

# Consideration of Comments

## Project 2010-13.2 Phase 2 Relay Loadability: Generation

The Relay Loadability: Generation standard drafting team thanks all commenters who submitted comments on PRC-025-1. The standard was posted for a 30-day formal comment period from June 20, 2013 through July 19, 2013. Stakeholders were asked to provide feedback on the standards and associated documents through a special electronic comment form. There were 43 sets of comments, including comments from approximately 114 different people from approximately 93 companies representing 7 of the 10 Industry Segments as shown in the table on the following pages.

All comments submitted may be reviewed in their original format on the standard's [project page](#).

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process. If you feel there has been an error or omission, you can contact the Vice President and Director of Standards, Mark Lauby, at 404-446-2560 or at [mark.lauby@nerc.net](mailto:mark.lauby@nerc.net). In addition, there is a NERC Reliability Standards Appeals Process.<sup>1</sup>

### Summary of changes (PRC-025-1)

The generator relay loadability standard drafting team ("SDT") made clarifying and non-substantive revisions the proposed draft of PRC-025-1 – Generator Relay Loadability during its 30-day formal comment posting of the standard and successive ballot which received 72.43% stakeholder approval. The following narrative is a summary of the non-substantive clarifications made to the above standard.

#### Standard

- Purpose
  - None change.
- Applicability
  - Stakeholders had concerns that in the section 3.2.4 (Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant.) did not take into account station service loads served by the same Elements and would not be truly "exclusive." The drafting team added the sentence "Elements may also supply generating plant loads." To clarify the intent.
- Requirement
  - None change.

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<sup>1</sup> The appeals process is in the Standard Processes Manual: [http://www.nerc.com/files/Appendix\\_3A\\_StandardsProcessesManual\\_20120131.pdf](http://www.nerc.com/files/Appendix_3A_StandardsProcessesManual_20120131.pdf)

- Measures
  - None change.
- Compliance
  - None change.
- Violation Severity Levels
  - None change.
- Attachment 1
  - Revised general text to improve clarity based on stakeholder comment.
  - Add a section for parallel and multiple line configures to clarify the issues with determining settings for those possible cases.
  - Clarified “full-load current” to note that means the rated armature current of the generator.
  - Add a footnote reference to direct the reader to the basis of the overload exclusion.
  - General revisions to comport with the Applicability clarification.
  - Clarified which Options are referring to “Elements utilized in the aggregation of dispersed power producing resources.” This scenario is identified in Figure 5, but not clearly in Attachment 1, Table 1.

### **Guidelines and Technical Basis**

- Editorial changes to match clarifications in the standard.
- Provided clarifying text about dispersed power producing resources.

### **Implementation Plan**

- No change.

### **VRF/VSL Justifications**

- No change.

**Index to Questions, Comments, and Responses**

1. The drafting team has made revisions to the PRC-025-1 standard and its associated documents which include addressing; (1) bright line of applicability between PRC-023-3 and PRC-025-1 by including the addition of the Distribution Provider and Transmission Owner to PRC-025-1, (2) increasing the Implementation Plan period from 48 to 60 months for applying settings where replacement is not necessary and from 72 to 84 months for replacement or removal, and (3) made clarifying revisions to the Guidelines and Technical Basis. Do you agree that the drafting team achieved the level of clarity needed for the proposed PRC-025-1 standard and the associated documents? If not or if you have any additional comment, provide specific suggestions to improve the clarity of the standard. ....13

**The Industry Segments are:**

- 1 — Transmission Owners
- 2 — RTOs, ISOs
- 3 — Load-serving Entities
- 4 — Transmission-dependent Utilities
- 5 — Electric Generators
- 6 — Electricity Brokers, Aggregators, and Marketers
- 7 — Large Electricity End Users
- 8 — Small Electricity End Users
- 9 — Federal, State, Provincial Regulatory or other Government Entities
- 10 — Regional Reliability Organizations, Regional Entities

Group/Individual		Commenter	Organization	Registered Ballot Body Segment											
				1	2	3	4	5	6	7	8	9	10		
1.	Group	Guy Zito	Northeast Power Coordinating Council												X
<b>Additional Member</b>		<b>Additional Organization</b>		<b>Region</b>	<b>Segment Selection</b>										
1.	Alan Adamson	New York State Reliability Council, LLC	NPCC	10											
2.	Greg Campoli	New York Independent System Operator	NPCC	2											
3.	Sylvain Clermont	Hydro-Quebec TransEnergie	NPCC	1											
4.	Chris de Graffenried	Consolidated Edison Co. of New York, Inc.	NPCC	1											
5.	Gerry Dunbar	Northeast Power Coordinating Council	NPCC	10											
6.	Mike Garton	Dominion Resources Services, Inc.	NPCC	5											
7.	Kathleen Goodman	ISO - New England	NPCC	2											
8.	Michael Jones	National Grid	NPCC	1											
9.	David Kiguel	Hydro One Networks Inc.	NPCC	1											
10.	Christina Koncz	PSEG Power LLC	NPCC	5											
11.	Helen Lainis	Independent Electricity System Operator	NPCC	2											
12.	Michael Lombardi	Northeast Power Coordinating Council	NPCC	10											
13.	Randy MacDonald	New Brunswick Power Transmission	NPCC	9											
14.	Bruce Metruck	New York Power Authority	NPCC	6											

Group/Individual	Commenter	Organization	Registered Ballot Body Segment												
			1	2	3	4	5	6	7	8	9	10			
15. Silvia Parada Mitchell	NextEra Energy, LLC	NPCC 5													
16. Lee Pedowicz	Northeast Power Coordinating Council	NPCC 10													
17. Robert Pellegrini	The United Illuminating Company	NPCC 1													
18. Si-Truc Phan	Hydro-QuebecTransEnergie	NPCC 1													
19. David Ramkalawan	Ontario Power Generation, Inc.	NPCC 5													
20. Brian Robinson	Utility Services	NPCC 8													
21. Brian Shanahan	National Grid	NPCC 1													
22. Wayne Sipperly	New York Power Authority	NPCC 5													
23. Donald Weaver	New Brunswick System Operator	NPCC 2													
24. Ben Wu	Orange and Rockland Utilities	NPCC 1													
2.	Group	Colby Bellville	Duke Energy	X		X		X	X						
<b>Additional Member</b>		<b>Additional Organization</b>	<b>Region</b>	<b>Segment</b>	<b>Selection</b>										
1.	Doug Hils		RFC	1											
2.	Lee Schuster		FRCC	3											
3.	Dale Goodwine		SERC	5											
4.	Greg Cecil		RFC	6											
3.	Group	David Thorne	Pepco Holdings Inc & Affiliates	X		X									
<b>Additional Member</b>		<b>Additional Organization</b>	<b>Region</b>	<b>Segment</b>	<b>Selection</b>										
1.	Carl Kinsley	Delmarva Power & Light Co	RFC	1, 3											
2.	Alvin Depew	Pepco Holdings Inc	RFC	1, 3											
4.	Group	Brandy Spraker	Tennessee Valley Authority	X		X		X	X						
<b>Additional Member</b>		<b>Additional Organization</b>	<b>Region</b>	<b>Segment</b>	<b>Selection</b>										
1.	Daniel McNeeley		SERC	1											
2.	Ian Grant		SERC	3											
3.	Marjorie Parsons		SERC	6											
4.	David Thompson		SERC	5											
5.	DeWayne Scott		SERC	1											
6.	Annette Dudley		SERC	5											
7.	Paul Palmer		SERC	5											
8.	Lee Thomas		SERC	5											

Group/Individual	Commenter	Organization	Registered Ballot Body Segment											
			1	2	3	4	5	6	7	8	9	10		
9. Jeff Galyon		SERC 5												
10. Brenda Eberhart		SERC 1												
5. Group	Jamison Dye	Bonneville Power Administration	X		X		X	X						
<b>Additional Member</b>		<b>Additional Organization</b>	<b>Region</b>		<b>Segment</b>		<b>Selection</b>							
1. Dean Bender	BPA, Transmission SPC Technical Svcs	WECC	1											
2. Jim Burns	BPA, Transmission Technical Operations	WECC	1											
3. Steve Enyeart	BPA, Transmission Customer Service Engineering	WECC	1											
6. Group	Louis Slade	Dominion	X		X		X	X						
<b>Additional Member</b>		<b>Additional Organization</b>	<b>Region</b>		<b>Segment</b>		<b>Selection</b>							
1. Mike Crowley	Electric Transmission		1											
2. Connie Lowe	NERC Compliance Policy		3											
3. Mike Garton	NERC Compliance Policy		5											
4. Louis Slade	NERC Compliance Policy		6											
5. Jeff Bailey	Nuclear		5											
6. Chip Humphrey	Fossil & Hydro		5											
7. Sean Iseminger	Fossil & Hydro		5											
8. Stephen Edwards	Electric Transmission		1, 3											
7. Group	Brent Ingebrigtsen	PPL NERC Registered Affiliates	X		X		X	X						
<b>Additional Member</b>		<b>Additional Organization</b>	<b>Region</b>		<b>Segment</b>		<b>Selection</b>							
1. Brenda Truhe	PPL Electric Utilities Corporation	RFC	1											
2. Annette Bannon	PPL Generation, LLC on behalf of Supply NERC Registerd Affiliates	RFC	5											
3.		WECC	5											
4. Elizabeth Davis	PPL EnergyPlus, LLC	MRO	6											
5.		NPCC	6											
6.		SERC	6											
7.		SPP	6											
8.		RFC	6											
9.		WECC	6											
8. Group	Chang Choi	City of Tacoma, Tacoma Public Utilities, Tacoma Power	X		X	X	X	X						

Group/Individual	Commenter	Organization	Registered Ballot Body Segment											
			1	2	3	4	5	6	7	8	9	10		
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. Travis Metcalfe	Tacoma Public Utilities	WECC	3											
2. Keith Morissette	Tacoma Public Utilities	WECC	4											
3. Chris Mattson	Tacoma Power	WECC	5											
4. Michael Hill	Tacoma Public Utilities	WECC	6											
9.	Group	Russel Mountjoy	MRO NERC Standards Review Forum (NSRF)	X	X	X	X	X	X					
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. Dan Inman	Minnkota Power Coop	MRO	1, 3, 5, 6											
2. Dave Rudolph	Basin Electric Power Cooperative	MRO	1, 3, 5, 6											
3. Kayleigh Wilkerson	Lincoln Electric Systems	MRO	1, 3, 5, 6											
4. Jodi Jensen	Western Area Power Administration	MRO	1, 6											
5. Joseph DePoorter	Madison Gas & Electric	MRO	3, 4, 5, 6											
6. Ken Goldsmith	Alliant Energy	MRO	4											
7. Lee Kittleson	Otter Tail Power Co.	MRO	1, 3, 5											
8. Marie Knox	Midcontinent Independent System Operator	MRO	2											
9. Mike Brytowski	Great River Energy	MRO	1, 3, 5, 6											
10. Scott Bos	Muscatine Power & Water	MRO	1, 3, 5, 6											
11. Scott Nickles	Rochester Public Utilities	MRO	4											
12. Terry Harbour	MidAmerican Energy	MRO	1, 3, 5, 6											
13. Tom Breene	Wisconsin Public Service	MRO	3, 4, 5, 6											
10.	Group	David Greene	SERC Protection and Controls Subcommittee											
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. Paul Nauert	Ameren													
2. Steve Edwards	Dominion Virginia Power													
3. David Greene	SERC													
11.	Group	Larry Raczkowski	FirstEnergy	X		X	X	X	X					
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. William Smith	FirstEnergy Corp	RFC	1											
2. Cindy Stewart	FirstEnergy Corp	RFC	3											

