

Consideration of Comments

Project 2010-13.2 Phase 2 Relay Loadability: Generation

The Relay Loadability: Generation Drafting Team thanks all commenters who submitted comments on PRC-025-1 and PRC-023-3. These standards were posted for a 30-day public comment period from April 25, 2013 through May 24, 2013. Stakeholders were asked to provide feedback on the standards and associated documents through a special electronic comment form. There were 51 sets of comments, including comments from approximately 166 different people from approximately 92 companies representing 9 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. In addition, there is a NERC Reliability Standards Appeals Process.¹

Summary of changes (PRC-023-3)

The generator relay loadability standard drafting team (“SDT”) has revised the proposed the draft of PRC-023-3 – Transmission Relay Loadability based on stakeholder comments received during its first 30-day formal posting. The following narrative is a summary of the significant improvements made to the standard.

Standard (PRC-023-3)

The SDT, based on industry stakeholder comments, made substantive changes to the PRC-023-3 standard. The chief change was removing the previously proposed Requirement R7 and R8 which applied to the generator interconnection Facility and generator step-up transformer applicable to the Distribution Provider and Transmission Owner. With this change the SDT added the Distribution Provider and Transmission Owner to the applicability of PRC-025-1 and removed the applicability of those lines and transformers that are used exclusively to export energy directly from a BES generating unit or generating plant to the network from PRC-023 to establish the bright line between standards according to stakeholder comments.

- Applicability
 - Removed references to Requirements R7 and R8

¹ The appeals process is in the Standard Processes Manual: http://www.nerc.com/files/Appendix_3A_StandardsProcessesManual_20120131.pdf

- Added the exception to sections 4.2.1.1, 4.2.2.1, and 4.2.2.2 to exclude lines and transformers that are used exclusively to export energy directly from a BES generating unit or generating plant to the network
- Removed the sections 4.2.3 and 4.2.4
- Requirements
 - Requirement R1, criterion 6 was removed to comport with the elimination of addressing load-responsive protective relays on lines and transformers that are used exclusively to export energy directly from a BES generating unit or generating plant to the network
- Measures
 - Removed the proposed Requirement R7
 - Removed the proposed Requirement R8
- Compliance
 - Removed R7 and R8 references
- Violation Severity Levels
 - Removed R7 and R8
- Attachment A
 - Revised criterion 2.4 as “Note Used” since it is no longer needed
- Attachment C
 - Removed due to Requirements R7 and R8 being eliminated

Implementation Plan (PRC-023-3)

- Updated to reflect the transition of PRC-023-3 Requirement R1, Criterion 6 to the proposed PRC-025-1 criterion

VRF/VSL Justifications (PRC-023-3)

No change, not being provided for comment because the SDT is not making substantive changes to the existing requirements. Only references to Requirement R1, criterion 6 were removed

Summary of changes (PRC-025-1)

The generator relay loadability standard drafting team (“SDT”) has revised 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 69.23% stakeholder approval. The following narrative is a summary of the significant improvements made to the above standard.

Standard (PRC-025-1)

- Purpose
 - Minor change for clarity
- Applicability
 - Included the Distribution Provider and Transmission Owner
 - Replaced “generator interconnection Facility” with “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”
- Requirement
 - Added the Distribution Provider and Transmission Owner
- Measures
 - Added the Distribution Provider and Transmission Owner
- Compliance
 - Added the Distribution Provider and Transmission Owner
- Violation Severity Levels
 - Added the Distribution Provider and Transmission Owner
- Attachment 1
 - General text revisions and clarifications
 - Removed the Regional Reliability Organization (RRO) references
 - Added the following elements to Options 15, 16, and 18; “Phase overcurrent supervisory elements (50) associated with current-based, communication-assisted schemes where the scheme is capable of tripping for loss of communications – installed on the high-side of the GSU transformer”

Implementation Plan (PRC-025-1)

- The implementation period for applying settings to load-responsive protective relays that do not require replacement or removal changed from 48 months to 60 months
- The implementation period for applying settings to load-responsive protective relays that do require replacement or removal changed from 72 months to 84 months

VRF/VSL Justifications (PRC-25-1)

- Removed references to PRC-023-3.

Index to Questions, Comments, and Responses

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1. Do the changes to the proposed PRC-023-2 and PRC-025-1 (listed above) provide a bright line between the two standards? If not, provide specific suggestions to improve or clarify the performance between the standards. 15
 2. Does the Table 1: Relay Loadability Evaluation Criteria in both PRC-023-3 (Attachment C) and PRC-025-1 (Attachment 1) clearly identify the criteria for setting load-responsive protective relays? If not, provide specific detail that would improve the clarity of Table 1. 33
 3. Does PRC-025-1, Guidelines and Technical Basis provide a clear understanding of the various criteria, including the options (e.g., 1a, 1b, 1c, 2a, etc.) for setting load-responsive protective relays? If not, provide specific detail that would improve the Guidelines and Technical Basis. 49
 4. The drafting team developed an Implementation Plan for the added requirements of the proposed PRC-023-3 that aligns with that proposed in PRC-025-1. Do you agree with the proposed Implementation Plan for PRC-023-3 Requirements R7 and R8 and the proposed RC-025-1: a. 48-months to apply load-responsive protective relay settings , where relay replacement is not required, and b. 72-months to apply load-responsive protective relay settings, where relay replacement is required? If not, provide an alternative implementation plan with specific rationale for such an alternative period. 61
 5. Do you have any other comments? If so, please provide suggested changes and rationale. 69

