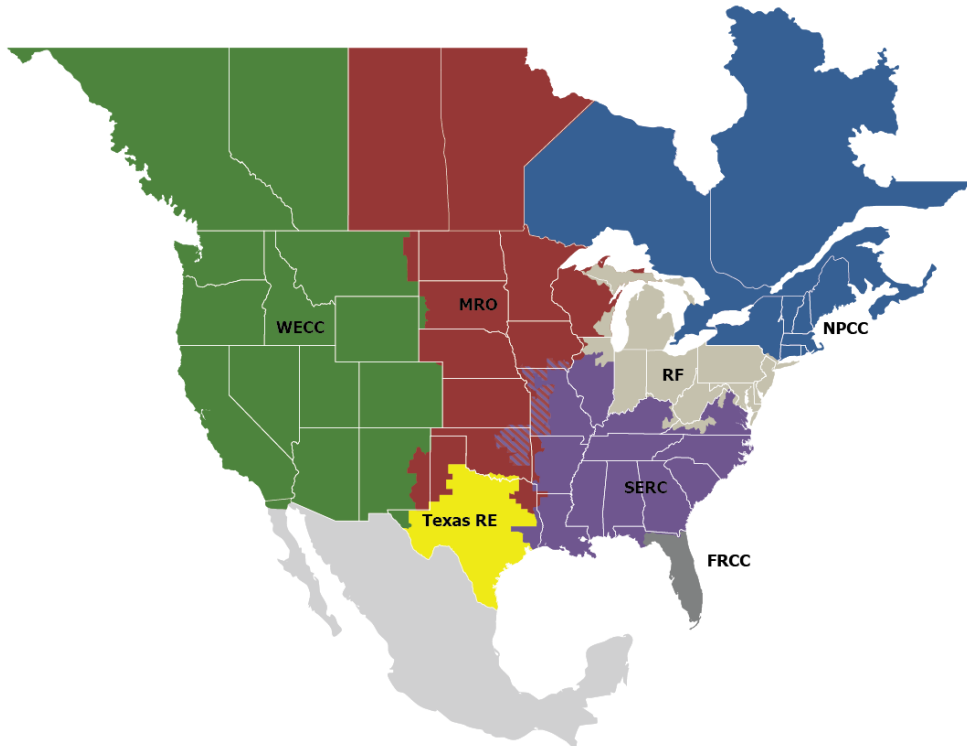
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Preface

The vision for the Electric Reliability Organization (ERO) Enterprise, which is comprised of the North American Electric Reliability Corporation (NERC) and the seven Regional Entities (REs), is a highly reliable and secure North American bulk power system (BPS). Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

The North American BPS is divided into seven RE boundaries as shown in the map and corresponding table below. The multicolored area denotes overlap as some load-serving entities participate in one Region while associated Transmission Owners/Operators participate in another.



FRCC	Florida Reliability Coordinating Council
MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RF	ReliabilityFirst
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	Western Electricity Coordinating Council

Introduction

This Data Quality Control Process document describes the controls in place to ensure metric numeric accuracy for Section 1600 data collection processes. The set of controls in place are designed to ensure that the Section 1600 application data are complete, accurate and timely to support analysis and compute metrics results that are credible for assessing the reliability of the bulk electric system.

Background

As part of its scope or work plan, the application Working Group has been tasked by the Planning Committee with developing a data quality control process that identifies the data collection process, data attributes, data controls, and roles of the various entities who report, review, or analyze the data.

Approach

A risk-based approach was used to identify controls necessary to achieve the objective. A control framework is a data structure that organizes and categorizes an organization's internal controls, which are practices and procedures established to create business value and minimize risk. Risks and controls have been identified in each of the high level process phases of reporting, compiling, analyzing and utilizing the application data.

Types of Quality Controls¹

- Directive – designed to establish desired outcomes
- Preventive – designed to avoid an unintended event or result at the time of initial occurrence
- Detective – designed to discover an unintended event or result after the initial processing has occurred but before the ultimate objective has concluded
- Corrective – designed to mitigate damage resulting from data errors

Data Attributes

The data attributes of completeness, accuracy and timeliness, are critical to the value of data collected. Within each data type, this section identifies types of controls to address these data attributes.