Group/Individual	Commenter	Organization	Registered Ballot Body Segment												
			1	2	3	4	5	6	7	8	9	10			
3. Doug Hohlbaugh	Ohio Edison	RFC	4												
4. Ken Dresner	FirstEnergy Solutions	RFC	5												
5. Kevin Querry	FirstEnergy Solutions	RFC	6												
12.	Group	Patrick Brown	North American Generator Forum Standards Review Tram												
	<b>Additional Member</b>	<b>Additional Organization</b>	<b>Region</b>	<b>Segment Selection</b>											
1.	Allen Schriver	NextEra		5											
2.	Steve Berger	PPL Susquehanna, LLC		5											
3.	Joe Crispino	PSEG Fossil, llc		5											
4.	Pamela Dautel	IPR-GDF Suez Generation NA		5											
5.	Mikhail Falkovich	PSEG		5											
6.	Dan Duff	Liberty Electric Power		5											
7.	Gary Kruempel	MidAmerican Energy Company		5											
8.	Don Lock	PPL Generation, LLC		5											
9.	Joe O'Brien	NIPSCO		5											
10.	Dana Showalter	E.ON		5											
11.	William Shultz	Southern Company		5											
12.	Mark Young	Tenaska, Inc		5											
13.	Group	Kathleen Black	DTE Electric												
	<b>Additional Member</b>	<b>Additional Organization</b>	<b>Region</b>	<b>Segment Selection</b>											
1.	Kent Kujala	NERC Compliance Organization	RFC	3											
2.	Daniel Herring	NERC Training & Standards Development	RFC	4											
3.	Al Eizans	Merchant Operations	RFC	5											
4.	David Szulczewski	DO SEE Relay Engineering	RFC												
14.	Group	Jason Marshall	ACES Standards Collaborators												
	<b>Additional Member</b>	<b>Additional Organization</b>	<b>Region</b>	<b>Segment Selection</b>											
1.	David Sofra	North Carolina Electric Membership Corporation	SERC	1, 3, 4, 5											
2.	John Shaver	Arizona Electric Power Cooperative	WECC	4, 5											
3.	John Shaver	Southwest Transmission Cooperative	WECC	1											
4.	Mark Ringhausen	Old Dominion Electric Cooperative	SERC	3, 4											



Group/Individual	Commenter	Organization	Registered Ballot Body Segment											
			1	2	3	4	5	6	7	8	9	10		
5. Michael Brytowski	Great River Energy	MRO	1, 3, 5, 6											
6. Shari Heino	Brazos Electric Power Cooperative	ERCOT	1, 5											
7. Mohan Sachdeva	Buckeye Power	RFC	3, 4											
15. Group	S. Tom Abrams	Santee Cooper		X		X		X						
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. Bridget Coffman	Santee Cooper	SERC	1, 3, 5											
2. Rene Free	Santee Cooper	SERC	1, 3, 5											
16. Group	David Dockery	Associated Electric Cooperative, Inc. - JRO00088		X		X		X	X					
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. Central Electric Power Cooperative		SERC	1, 3											
2. KAMO Electric Cooperative		SERC	1, 3											
3. M & A Electric Power Cooperative		SERC	1, 3											
4. Northeast Missouri Electric Power Cooperative		SERC	1, 3											
5. N.W. Electric Power Cooperative, Inc.		SERC	1, 3											
6. Sho-Me Power Electric Cooperative		SERC	1, 3											
17. Group	Robert Rhodes	SPP Standards Review Group			X									
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. John Allen	City Utilities of Springfield	SPP	1, 4											
2. Andy Evans	Westar Energy	SPP	1, 3, 5, 6											
3. Louis Guidry	Cleco Power LLC	SPP	1, 3, 5											
4. Stephanie Johnson	Westar Energy	SPP	1, 3, 5, 6											
5. Bo Jones	Westar Energy	SPP	1, 3, 5, 6											
6. Tiffany Lake	Westar Energy	SPP	1, 3, 5, 6											
7. James Nail	City of Independence Power & Light Department	SPP	3											
8. Lynn Schroeder	Westar Energy	SPP	1, 3, 5, 6											
9. Kevin Stephan	Westar Energy	SPP	1, 3, 5, 6											
18. Group	Michael Jones	National Grid		X		X								
<b>Additional Member Additional Organization Region Segment Selection</b>														
1. Brian Shanahan	National Grid (Niagra Mohawk)		1, 3											

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
19.	Individual	Janet Smith, Regulatory Affairs Supervisor	Arizona Public Service Company	X		X		X	X				
20.	Individual	Pamela Hunter	Southern Company: Southern Company Services, Inc.; Alabama Power Company; Georgia Power Company; Gulf Power Company; Mississippi Power Company; Southern Company Generation; Southern Company Generation and Energy Marketing	X		X		X	X				
21.	Individual	Erika Doot	Bureau of Reclamation	X				X					
22.	Individual	Kaleb Brimhall	Colorado Springs Utilities	X		X		X	X				
23.	Individual	NICOLE BUCKMAN	Atlantic City Electric Company			X							
24.	Individual	Mark Yerger	Potomac Electric Power Company			X							
25.	Individual	Thomas Foltz	American Electric Power	X		X		X	X				
26.	Individual	Michael Falvo	Independent Electricity System Operator		X								
27.	Individual	Michael Mayer	Delmarva Power & Light Company			X							
28.	Individual	Rick Terrill	Luminant Generation Company LLC					X					
29.	Individual	Dale Fredrickson	Wisconsin Electric Power Company			X	X	X					
30.	Individual	Nazra Gladu	Manitoba Hydro	X		X		X	X				
31.	Individual	Tim Brown	Idaho Power Company	X									
32.	Individual	Texas Reliability Entity	Texas Reliability Entity										X
33.	Individual	Don Weaver	New Brunswick System Operator		X								
34.	Individual	Michelle D'Antuono	Occidental Energy Ventures Corp.					X					
35.	Individual	David Jendras	Ameren	X		X		X	X				
36.	Individual	Thomas Breene	Wisconsin Public Service Corporation			X	X	X	X				
37.	Individual	Brett Holland	Kansas City Power & Light	X		X		X	X				
38.	Individual	Ryan Walter	Tri-State Generation and Transmission Association, Inc.	X		X		X					

Group/Individual		Commenter	Organization	Registered Ballot Body Segment										
				1	2	3	4	5	6	7	8	9	10	
39.	Individual	Daniel Duff	Liberty Electric Power					X						
40.	Individual	Alice Ireland	Xcel Energy	X		X		X	X					
41.	Individual	Scott Berry	Indiana Municipal Power Agency				X							
42.	Individual	Brenda Hampton	Luminant Energy Company LLC						X					
43.	Individual	Modesto Irrigation District	Modesto Irrigation District			X	X		X					

If you support the comments submitted by another entity and would like to indicate you agree with their comments, please select "agree" below and enter the entity's name in the comment section (please provide the name of the organization, trade association, group, or committee, rather than the name of the individual submitter).

**Summary Consideration:**

The drafting team appreciates the entities below supporting the comments supported by others. Having single sets of comments with documented supported greatly improves the efficiency of the team. This format also ensures the drafting team has a clearer picture of the number of stakeholders supporting the same concerns or suggestions as the case may be.

Organization	Agree	Supporting Comments of "Entity Name"
Liberty Electric Power	Agree	Essential Power (confirmed with entity – should have listed North American Generator Forum)
Dominion	Agree	North American Generator Forum
Kansas City Power & Light	Agree	North American Generator Forum
Tennessee Valley Authority	Agree	North American Generator Forum (NAGF)
Atlantic City Electric Company	Agree	Pepco Holdings Inc and Affiliates
Delmarva Power & Light Company	Agree	Pepco Holdings Inc.& Affiliates
Potomac Electric Power Company	Agree	Pepco Holdings, Inc. & Affiliates
Associated Electric Cooperative, Inc. - JRO00088	Agree	SERC PCS

1. The drafting team has made revisions to the PRC-025-1 standard and its associated documents which include addressing; (1) bright line of applicability between PRC-023-3 and PRC-025-1 by including the addition of the Distribution Provider and Transmission Owner to PRC-025-1, (2) increasing the Implementation Plan period from 48 to 60 months for applying settings where replacement is not necessary and from 72 to 84 months for replacement or removal, and (3) made clarifying revisions to the Guidelines and Technical Basis. Do you agree that the drafting team achieved the level of clarity needed for the proposed PRC-025-1 standard and the associated documents? If not or if you have any additional comment, provide specific suggestions to improve the clarity of the standard.

#### Summary Consideration:

Overall, the proposed PRC-025-1 standard is well received. The drafting team did not receive any comments concerning the Implementation Plan with regard to the period for implementing the requirement. There were minority comments asking for clarification on the “Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant.” The drafting appended the text “Elements may also supply generating plant loads” and provided additional clarification that the intent for “exclusive” was meant for non-generation plant related station service.

Of the majority comments, approximately one quarter of individuals supported by a couple of entities remain concerned about the High Violation Risk Factor and the Severe Violation Severity Level for the only requirement. The drafting team revisited the concerns and concluded that, as written, the VRF and VSL designations adhere to NERC and FERC guidance; therefore no revisions were made.

Approximately one third of the individuals supporting comments were concerned about the impacts and burden to small Generation Owners (i.e., gensets) that are subject to the standard because of inclusion in the Applicability for Blackstart resources identified in the Transmission Operator’s system restoration plan. The drafting team has been firm that these resources must meet the loadability criteria anticipated by the standard to ensure reliability during system disturbances and restoration.

About one third of individuals supported by a few comments raised concerns about the changes the drafting team made during the last revision to narrow the scope the load-responsive protective relays associated with the unit auxiliary transformer (UAT). The drafting team through this discussions concluded the most appropriate approach to address these relays was to create a clear demarcation to only apply the standard to those relays which are applied at the high-side terminals of the UAT, for which operation of the relays will cause the associated generator to trip. The drafting team, in doing so, has met the intent of the directive from FERC to address the UAT, but has not expanded the scope into low-side relays that protect items like motor control centers.

