

## Project 2015-09 – System Operating Limits Drafting Team Meeting Notes

Tuesday, March 15, 2016 | 8:30 AM – 5:00 PM, EST  
Wednesday, March 16, 2016 | 8:30 AM – 5:00 PM, EST

NERC Washington DC Office  
1325 G Street, NW Suite 600  
Washington, DC 20005

ReadyTalk | Dial In: 1-866-740-1260 | Access Code: 5216143 | Security Code: 31116

### Attendees:

Name	Company	Member/ Observer	In-person (IP)/ Web (W)		
			3/15	3/16	
Vic Howell	Peak Reliability	Chair	IP	IP	
Hari Singh	Xcel Energy	Vice-chair	IP	IP	
David Bueche	CenterPoint Energy	Member	IP	IP	
David Hislop	PJM Interconnection	Member	IP	IP	
Samuel Jager	Independent Electricity System Operator	Member	--	--	
Dean LaForest	ISO New England	Member	W	W	
Thomas Leslie	Georgia Transmission Corp	Member	IP	IP	
Jason Smith	Southwest Power Pool	Member	W	W	
Stephen Solis	Electric Reliability Council of Texas	Member	W	W	
Aaron Staley	Orlando Utilities Commission	Member	IP	IP	
Dede Subakti	California ISO	Member	IP	IP	
Kumar Agarwal	FERC	Observer	W	IP	
Eugene Blick	FERC	Observer	IP	IP	
David O'Connor	FERC	Observer	IP	IP	
Dennis Fuentes Pedrosa	FERC	Observer	IP	IP	
Charles-Eric Langois	Hydro Quebec	Observer	IP	IP	
Lacey Ourso	NERC – Standards	NERC staff	IP	IP	
Mark Olson	NERC – Standards	NERC staff	IP	IP	
Shamai Elstein	NERC – Legal	NERC staff	IP	IP	

### Agenda Items:

1. Welcome and administrative items (NERC Antitrust Guidelines, public meeting notice, etc.)
2. Discuss meeting objective(s)
3. Roundtable discussion regarding IROL issues and proposed revisions to definition
  - a. Drafting team examples related to instability not deemed to be IROL
  - b. Questions raised in [FERC Order No. 817](#)

4. Technical conference preparation, including:
  - a. Agenda and discussion topics
  - b. Background materials
  - c. SDT lead(s) for each topic
5. Discussion with Project 2007-6.2 SDT chair (Mark Peterson) and vice-chair (Michael Cruz-Montes) regarding proposed changes to ORA and RTA definitions. **Wednesday, March 16 at 11:00 EST**
6. Project schedule and work plan
7. Next steps and action items

**Meeting Notes:**

**Discussion regarding IROLs**

Existing language	Possible language (under consideration by SDT)
<p>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.</p>	<p><b>As of January 2016 SDT meeting:</b></p> <p>A System Operating Limit that if exceeded could lead to instability that cannot be restrained from spreading beyond an area predetermined by studies, Cascading or uncontrolled separation.</p> <p>A System Operating Limit that if exceeded has been demonstrated to result in instability that cannot be restrained from spreading beyond an area predetermined by studies, Cascading or uncontrolled separation.</p> <p>A System Operating Limit that, if exceeded, has been demonstrated by studies to result in Cascading, uncontrolled separation, or instability that cannot be restrained from spreading beyond a predetermined area.</p>

**Issues discussed by SDT:**

- Discussion regarding risk. What are the circumstances when managing risk is acceptable (i.e., not IROL)? When is “managing risk” not acceptable (i.e., IROL)
- Definition language is ambiguous.
  - a. “If violated” – consider whether to replace with “if exceeded”
  - b. “Could lead to”
  - c. “adversely impacts the BES” – Contained? What does that mean? See list of factors (#2 below) that must be considered.
  - d. Instability (local vs. non-local) – part of containment. Not all instability is automatically an IROL. What is acceptable level of “manageable” risk