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	Pamela R. 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				
No additional members listed.													
2.	Group	Guy Zito	Northeast Power Coordinating Council										
Additional Member		Additional Organization	Region	Segment Selection									
1.	Alan Adamson	New York States Reliability Council, LLC	NPCC	10									
2.	Helen Lainis	Independent Electricity System Operator	NPCC	2									
3.	Greg Campoli	New York Independent System Operator	NPCC	2									
4.	Sylvain Clermont	Hydro-Quebec TransEnergie	NPCC	1									
5.	Chris de Graffenried	Consolidated Edison Co. of New York, Inc.	NPCC	1									
6.	Gerry Dunbar	Northeast Power Coordinating Council	NPCC	10									
7.	Mike Garton	Dominion Resources Services, Inc.	NPCC	5									

	Group/Individual	Commenter	Organization		Registered Ballot Body Segment										
					1	2	3	4	5	6	7	8	9	10	
8.	Kathleen Goodman	ISO - New England	NPCC	2											
9.	Michael Jones	National Grid	NPCC	1											
10.	David Kiguel	Hydro One Networks Inc.	NPCC	1											
11.	Christina Koncz	PSEG Power LLC	NPCC	5											
12.	Randy MacDonald	New Brunswick Power Transmission	NPCC	9											
13.	Bruce Metruck	New York Power Authority	NPCC	6											
14.	Silvia Parada Mitchell	NextEra Energy, LLC	NPCC	5											
15.	Lee Pedowicz	Northeast Power Coordinating Council	NPCC	10											
16.	Robert Pellegrini	The United Illuminating Company	NPCC	1											
17.	Si-Truc Phan	Hydro-Quebec TransEnergie	NPCC	1											
18.	David Ramkalawan	Ontario Power Generation, Inc.	NPCC	5											
19.	Brian Robinson	Utility Services	NPCC	8											
20.	Brian Shanahan	National Grid	NPCC	1											
21.	Wayne Sipperly	New York Power Authority	NPCC	5											
22.	Donald Weaver	New Brunswick System Operator	NPCC	2											
23.	Ben Wu	Orange and Rockland Utilities	NPCC	1											
24.	Peter Yost	Consolidated Edison Co. of New York, Inc.	NPCC	3											
3.	Group	David Thorne	Pepco Holdings Inc. & Affiliates		X		X								
	Additional Member	Additional Organization	Region	Segment Selection											
1.	Carl Kinsley	Delmarva Power & Light Company	RFC	1, 3											
2.	Alvin Depew	Pepco Holdings Inc.	RFC	1, 3											
4.	Group	Doug Hohlbaugh	FirstEnergy		X		X	X	X	X					
	Additional Member	Additional Organization	Region	Segment Selection											
1.	Bill Smith	FE RBB Voter Seg 1	RFC	1											
2.	Larry Raczkowski (proxy for Cindy Stewart)	FE RBB Voter Seg 3	RFC	3											
3.	Doug Hohlbaugh	FE RBB Voter Seg 4	RFC	4											
4.	Ken Dresner	FE RBB Voter Seg 5	RFC	5											
5.	Kevin Query	FE RBB Voter Seg 6	RFC	6											
6.	Bill Duge	FE SME - Generation	RFC	5											
7.	Brian Orians	FE SME - Generation	RFC	5											

Group/Individual	Commenter	Organization	Registered Ballot Body Segment																		
			1	2	3	4	5	6	7	8	9	10									
8.	Rusty Loy	FE SME - Generation	RFC	5																	
9.	Jim Detweiler	FE SME - Transmission	RFC	1																	
10.	Rich Maxwell	FE SME - Transmission	RFC	1																	
5.	Group	Russel Mountjoy	MRO NERC Standards Review Forum			X	X	X	X	X	X									X	
	Additional Member	Additional Organization	Region	Segment Selection																	
1.	Alice Ireland	Xcel Energy	MRO	1, 3, 5, 6																	
2.	Chuck Lawrence	ATC	MRO	1																	
3.	Dan Inman	MPC	MRO	1, 3, 5, 6																	
4.	Dave Rudolf	BEPC	MRO	1, 3, 5, 6																	
5.	Kayleigh Wilkerson	LES	MRO	1, 3, 5, 6																	
6.	Jodi Jensen	WAPA	MRO	1, 6																	
7.	Joseph DePoorter	MGE	MRO	3, 4, 5, 6																	
8.	Ken Goldsmith	ALTW	MRO	4																	
9.	Lee Kittleson	OTP	MRO	1, 3, 4																	
10.	Mahmood Safi	OPPD	MRO	1, 3, 5, 6																	
11.	Marie Knox	MISO	MRO	2																	
12.	Mike Brytowski	GRE	MRO	1, 3, 5, 6																	
13.	Scott Bos	MPW	MRO	1, 3, 5, 6																	
14.	Scott Nickels	RPU	MRO	4																	
15.	Terry Harbour	MEC	MRO	1, 3, 5, 6																	
16.	Tom Breene	WPS	MRO	3, 4, 5, 6																	
17.	Tony Eddleman	NPPD	MRO	1, 3, 5																	
6.	Group	David Greene	SERC Protection and Controls Subcommittee																		
	Additional Member	Additional Organization	Region	Segment Selection																	
1.	Paul Nauert	Ameren																			
2.	Bridget Coffman	Santee Cooper																			
3.	Phil Winston	Southern Company																			
4.	Joel Masters	SCE&G																			
5.	David Greene	SERC RRO																			