Organization	Yes or No	Question 1 Comment
<p>North American Generator Forum Standards Review Team</p>	<p>No</p>	<p>1. UATs should be dropped from the standard. The Application Guidelines state that the reliability objective of PRC-025 is to cover, “all load-responsive protective relays that are affected by increased generator output in response to system disturbances,” but the relays of UATs are not in this category. A disturbance on the HV system would not significantly affect the real or reactive power draws of auxiliary loads, and it was stated in the 12/13/2012 webinar that UAT relay trips are not known to have caused the loss of any generation units during the northeast blackout of ‘03. UATs are stated later in the Application Guidelines to have been included to satisfy a FERC directive (Order No. 733, paragraph 104), but such a move nonetheless appears to be incorrect, particularly in light of NERC’s recent emphasis on the cost justification of reliability standards.</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential” language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis. Change made.</p> <p>2. The term “full-load current” needs clarification in Exclusion #6 (generator overload protection with extremely inverse characteristics). Is this the current at normal full-load turbine output and typical PF, or the value determined from the generator nameplate MVA at rated voltage, or the base (no fans, no oil circulation) rating of the GSU?</p> <p><b>Response:</b> The drafting team notes that the phrase “full load current” refers to</p>

Organization	Yes or No	Question 1 Comment
		<p>rated armature current of the generator. The drafting made a clarifying change in Attachment 1: Relay Settings, Exclusion 6. Change made.</p> <p>3. PRC-025 should be revised to grandfather existing major equipment, similar to the approach recently used for PRC-024. It may not always be possible to develop PRC-025-conforming means of protection without replacing GSUs or UATs; and, in the absence of any compensation to the owner, it would be inappropriate to outlaw equipment that was acceptable under the rules in effect at the time it was installed.</p> <p><b>Response:</b> The drafting team contends that it is possible to provide phase fault backup protection while meeting the requirements of this standard. The drafting team notes that the standard provides multiple options for setting transformer load-responsive phase relays to address this concern. If legacy approaches do not allow the entity to meet the requirement and protection objectives, other approaches may be necessary. To prevent equipment damage from excessive time exposed to overload conditions, the drafting team has included exclusions for dedicated generator and transformer overload protection that operates in time frames appropriate to overload protection. No change made.</p> <p>4. The applicability of PRC-025 should exclude small gensets that are NERC-registered solely due to being black start-capable, the tripping of which would not meaningfully affect the ability of the system to ride through Disturbances. It would be best to allow such units to maintain their present loadability relay settings, if they are consistent with a reasonable coordination study, rather than mandate upgrades that augment the degree to which the costs incurred due to NERC requirements have already eliminated any economic rationale for having black-start facilities.</p> <p><b>Response:</b> The drafting team notes that the standard only applies to those Blackstart resources identified in the Transmission Operator’s system restoration plan (i.e., SRP) because load-responsive protective relays may not perform as</p>

Organization	Yes or No	Question 1 Comment
		<p>needed to facilitate system restoration. No change made.</p> <p>5. Regarding in particular voltage-restrained overcurrent relays, this type of device is notorious for not having a predictable operation time under fault conditions. If they did mis-operate in the August 2003 blackout they should be changed-out rather than requiring that the settings be set as high as specified in the draft standard.</p> <p><b>Response:</b> The drafting team agrees, in general, that these devices are not recommended and, where used, that these devices should be replaced. However, as the drafting team is unable to require that such relays be replaced, applicable criteria are provided. No change made.</p> <p>6. Deeming any and all violations of this standard to have a high violation risk factor and a severe violation severity level seems overly harsh, given the compliance feasibility uncertainties expressed above.</p> <p><b>Response:</b> The drafting team contends that the High VRF is correct, as it fully satisfies the associated criteria from the VRF Guidelines, "... a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, ..." Please note that the above criteria include emergency and abnormal conditions under which a loss of a generator that does not meet the loadability requirements could lead to one of these consequences. The drafting team also believes that a High VSL is appropriate, in that PRC-025-1 R1 applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL. The VSL is binary regardless of the size of the generating unit. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		



Organization	Yes or No	Question 1 Comment
Colorado Springs Utilities	No	<p>#1 - The term “full-load current” needs clarification in Exclusion #6 (generator overload protection with extremely inverse characteristics). Is this the current at normal full-load turbine output and typical PF, or the value determined from the generator nameplate MVA at rated voltage, or the base (no fans, no oil circulation) rating of the GSU or UAT?</p> <p><b>Response:</b> The drafting team notes that the phrase “full load current” refers to rated armature current of the generator. The drafting made a clarifying change in Attachment 1: Relay Settings, Exclusion 6. Change made.</p> <p>#2 - Deeming any and all violations of this standard to have a high violation risk factor and a severe violation severity level seems overly harsh.</p> <p><b>Response:</b> The drafting team contends that the High VRF is correct, as it fully satisfies the associated criteria from the VRF Guidelines, “... a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, ...” Please note that the above criteria include emergency and abnormal conditions under which a loss of a generator that does not meet the loadability requirements could lead to one of these consequences. The drafting team also believes that a High VSL is appropriate, in that PRC-025-1 R1 applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL. The VSL is binary regardless of the size of the generating unit. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
ACES Standards Collaborators	No	(1) We disagree with the inclusion of a Distribution Provider in the standard. By definition in the NERC Glossary a Distribution Provider “provides and operates

Organization	Yes or No	Question 1 Comment
		<p>the ‘wires’ between the transmission system and the end-use customer”. They do not own facilities that interconnect generators to the Bulk Electric System. This is further supported by the registry criteria which only identify ownership of a transmission Protection System, Special Protection System, UFLS, UVLS or peak load exceeding 25 MW as reasons to register a Distribution Provider. The response to our previous comments regarding applicability of the Distribution Provider to the previously proposed PRC-023-3 R7 and R8 indicated this was an unlikely situation but was intended to avoid gaps. While we appreciate the attempt avoid gaps, this is a very obscure situation and no standard can anticipate every possible nuance. NERC has the ability within its Rules of Procedure to register an entity if facts and circumstances warrant it. If there is a DP that should be registered for additional functions and be subject to additional compliance burdens, that determination should be made through pre-existing processes and procedures and not through the applicability of a reliability standard. Furthermore, if the anticipated gap was a conceptual gap and not an actual known gap, we believe no attempt should be made to address an obscure situation that will likely never exist. The regional entities can evaluate situations, configurations and systems to determine whether a gap exists and how to proceed. It is not the role of the drafting team to create standards for every possible scenario that could lead to an event on the Bulk Electric System. The drafting team should consider revising the standard to address the majority of the situations that may arise for improper relay settings and allow the other processes and procedures to address any gaps as they arise. Furthermore, as demonstrated by the early discussion regarding the definition and registry criteria, this would actually be a registration issue and not a gap in the standard.</p> <p><b>Response:</b> The Distribution Provider is included to address those cases where a Distribution Provider owns load-responsive protective relays on the Elements listed in the Applicability section of the standard. This also avoids an entity having to register as a Transmission Owner for this specific condition. No change</p>

Organization	Yes or No	Question 1 Comment
		<p>made.</p> <p>(2) We understand that the term “Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant” was used in PRC-025 because the Guidelines and Technical Basis document indicated there was a concern that a Distribution Provider may own a “generation interconnection Facility” and that the term implies ownership by the GO. We disagree with this implication and have found numerous references including November 16, 2009 Final Report from the Ad Hoc Group for Generator Requirements at the Transmission Interface that indicate the facility may or may not be owned by the GO. Futhermore, the original proposed definition from the report did not indicate ownership.</p> <p><b>Response:</b> The term “generator interconnection Facility” was replaced by “3.2.4 Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant. Elements may also supply generating plant loads.” to reduce confusion. The drafting team received previous questions about Transmission Facility, generator leads, and generator interconnection Facility. Also, the proposed phrasing de-emphasizes ownership of the connection since the standard is addressing ownership of the load-responsive protective relays applied on those Facilities. The drafting team made minor clarifications to the Guidelines and Technical Basis. Change made.</p> <p>(3) We disagree with the applicability of 3.2.5. Because “Element” is not limited to the BES by the definition, the applicability could be interpreted to include the distribution collector system. We do not believe inclusion of the distribution collector system for dispersed generation benefits reliability. If a subset of generators in the dispersed generation site trip, it will be a small amount of MWs lost that would not impact the reliability of the Bulk Power System. We can</p>

Organization	Yes or No	Question 1 Comment
		<p>understand inclusion of the main GSU for a large site but not the individual collector elements. We recommend the drafting team revise the standard to remove all references, such as the unqualified use of Element (i.e without a BES adjective) to the distribution system because it does not impact the Bulk Electric System.</p> <p><b>Response:</b> The Applicability section 3.2, Facilities is constructed such that, once a generating unit or generating plant is identified as “Bulk Electric System,” the “Elements” listed in sections 3.2.1 through 3.2.5 are within scope for those BES resources in section 3.2. No change made.</p> <p>The drafting team notes that those generators aggregated in a collector system will behave similarly for the conditions anticipated by the standard. No change made.</p> <p>(4) The light blue bar under Option 2c with “The same application continues on the next page with a different relay type” text in Table 1 should be removed.</p> <p><b>Response:</b> The formatting has been corrected. Change made.</p> <p>(5) Since the “generator interconnection Facility” term has already been established in other standards and was deemed to be understood well enough by the Project 2010-07 Generator Requirements at the Transmission Interface drafting team that a glossary term was not necessary contrary to the ad hoc report, it should be used in PRC-025 to avoid confusion and inconsistency. Confusion could arise with enforcement and compliance personnel over the use of the term “Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant” and how to apply the standard to the GO. This will result in the GO, NERC and Regional Entities expending additional resources on an unnecessary compliance activity that does not support reliability of the Bulk Electric System.</p>

Organization	Yes or No	Question 1 Comment
		<p><b>Response:</b> The drafting team disagrees as the term Elements refers to load-responsive protective relays applied on the Elements listed in the Applicability sections 3.2.1 through 3.2.5 and not the “generator interconnection Facility.” There should be no substantive additional resource burden on identifying these relays as they should be identified in the entity’s maintenance and testing program. No change made.</p> <p>(6) We understand that the term “Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant” was used in PRC-025 because the Guidelines and Technical Basis document indicated there was a concern that a Distribution Provider may own a “generation interconnection Facility” and that the term implies ownership by the GO. We disagree with this approach and have found numerous references including November 16, 2009 Final Report from the Ad Hoc Group for Generator Requirements at the Transmission Interface that indicate the facility may or may not be owned by the GO.</p> <p>Futhermore, the original proposed definition from the report did not indicate ownership.</p> <p><b>Response:</b> The term “generator interconnection Facility” was replaced by “3.2.4 Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant. Elements may also supply generating plant loads.” to reduce confusion. The drafting team received previous questions about Transmission Facility, generator leads, and generator interconnection Facility. Also, the proposed phrasing de-emphasizes ownership of the connection since the standard is addressing ownership of the load-responsive protective relays applied on those Facilities. The drafting team made minor clarifications to the Guidelines and Technical Basis. Change made.</p> <p>(7) There are inconsistent applications between the terms in PRC-023 and PRC-</p>