- Given the manner in which the current definition is drafted, are there different understandings of the meaning of the term “instability”? Is “instability” limited by phrase “that adversely impacts the reliability of the BES,” or does the phrase only apply to Cascading outages?
  - Individual team members provided illustrations of examples of stability SOLs that do not warrant the establishment of an IROL.
    - Example of “local” generator instability that is not an IROL
    - Example of “local” voltage instability that is not an IROL.
      - Local load serving area with no generation
      - Local load serving area with limited generation
  - Discussion regarding “limited impact” language used by RAS SDT
  - Options discussed by SDT to address ambiguity:
    - i. Revise definition to remove ambiguity regarding “instability”
    - ii. Do not revise definition; provide clarity in requirements regarding what factors should be considered by the RC when developing IROL methodology (continue to allow for flexibility)
2. Contained/pre-determined boundaries. Factors that should be considered by the Reliability Coordinator methodology when identifying IROLs:
- a. Loss of load criteria
  - b. Number of Facilities affected
  - c. Impact on neighboring systems (RC footprint vs. TOP?)
  - d. Potential benefit and practicality of pre-Contingency load shedding
  - e. Impact on interconnection frequency
  - f. Inter-area oscillations
  - g. Loss of generation impacted (how much generation loss is acceptable under the circumstances?)
3. Questions raised by FERC Order No. 817, including:
- a. Identification of all regional differences or variances in the formulation of IROLs
  - b. The potential reliability impacts of such differences or variations
  - c. The value of providing a uniform approach or methodology to defining and identifying IROLs

## **Preparation for technical conference**

- Change in location and date in order to coincide with the Operating Reliability Subcommittee (ORS) meeting in Atlanta. Technical conference to be held at the NERC office in Atlanta, GA: **Wednesday, May 4, 1:00-5:00pm and Thursday, May 5, 8:30-12:00pm.**

- List of questions for discussion at technical conference:

### **Topic 1: Definitions**

1. Is every BES Facility required to have a SOL?
2. Should the definition include a reference to the time-horizon in which the limit is being used (i.e., “used for operations”)?
3. Currently operating criteria are defined as thermal, voltage and stability. Are there other types of operating criteria or limits? Equipment limits?
  - a. What limitations are there? (Phase angle limitations; sub-synchronous oscillation/SSO; short circuit ratio/SCR; fault interrupting capability of breakers; transient voltage limitations on equipment; geomagnetic induced currents on equipment)
  - b. Definitions of RTA and OPA include “and identified phase angle and equipment limitations”
4. Do you allow use of “proxy” limits?
5. Is there a need to define SOL Exceedance?
  - a. At what point in time does an exceedance occur?
  - b. Is an exceedance a violation after a certain amount of time or is it reaching a certain unacceptable condition as a result of the exceedance?
  - c. If your calculated post-Contingency flow exceeds the highest available Facility Rating, this constitutes unacceptable system performance, and thus an SOL exceedance?
6. Is there a need to revise the definition of SOL?
7. Is there a need to revise the definition of Interconnection Reliability Operating Limit (IROL)?

### **Topic 2: Establishing SOLs (in the Planning Horizon)**

1. What is the role of SOLs established in the planning horizon?
2. Do you believe FAC-010-3 is needed for reliability, or can it be retired?
  - a. Given TPL-001-4, does retirement of FAC-10-3 leave a gap in planning?
  - b. Given TPL-001-4, does retirement of FAC-10-3 leave a gap in operations?
  - c. What, if any, FAC-010 requirements should be maintained?
  - d. What revisions, if any, should be made to ensure that operating limit information is exchanged between planning and operating entities?
3. How does the PC (and TP) consider the RC SOL methodology today? Is it considered?
4. How does the RC consider the PC (and TP) methodology today?
5. What if PC (and TP) were required to follow the RC methodology?