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
7.	Group	Brent Ingebrigtsen	PPL NERC Registered Affiliates	X		X		X	X				
Additional Member		Additional Organization		Region	Segment Selection								
1.	Brenda Truhe	PPL Electric Utilities Corporation		RFC	1								
2.	Annette Bannon	PPL Generation LLC on behalf of Supply NERC Registered 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	Patrick Brown	North American Generator Forum Standards Review Team					X					
Additional Member		Additional Organization		Region	Segment Selection								
1.	Allen Schriver	NextEra Energy			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.	Dan Duff	Liberty Electric Power			5								
6.	Mikhail Falkovich	PSEG			5								
7.	Mike Hirst	Cogentrix Energy, LLC			5								
8.	Gary Kruempel	MidAmerican Energy Company			5								
9.	Katie Legates	American Electric Power			5								
10.	Don Lock	PPL Generation, LLC			5								
11.	Joe O'Brien	NIPSCO			5								
12.	Dana Showalter	e.on			5								
13.	William Shultz	Southern Company			5								
14.	Mark Young	Tenaska, Inc.			5								
9.	Group	Lloyd A. Linke	Western Area Power Administration	X					X				
Additional Member		Additional Organization		Region	Segment Selection								

Group/Individual	Commenter	Organization	Registered Ballot Body Segment																	
			1	2	3	4	5	6	7	8	9	10								
1.	Upper Great Plains Region	Western Area Power Administration	MRO	1, 6																
2.	Rocky Mountain Region	Western Area Power Administration	WECC	1, 6																
3.	Desert Southwest Region	Western Area Power Administration	WECC	1, 6																
4.	Sierra Nevada Region	Western Area Power Administration	WECC	1, 6																
5.	CRSP Management Center	Western Area Power Administration	WECC	6																
10.	Group	Randi Heise	Dominion		X		X		X	X										
	Additional Member	Additional Organization	Region	Segment Selection																
1.	Connie Lowe	Dominion	MRO	6																
2.	Louis Slade	Dominion	RFC	5, 6																
3.	Michael Garton	Dominion	NPCC	5, 6																
4.	Michael Crowley	Dominion	SERC	1, 3																
11.	Group	Michael Lowman	Duke Energy		X		X		X	X										
	Additional Member	Additional Organization	Region	Segment Selection																
1.	Doug Hils		RFC	1																
2.	Lee Schuster		FRCC	3																
3.	Dale Goodwine		SERC	5																
4.	Greg Cecil		RFC	6																
12.	Group	Terry L. Blackwell	Santee Cooper		X		X		X	X										
	Additional Member	Additional Organization	Region	Segment Selection																
1.	Tom Abrams	Santee Cooper	SERC	1																
2.	Bridget Coffman	Santee Cooper	SERC	1																
3.	Rene' Free	Santee Cooper	SERC	1																
4.	Paul Camilletti	Santee Cooper	SERC	5																
13.	Group	Tom McElhinney	JEA		X		X		X											
	Additional Member	Additional Organization	Region	Segment Selection																
1.	Ted Hobson	JEA	FRCC	1																
2.	Garry Baker	JEA	FRCC	3																
3.	John Babik	JEA	FRCC	5																
14.	Group	Kent Kujala	DTE Electric				X	X	X											

Group/Individual	Commenter	Organization	Registered Ballot Body Segment										
			1	2	3	4	5	6	7	8	9	10	
Additional Member Additional Organization Region Segment Selection													
1.	Eizans	RFC	3, 4, 5										
2.	Herring	NPCC	3, 4, 5										
15.	Group	Jamison Dye	Bonneville Power Administration	X		X		X	X				
Additional Member Additional Organization Region Segment Selection													
1.	Dean Bender	Transmission Technical Services	WECC 1										
2.	Stephen Enyeart	Customer Service Engineering	WECC 1										
3.	Jim Burns	Technical Operations	WECC 1										
4.	Sandra Takabayashi	Hydro Projects	WECC 5										
16.	Group	Dennis Chastain	Tennessee Valley Authority	X		X		X	X				
Additional Member Additional Organization Region Segment Selection													
1.	Daniel McNeely		SERC 1										
2.	Ann Tankesley		SERC 1										
3.	Lee Thomas		SERC 5										
4.	Tom Vandervort		SERC 5										
5.	Paul Palmer		SERC 5										
6.	Annette Dudley		SERC 5										
7.	DeWayne Scott		SERC 1										
8.	Ian Grant		SERC 3										
9.	David Thompson		SERC 5										
10.	Marjorie Parsons		SERC 6										
17.	Group	Jason Marshall	ACES Standards Collaborators						X				
Additional Member Additional Organization Region Segment Selection													
1.	Scott Brame	North Carolina Electric Membership Corporation	SERC 1, 3, 4, 5										
2.	Megan Wagner	Sunflower Electric Power Corporation	SPP 1										
3.	Chris Bradley	Big Rivers Electric Corporation	SERC										
4.	Michael Brytowski	Great River Energy	MRO 1, 3, 5, 6										
5.	Shari Heino	Brazos Electric Power Cooperative	ERCOT 1, 5										
18.	Individual	Ed Croft	Operational Compliance	X		X		X					