Organization	Yes or No	Question 1 Comment
		<p>025 that are intended to apply to non-radial and radial generator interconnection Facilities. PRC-025 uses the term “Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant” while PRC-023 uses slight variants of the term “except lines and transformers that are used exclusively to export energy directly from a BES generating unit or generating plant to the network.” Some differences that should be eliminated include the appended “to the network” in the PRC-023 term, use of “Elements” in PRC-025, and use of “lines and transformers.” Keeping the language of the two standards consistent will reduce the possibilities of inconsistent application of compliance personnel.</p> <p><b>Response:</b> The drafting team crafted the language to align with each standard. The proposed PRC-023-3 standard includes “lines and transformers” because the proposed PRC-025-1 standard addresses sections 3.2.2 Generator step-up (i.e., GSU) transformer(s) and 3.2.4 Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant. The phrase “to the network” will be reviewed by the drafting team upon completion of the current PRC-023-3 comment period. No change made.</p> <p>(8) We do not understand how replacing “generation interconnection Facility” with a 26 word phrase is helpful or adds clarity to the standard. The Project 2010-07 drafting team already determined that “generator interconnection Facility” was a well understood term and did not imply ownership. We recommend persisting with the use of the term for clarity. We simply do not see how replacing “generator interconnection Facility” with a 26-word phrase provides additional clarity. Rather, it invites multiple interpretations, inconsistent application, and further confusion.</p> <p><b>Response:</b> The term “generator interconnection Facility” was replaced by “3.2.4</p>

Organization	Yes or No	Question 1 Comment
		<p>Elements that connect the GSU transformer(s) to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant. Elements may also supply generating plant loads.” to reduce confusion. The drafting team received previous questions about Transmission Facility, generator leads, and generator interconnection Facility. Also, the proposed phrasing de-emphasizes ownership of the connection since the standard is addressing ownership of the load-responsive protective relays applied on those Facilities. The drafting team made minor clarifications to the Guidelines and Technical Basis. Change made.</p> <p>(9) We continue to disagree with the approach of requiring a registered entity to replace all relays that cannot meet the settings of PRC-025-1 in order to comply with this standard. The standard should provide more flexibility to allow a registered entity to replace relays when they have reach the end of their useful life unless the circuit has been deemed a critical facility by another standard.</p> <p><b>Response:</b> The drafting team contends that it is possible to provide phase fault backup protection while meeting the requirements of this standard. The drafting team notes that the standard provides multiple options for setting transformer load-responsive phase relays to address this concern. If legacy approaches do not allow the entity to meet the requirement and protection objectives, other approaches may be necessary. To prevent equipment damage from excessive time exposed to overload conditions, the drafting team has included exclusions for dedicated generator and transformer overload protection that operates in time frames appropriate to overload protection. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
DTE Electric	No	<p>(1) Please define the term [consequential trip] as it applies to unit auxiliary transformers on page 23 of the Guidelines and Technical Basis document. Is there a timeframe where loss of the transformer must result in a trip of the</p>

Organization	Yes or No	Question 1 Comment
		<p>generator. For example, the trip of a fuel supply transformer may take hours before it causes a loss of generation.</p> <p><b>Response:</b> In this case, “consequential” means following as an effect, result, or outcome. No change made.</p> <p>(2) It is suggested that if elements utilized in the aggregation of dispersed power producing resources are to be included in this standard, then Table 1 should be modified to include this application in order to be consistent with the other facilities listed in Section 3.2.</p> <p><b>Response:</b> The drafting team clarified Table 1 to align with the elements utilized in the aggregation of dispersed power producing resources as shown in Figure 5 of the Guidelines and Technical Basis and included additional discussion under the Dispersed Generation section. Change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Ameren	No	<p>(1) We support the SERC Protection &amp; Control Subcommittee comments and hereby include them by reference rather than repeating them all.</p> <p><b>Response:</b> Thank you.</p> <p>(2) We are voting negative because this present draft expands the Option 13a and 13b language from that of draft 3 (for which we voted affirmative). This language includes ‘consequential trips’, which we believe is ambiguous, and is inconsistent with the NERC BOT, approved PRC-005-2. We request the SDT for Option 13a and 13b to only include direct trips for which there is certainty that the generator will be tripped; we believe this provides a bright line for both auditors and entities.</p> <p><b>Response:</b> The drafting team has modified the Guidelines and Technical Basis to be consistent with the language in Attachment 1: Relay Settings, Option 13a and</p>



Organization	Yes or No	Question 1 Comment
		<p>13b, unit auxiliary transformer application. Change made.</p> <p>(3) Furthermore, we neither have experience or awareness of UAT relay loadability being a cause of incorrect generator trips so there’s little justification for including the UAT in a generator loadability standard.</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential” language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis. Change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Pepco Holdings Inc & Affiliates	No	<p>1 ) The wording in Table 1, Options 15, 16, 18, and 19 could be interpreted to imply that in addition to the supervisory phase overcurrent elements used in communication based schemes to prevent false operation during loss of communications, that any 51 or 67 element that is intentionally armed during loss of communications would also be subject to this loadability criterion. This concept was extensively debated in the development of PRC-023. However, in PRC-023 Attachment A, Section 2.1 it specifically excludes “those elements that are only enabled during a loss of communications except as noted on Section 1.6”. Section 1.6 applies only to “phase overcurrent supervisory elements (i.e. phase fault detectors) associated with current-based, communication-assisted schemes (i.e. pilot wire, phase comparison, and line current differential) where the scheme is capable of tripping for loss of communications.” Therefore to be consistent with PRC-023, and to not draw into scope other elements that are</p>

Organization	Yes or No	Question 1 Comment
		<p>intentionally armed only during loss of communications, the following bullet should be added to the list of Exclusions in Attachment 1 of PRC-025-1:                      “Elements that are only enabled during a loss of communications except phase supervisory elements (i.e. phase fault detectors) associated with current-based, communication-assisted schemes (i.e. pilot wire, phase comparison, and line current differential) where the scheme is capable of tripping for loss of communications.”</p> <p><b>Response:</b> The drafting team clarified the Relay Type column language in Options 15, 16, 18, and 19 by reordering the applicable relays. Change made.</p> <p>2 ) In the Guidelines and Technical Basis document Equations 33, 47, 51, 87, 101, 113, and 117 all use the formula <math>I_{pri} = S / 1.73 V_{bus}</math>. However, Equations 68, 132, 155, 159, and 174 all use the formula <math>I_{pri} = S (\text{conjugate}) / 1.73 V_{bus}</math>. Also, in some of the examples the angle of the current is calculated as well, while in others only scalar quantities are used. To be technically correct, the equation for I primary is developed from the apparent power expression <math>S = V I (\text{conjugate})</math>. Solving for I results in <math>I_{pri} = S (\text{conjugate}) / 1.73 V (\text{conjugate})</math>. But since the angle of <math>V_{bus}</math> is assumed to be zero degrees <math>V_{bus} = V_{bus} (\text{conjugate})</math>. Therefore the correct expression reduces to <math>I_{pri} = S (\text{conjugate}) / 1.73 V_{bus}</math>. For consistency purposes, the same equation should be used in all examples.</p> <p><b>Response:</b> The drafting team intentionally left the angle out of the equation where it is not required to simplify the example calculations. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
<p>SERC Protection and Controls Subcommittee</p>	<p>No</p>	<p>1) In PRC-025-1 please replace “secondary” with “voltage sensing device” from Exclusions #3 on page 8. We recommend that it read “(in order to prevent false operation in the event of a blown voltage sensing device fuse)...”</p> <p><b>Response:</b> The drafting team removed the phrase “blown secondary fuse” and</p>

Organization	Yes or No	Question 1 Comment
		<p>replaced it with “a loss of potential”). Change made.</p> <p>2) In PRC-025-1 please add an Exclusion of Relay Types that are directional (e.g., 21, 67) toward the generator. We recommend that it read “Load-responsive protective relay elements applied directional toward the generator.”</p> <p><b>Response:</b> The drafting team notes that standard addresses those load-responsive protective relays that are applicable. The standard should not address exclusions unless the exclusion is a subset of the applicable items. No change made.</p> <p>3) In PRC-025-1 your revised Table 1 Options 13a and 13b Relay Type wording is less clear than draft 3. Please restore the draft 3 tripping action wording. We recommend that it read “Phase time overcurrent relay (51) applied at the high-side terminals of the UAT that trips the generator either directly or via an interposing auxiliary/lockout relay.”</p> <p><b>Response:</b> See #4 below.</p> <p>4) In the PRC-025-1 Guidelines and Technical Basis please remove “or consequential” from the Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b) section on page 23. We recommend that it read “Phase time overcurrent relays applied at the high-side of the UAT that remove the transformer from service resulting in an immediate (e.g., via lockout or auxiliary tripping relay operation) trip of the associated generator are to be compliant with the relay setting criteria in this standard.” Such reference to ‘consequential’ trips are ambiguous and should be excluded as they were in draft 3.</p> <p><b>Response to Items #3 and #4:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some</p>

Organization	Yes or No	Question 1 Comment
		<p>individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential” language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis. Change made.</p> <p>The comments expressed herein represent a consensus of the views of the above-named members of the SERC EC Protection and Control Subcommittee only and should not be construed as the position of SERC Reliability Corporation, its board, or its officers.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Southern Company; Southern Company Services, Inc.; Alabama Power Company; Georgia Power Company; Gulf Power Company; Mississippi Power Company; Southern Company Generation; Southern Company Generation and Energy Marketing</p>	<p>No</p>	<p>1. UATs should be dropped from the standard. The Application Guidelines state that the reliability objective of PRC-025 is to cover, “all load-responsive protective relays that are affected by increased generator output in response to system disturbances,” but the relays of UATs are not in this category. A disturbance on the HV system would not affect the real or reactive power draws of auxiliary loads, and it was stated in the 12/13/2012 webinar that UAT relay trips are not known to have caused the loss of any generation units during the northeast blackout of ‘03. UATs are stated later in the Application Guidelines to have been included to satisfy a FERC directive (Order No. 733, paragraph 104), but such a move nonetheless appears to be incorrect, particularly in light of NERC’s recent emphasis on the cost justification of reliability standards.</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential”</p>

Organization	Yes or No	Question 1 Comment
		<p>language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis. Change made.</p> <p>2. The term “full-load current” needs clarification in Exclusion #6 (generator overload protection with extremely inverse characteristics). Is this the current at normal full-load turbine output and typical PF, or the value determined from the generator nameplate MVA at rated voltage, or the base (no fans, no oil circulation) rating of the GSU?</p> <p>The methods to determine the generator current rating described in PRC-025 are unnecessarily complicated. It should use the lower of the generator maximum MVA rating or the GSU’s maximum rating.</p> <p><b>Response:</b> The drafting team notes that the phrase “full load current” refers to rated armature current of the generator. The drafting made a clarifying change in Attachment 1: Relay Settings, Exclusion 6.</p> <p>The drafting team notes that the generator MVA and GSU transformer MVA may not always be matched. The goal of the standard is to address the maximum capability of the generator during the conditions anticipated by the standard. Change made.</p> <p>3. PRC-025 should be revised to grandfather existing major equipment, similar to the approach recently used for PRC-024. It may not always be possible to develop PRC-025-conforming means of protection without replacing GSUs or UATs; and, in the absence of any compensation to the owner, it would be inappropriate to outlaw equipment that was acceptable under the rules in effect at the time it of which would not meaningfully affect the ability of the system to ride through Disturbances. It would be best to allow such units to maintain their present loadability relay settings, if they are consistent with a reasonable was installed.</p>