### **Topic 3: Establishing SOLs (in the Operations Horizon)**

1. Should FAC-011 include a table of applicable contingencies and acceptable system performance requirements (similar to TPL-001-4)?
  - a. How are studied contingencies different between Planning and Operations time horizons? Do the differences impact reliability?
2. Where is the appropriate place to define acceptable performance criteria for operations?
3. When establishing different types of operating limits, how do you consider the following:

- a. Facility Ratings
  - i. Is there a need for uniformity in establishing ratings?
  - ii. What happens if the Facility has multiple owners?
  - iii. Facility Ratings used in operations should be predetermined and consistent between the TOP and RC. What happens if the TOP and RC are not using the same limit? (e.g., 2 hour vs. 4 hour)
  - iv. Where is the best place to address the use of Facility Ratings in operations? In the requirement of a standard (SOL methodology) or through a definition?
  - v. How are ratings communicated?
- b. Voltage limits
  - i. Is a definition needed for "System Voltage Limits?"
  - ii. Do you believe that VAR-001 addresses voltage limits?
  - iii. Is there a need to have requirements for establishing voltage limits?
    - 1. Who establishes voltage limits?
    - 2. How does the TOP consider equipment voltage ratings provided by the owner (TO or GO)?
  - iv. Should voltage limits be required to contain normal and emergency, high and low limits?
  - v. How are voltage limits communicated?
- c. Stability limitations (transient stability and voltage stability)
  - i. Currently, there is no industry-wide stability limit criteria. Is greater specificity needed?
  - ii. Currently, the standard gives the RC flexibility to define what acceptable stability performance is for its RC Area. Does this flexibility support reliability?
  - iii. What is the best way to maintain RC flexibility, but yet create some uniformity or minimum criteria that must be identified by the RC?
  - iv. How are stability limitations communicated?

#### **Topic 4: Establishing IROLs**

1. Currently, RC has flexibility to identify IROLs to meet the unique characteristics of their particular system. (FAC-011-3 Requirements R1 and R3 allow the RC to identify which specific SOLs qualify as IROLs.) Does this flexibility support reliability?
2. Do you believe that the current definition of IROL could be construed to mean that *any* instability would require the establishment of an IROL?
3. Does all instability warrant establishing an IROL? If no, what type of instability is not an IROL?
4. Should pre-Contingency mitigation action be required for any type of instability, up to and including load shed?
5. Are there regional differences or variances in the formulation of IROLs? What are the potential reliability impacts of such differences?
6. What, if any, value is there to providing a uniform approach or methodology to defining and identifying IROLs?

#### **Topic 5: Communicating SOLs and IROLs**

1. How are SOLs or IROLs that are determined in Real-time communicated to other entities?

**Topic 6: Using SOLs**

1. How are SOLs used in the new TOP and IRO standards, including Operational Planning Analysis, Operating Plans, Real-time Assessments, and requirements to implement operating plans to prevent or mitigate SOL exceedances?

**Discussion regarding “using” SOLs**

- Initial review of FAC-011-3 requirements related to “use” of SOLs (i.e., how the system should be operated)
- Topic to be addressed in greater detail at next SDT meeting

**Upcoming SDT deadlines and meetings**

April 6 (Weds)	Deadline for sub-teams to submit technical conference background materials (email to Mark and Lacey)
April 11, 2:30pm EST (Mon)	Conference call to review background materials submitted by sub-teams <u>Dial-in information:</u> 1-866-740-1260   Access Code: 5216143   Security Code: 41116
April 18 (Mon)	Deadline for sub-teams to submit final background documents and presentation materials (email to Mark and Lacey)
April 21, 1:00pm, EST (Th)	Conference call for final review of technical conference materials <u>Dial-in information:</u> 1-866-740-1260   Access Code: 5216143   Security Code: 42116
April 27 (Weds)	Distribute/post technical conference materials to industry
May 4-6 (Weds-Fri)	NERC Atlanta office (3353 Peachtree Road NE, Suite 600, Atlanta, GA 30326) <u>Technical conference:</u> Wednesday, May 4, 1:00pm-5:00pm Thursday, May 5, 8:30am-12:00pm  <u>SDT meeting:</u> Wednesday, May 4, 8:30am-12pm Thursday, May 5, 1:00pm-5:30pm Friday, May 6, 7:30am-11am
May 24-26 (Tu-Th)	Xcel Energy in Denver, CO (1800 Larimer Street, Suite 600, Denver, CO 80202) <u>SDT meeting:</u> Tuesday, May 24, 8:30am - 5:30pm Wednesday, May 25, 8:30am - 5:30pm Thursday, May 26, 8:30am - 12:00pm