Group/Individual		Commenter	Organization	Registered Ballot Body Segment									
				1	2	3	4	5	6	7	8	9	10
19.	Individual	Ryan Millard	PacifiCorp	X		X		X	X				
20.	Individual	Texas Reliability Entity	Texas Reliability Entity										X
21.	Individual	Vladimir Stanisic	AESI Inc.										
22.	Individual	John Yale	Chelan County PUD	X				X					
23.	Individual	Barbara Kedrowski	Wisconsin Electric			X	X	X					
24.	Individual	Clem Cassmeyer	Western Farmers Electric Cooperative	X				X					
25.	Individual	Michael Mayer	Delmarva Power & Light Company			X							
26.	Individual	NICOLE BUCKMAN	Atlantic City Electric Company			X							
27.	Individual	Mark Yerger	Potomac Electric Power Company			X							
28.	Individual	Jonathan Meyer	Idaho Power Company	X									
29.	Individual	Alice Ireland	Xcel Energy	X		X		X	X				
30.	Individual	Michael Falvo	Independent Electricity System Operator		X								
31.	Individual	Wryan Feil	Northeast Utilities	X									
32.	Individual	Nazra Gladu	Manitoba Hydro	X		X		X	X				
33.	Individual	Anthony Jablonski	ReliabilityFirst										X
34.	Individual	David Jendras	Ameren	X		X		X	X				
35.	Individual	Thomas Foltz	American Electric Power	X		X		X	X				
36.	Individual	Chris Mattson	Tacoma Power	X		X	X	X	X				
37.	Individual	RoLynda Shumpert	South Carolina Electric and Gas	X		X		X	X				
38.	Individual	Rick Terrill	Luminant Generation					X					
39.	Individual	David Gordon	Massachusetts Municipal Wholesale Electric Company					X					
40.	Individual	Mark Stein	Tri-State G&T	X		X		X					
41.	Individual	Michelle R. D'Antuono	Ingleside Cogeneration LP					X					
42.	Individual	Brenda Hampton	Luminant Energy Company LLC						X				

Group/Individual		Commenter	Organization	Registered Ballot Body Segment										
				1	2	3	4	5	6	7	8	9	10	
43.	Individual	John Bee	Exelon and its affiliates	X		X		X						
44.	Individual	Daniel Duff	Liberty Electric Power LLC					X						
45.	Individual	Oliver Burke	Entergy Services, Inc. (Transmission)	X		X		X	X					
46.	Individual	Chantel Haswell	Public Service Enterprise Group	X		X		X	X					
47.	Individual	Bret Galbraith	Seminole Electric Cooperative Inc.			X	X	X	X					
48.	Individual	Russ Schneider	Flathead Electric Cooperative			X	X							
49.	Individual	Robert Rhodes	Southwest Power Pool		X									
50.	Individual	Brett Holland	Kansas City Power and Light	X		X		X	X					
51.	Individual	Phil Waudby	Consumers Energy			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 thanks you for your support of other industry stakeholder comments. Approximately ten commenters supported four other organization’s comments. These comments are too extensive to summarize here and are summarized in the latter questions. Groups supported include Luminant Generation Company, LLC, North American Generator Forum (i.e., Generator Forum SDT and NAGF), Pepco Holdings Inc. & Affiliates, and Western Farmers Electric Cooperative.

Organization	Agree	Supporting Comments of “Entity Name”
DTE Electric	Agree	North American Generator Forum
Wisconsin Electric	Agree	NAGF
Western Farmers Electric Cooperative	Agree	Western Farmers Electric Cooperative
Delmarva Power & Light Company	Agree	Pepco Holdings Inc. & Affiliates
Atlantic City Electric Company	Agree	Pepco Holdings Inc. and Affiliates
Potomac Electric Power Company	Agree	Pepco Holdings Inc. and Affiliates
Massachusetts Municipal Wholesale Electric Company	Agree	North American Generator Forum
Luminant Energy Company	Agree	Luminant Generation Company LLC

Organization	Agree	Supporting Comments of "Entity Name"
LLC		
Liberty Electric Power LLC	Agree	Generator Forum SDT, as submitted by Patrick Brown, Essential Power
Tennessee Valley Authority		TVA electric generators segment agrees with comments submitted by the North American Generator Forum (NAGF).

1. Do the changes to the proposed PRC-023-2 and PRC-025-1 (listed above) provide a bright line between the two standards? If not, provide specific suggestions to improve or clarify the performance between the standards.

Summary Consideration: Approximately three comments representing about eight entities agreed that the changes established a bright line; however, the majority comments revealed that industry stakeholders did not agree with the drafting team’s proposed changes to the draft PRC-023-3 standard by adding Requirements R7 and R8 to address those load-responsive protective relays that would apply to the Distribution Provider and Transmission Owner. Among the previous additions include, Attachment C and Table 1 which contained the relay setting criteria as defined by the proposed PRC-025-1 standard applicable only to the generator. The drafting team received approximately six comments supported by 35 stakeholders that either said they did not see how the bright line was improved and the proposed Requirements R7 and R8, and Attachment C only added to confusion.

The drafting team agreed with the above comments and decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. In doing so, the generator requirements subject to PRC-023-3 have been removed; however, will be enforceable until the applicable entities become compliant with PRC-025-1, if settings need modifications. The drafting team notes that it is important to recognize that the owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025-1 and owner of load-responsive protective relays network-related Facilities in PRC-023-3 regardless of ownership of the Facilities.

The following discuss other minority comments by stakeholders. There was one comment supported by 11 entities asking the drafting team to define “generation interconnection Facilities.” Although this was a minority comment, the drafting team decided this had merit because the phrase was related to the work done under the NERC Project 2009-07 – Requirements at the Generation Interface. Based on this project and industry’s understanding the generator interconnection Facility is generally owned by the Generation Owner, the drafting team understood that when incorporating the Distribution Provider and Transmission Owner in PRC-025-1 that the phrase would add confusion; therefore, the drafting team developed alternative phrasing that reads: “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.”