Organization	Yes or No	Question 1 Comment
		<p>This grandfathering should also be done for generation/transmission/excitation protection coordination on units that are in service as of the adoption date of the standard.</p> <p><b>Response:</b> The drafting team contends that it is possible to provide phase fault backup protection while meeting the requirements of this standard. The drafting team notes that the standard provides multiple options for setting transformer load-responsive phase relays to address this concern. If legacy approaches do not allow the entity to meet the requirement and protection objectives, other approaches may be necessary. To prevent equipment damage from excessive time exposed to overload conditions, the drafting team has included exclusions for dedicated generator and transformer overload protection that operates in time frames appropriate to overload protection.</p> <p>The drafting team notes that the concerns raised relative to relays on an Exciter Power Potential Transformer (PPT) between the generator and the unit auxiliary transformer (UAT) are not within the scope of the project. Only the generator unit, generator step-up transformer, and auxiliary unit transformers (UAT) are within the scope of the standard. No change made.</p> <p>4. The applicability of PRC-025 should exclude small gensets that are NERC-registered solely due to being black start-capable, the tripping coordination study, rather than mandate upgrades that augment the degree to which the costs incurred due to NERC requirements have already eliminated any economic rationale for having black-start facilities.</p> <p><b>Response:</b> The drafting team notes that the standard only applies to those Blackstart resources identified in the Transmission Operator’s system restoration plan (i.e., SRP) because load-responsive protective relays may not perform as needed to facilitate system restoration. No change made.</p> <p>5. Regarding in particular voltage-restrained overcurrent relays, this type of</p>

Organization	Yes or No	Question 1 Comment
		<p>device is notorious for not having a predictable operation time under fault conditions. If they did mis-operate in the August 2003 blackout they should be changed-out rather than requiring that the settings be set as high as specified in the draft standard. PRC-025 has all kinds of methods described on how to set these relays. It would be much easier just to “outlaw” their use on all system connected units.</p> <p><b>Response:</b> The drafting team agrees, in general, that these devices are not recommended and, where used, that these devices should be replaced. However, as the drafting team is unable to require that such relays be replaced, applicable criteria are provided. No change made.</p> <p>6. Deeming any and all violations of this standard to have a high violation risk factor and a severe violation severity level seems overly harsh, given the compliance feasibility uncertainties expressed above.</p> <p><b>Response:</b> The drafting team contends that the High VRF is correct, as it fully satisfies the associated criteria from the VRF Guidelines, “... a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, ...” Please note that the above criteria include emergency and abnormal conditions under which a loss of a generator that does not meet the loadability requirements could lead to one of these consequences. The drafting team also believes that a High VSL is appropriate, in that PRC-025-1 R1 applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL. The VSL is binary regardless of the size of the generating unit. No change made.</p> <p>7. PRC-025 as written does not mention the generator and generator protection ANSI standards (ANSI/IEEE C37.102 and ANSI/IEEE C50.13) that give maximum</p>

Organization	Yes or No	Question 1 Comment
		<p>limits of overload protection. Under a sub-heading it is alluded to but they should be referred to as a major section.</p> <p><b>Response:</b> The ANSI/IEEE standards are voluntary and are generally written from an equipment-specific perspective. The drafting team notes that they do, in many cases, mention system performance, and the concerns noted in the ANSI/IEEE standards for system performance do not differ greatly from the criteria proposed in PRC-025-1. Finally, the drafting team notes that the last two bullets in the Exceptions in PRC-025-1 Attachment 1 address overload protection.</p> <p>8. A requirement that the protection of the unit overrides any transmission need for the unit to remain on the line should also be a major section of PRC-025.</p> <p><b>Response:</b> If legacy approaches do not allow the entity to meet the requirement and protection objectives, other approaches may be necessary. To prevent equipment damage from excessive time exposed to overload conditions, the drafting team has included exclusions for dedicated generator and transformer overload protection that operates in time frames appropriate to overload protection. No change made.</p> <p>9. In PRC-025-1 please replace “secondary” with “voltage sensing device” from Exclusions #3 on page 8. We recommend that it read “(in order to prevent false operation in the event of a blown voltage sensing device fuse)...”</p> <p><b>Response:</b> The drafting team removed the phrase “blown secondary fuse” and replaced it with “a loss of potential”). Change made.</p> <p>10. In PRC-025-1 please add an Exclusion of Relay Types that are directional (e.g., 21, 67) toward the generator. We recommend that it read “Load-responsive protective relay elements applied directional toward the generator.”</p> <p><b>Response:</b> The drafting team notes that standard addresses those load-responsive protective relays that are applicable. The standard should not</p>



Organization	Yes or No	Question 1 Comment
		address exclusions unless the exclusion is a subset of the applicable items. No change made.
<b>Response:</b> The drafting team thanks you for your comments; please see the above responses.		
Wisconsin Electric Power Company	No	<p>1. We appreciate the time and effort of the SDT members to develop this important standard.</p> <p><b>Response:</b> Thank you.</p> <p>2. However, as presently written, this standard will apply to individual wind turbine generators and other small dispersed generators by virtue of the new BES definition. To apply the rigorous requirements of this standard to the vast numbers of wind generators (typically less than 2 MW each) will require huge resources for minimal reliability benefit. The industry’s resources need to be focused on higher priorities affecting overall system reliability. To avoid this problem, we request that the Applicability be revised to include only generators rated above 20 MVA; for stations with aggregate generation over 75 MVA, the requirements should apply only to the relaying from the high-voltage transmission interconnection through the main transformer (eg, 138-34.5 kv).</p> <p><b>Response:</b> The Applicability section 3.2, Facilities is constructed such that, once a generating unit or generating plant is identified as “Bulk Electric System,” the “Elements” listed in sections 3.2.1 through 3.2.5 are within scope for those BES resources in section 3.2. No change made.</p> <p>The drafting team notes that those generators aggregated in a collector system will behave similarly for the conditions anticipated by the standard. No change made.</p> <p>3. Since there is no evidence that improper relay settings on UAT’s or SAT’s which supply generator auxiliary loads has contributed to loss of generation during disturbances, it is highly recommended to remove these elements from</p>

Organization	Yes or No	Question 1 Comment
		<p>the requirements. These are lower priority risks which do not rise to the level of systemic reliability concerns.</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential” language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis. Change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
PPL NERC Registered Affiliates	No	<p>1.) The PPL NERC Registered Affiliates reiterate their concern in regards to the following comments. The Application Guidelines state that the reliability objective of PRC-025 is to cover, “all load-responsive protective relays that are affected by increased generator output in response to system disturbances.” Unit Auxiliary Transformers (UAT’s) are not in this category and should therefore be excluded from the Applicability of the Standard in Section 3.2.3. The point was made in the 5/15/13 webinar that a decrease in HV system voltage would affect the plant MV voltage as well, causing a proportional increase in current (at constant power draw by plant auxiliary loads) and thereby potentially tripping UAT loadability relays. Reduction in frequency during disturbances will strongly reduce the power draw of pumps and fans, however, so MV current may actually drop despite the HV voltage reduction being experienced. This point of view is supported by the statement in the 12/13/2012 webinar that UAT relay trips are not known to have caused the loss of any generation units during the northeast blackout of ‘03, so extending PRC-025 applicability to UATs provides only a</p>

Organization	Yes or No	Question 1 Comment
		<p>hypothetical benefit that has not been observed (or has in fact been disproved) in practice. The PPL NERC Registered Affiliates again state that Facilities' UATs in Section 3.2.3 do not belong in this standard, as no technical justification has been provided. An investigation and evaluation of the protection systems for unit auxiliary transformers and the UAT's lack of impact on generator loadability should be considered by the SDT. A cost-benefit analysis for generator UATs should be performed to demonstrate that net benefits will result from any such standard before it is proposed. Without such an analysis, the standard may result in costs without a sufficient reliability benefit and may in some cases actually lessen reliability (see item 5 below).</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the "consequential" language. Also for more information, please see the section "Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)" in the Guidelines and Technical Basis. Change made.</p> <p>2.) The term "full-load current" needs clarification in the exclusion for generator overload protection with extremely inverse characteristics." The PPL NERC Registered Affiliates suggest that the SDT state in the Guidelines and Technical Basis that "full-load current" is understood to be the generator nameplate MVA at rated voltage.</p> <p><b>Response:</b> The drafting team notes that the phrase "full load current" refers to rated armature current of the generator. The drafting made a clarifying change in Attachment 1: Relay Settings, Exclusion 6. Change made.</p> <p>3.) The overload protection exception for "extremely inverse characteristics"</p>

Organization	Yes or No	Question 1 Comment
		<p>should be applied for UAT’s as well if eliminating UAT’s in its entirety (per comment #1 above) does not prove feasible.</p> <p><b>Response:</b> The drafting team notes that the “overload protection exception for extremely inverse characteristics” is provided by Exclusion 7 in the PRC-025-1, Attachment 1: Relay Settings and is not restricted to only the extremely inverse characteristics. No change made.</p> <p>4.) The PPL NERC Registered Affiliates reiterate their concern in regards to the following comments. PRC-025 should be revised to grandfather existing major equipment, similar to the approach recently used for PRC-024. It may not always be possible to develop PRC-025-conforming means of protection without replacing GSUs or UATs; and, in the absence of any compensation to the owner, it would be inappropriate to outlaw equipment that was acceptable under the rules in effect at the time it was installed.</p> <p><b>Response:</b> The drafting team contends that it is possible to provide phase fault backup protection while meeting the requirements of this standard. The drafting team notes that the standard provides multiple options for setting transformer load-responsive phase relays to address this concern. If legacy approaches do not allow the entity to meet the requirement and protection objectives, other approaches may be necessary. To prevent equipment damage from excessive time exposed to overload conditions, the drafting team has included exclusions for dedicated generator and transformer overload protection that operates in time frames appropriate to overload protection. No change made.</p> <p>5.) The applicability of PRC-025 should exclude small gensets that are NERC-registered solely due to being black start-capable, the tripping of which would not meaningfully affect the ability of the system to ride through Disturbances. It would be best to allow such units to maintain their present loadability relay settings, if they are consistent with a reasonable coordination study, rather than mandate upgrades that augment the degree to which NERC requirements have</p>

Organization	Yes or No	Question 1 Comment
		<p>already eliminated any economic rationale for having black-start facilities. Given the numerous CIP standards in effect to afford protection to the critical BS restoration facilities, it would be contradictory to impose a standard that could potentially increase risk of damage to a BlackStart Generator by forcing the BS facility to ride through the disturbance. If that disturbance is a precursor to a blackout, then having BS Resource unavailable to facilitate system restoration would defeat the purpose of designating it as a Blackstart Resource.</p> <p><b>Response:</b> The drafting team notes that the standard only applies to those Blackstart resources identified in the Transmission Operator’s system restoration plan (i.e., SRP) because load-responsive protective relays may not perform as needed to facilitate system restoration. No change made.</p> <p>6.) The PPL NERC Registered Affiliates reiterate their concern in regards to the following comments. Regarding in particular voltage-restrained overcurrent relays, this type of device is known for not having a predictable operation time under fault conditions. If they did mis-operate in the August 2003 blackout they should be changed-out rather than requiring that the settings be set as high as specified in the draft standard.</p> <p><b>Response:</b> The drafting team agrees, in general, that these devices are not recommended and, where used, that these devices should be replaced. However, as the drafting team is unable to require that such relays be replaced, applicable criteria are provided. No change made.</p> <p>7.) Deeming any and all violations of this standard to have a high violation risk factor and a severe violation severity level seems overly harsh, given the compliance feasibility uncertainties expressed above.</p> <p>The compliance uncertainties expressed above also promote the use of risk based compliance approach rather than a zero tolerance policy. Other standards in development (CIP V5 standards) no longer dictate a zero tolerance policy. This</p>