Roles and Accountabilities

It is important that the various stakeholders involved in the reporting, collection and use of the application data understand their respective roles and accountabilities. Roles and accountabilities are embedded in the list of controls included within this section. The roles involved in collection of the application data, along with their primary accountabilities pertaining to data quality include:

NERC:

- Owner of the application data
- Provides access to definitions and data reporting requirements
- Communicates reporting application updates with all stakeholders involved in the application data reporting
- Provides application and subject-matter support to registered entities and REs

¹ Internal Control – Integrated Framework, Committee of Sponsoring organizations of the Treadway Commission (COSO), December 2011, page 80

- Maintains and publishes the reporting deadlines
- Reviews the application data
- Coordinates with REs for data collection and communication with reporting entities
- Develops processes to ensure accuracy and timeliness of the application data
- Maintains the reporting application, including modifications, validation rules, and user security levels

The application Working Group:

- Provides industry stakeholder representation and subject-matter expertise to NERC
- Maintains definitions and data reporting requirements
- Makes recommendations to Performance Analysis Subcommittee and Planning Committee for updates to data definitions and reporting requirements
- Suggests use of data for reports and metrics, application changes, and data quality controls
- Develops the application training materials
- Reviews analysis and reports that utilize the application data

Registered Entities:

- Primary suppliers of data reported
- May participate in the application Working Group
- Make and review recommendations of the application Working Group for updates to data definitions and reporting requirements
- Suggests use of data for reports and metrics, application changes, and data quality controls
- Attend the application training offered by NERC

Regional Entities:

- Provide primary support of application and subject matter to registered entities and coordination with NERC for additional support when necessary.
- Provide Regional expertise to NERC
- Review the application data reported by registered entities within the specific Region
- Follow up with registered entities with incomplete data reported for a reporting period
- May use data reported for Region-specific analysis and metrics

Chapter 1: Data Types and Data Preparation

Data Requirements

The data requirements include the data elements, reporting periods, and reporting deadlines. These requirements are described in a NERC Rules and Procedure (ROP) Section 1600 data request and corresponding data reporting instructions. Minor changes to the Data Reporting Instructions are recommended to the Performance Analysis Subcommittee and Planning Committee by the application Working Group. Major changes require a public review period of the Section 1600 and corresponding data reporting instructions after approval by the Performance Analysis Subcommittee and Planning Committee. The Board of Trustees approve all Section 1600 data requests, including major changes.

Summary of Controls

Table 1.1: Summary of Controls – Data Requirements

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	Data Reporting Instructions, definitions, frequently asked questions and scenarios, training materials, and other example documents	☑	☑	☑
Preventive	Import templates or file formats and the application Working Group review and recommendations	☑	☑	☑
Detective	Public review, Performance Analysis Subcommittee, and Planning Committee	☑		☑
Corrective	ERO Enterprise	☑	☑	☑

Risks to data quality

The application data requirements need to be clearly defined and made available to all data reporters to ensure quality data. A lack of understanding of data requirements, formats, definition, or reporting periods may result in inaccurate, incomplete, and lack of timely data, which impacts any analysis on the data.

Controls

Directive:

- Data Reporting Instructions specify the data required, the format of the data and reporting periods.
- Definitions provide explanations of the data elements to report.
- Frequently asked questions and scenarios outlining how to report common types of situations.
- Training materials provide applied, structured guidance on reporting procedures.

Preventive:

- Import template provides structure for entering data for submission to reporting application.

- The application Working Group evaluates reporting issues or gaps and makes recommendations to improve data collection or data quality.

Detective:

- Oversight of data reporting requirements from industry (public comment), Performance Analysis Subcommittee and Planning Committee.

Corrective:

- The ERO Enterprise works with entities and specific data to resolve reporting errors.

Communication and Training

Various communication methods are used to provide data reporters with information about required data, reporting deadlines, training opportunities and materials, and documentation to support the reporting process for the application.

Summary of Controls

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	Data Reporting Instructions, definitions, frequently asked questions and scenarios, training materials, other example documents, and reporting deadlines posted on NERC’s website.	☑	☑	☑
Preventive	Import templates, the application Working Group, training sessions, Regional Entity, and dedicated application E-mail.	☑	☑	☑
Corrective	ERO Enterprise	☑	☑	☑

Risks to data quality

A lack of access to materials and resources results in a lack of understanding of data requirements, formats, definition, or reporting periods that may result in inaccurate, incomplete, and lack of timely data, which impacts any analysis on the data.