Adding the Distribution Provider and Transmission Owner to the proposed PRC-025-1 standard addressed other minority comments. One commenter noted that the Distribution Provider, Generator Owner, and Transmission Owner should be in both standards. This was resolved addressing the majority comments. Two comments from individual entities noted that it appeared that both the generator step-up (GSU) transformer and the unit auxiliary transformer (UAT) appeared to be in both standards. After review, the drafting team noted that the GSU was applicable to the Distribution Provider and Transmission Owner in PRC-023-3 and the

Generator Owner in PRC-025-1 that own load-responsive protective relays on a GSU Facility; however, what was revealed was the lack of coverage for a UAT that might be served from the Transmission System. This identification provided support in the drafting team’s decision and response to comments to remove Requirements R7 and R8 from PRC-023-3 and add the Distribution Provider and Transmission Owner to PRC-025-1 which included the UAT.

The final minority comments were related to applicability. One commenter believed that only Facilities 200 kV and above should apply to the proposed Requirements R7 and R8 in PRC-023-3. The drafting team noted that it would create a gap in the Facilities that would be covered in each standard; however, with the removal of the two proposed requirements this problem no longer exists. About three comments supported by five entities ask for items that were either already in the provided Figures or as asked for more clarity. The drafting team revised Figures 1, 2, 3, and 5 to add clarity.

An individual comment asked for clarity regarding “BES Generation Unit.” The drafting team noted that the proposed PRC-025-1 standard is driven by whether or not an individual generating unit or generating plant meets the Bulk Electric System (BES) definition criteria (e.g., single units larger than 20 MVA or a site with an aggregate capacity of 75 MVA or greater). Once the unit or plant is applicable, those Elements found the Applicability section 3.2, Facilities are to be addressed by the loadability criteria of the standard. Last, one commenter asked how very small dispersed generators would be impacted. As mentioned in the previous sentence, small generators are addressed by virtue of the BES definition.

Organization	Yes or No	Question 1 Comment
Pepco Holdings Inc. & Affiliates	No	1) The inclusion of Requirements R7 and R8 and the entire Table 1 from PRC-025-1 overly complicates PRC-023-3. In addition, inclusion of these Table 1 requirements without the corresponding Guidelines and Technical Basis document produced for PRC-025 makes the application of Table 1 in PRC-023 difficult, if not impossible. The intent of the original PRC-023 was to apply to owners of load responsive relays (whether they be TO’s or GO’s) that are applied on BES transmission circuits and BES power transformers. The new PRC-025 standard should apply to owners of load responsive relays (whether they be TO’s or GO’s) that are applied on BES generators, GSUs, UAT’s and Generator Interconnection Facilities. In a good faith effort to provide a bright line between the two standards, the new PRC-023-3 standard became overly complicated and extremely confusing. It would seem that instead of adding PRC-025 requirements to PRC-023, it would be much simpler to just add Transmission Owners to the

Organization	Yes or No	Question 1 Comment
		<p>Applicability Entities section of PRC-025. The Applicable Facilities section of each standard should identify that any load responsive relay (whether they are owned by GO's or TO's) installed on these types of facilities must comply with the respective requirements of that standard. If this were done then the original PRC-023 could be revised to exclude relays installed on generators, GSU's, UAT's and Generator Interconnection Facilities, as they will be covered by PRC-025. PRC-023 would apply solely to owners of load responsive relays (whether they be TO's or GO's) that are applied on BES transmission circuits and BES power transformers.</p> <p>2) It is unnecessary to remove Criterion 6 from PRC-023-3 as it represents an acceptable alternative to the methods offered in PRC-025. When load responsive relays are set on transmission line terminals connected to generation stations remote from load in accordance with Criterion 6 of PRC-023 (230% of aggregate generation nameplate capability) the resulting setting provides sufficient margin to accommodate acceptable loadability. This criterion has been successfully used for years and has gone through the full standards development process and been vetted as an acceptable alternative. Consider the example calculation for Option 14a in PRC-025. From Equation 112 the apparent primary impedance seen by the relay on the high side of the GSU is 74.3 ohms primary at an angle of 52.77 degrees. Now assume the 230% method from PRC-023 Criterion 6 was used instead. The new apparent power would be $2.3 \times (767.6 \text{ MW} + j 475.6 \text{ MVAR}) = 2.3 \times 903 \text{ MVA} = 2076.9 \text{ MVA}$ at an angle of 31.8 degrees. Using Equation 112 the apparent primary impedance would be 41.4 ohms at 31.8 degrees. From Equation 115 the setting required to satisfy Option 14a criteria from PRC-025 would be 15.283 ohms sec = 76.42 ohms primary at 85 degrees. The reach of this relay along the 31.8 degree load angle would be $76.42 \times \text{Cos}(85 - 31.8) = 45.77 \text{ ohms primary}$. Since this is greater than the 41.4 ohm setting resulting from Criterion 6 of PRC-023, the PRC-023 Criterion is slightly more conservative, requiring a slightly smaller relay reach than Option 14a. As such, both methods should be considered equally effective in ensuring relay loadability.</p>