Organization	Yes or No	Question 1 Comment
		<p>concept should be applied to the PRC-025 standard to align with the direction NERC standard development is progressing.</p> <p><b>Response:</b> The drafting team contends that the High VRF is correct, as it fully satisfies the associated criteria from the VRF Guidelines, "... a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, ..." Please note that the above criteria include emergency and abnormal conditions under which a loss of a generator that does not meet the loadability requirements could lead to one of these consequences. The drafting team also believes that a High VSL is appropriate, in that PRC-025-1 R1 applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL. The VSL is binary regardless of the size of the generating unit. No change made.</p> <p><b>Response:</b> The drafting team continues to support the proposed standard as currently structured. The requirement allows Compliance Enforcement Authorities to take into account use of internal controls in connection with monitoring activities. However, internal controls are a mechanism to help auditors determine the depth and breadth of testing as it pertains to compliance with the related Reliability Standard and specific requirements and when necessary understand the facts and circumstances of instances of potential non-compliance. How any possible violations may be treated is outside of the scope of the project and reserved to the enforcement process. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Xcel Energy	No	<p>1. For Table 1 description on page 8, we recommend the following wording to match the 3.2 Facilities section: The first column identifies the application (e.g.,</p>

Organization	Yes or No	Question 1 Comment
		<p>synchronous or asynchronous generators, generator step-up transformers, unit auxiliary transformers, Elements utilized in the aggregation of dispersed power producing resources, and Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant ). Dark blue horizontal bars, excluding the header which repeats at the top of each page, demarcate the various applications.</p> <p><b>Response:</b> The drafting team added the example from the Applicability 3.2.5. Change made.</p> <p>2. For Table 1 applications - recommend update to match the 3.2 Facilities Section (e.g. Add 'Elements utilized in the aggregation of dispersed power producing resources').</p> <p><b>Response:</b> See #3 below.</p> <p>3. For Table 1 applications - Recommend addition of Aggregating equipment for Asynchronous and Synchronous equipment (e.g. bus in a hydro plant).</p> <p><b>Response to items #2 and #3:</b> The drafting team clarified Table 1 to align with the elements utilized in the aggregation of dispersed power producing resources as shown in Figure 5 of the Guidelines and Technical Basis and included additional discussion under the Dispersed Generation section. Change made.</p> <p>4. The Phase time over current relay (51) function is missing in the Synchronous Generator application section.</p> <p><b>Response:</b> The drafting team notes this is not a typical installation for synchronous equipment and the standard does not address the case. No change made.</p> <p>5. In attachment 1 of PRC-025-1 there are some very specific guidelines on how to handle transformer taps. No such direction was ever given for PRC-023. Please</p>

Organization	Yes or No	Question 1 Comment
		<p>clarify if the terminology used in PRC-025 also applies to PRC-023, since they are both loadability standards.</p> <p><b>Response:</b> The drafting team notes that the proposed PRC-025-1 provides clarity regarding transformer taps because the tap setting is relevant to the determination of the values used in calculating the dynamic conditions anticipated by the standard. The standard PRC-023-3 criteria is based on ratings rather than dynamic performance and thus is not impacted by transformer tap settings. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Bonneville Power Administration	No	<p>BPA supports the addition of TO’s and DP’s to PRC-025 and the transfer of applicability for “lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network” from PRC-023 to PRC-025.</p> <p>However, we are concerned that certain protective relays at the network terminal of these lines are not addressed in Table 1. We appreciate that certain relays at the network terminal, directional toward the generation (for example phase distance relays), are not challenged by the same loadability concerns as the relays at the generation terminal directional toward the network; however, these relays at the network terminal are presently required to comply with PRC-023, and we are a little skeptical that they will no longer need to comply in some way with either PRC-023 or PRC-025. It appears that they will be covered by PRC-025, but there is no mention of any requirements for compliance in Table 1. If there are really no loadability requirements for these relays, please state that in Table 1. If there are loadability requirements, please state what those are in Table 1.</p> <p><b>Response:</b> The drafting team notes that relays that are responsive to load flows from the generating plant to the system are addressed by the proposed PRC-</p>



Organization	Yes or No	Question 1 Comment
		<p>025-1 standard and relays responsive to load flows from the system to the generating plant are not subjected to any loadability concerns and are therefore proposed to have no loadability requirement in the proposed PRC-023-3 standard. No change made.</p> <p>We also have a minor comment on the standard. Since PRC-023 and PRC-025 are so closely related, it would be helpful if they used the same terminology. PRC-023 uses the term, “except lines that are used exclusively to export energy directly from a Bulk Electric System (BES) generating unit or generating plant to the network”, while PRC-025 uses the term, “elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant.” We would like to see the same term used in both standards.</p> <p><b>Response:</b> The drafting team crafted the language to align with each standard. The proposed PRC-023-3 standard includes “lines and transformers” because the proposed PRC-025-1 standard addresses sections 3.2.2 Generator step-up (i.e., GSU) transformer(s) and 3.2.4 Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generating unit or generating plant. The phrase “to the network” will be reviewed by the drafting team upon completion of the current PRC-023-3 comment period. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Indiana Municipal Power Agency	No	<p>For Exclusion number 6, IMPA would like to see clarification in the generator “full-load current” area, especially when it comes to gas turbines. Gas turbines loading changes with the air temperature and their loading can be very different from summer to winter with different loads reported to their Transmission Planner for each season. This would be a problem if the full-load current references the 100% of the gross MW capacity reported at the Transmission</p>

Organization	Yes or No	Question 1 Comment
		<p>Planner because the statement does not account for the different seasonal capability reported values for gas turbines. If the exclusion is referencing the full-load current based on generator nameplate, then it just needs to be referenced in the exclusion.</p> <p>IMPA would also like to see additional clarification in table 1 when referencing "Real Power Output". For gas turbines, two seasonal values are reported to the Transmission Planner (Summer and Winter). These two seasonal values are very different and IMPA believes the SDT needs to specify which seasonal value should be used for the Real Power output when performing the calculation.</p>
<p><b>Response:</b> The drafting team notes that the phrase “full load current” refers to rated armature current of the generator. The drafting made a clarifying change in Attachment 1: Relay Settings, Exclusion 6. Change made.</p> <p>Seasonal variations are discussed in Attachment 1: Relay Settings under the heading “Generators.” The section states: “If different seasonal capabilities are reported, the maximum capability shall be used for the purposes of this standard.” No change made.</p> <p>The exclusion references full-load current (i.e., rated armature current) relating to overload, and the generator nameplate references calculations used in determining the loadability settings in Table 1. No change made.</p>		
Modesto Irrigation District	No	<p>In section 3.2 "Facilities", I think it is critical that the following phrase be added at the end of the first paragraph: "..., and any generator, regardless of size or connected voltage, that has been shown to be material to the reliability of the BES". The “bright line” of 100 kV and 20 MVA is fine in general, but when it is known that a generator connected at less than 100 kV is material to the reliability of the BES, it should be included as an applicable facility for this standard.</p> <p>WECC requires dynamic model verification for all units 20 MVA or larger connected at voltages 60 kV and above. This is because WECC members have learned over the years to recognize the significant role that smaller size generators play in system response and stability. Also, past WECC studies of</p>

Organization	Yes or No	Question 1 Comment
		<p>major outages have shown that generators connected at less than 100 kV, have played a major role in the impact of outages. In fact, the most accurate duplication of the 1996 outage and more recent outages that the WECC MVWG has simulated, have shown that the accuracy of the simulated results of actual system outages is highly affected by the accuracy of the modeled system below 100 kV I am voting NO because I think it is critical to revise the applicability statement in section 3.2 before approving the Standard. The technical section on the settings seems fine to me, but getting the applicability correct is very important. Thank you.</p>
<p><b>Response:</b> Generators that are demonstrated to be material to the BES will likely be declared to be BES generators under the provisions of the latest approved version of the BES definition; therefore, will be included in the applicability of the standard. No change made.</p>		
Occidental Energy Ventures Corp.	No	<p>In the course of developing PRC-025-1, the project team has abandoned its initial efforts to address cost/benefit effectiveness. Although we understand that FERC has directed a generator-related load relay standard, we do not believe that this justifies a zero-tolerance approach that may lead to an expensive relay reconfiguration or replacement. For example, a number of industry commenters have indicated that they may be required to spend capital and expense dollars on UAT protection systems - even if there is no data indicating a correlation between UAT relay actions and BES Disturbances.</p> <p>The Cost Effective Analysis Process (CEAP) in the draft 3 posting of PRC-025-1 was an initial pilot of the program for only Phase II of the CEAP. The drafting team was provided summary information which did not reveal substantive reasons for changing the way the team developed PRC-025-1. Please see the Pilot CEAP Report on the Project 2010-13.2 project page (<a href="http://www.nerc.com/pa/Stand/Pages/Project-2010-13-2-Phase-2-Relay-Loadability-Generation.aspx">http://www.nerc.com/pa/Stand/Pages/Project-2010-13-2-Phase-2-Relay-Loadability-Generation.aspx</a>). No change made.</p>

Organization	Yes or No	Question 1 Comment
		<p><b>Response:</b> The drafting team continues to support the proposed standard as currently structured. The requirement allows Compliance Enforcement Authorities to take into account use of internal controls in connection with monitoring activities. However, internal controls are a mechanism to help auditors determine the depth and breadth of testing as it pertains to compliance with the related Reliability Standard and specific requirements and when necessary understand the facts and circumstances of instances of potential non-compliance. How any possible violations may be treated is outside of the scope of the project and reserved to the enforcement process. No change made.</p> <p>Along the same lines, there is no assurance that even if the settings in PRC-025-1 are perfectly applied, that a CEA will not assess a violation should a Fault-sensing relay trip. The only level of consideration that an auditor must apply is that the relay owner must maintain “reliable fault Protection”, a highly arbitrary assessment. It is easy to see that an after-the-fact review of the triggering event would expose the owner to penalties - even if the Fault relay tripped because of some highly unusual conditions. As an example, it is well known that the proliferation of high-efficiency air conditioners has led to undervoltage waveform distortions in recent years. It is not appropriate that a Generator Owner be held accountable to rapid changes in load technologies - particularly if they make good faith efforts to accommodate the NERC standards.</p> <p><b>Response:</b> The drafting team notes that violations would be assessed on a failure to comply with the requirements of the standard, not a trip of a load-responsive protective relay subject to the standard.</p> <p>The drafting team contends that the description of the term “while maintaining reliable fault protection” found in the Requirement R1 rationale box adequately conveys the suggested intent. No change made.</p> <p>NERC has begun to capture the concept of risk-based compliance, and has made a commitment to proceed in this direction. This separates the treatment of</p>