Controls

Directive:

- Data Reporting Instructions specify the data required, the format of the data and reporting periods.
- Definitions provide explanations of the data elements to report.
- Frequently asked questions and scenarios outlining how to report common types of situations.
- Training materials provide applied, structured guidance on reporting procedures.

- Reporting deadlines posted on the application-specific web page provide easily accessible information for timely reporting.

Preventive:

- Import template provides structure for entering data for submission to reporting application.
- Training sessions provide opportunity for interaction with subject-matter experts.
- Assigned RE to provide personal training and contact registered entities about approaching or missed reporting deadlines.
- Dedicated application E-mail allows users to communicate to a distribution list of NERC staff supporting the application.
- NERC staff communicate with technical experts from working group to answer highly technical questions for reporting frequently asked questions and scenarios.

Corrective:

- The ERO Enterprise works with entities and specific data to resolve reporting errors.

Data Preparation

The registered entities use the application Data Reporting Instructions and associated templates, as applicable, to guide the preparation of data for submission to the application.

Summary of Controls

Table 1.3: Summary of Controls – Data Preparation

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	Data Reporting Instructions, definitions, frequently asked questions and scenarios, training materials, and other example documents.	☑	☑	☑
Preventive	Import templates or file formats	☑	☑	☑
Detective	Validations within the reporting application or template used by the registered entity or RE before submittal to NERC	☑	☑	
Corrective	Validations within the reporting application used by the ERO Enterprise after data is submitted to NERC in order to detect accepted validation errors	☑	☑	

Risks to data quality

Registered entities reporting to the application prepare the data in the format or template using the information provided in the application Data Reporting Instructions and supporting materials. A lack of understanding of data requirements, formats, definition, or reporting periods may result in inaccurate, incomplete, and lack of timely data, which impacts any analysis on the data.

Controls

Directive:

- Data Reporting Instructions specify the data required, the format of the data and reporting periods.
- Definitions provide explanations of the data elements to report.
- Frequently asked questions and scenarios outline examples of how to report common types of situations.
- Training materials provide applied, structured guidance on reporting procedures.

Preventive:

- Import templates or defined file formats provides structure for preparing data for submission to reporting application.

Detective:

- Validations with the reporting application or template test validity of specific types of data errors.
- Validations may present warnings and accept the data or completely reject the submission until errors are corrected.
- Validations with the reporting application alert the RE to specific types of data errors and may present warnings and accept the data or completely reject the submission until errors are corrected.

Corrective:

- Validations within the reporting application used by the ERO Enterprise after data is submitted to NERC to detect accepted validation errors

Data Access

Users of the application must to be authorized to submit data for their entity. A vetting process or digital certificate may be required to grant access to a user. The application must not permit a user from one entity to have access to another entity’s data without authorization from the entity.

Summary of Controls

Table 1.4: Summary of Controls – Data Access				
Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	Training materials and other supporting materials describe requirements and process for access.	☑	☑	
Preventive	User setup requires digital certificate or entity approval for access; role-based functionality.	☑	☑	
Detective	Digital certificate requires coordination with third party; user access and transactions are tracked in the application.	☑	☑	
Corrective	Security in the reporting application prevent unauthorized access to another entity’s data.	☑	☑	

Risks to data quality

Registered entity access to another entity’s data could result in compromised data through data manipulation or access to confidential business operating information.

Controls

Directive:

- Training materials and other supporting documents provide guidance on access requirements.

Preventive:

- Access to the reporting application may require a digital certificate to be issued to the user. This registers the user and company to a specific computer.
- Some reporting applications require a NERC account and a vetting process to obtain access to the reporting application.
- NERC sets up the users in the applications that require a digital certificate.
- Where a vetting process occurs, the reporting entity vets the user requesting access.
- Functionality is limited based on permissions.

Detective:

- Users must obtain a digital certificate from a third party for some web-based reporting applications.
- User access and transactions are tracked within the application.

Corrective:

- Security in the reporting application prevent unauthorized access to another entity’s data.

Reporting

Registered entity users with permission to report, use import templates or defined file formats to report data based on a schedule. The reporting schedule permits the data to be collected on an interval basis that has been defined in the Section 1600 data request. Reporting deadlines may vary by application and are made available to the registered entities through information in the reporting application or the NERC web page specific to that data reporting application.