Organization	Yes or No	Question 1 Comment
		<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the standard is being revised to exclude the lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network from its Applicability. Also, Requirement R1, Criterion 6 is proposed for removal from the standard, as it addresses those Facilities being excluded from the Applicability. Change made.</p> <p>The drafting team thanks you for your comment and notes that it considered this same concern in past meetings and concluded that the Mega-Watt (MW) value reported to the Transmission Planner was the most practical approach for a basis in determining the required setting(s). The Generator Owner has flexibility in using a more restrictive setting, which would be the case of using the generator name plate. In option 1, for example, the requirement is to use 100% of the reported MW and 150% of the nameplate MW to arrive at the Mvar component of the complex power. The impedance element must be set less than the calculated impedance derived from 115% of the complex power, which is using criteria (1) and (2). The standard allows the applicable entities the flexibility to account for variable changes in the reported MW value and select a setting that best suits their specific operating history or expectation. No change made.</p> <p>Using the reported MW value accounts for environmental conditions that impact the operation of generation units and those units which operate at a level lower than their nameplate rating. This more closely achieves a loadability setting corresponding with the expected performance of the generator during field-forcing. No change made.</p>
FirstEnergy	No	<p>FirstEnergy (FE) appreciates the attempt to develop a bright-line method but feel the approach taken is over complicating the standards. FE believes that the changes made to PRC-023 with the inclusion of requirements R7 and R8 and the associated Attachment C cause unnecessary confusion. FE proposes that the team remove R7, R8 and Attachment C from PRC-023 and retain a modified version of PRC-023, R1 item 6. Further, as supported in our comments below, we encourage the team to limit the applicability of PRC-023 to the TO and DP and the applicability of PRC-025 to the GO. FE</p>

Organization	Yes or No	Question 1 Comment
		<p>believes it is imperative for NERC to develop its standards in a consistent approach in regard to terminology that is deemed “transmission” and those deemed “generation”. We are concerned that the proposed changes to PRC-023 and PRC-025 overly complicate what most in industry already understand to be “transmission” and “generation” facilities. For example, NERC recently proposed errata changes to PRC-004 and PRC-005 to clarify that for a GO the requirements of those standards extend not only to protection systems associated with the generating facility or station itself, but also to any protection systems associated with the generator interconnection facility. It’s difficult to understand why PRC-004 and PRC-005 seem to have clear TO and GO boundaries when it comes to reporting relay misoperations and performing relay maintenance, yet when ensuring relay loadability requirements are met things all of a sudden become much more complicated. To date, generation interconnection facility(ies) as used in NERC standards are generator owner assets, “generator lead”, operated at transmission voltage levels. However, if the generator lead happens to be owned by a transmission owner, then it’s understood simply to be a transmission line or transmission facility. The two relay loadability standards should maintain this same simplicity and PRC-023 should apply only to TO/DP and PRC-025 to the GO.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the standard is being revised to exclude the lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network from its Applicability. Also, Requirement R1, Criterion 6 is proposed for removal from the standard, as it addresses those Facilities being excluded from the Applicability. Change</p>

Organization	Yes or No	Question 1 Comment
		<p>made.</p> <p>The Generator Owner must be retained in the proposed PRC-023-3 standard to address those cases where the Generator Owner owns transmission load-responsive protective relays. Generator Owners may own transmission load-responsive protective relays applied on network transmission lines. For both standards, it is the ownership of the relays that drives the Applicability, not the ownership of the assets (e.g., GSU, transmission line). No change made.</p> <p>We suggest that the team take this opportunity to introduce a formally defined NERC Glossary Term for generator interconnection facility. During the recent webinar the team spent a fair amount of time indicating that when evaluating a generator interconnection facility(ies) as shown in Figure 1 and Figure 2 that it essentially comes down to the relay owner when determining which standard (PRC-023 or PRC-025) is applicable. The team indicated that if the GO owns the relay for line breaker(s) at Bus A then PRC-025 applies, but if the DP/TO owns the relay then PRC-023 applies. The team further described that the GO was left in PRC-023 to handle a situation where they may own relaying for line breaker(s) on networked transmission lines as shown in Figure 3.</p> <p>Response: The drafting team has replaced this term with "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant." Change made.</p> <p>The team also cited they retained the GO for this situation to avoid a potential "registration tension". The perceived need for the GO in standard PRC-023 calls into question the facility rating for the network transmission line as established under FAC-008-3. NERC standards must maintain consistent philosophies in terminology throughout all standards and cover the most common system configurations. Any unique situations will need to be dealt with on a case by case basis between asset owners. Additionally, NERC drafting teams should not be writing standards to cover</p>

Organization	Yes or No	Question 1 Comment
		<p>one-off configurations simply to address potential entity registration concerns.</p> <p>Response: The drafting team found that these conditions exist throughout North America in varying degrees due to industry deregulation and other factors. The drafting team is defining criteria such that similar Facilities will be subject to similar requirements regardless of Facility ownership as it relates to the NERC functional model. No change made.</p> <p>While FE strongly objects to the use of R7, R8 and Attachment C in PRC-023, if the team does not agree with our proposal to remove the GO completely from PRC-023 then as an alternate approach we support comments filed by Pepco Holdings, Inc. - PHI which suggesting adding the TO/DP to PRC-025 and removing R7, R8 and Attachment C from PRC-023. Either approach (FE's or PHI's) requires retaining item 6 of R1 in PRC-023.</p> <p>Response: In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the standard is being revised to exclude the lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network from its Applicability. Also, Requirement R1, Criterion 6 is proposed for removal from the standard, as it addresses those Facilities being excluded from the Applicability. Change made.</p> <p>The Generator Owner must be retained in the proposed PRC-023-3 standard to address those cases where the Generator Owner owns transmission load-responsive protective relays. Generator Owners may own transmission load-responsive protective relays applied on network transmission lines. For both standards, it is the ownership of the relays that drives the Applicability, not the ownership of the assets (e.g., GSU, transmission line). No change made.</p> <p>The criterion in PRC-025-1 is technically similar, but more precise than PRC-023-2 Requirement R1, Criterion 6; therefore, Criterion 6 must be removed. The drafting team acknowledges that entities that previously implemented Criterion 6 may find that changes are necessary; if so, the PRC-025-1 Implementation Plan would apply. Change</p>