Organization	Yes or No	Question 1 Comment
		<p>entities who maintain strong internal compliance controls from those who do not. In addition, this advanced methodology relentlessly collects and assesses disturbance data to detect risk trends - identifying those which deserve the highest priority regulatory attention. Even if we hold the minority opinion, a very fundamental opportunity to advance the risk-based concept is being lost in the rush to accommodate FERC's directives. This is a mistake in our view - and may lead to low-priority items taking precedence over more pressing issues.</p> <p><b>Response:</b> The drafting team continues to support the proposed standard as currently structured. The requirement allows Compliance Enforcement Authorities to take into account use of internal controls in connection with monitoring activities. However, internal controls are a mechanism to help auditors determine the depth and breadth of testing as it pertains to compliance with the related Reliability Standard and specific requirements and when necessary understand the facts and circumstances of instances of potential non-compliance. How any possible violations may be treated is outside of the scope of the project and reserved to the enforcement process. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
National Grid	No	<p>RE: Draft Standard: Page 3 of 25 under applicability should read "owns" instead of "applies."</p> <p><b>Response:</b> The drafting team disagrees with the suggestion. Ownership is not clear that the relays are applied to the Elements listed in 3.2, Facilities. By "applying" the relay also emphasizes that an entity must demonstrate the settings are applied to the relay. No change made.</p> <p>Page 7 of 25, under Generators, the 1st paragraph needs clarification regarding how to derive MVAR. When reading Attachment 1, it is evident what is being proscribed but you can't deduce that from the subject paragraph.</p>

Organization	Yes or No	Question 1 Comment
		<p><b>Response:</b> The drafting team asserts the text is accurate and that a review of the calculations in the Guidelines and Technical Basis will provide additional clarity. No change made.</p> <p>Page 9 of 25 the last paragraph text "thoseof" needs correction.</p> <p><b>Response:</b> The drafting team replaced "those" with "of." Change made.</p> <p>Generator Owners own relays on the transmission system beyond what is listed in Attachment 1. Generator Owners should be responsible for the relays they own on the transmission system. The Generator Owner's responsibility for loading is not limited just to relays in PRC-025, Attachment 1.</p> <p><b>Response:</b> The drafting team agrees and notes that the Generator Owner functional entity is applicable to PRC-023. No change made.</p> <p>RE: Implementation Plan Pages 4 and 5: "relays applicable to this standard" should be changed to either "relays to which this standard is applicable" or "relays subject to this standard"</p> <p><b>Response:</b> NERC legal staff vetted this language. No change made.</p> <p>Pages 4, 5, 6 and 7: The text references relays and circuit breakers that are not shown or labeled in the figures.</p> <p>The figures are mislabeled. For instance the text for Fig. 2 states "Generation exported through multiple radial lines" but the drawing above the text depicts only a single radial line. A later unlabeled figure appears to meet that description but breakers are unlabeled and relays are not depicted.</p> <p><b>Response:</b> The drafting team notes that the "redline" version did not present the Figure changes accurately. Please see the "clean" version. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		

Organization	Yes or No	Question 1 Comment
Luminant Generation Company LLC	No	<p>The additional work provided by the standard drafting team has clarified the bright line between PRC-025 and 023. However, Luminant disagrees with the loadability criteria (aggregate generation) used in PRC-025 for multiple lines used for exporting generation (Figure 2 in the Guidelines and Technical Basis document).</p> <p>The loadability criteria is too conservative when compared to PRC-023 Requirement R1 transmission line criteria. Luminant recommends that the loadability criteria used in PRC-023 for transmission lines be part of PRC-025 for use in cases where multiple lines are used to export energy.</p>
<p><b>Response:</b> The drafting team thanks you for your comment and has added clarifying text to Attachment 1 (Multiple Lines) to address the multiple lines issue. Change made.</p>		
Luminant Energy Company LLC	No	<p>The additional work provided by the standard drafting team has clarified the bright line between PRC-025 and 023. However, Luminant disagrees with the loadability criteria (aggregate generation) used in PRC-025 for multiple lines used for exporting generation (Figure 2 in the Guidelines and Technical Basis document).</p> <p>The loadability criteria is too conservative when compared to PRC-023 Requirement R1 transmission line criteria. Luminant recommends that the loadability criteria used in PRC-023 for transmission lines be part of PRC-025 for use in cases where multiple lines are used to export energy.</p>
<p><b>Response:</b> The drafting team thanks you for your comment and has added clarifying text to Attachment 1 (Multiple Lines) to address the multiple lines issue. Change made.</p>		
Tri-State Generation and Transmission Association, Inc.	No	<p>The Facilities section addition “Elements that connect a GSU transformer to the Transmission system that are used exclusively to export energy directly from a BES generator generating unit or generating plant” can be interpreted to exclude</p>

Organization	Yes or No	Question 1 Comment
		<p>a tie to a GSU transformer if the station service to the generator is served through the same tie and GSU. This same phrase is used in a few other locations in the standard, as well.</p> <p><b>Response:</b> The drafting team has clarified Applicability 3.2.4 to address this concern to permit supplying station service. Change made.</p> <p>In the third item in the Exclusion section, there is no need for the phrase after the parentheses that begins “provided that the distance...” and the sentence should be ended after the parenthetical phrase, though it also seems unnecessary.</p> <p><b>Response:</b> The drafting team contends that this phrase is necessary to fully complete the entire thought for the exclusion. No change made.</p> <p>We believe the rationale for Exclusion six (clause 4.1.1.2 of the C37.102-2006 IEEE Guide for AC Generator Protection) should be included in the standard in a rationale box or a footnote.</p> <p><b>Response:</b> The drafting team has added a footnote to reference the basis of the exclusion. Change made.</p> <p>The first sentence in the last paragraph on page 9, beginning with “The table is further formatted...” does not make sense to Tri-State.</p> <p><b>Response:</b> The drafting team replaced “those” with “of.” Change made.</p> <p>UATs should be dropped from the standard. The Application Guidelines state that the reliability objective of PRC-025 is to cover, “all load-responsive protective relays that are affected by increased generator output in response to system disturbances,” but the relays of UATs are not in this category. A disturbance on the HV system would not affect the real or reactive power draws of auxiliary loads, and it was stated in the 12/13/2012 webinar that UAT relay trips are not known to have caused the loss of any generation units during the</p>



Organization	Yes or No	Question 1 Comment
		<p>northeast blackout of '03. UATs are stated later in the Application Guidelines to have been included to satisfy a FERC directive (Order No. 733, paragraph 104), but such a move nonetheless appears to be incorrect, particularly in light of NERC's recent emphasis on the cost justification of reliability standards.</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the "consequential" language. Also for more information, please see the section "Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)" in the Guidelines and Technical Basis. Change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
<p>MRO NERC Standards Review Forum (NSRF)</p>	<p>No</p>	<p>The NSRF is not prepared to support this Standard since there is not an approved BES definition. The risk of this Standard being applicable to individual wind turbines (i.e., time, effort, risk of non compliance) is greater than the suggested reliability benefit, concerning dispersed power producing resources.</p>
<p><b>Response:</b> The Applicability section 3.2, Facilities is constructed such that, once a generating unit or generating plant is identified as "Bulk Electric System," the "Elements" listed in sections 3.2.1 through 3.2.5 are within scope for those BES resources in section 3.2. No change made.</p> <p>The drafting team notes that those generators aggregated in a collector system will behave similarly for the conditions anticipated by the standard. No change made.</p>		
<p>Wisconsin Public Service Corporation</p>	<p>No</p>	<p>The proposed Phase I and Phase II BES definition inappropriately applies to individual wind turbines. The standard drafting team should consider revising the</p>

Organization	Yes or No	Question 1 Comment
		<p>applicability criteria to clearly state that PRC-025 is not meant to apply to individual wind turbines but to aggregated generation greater than 75MVA connected at a common point at 100kV or above. Changing the BES definition to exclude individual wind turbines would also address this comment.</p>
<p><b>Response:</b> The Applicability section 3.2, Facilities is constructed such that, once a generating unit or generating plant is identified as “Bulk Electric System,” the “Elements” listed in sections 3.2.1 through 3.2.5 are within scope for those BES resources in section 3.2. No change made.</p> <p>The drafting team notes that those generators aggregated in a collector system will behave similarly for the conditions anticipated by the standard. No change made.</p>		
Duke Energy	No	<p>The relays identified in this standard are shown at the high side winding of the UAT, there are many examples at Duke Energy where these relays are omitted from the design at that location. Duke Energy is concerned as to why the time overcurrent relays at the low side main breaker are not being included in this standard. These relays are set similarly and if a low side main “load responsive” relay operated unnecessarily, the outcome is similar. The generating unit would trip offline or at best run back to a reduced load. (if possible and only if multiple buses exist with diverse loads). The purpose of the standard is to improve the BES by setting “load responsive” protective relays at a level to prevent unnecessary tripping of generators. If the UAT high side “load responsive” relay is included within this standard, then the low side main “load responsive” relay must also be included. The low side main “load responsive” relays are typically set with similar criteria as the high side “load responsive” relays. The misoperation of either relay will result in lost generation. To omit the low side main “load responsive” relay from the standard means the owner can continue to set this relay at levels that would violate the intent of the standard.</p> <p>Lastly, the SDT should be aware that the low side main “load responsive” relay is excluded from the protection maintenance standard.</p>

Organization	Yes or No	Question 1 Comment
<p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential” language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis.</p> <p>Due to the complexity of the application of low-side overload relays for single or multi-winding transformers, phase time overcurrent relaying applied to the low voltage terminals of the UAT are not addressed in this standard. These relays include, but are not limited to, a relay used for arc flash protection, feeder protection relays, breaker failure, and relays whose operation may result in a generator runback. The drafting team removed the examples of low-side relays from the Guidelines and Technical Basis as this reference is not relevant to the applicable to the applications provided in the standard. Change made.</p>		
Santee Cooper	No	<p>The wording of Table 1 Options 13a and 13b should be changed back to the Draft 3 wording. The wording in the new draft is more ambiguous and could lead to more confusion. We agree with the SERC PCS’s recommendation for this section to read “Phase time overcurrent relay (51) applied at the high-side terminals of the UAT that trips the generator either directly or via an interposing auxiliary/lockout relay.”</p> <p><b>Response:</b> Beyond satisfying the directive in FERC Order No. 733, paragraph 104, the drafting team contends that applying the loadability criteria to the overall unit auxiliary transformer (UAT) protective relays aims to prevent the tripping of the UAT itself even though it is possible that some individual loads may be lost during the conditions anticipated by the standard. The drafting team clarified the Attachment 1, Table 1, Options 13a and 13b to remove the “consequential” language. Also for more information, please see the section “Unit Auxiliary Transformers Phase Time Overcurrent Relay (51) (Options 13a and 13b)” in the Guidelines and Technical Basis. Change made.</p> <p>We also feel there should be an additional item in the list of Exclusion of Relay</p>