Summary of Controls

Table 1.5: Summary of Controls – Reporting				
Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	Data Reporting Instructions, definitions, frequently asked questions and scenarios, training materials, other example documents, and reporting deadlines posted on NERC’s website.	☑	☑	☑
Preventive	Import templates, E-mail reminders, and reporting checklists	☑	☑	☑

Table 1.5: Summary of Controls – Reporting

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Detective	Validations within the reporting application or template and reporting checklists	☑	☑	☑
Corrective	ERO Enterprise	☑	☑	

Risks to data quality

A lack of understanding of data requirements, formats, definition, or reporting periods may result in inaccurate, incomplete, and lack of timely data, which impacts any analysis on the data.

Controls

Directive:

- Data Reporting Instructions specify the data required, the format of the data and reporting periods.
- Definitions provide explanations of the data elements to report.
- Frequently asked questions and scenarios outlining examples of how to report common types of situations.
- Training materials provide applied, structured guidance on reporting procedures.

Preventive:

- Import template provides structure for entering data for submission to reporting application.
- Automated reminders are sent to registered entity users to remind them of upcoming reporting obligations. These are typically sent at various intervals up to the reporting deadline, such as two weeks prior, one week prior, and one day prior.
- Reporting checklists provide registered entities with a list of required data and the reporting status. When all data are provided, the checklist displays as complete.

Detective:

- Validations within the reporting application test the validity of the reported data and prevent a checklist from being reported as complete when there are issues with the data that was submitted.
- Entities may enter comments on the checklist to alert the RE or NERC to any issues with the data for a given period.

Corrective:

- The ERO Enterprise works with entities and specific data to resolve reporting errors.

Chapter 2: Reporting Oversight

Each Section 1600 data request specifies the reporting interval and reporting period deadline for registered entities. This provides time after the end of the reporting period for the registered entities to gather and review data before submission. REs have an additional period following the registered entities' reporting period deadline. This chapter describes the controls for coordinated oversight by NERC and REs. REs may have additional internal controls not included in this document.

Regional Entity Oversight

REs monitor reporting progress of all entities in the Region through the Regional checklist and may review the detail of the checklist of any entity in the Region. Reporting checklist information may be exported to Excel.

Summary of Controls

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	Regions use the Data Reporting Instructions, definitions, frequently asked questions and scenarios, training materials, and other example documents to inform the registered entities of their reporting obligations.	☑	☑	☑
Preventive	Regional checklists, Regional training provided to registered entities	☑	☑	☑
Detective	Validations within the reporting application or template and reporting checklists Reporting verification process training for REs	☑	☑	☑
Corrective	Regional review period and ERO Performance Analysis group	☑	☑	☑

Risks to data quality

A lack of understanding of data requirements, formats, definition, or reporting periods may result in inaccurate, incomplete, and lack of timely data, which impacts any analysis on the data.

Controls

Directive:

- Regions and registered entities have access to the Data Reporting Instructions, training materials and other support materials available on NERC's website.
- NERC's reporting verification process training provides REs information related to the reporting timeline. Each RE may have internal procedures for evaluating reported data and contacting entities that have not completed their reporting for a period.

Preventive:

- Regions may provide one-on-one or other training support to registered entities to help them with reporting issues or questions.
- REs may monitor reporting progress of all entities in the Region through the Regional checklist and may review the detail of the checklist of any entity in the Region.
- NERC may monitor the reporting progress of entities at the individual or Regional level.

Detective:

- The reporting application provides periodic updates to notify the Regions of entities that have not reported by the reporting deadline.
- NERC sends Regional checklists to the Regional application contact, showing the reporting status of each registered entity for the reporting period.

Corrective:

- Regions have a review period in which to attempt to collect additional data from registered entities after the reporting deadline.
- Regions have the ability to import data for a registered entity during the Regional review period.
- REs communicate with NERC through an ERO Performance Analysis group to identify and resolve data reporting issues in their Region.

NERC Oversight

NERC provides user support and manages the applications that collect data from the registered entities. NERC monitors the progress of data reporting through a summary checklist that includes the reporting status of the entities or regions by reporting period. NERC supports the Regions to upload data provided by a registered entity after the Regional review period closes. NERC monitors, updates, and reports quarterly dashboard on completeness of reporting at the Regional level.