Organization	Yes or No	Question 1 Comment
		<p>made.</p> <p>In summary, for PRC-023, FE proposes the following:</p> <ol style="list-style-type: none"> 1.) Remove the Generator Owner applicability 2.) Remove Requirements 7 and 8 since they will be included in PRC-025 3.) Remove Attachment C 4.) Change Requirement 1 Criteria #6 to read as follows: <p>“Set transmission line relays applied on transmission lines connected to generation stations remote to load directional towards the generator so they do not operate at or below 115% of the rating of the generator as calculated according to applicable NERC standards.”</p> <p>Although not our preferred option, we also recommend the team considered the suggestion by PHI that would add the TO as an applicable entity to PRC-025 while also removing PRC-023 R7, R8 and Attachment C.</p> <p>Response: Thank you for adding the summary. Please see the above responses.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
DTE Electric	No	<p>Comments: The distinction is not clear between these two standards regarding generator owner relays that look toward the transmission system. Perhaps specifying the application location of the relay (CT and PT inputs) would help in clarifying the differences</p>
<p>Response: The drafting team thanks you for your comment and notes that load-responsive protective relays applied on "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, “generator interconnection Facility”) are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are covered under the proposed PRC-023-3 standard. Please refer to the revised Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines</p>		

Organization	Yes or No	Question 1 Comment
and Technical Basis for further information on applications. Change made.		
Bonneville Power Administration	No	<p>The requirements for generator interconnection facilities in PRC-023-3 apply to Transmission Owner’s (and Distribution Provider’s, and the requirements for generator interconnection facilities in PRC-025-1 apply to Generation Owner’s. BPA believes that putting requirements for the generator interconnection facilities in two separate standards and making the applicability of the standards different is confusing and unnecessary. BPA recommends that all interconnection facilities, regardless of ownership, should be covered within one standard to provide uniformity in the application of settings for interconnection facilities.</p>
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p>		
ACES Standards Collaborators	No	<p>There is definitely much clearer delineation between what is required in PRC-023 by the Transmission Owner and Distribution Provider and in PRC-025 by the Generation Owner for generator step up transformers, generators, auxiliary transformers and generator interconnection facilities.</p> <p>However, PRC-023 still has other requirements that are applicable to Generators Owners that do not make sense, create compliance risks and, thus, detract from reliability by distracting the Generator Owner from value added reliability activities. For example, PRC-023 R1 is still applicable to the Generation Owner and it should not be. A Generation Owner does not own transmission beyond the generator interconnection facility. This is recognized in Project 2010-07 Generator Requirements at the Transmission Interface and NERC’s work surrounding the GO/TO and GOP/TOP registration issues. If a Generator Owner owned transmission beyond the generator</p>

Organization	Yes or No	Question 1 Comment
		interconnection facility, they would be registered as a Transmission Owner. Thus, the Generator Owner will be stuck essentially going through a registration exercise for every compliance activity to prove that the requirements do not apply because they do not own transmission facilities. Other requirements in PRC-023 that require removal of Generator Owner include R2, R3, R4, and R5. Until these removals occur, we will not be able to support the standard.
<p>Response: The drafting team thanks you for your comment and notes that the Generator Owner must be retained in the proposed PRC-023-3 standard to address those cases where the Generator Owner owns transmission load-responsive protective relays. Generator Owners may own transmission load-responsive protective relays applied on network transmission lines. For both standards, it is the ownership of the relays that drives the Applicability, not the ownership of the assets (e.g., GSU, transmission line). No change made.</p>		
Chelan County PUD	No	It seems that GSU and UAT would be subject to PRC-023 and PRC-025. It would be cleaner if one standard applied to GSU and UAT and the other to the transmission circuits.
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>With the changes, the GSU and UAT now apply to one standard, the proposed PRC-025-1.</p>		
Western Farmers Electric Cooperative	No	See comments to question 5
<p>Response: The drafting team thanks you for your comments; please see responses in question 5.</p>		

Organization	Yes or No	Question 1 Comment
Ameren	No	(1) For consistency, we believe that PRC-023-3 requirement R7 should only apply at 200kV and above. Therefore, we request the SDT to change 4.2.3.1 to 'Transmission lines operated at 200kV and above that are used...'
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>Although PRC-023 has a provision for addressing Facilities less than 200 kV for transmission network load-responsive protective relays; however, the drafting team is addressing generation Facilities such that the PRC-025 standard will be consistent with the definition of the Bulk Electric System (BES). Including those generation Facilities that are less than 200 kV addresses all BES generation which may be important during an event where field-forcing increases the need for a reasonable level of loadability. No change made.</p>		
American Electric Power	No	<p>AEP believes that both documents would benefit from the inclusion of a simplified GO/TO interface diagram showing the overlap and applicability of the two standards within the opening section of each standard. Clarity needs to be provided to PRC-023-3 regarding the proper consideration of GO-owned transmission line protection systems. It must be understood that for load responsive relays subject to R7 and R8, the responsibility to perform loadability evaluations is on whoever is the owner of the Protection System.</p> <p>Regarding PRC-023-3, it is unclear exactly what facilities are included in the term “BES Generating Unit”. It is requested that this be clarified. AEP also requests clarification on the voltage levels applicable to Regarding PRC-023-3 R7. Section 4.2.3.1 currently applies to “transmission lines” which implies that all voltage levels would be subject to this requirement. It is requested that this be revised to clarify exactly what voltage applies.</p>

