

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Adequate Level of Reliability Metric 3-5:

Interconnection Reliability Operating Limits and
System Operating Limits

Final Report and Data Request

to ensure
the reliability of the
bulk power system

August 2010

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Table of Contents

Introduction.....	1
ALR3-5: Data Request Information.....	2
Description of Data Request.....	2
Use of Data and ALR3-5 Metrics.....	3
Obligations Under Applicable Laws and Agreements.....	3
Data Collection and Validation.....	4
Reporting Entities.....	4
Deliverables.....	4
Confidentiality.....	4
Relative Burden Imposed.....	4
Data Request Schedule.....	5
Appendix I-IV.....	5



Introduction

With Planning and Operating Committees (PC/OC) support, the Reliability Metrics Working Group (RMWG) received approval to collect data and calculate nine metrics in 2009.¹ Data for seven of these metrics is available through information routinely reported to NERC as part of complying with existing standards and mandatory data requests. However, to obtain the data needed to calculate the Adequate Level of Reliability (ALR) metric, entitled *ALR3-5 Interconnection Reliability Operating Limits and System Operating Limits (IROL²/SOL)*, a mandatory data request is required, which is the subject of this document.

In adherence to NERC's *Rules of Procedure: Section 1600 Requests for Data and Information*,³ the Reliability Metrics Working Group (RMWG) completed the following activities:⁴

1. Issued a data request for industry comment on March 5, 2010, entitled "*ALR3-5 IROL/SOL Excursion*" with a due date of April 19, 2010.⁵
2. Responded to eight sets of comments on June 1, 2010.⁶ Several respondents suggested changing the metric title from "Excursion" to "Exceedance." This proposal was adopted and the enhanced metric was approved by the PC/OC at the June 2010 meetings.
3. Developed a detailed description of the revised metric, *ALR3-5 IROL/SOL Exceedance*.⁷
4. Created a template for this data request is available on NERC's website.⁸

The requirements for reporting *ALR3-5 IROL/SOL Exceedances* includes the following elements:

- Reporting Reliability Coordinator
- Reporting Quarter
- Reporting Year
- The total number of exceeded IROLs and SOLs for each of the following time periods:
 - Greater than 10 seconds and less than or equal to 10 minutes
 - Greater than 10 minutes and less than or equal to 20 minutes
 - Greater than 20 minutes and less than or equal to 30 minutes
 - Greater than 30 minutes

With NERC's Board of Trustees approval of this data request, as described in the *Rules of Procedure: Section 1600 Requests for Data and Information*, submittal of this data will become mandatory for all Reliability Coordinators (RCs) starting in January 2011, with provision of the data for the first quarter of 2011 due to NERC on April 30, 2011.

¹ 2009 RMWG report entitled "*Bulk Power System Reliability Performance Metric Recommendations*,"

http://www.nerc.com/docs/pc/rmwg/RMWG_Metric_Report-09-08-09.pdf

² In accordance with the definition in the NERC's Glossary of Terms, an Interconnection Reliability Operating Limit is defined as "*A System Operating Limit that, if violated, could lead to instability, uncontrolled separation, or Cascading Outages that adversely impact the reliability of the Bulk Electric System.*"

³ See <http://www.nerc.com/page.php?cid=1%7C8%7C169>

⁴ See RMWG Scope at: http://www.nerc.com/docs/pc/rmwg/Reliability_Metrics_Working_Group_Scope_Final.pdf

⁵ See cover letter: http://www.nerc.com/docs/pc/rmwg/ALR3-5_Data_Request_Comments_and_Responses6.1.pdf

⁶ See Appendix I: http://www.nerc.com/docs/pc/rmwg/ALR3-5_Data_Request_Comments_and_Responses6.1.pdf

⁷ http://www.nerc.com/docs/pc/rmwg/ALR3-5_Form.pdf

⁸ ALR3-5 Reporting Template: [http://www.nerc.com/docs/pc/rmwg/ALR3-5_Template\(7.9\).pdf](http://www.nerc.com/docs/pc/rmwg/ALR3-5_Template(7.9).pdf)

ALR3-5: Data Request Information

This section describes the data or information being requested, the use of the data or information, and the necessity of the data or information for NERC to meet its obligations under applicable laws and agreements. *ALR3-5 IROL/SOL Exceedance* will be reviewed by NERC and the OC/PC five years after implementation to determine its usefulness in the assessment of bulk power system risk as part of the ALR definition filed with the Federal Energy Regulatory Commission (FERC).⁹ If the metric does not provide suitable information balanced against the effort expended to collection this data, the requirement to record the data supporting will be rescinded, unless such data is being used to support other metrics.