Summary of Controls

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	User support to inform users of available resources for user setup, data reporting, or application updates.	☑	☑	☑
Preventive	Import templates and user support, e-mail reminders to registered entities or REs	☑	☑	☑
Detective	Use of application dashboard to notify users of any application issues		☑	☑
Corrective	Regional review period and ERO Performance Analysis group	☑	☑	☑

Risks to data quality

A lack of understanding of data requirements, formats, definition, or reporting periods may result in inaccurate, incomplete, and lack of timely data, which impacts any analysis on the data.

Controls

Directive:

- NERC guides users to applicable resources to address user support inquiries.
- NERC uses user lists to notify users of application issues or updates.

Preventive:

- NERC develops and maintains the import templates that provide the structure for entering data for submission to reporting application.
- NERC sets up the reminder E-mails that are sent from each reporting application to reporting entities and REs.

Detective:

- NERC uses the application dashboard (where applicable) to notify users of any application issues

Corrective:

- The ERO Enterprise works with entity/entities and specific data to resolve reporting errors.
- NERC communicates with REs through an ERO Performance Analysis group to identify and resolve data reporting issues in their Region.

Late Reporting and Data Updates

Registered entities may still provide missing data or make corrections to data after the reporting deadline or the close of the Regional review period. This may occur because the person responsible for reporting has left the entity or updated information becomes available. The reporting application prevents the registered entity or the RE from entering data after the specified deadlines. Data reported to NERC after the Regional review period is imported by NERC staff, provided it is sent to NERC in the correct import format. When validation errors or incomplete checklists occur, NERC staff work with the registered entity to resolve issues and complete the data imports. A process to accept late data or updates after reporting periods are closed out by the application allows NERC to maintain a more complete representative data set.

Summary of Controls

Table 2.3: Summary of Controls – Late Reporting

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Directive	NERC Performance Analysis Late Reporting process	☑	☑	
Preventive	Import templates or file formats	☑	☑	
Detective	Validations within the reporting application or template and reporting checklists	☑	☑	

Table 2.3: Summary of Controls – Late Reporting

Control	Process or Documentation	Completeness	Accuracy	Timeliness
Corrective	ERO Enterprise coordination with registered entity	☑	☑	

Risks to data quality

Incomplete data impacts analysis and may result in sample sizes that are not representative of a given data set.

Controls

Directive:

- The NERC Performance Analysis Late Reporting process provides instructions to regions on accepting late or updated data provided after the entity and Region periods have closed in the application
- Supporting materials provide REs with references to NERC’s authority to collect this data from registered entities and templates for requesting late data.

Preventive:

- Import template provides structure for entering data for submission to reporting application. Entities are required to provide data to NERC and REs via the import template to ensure that validations are applied to incoming data.

Detective:

- Validations within the reporting application test the validity of the reported data and prevent a checklist from being reported as complete when there are issues with the data that was submitted.

Corrective:

- ERO Enterprise works directly with the registered entity to resolve any validation errors resulting from a late submission.

Appendix A: Application References

Reporting Templates

The links below may be used to access the reporting template for each application.

Reporting Template Links

Table A.1: Reporting Template Links	
Application	NERC Web Page Link
Demand Response Availability Data System (DADS)	<p>Application reference page: http://www.nerc.com/pa/RAPA/dads/Pages/default.aspx</p> <p>Bulk upload format and instructions: http://www.nerc.com/pa/RAPA/dads/Documents/Data%20Reporting%20Instructions.pdf</p>
Generating Availability Data Systems (GADS)	<p>Application reference page: http://www.nerc.com/pa/RAPA/gads/Pages/default.aspx</p> <p>Data Reporting Instructions: https://www.nerc.com/pa/RAPA/gads/Pages/Data%20Reporting%20Instructions.aspx</p>
GADS - Wind	<p>Application reference page, Data Reporting Instructions (DRI), and reporting templates: https://www.nerc.com/pa/RAPA/gads/Pages/GADS-Wind-DRI.aspx</p>
Misoperations Information Data Analysis System (MIDAS)	<p>Application reference page, Data Reporting Instructions (DRI), and reporting templates: http://www.nerc.com/pa/RAPA/Pages/Misoperations.aspx</p>
Transmission Availability Data System (TADS)	<p>Application reference page, Data Reporting Instructions (DRI), and reporting templates: http://www.nerc.com/pa/RAPA/tads/Pages/default.aspx</p>