Organization	Yes or No	Question 1 Comment
		<p>Types to cover relay types that are directional toward the generator.</p> <p><b>Response:</b> The drafting team notes that relays that are responsive to load flows from the generating plant to the system are addressed by the proposed PRC-025-1 standard and relays responsive to load flows from the system to the generating plant are not subjected to any loadability concerns and are therefore proposed to have no loadability requirement in the proposed PRC-023-3 standard. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Northeast Power Coordinating Council	No	<p>We disagree with the Drafting Team’s decision not to make the change suggested during an earlier posting (remove the following words from R1 “...while maintaining reliable fault protection.”)</p> <p>This phrase should be replaced and therefore suggest R1 be revised to read Each Generator Owner, Transmission Owner, and Distribution Provider shall apply settings that are in accordance with PRC-025-1 - Attachment 1: Relay Settings, on each load-responsive protective relay while achieving its desired protection goals.</p>
<p><b>Response:</b> The drafting team contends that the description of the term “while maintaining reliable fault protection” found in the Requirement R1 rationale box adequately conveys the suggested intent. No change made.</p>		
Dominion	No	<p>While Dominion does not agree with the SDT’s decision not to make the change we suggested (to remove the following words from R1 “...while maintaining reliable fault protection.”) we appreciate that they responded. However, we remain convinced that this phrase should be replaced and therefore suggest R1 be revised to read “Each Generator Owner, Transmission Owner, and Distribution Provider shall apply settings that are in accordance with PRC-025-1 - Attachment 1: Relay Settings, on each load-responsive protective relay while</p>

Organization	Yes or No	Question 1 Comment
		<p>maintaining reliable fault protection. achieving its desired protection goals.</p> <p><b>Response:</b> The drafting team contends that the description of the term “while maintaining reliable fault protection” found in the Requirement R1 rationale box adequately conveys the suggested intent. No change made.</p> <p>Section 3.2 - remove the entire section (3.2, 3.2.1, 3.2.2, 3.2.3, and 3.2.4), the revised Section 3.1.1 now will cover this section. The current approach would expand on the existing definition of BES and is not acceptable.</p> <p><b>Response:</b> The drafting team contends that this suggestion creates ambiguity in the Facilities that apply to the standard. Section 3.1 pertains to the entities and Section 3.2 the Facilities that are applicable to the standard. No change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Kansas City Power & Light	No	
Liberty Electric Power	No	
Manitoba Hydro	Yes	<p>Although Manitoba Hydro is in general agreement with the revisions to the standard, we have the following comments</p> <p>(1) 3.2 - add the acronym [(BES)] following the words “Bulk Electric System” since this is the first instance of these words in the standard.</p> <p><b>Response:</b> The drafting team agrees. Change made.</p> <p>(2) PRC-025-1, Attachment 1: Relay Settings, Introduction - for clarity, add a comma after the word “Facilities”.</p> <p><b>Response:</b> The drafting team agrees. Change made.</p> <p>(3) PRC-025-1, Attachment 1: Relay Settings, Introduction - for clarity, re-write the sentence as follows: “shall use one of the following [19] Options listed in</p>

Organization	Yes or No	Question 1 Comment
		<p>Table 1,”.</p> <p><b>Response:</b> The drafting team removed the reference “1-19” for clarity. Change made.</p> <p>(4) PRC-025-1, Attachment 1: Relay Settings - capitalize all instances of the word “element” found throughout the attachment.</p> <p><b>Response:</b> The drafting team reviewed the occurrences of “element” (lowercase) and found them to be consistent with the lower case use and not the capitalized case which infers the NERC Glossary term. No change made.</p> <p>(5) PRC-025-1, Section 3.1.1 - only refers to Generator Owners, yet R1 also applies to Transmission Owners and Distribution Providers. This discrepancy should be rectified.</p> <p><b>Response:</b> The drafting team notes that the Transmission Owner and the Distribution Provider did not appear in the initial posting and was reported by a stakeholder, corrected and reposted in the first two days of the comment period.</p> <p>(6) The revisions to Section 3.2.4 and Attachment 1 use the term “export” means the transmission of electricity from one jurisdiction to a foreign jurisdiction. It is not clear why such a term would be used. Unless this was the actual intention, the term “export” should be replaced with [transmit] or [deliver].</p> <p><b>Response:</b> The drafting team contends that the term “export” is consistent with the use to refer to energy delivery from the generator to the Transmission system. No change made.</p> <p>(7) Implementation Plan - the chart’s Applicability section for R1 does not describe applicable entities, but instead describes a requirement.</p> <p><b>Response:</b> The drafting team notes this is correct. The applicability is to the performance (i.e., time frame) for which each applicable entity must implement</p>

Organization	Yes or No	Question 1 Comment
		the specific requirement. No change.
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
<p>City of Tacoma, Tacoma Public Utilities, Tacoma Power</p>	<p>Yes</p>	<p>Are excitation transformers considered UATs? It is recommended that they not be considered UATs.</p> <p><b>Response:</b> The drafting team notes that the concerns raised relative to relays on an Exciter Power Potential Transformer (PPT) between the generator and the unit auxiliary transformer (UAT) are not within the scope of the project. Only the generator unit, generator step-up transformer, and auxiliary unit transformers (UAT) are within the scope of the standard. No change made.</p> <p>In Draft 4 of PRC-025-1, under Exclusions, Tacoma Power suggests that “the following protection systems are excluded from the requirements of this standard:” be changed to something like “Protection Systems that are excluded from the requirements of this standard include, but are not limited to, the following:”</p> <p><b>Response:</b> The drafting team contends that the exclusion list specifically includes those applications that should be excluded from the requirements. No change made.</p> <p>On page 9 of 25 of the redlined Draft 4 of PRC-025-1, change “...shading groups those relays...” to “...shading groups of those relays...”</p> <p><b>Response:</b> The drafting team replaced “those” with “of.” Change made.</p> <p>Referring to Option 13 of Draft 4 of PRC-025-1, change “...operation of the relays...” to “...operation of the relay...”</p> <p><b>Response:</b> The drafting team removed the “s” off of “relays.” Change made</p> <p>On p. 78 of 83 in redlined Guidelines and Technical Basis, consider changing “...a</p>

Organization	Yes or No	Question 1 Comment
		<p>synchronous generation Elements...” to “...synchronous generation Elements...”</p> <p><b>Response:</b> The drafting team corrected this occurrence and others that were also found upon review. Change made.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
FirstEnergy	Yes	<p>FirstEnergy (FE) agrees the revisions made provide clarity in the applicability between the reliability standards of PRC-023 and PRC-025. FE agrees with the replacement of the term [generator interconnection Facility] with a more prescriptive definition, but we take exception to the use of the wording [exclusively to export] in Part 3.2.4. By using the word [exclusively], Part 3.2.4 does not take into account the operation of a pump hydro facility and other small units that use the GSU as an auxiliary power source when the unit is off-line.</p> <p>Also, with the word exclusively used, it could inadvertently cause a “loop hole” related to facilities intended to be in scope. To address our concern FE proposes that Part 3.2.4 be revised to read as follow:</p> <p>["Elements that connect a GSU transformer to the Transmission system that are used to export energy directly from a BES generating unit or generating plant."]</p> <p><b>Response:</b> The drafting team has clarified Applicability 3.2.4 to address this concern to permit supplying station service. Change made.</p> <p>Recognizing that the wording will also be used in PRC-023 applicability statement 4.2.1.1 the team should carefully consider a similar “loop hole” that may be caused by the word “export” in PRC-023. The question that needs to be considered is do the facilities need to be reviewed from a load serving perspective in PRC-023? FE’s view is that, the subject facilities when used to serve a plant auxiliary load, or pumping load would be radial to load facilities and not considered “network” facilities that is the focus of PRC-023. It’s FE’s view</p>



Organization	Yes or No	Question 1 Comment
		<p>that from a load serving mode perspective the radial facilities do not warrant consideration and do not present a reliability risk to the BES.</p> <p>To better clarify that the facilities reviewed under PRC-025 can be excluded in PRC-023 the team may wish to consider the following alternative language for Part 3.2.4.:</p> <p>["Elements that connect a GSU transformer to the Transmission system that are used for the sole-purpose of a BES generating unit or generating plant."]</p> <p><b>Response:</b> The drafting team appreciates FirstEnergy bringing awareness to this issue and will address these concerns when responding to stakeholder comments following the proposed PRC-023-3 standard comment period. No change made.</p> <p>This alternate language removes both the "exclusive" and "export" wording and may better meet the team's intentions for how the standards supplement each other in regards to relay loadability reviews.</p> <p>FE views our proposed changes as clarifying changes which do not substantively alter the team's intentions and scope of the PRC-025 and PRC-023 standards.</p> <p>FE appreciates the team's careful consideration of industry comments and the revisions made in its current draft standards. We have revised our ballot position to Affirmative for the current draft of PRC-025.</p>
<p><b>Response:</b> The drafting team thanks you for your comments; please see the above responses.</p>		
Arizona Public Service Company	Yes	<p>Negative vote for PRC-025-1: A high VRF is unjustified since a single unit relay setting error will have minimal impact on BES, particularly for smaller units.</p>
<p><b>Response:</b> The drafting team contends that the High VRF is correct, as it fully satisfies the associated criteria from the VRF Guidelines, "... a requirement in a planning time frame that, if violated, could, under emergency, abnormal, or restorative conditions</p>		

Organization	Yes or No	Question 1 Comment
<p>anticipated by the preparations, directly cause or contribute to bulk electric system instability, separation, or a cascading sequence of failures, or could place the bulk electric system at an unacceptable risk of instability, separation, or cascading failures, ..." Please note that the above criteria include emergency and abnormal conditions under which a loss of a generator that does not meet the loadability requirements could lead to one of these consequences. The drafting team also believes that a High VSL is appropriate, in that PRC-025-1 R1 applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL. The VSL is binary regardless of the size of the generating unit. No change made.</p>		
New Brunswick System Operator	Yes	<p>One omission which should be clarified is that the applicability section does not reference Distribution Provider and Transmission Owner, but they are referenced in the requirements. This could lead to some confusion so to clarify further, Distribution Provider and Transmission Owner should be added to the applicability section.</p>
<p><b>Response:</b> The drafting team notes that the Transmission Owner and the Distribution Provider did not appear in the initial posting and was reported by a stakeholder, corrected and reposted in the first two days of the comment period.</p>		
Bureau of Reclamation	Yes	<p>The Bureau of Reclamation suggests that the drafting team define the term "load responsive protective relay," perhaps as a "relay that responds or operates for a load current during temporary over-loading." The Bureau of Reclamation would like to thank the drafting team for a job well done!</p>
<p><b>Response:</b> The drafting team notes that the phrase "load-responsive protective relay" is widely understood by industry. No change made.</p>		
SPP Standards Review Group	Yes	<p>This is especially true regarding the treatment of UATs and the movement of focus to the high-side of the transformer.</p>
<p><b>Response:</b> The drafting team thanks you for your comment.</p>		
Texas Reliability Entity	Yes	<p>We are voting FOR this standard, subject to the following comment: (1) Most references to "Regional Reliability Organization" were correctly removed from</p>

Organization	Yes or No	Question 1 Comment
		this draft, but one occurrence remains on page 1 of Attachment 1, third paragraph. That reference to RRO should also be removed.
<p><b>Response:</b> The drafting team thanks you for identifying the missed item. Change made.</p>		
American Electric Power	Yes	
Independent Electricity System Operator	Yes	
Idaho Power Company	Yes	

END OF REPORT