Description of Data Request

In the U.S., the data needed to fulfill this request was previously identified in an August 17, 2007 data request issued to comply with FERC Order No. 693, *Requirements Interconnection Reliability Operating Limits*.¹⁰ As this FERC Order only pertains only to U.S.-based Reliability Coordinators, those based in Canada may need to develop enhanced reporting mechanisms to support data collection. In addition, to pilot the collection process, voluntary data submittal has been encouraged beginning January 1, 2010 and ending December 31, 2010.

This mandatory request for data is scheduled to be provided on a quarterly basis beginning on January 1, 2011. The NERC spreadsheet template, provided on-line is being used to submit this voluntary information.¹¹

Each quarter, Reliability Coordinators that experience IROL/SOL¹² excursion events should provide the number of IROL/SOL exceedances, categorized in the following time frames:

- Greater than 10 seconds, and less than or equal to 10 minutes
- Greater than 10 minutes, and less than or equal to 20 minutes
- Greater than 20 minutes, and less than or equal to 30 minutes
- Greater than 30 minutes

⁹ See NERC's document, entitled, "*Definition of Adequate Level of Reliability*," posted at <http://www.nerc.com/docs/pc/Definition-of-ALR-approved-at-Dec-07-OC-PC-mtgs.pdf>

¹⁰The official data request issued by NERC to comply with FERC order No. 693 is available at <http://www.nerc.com/files/PublicFinalFiled-IROL-Data-Request-10312008.pdf>. While Reliability Coordinators are not being asked to provide NERC with the additional detailed data described in the FERC August 17, 2007 data request, they are encouraged to collect and retain this data to facilitate their own analysis of the metric results.

¹¹ALR3-5 *IROL/SOL Excursion* Reporting Template [http://www.nerc.com/docs/pc/rmwg/ALR3-5_Template\(7.9\).pdf](http://www.nerc.com/docs/pc/rmwg/ALR3-5_Template(7.9).pdf).

¹²Both terms IROL and SOL are used in this data request to recognize that, while the IROL is used in the Eastern, Texas and Québec Interconnections, there are no pre-identified IROLs in the Western Interconnection. Through this data request, the RCs in the Eastern and Québec Interconnections are required to submit quarterly IROL excursion data only; and the RCs in the Western Interconnection are required to submit quarterly SOL excursion data; and the RC in Texas Interconnection is required to submit the IROL and SOL excursion data until its IROL method is changed.

The individual data submissions should be sent to NERC at metrics@nerc.net by the end of the month following each calendar quarter (due dates annually being April 30, July 31, October 30, and January 31). The first mandatory data collection will be due April 30, 2011.

Use of Data and ALR3-5 Metrics

The data collected will be used to calculate the ALR3-5 *IROL/SOL Exceedance* metrics. The intent is to track the number of IROL/SOL exceedances and grouped according to the aforementioned time frames. Over a period of time, this data will identify trends measuring an aspect of the operational reliability of bulk power system. For example, the data results may identify opportunities to enhance Reliability Coordinators operating practices or clarify IROL/SOL related reliability standards to eliminate multiple interpretations that may exist.

The RMWG will document ALR3-5 along with a portfolio of metrics in its annual reports, which, after approval by NERC's Planning and Operating Committee, are posted on NERC's website. Further, quarterly trend updates will be posted on the NERC website.

Obligations Under Applicable Laws and Agreements

As required by NERC's IRO-009-1 Standard, Reliability Coordinators ensure prompt action to prevent or mitigate instances of exceeding IROL/SOLs that might cause instability, uncontrolled separation, or cascading outages. This data will enable NERC to measure the frequency and duration of exceeded IROL/SOLs. To minimize the data collection effort, NERC is not requesting detailed data for each IROL/SOL excursion. Over time, as trends become evident, NERC, Regional Entities, the Operating or Planning Committees may undertake initiatives to commence detailed analysis and root causes.

IROL and SOL are used in this data request to recognize that, while the IROL is used in the Eastern, Texas and Québec Interconnections, there are no IROLs pre-identified in the Western Interconnection due to its higher operating performance level requirements. The WECC Standard *TOP-007-WECC-1 – System Operating Limits has requirements for reducing actual flows within System Operating Limits (SOL) on Major WECC Transfer Paths*.¹³ These major paths are significant components for reliable delivery of power in the Western Interconnection. Further, Texas uses both SOLs and IROLs and is in the process of revising its SOL method, which may result in the Texas Interconnection no longer using IROL.

Because of operating differences, comparisons of Interconnections with this metric will not be meaningful. However, the data will be useful in identifying trends over time on an Interconnection basis.

¹³ WECC Standard TOP-007-WECC-1 – *System Operating Limits* is available at <http://www.wecc.biz/Standards/Pending%20Standards/TOP-007-WECC-1.pdf>.



Data Collection and Validation

As mentioned in the previous section, the individual data submissions will be sent to the NERC at metrics@nerc.net by the end of the month following each calendar quarter beginning January 2011. Submitted data will be subjected to specific rules embedded within the reporting form to validate data entry. Data will be subject to a thorough NERC staff review and results will be vetted by the RMWG and Planning Committee.

Reporting Entities

All NERC Reliability Coordinators will be required to provide the data.

Deliverables

Reliability Coordinators are to report the requested data by the end of the month after the close of the calendar quarter for IROL/SOL events occurring during the previous quarter, beginning April 30, 2011.

Confidentiality

All data collected will be aggregated at the Interconnection level only. The data will be annotated to describe the different IROL/SOL definitions in each Interconnection. Because no details describing each IROL/SOL excursion are being reported, this data is not considered Confidential Energy Infrastructure Information (CEII) and can be reported to the public.

Relative Burden Imposed

For Reliability Coordinators in the United States, costs to develop the necessary reporting processes is expected to be less than the cost incurred to meet the August 17, 2007 official data request to fulfill FERC's *Order No. 693 Requirements Interconnection Reliability Operating Limits*, as much less detail is being requested. Canadian Reliability Coordinators may need to develop enhanced or new reporting processes to provide the requested data. The underlying data should be available in existing operating logs.

Minimal ongoing cost is expected for Reliability Coordinators to collect, compile, and report to NERC the requested data. Some Reliability Coordinators may need to modify their monitoring systems, or develop applications to track IROL/SOL excursions as specified. Further, Reliability Coordinators may need to train their personnel and provide resources to validate potential IROL/SOLs



Data Request Schedule

Below provides a schedule for the *ALR3-5 IROL/SOL Exceedance* data collection process.

Date	Action
September 9, 2009	PC/OC approved 2009 report
January 1, 2010 to December 31, 2010	Request for voluntary data submission
February 12, 2010	Data request submitted to FERC
March 5, 2010	Data Request posted for Public Comment
April 19, 2010	Deadline for Public Comments
June 15, 2010	PC/OC approved comments and responses
August 4-5, 2010	Request approval of mandatory data collection from NERC's Board of Trustees
January 1, 2011	Reliability Coordinators begin collecting IROL/SOL Exceedance data
April 30, 2011	Due date for first quarter of mandatory data submission
July 31, 2011	Due date for second quarter of mandatory data submission
October 31, 2011	Due date for third quarter of mandatory data submission
January 31, 2012	Due date for fourth quarter of mandatory data submission

Due dates for the subsequent quarters will follow the calendar outlined above.

Appendix I-IV

Appendices I to IV is available through this link
http://www.nerc.com/docs/pc/rmwg/Appendix_I_IV.pdf