Organization	Yes or No	Question 1 Comment
		<p>Response: The drafting team thanks you for your comment and notes that the Generator Owner must be retained in the proposed PRC-023-3 standard to address those cases where the Generator Owner owns transmission load-responsive protective relays. Generator Owners may own transmission load-responsive protective relays applied on network transmission lines. For both standards, it is the ownership of the relays that drives the Applicability, not the ownership of the assets (e.g., GSU, transmission line). No change made.</p> <p>The circumstance is the same as the current definition of Bulk Electric System that apply to the those individual generating units 20 MVA and larger or 75 MVA in aggregate on a site, including those Blackstart generating units identified in the Transmission Operator’s system restoration plan. No change made.</p> <p>The drafting team notes that load-responsive protective relays applied on "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, “generator interconnection Facility”) are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are covered under the proposed PRC-023-3 standard. Please refer to the revised Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis for further information on applications. Change made.</p> <p>With the removal of Requirements R7 and R8, the Applicability section 4.2.3.1 is no longer relevant. Change made.</p>
Luminant Generation	No	<p>Luminant recommends the following:</p> <p>(1) Load responsive relays identified in PRC-025-1 and 023-3 connected on generator breaker(s) at the GSU high side and are primarily used for backup of failed transmission line relaying shall use options in Attachment C (PRC-023-3) and Attachment 1 (PRC-025-1).</p> <p>(2) Load responsive relays identified in PRC-023-3 and connected on the high side of the GSU that are primarily used for transmission line protection shall use the existing criteria in PRC-023-2, Requirements R1 through R6. The above recommendations can be done by adding diagrams in PRC-023-3 and clarifying Figures 1, 2, and 3 in PRC-025-1.</p>

Organization	Yes or No	Question 1 Comment
<p>Response: The drafting team thanks you for your comment and notes that load-responsive protective relays applied on "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, "generator interconnection Facility") are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are covered under the proposed PRC-023-3 standard. Please refer to Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis for further information on applications. No change made.</p>		
<p>Ingleside Cogeneration LP</p>	<p>No</p>	<p>Even though the language in both standards draws a technically accurate bright line, Ingleside Cogeneration believes that the addition of the generator relay criteria to PRC-023-3 is confusing at best. It appears that the issue has to do with the ownership of the relays. In some cases the DP and/or the TO owns a load responsive relay that is protecting generation equipment. Conversely, some GOs own load responsive relays that protect transmission equipment.</p> <p>If the concept of the two standards is that PRC-023-3 applies to transmission-related relays and PRC-025-1 applies to generation-related relays, than the owner of the relay is not a gating factor. This means that the applicability table for both standards would include DPs, GOs, and TOs. There would be no repeated criteria between the standards in this arrangement - and less confusing in our view.</p>
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p>		
<p>Luminant Energy Company LLC</p>	<p>No</p>	<p>See Luminant Generation Company LLC comments.</p>
<p>Response: The drafting team thanks you for your comments; please see the response(s) for Luminant Generation Company LLC.</p>		

Organization	Yes or No	Question 1 Comment
Public Service Enterprise Group	No	For UATs per PRC-025-1, that are energized from the system (as opposed to from the GSU), the SDT seems to assume that no TO or DP owns the load responsive relays for these UATs. Has that been verified by the SDT?
<p>Response: The drafting team thanks you for your comment and notes it has not independently verified this particular scenario; however, with the proposed revisions, the Distribution Provider and Transmission Owner that own load-responsive protective relays regarding the unit auxiliary transformer (UAT) are now applicable under the proposed PRC-025-1 standard.</p> <p>The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p>		
Flathead Electric Cooperative	No	it is not clear to me how this would impact very small dispersed generators.
<p>Response: The drafting thanks you for your comments. This would not have any impact on very small dispersed generators unless they form aggregated generation at a single interconnection point as delineated in the latest approved BES definition (i.e., those individual generating units 20 MVA and larger or 75 MVA in aggregate on a site). No change made.</p>		
Kansas City Power and Light	No	We do not think that the Requirements added to the PRC-023-2 are any different than the Requirements in PRC-025-1. We agree that the addition of PRC-025-1 will cause the removal of part 6 of Requirement 1 in PRC-023-2.
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the standard is being revised to exclude the lines</p>		

Organization	Yes or No	Question 1 Comment
<p>that are used exclusively to export energy directly from a BES generating unit or generating plant to the network from its Applicability. Also, Requirement R1, Criterion 6 is proposed for removal from the standard, as it addresses those Facilities being excluded from the Applicability. Change made.</p>		
Liberty Electric Power LLC	No	
Dominion	Yes	<p>Dominion agrees that the addition of requirements in PRC-023-3, R7 and R8 strengthens the bright line between the two standards. However, we do not agree with use of the term “Transmission’ in 4.2.3.1 as it is our position that it does not conform with the intent of the term as defined in the NERC Glossary of Terms. We therefore suggest the sentence be revised to read “Lines that are used solely to export energy directly from a BES generating unit or generating plant to the network.”</p>
<p>Response: The drafting team thanks you for your comment and notes that the comment above is no longer relevant because: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p>		
Operational Compliance	Yes	<p>Content is good. However - the two standards should refer to EXACTLY the same table of Relay Loadability Evaluation Criteria with EXACTLY the SAME OPTION #s for each Relay Type/Application. The table could stand on its own and each record be labeled with PRC-025 and/or PRC-023 applicability (new column(s)).</p>
<p>Response: The drafting team thanks you for your comment and notes that the comment above is no longer relevant because: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive</p>		

Organization	Yes or No	Question 1 Comment
protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.		
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	Yes	
MRO NERC Standards Review Forum	Yes	
SERC Protection and Controls Subcommittee	Yes	
PPL NERC Registered Affiliates	Yes	
Western Area Power Administration	Yes	

Organization	Yes or No	Question 1 Comment
Duke Energy	Yes	
Tennessee Valley Authority	Yes	
PacifiCorp	Yes	
AESI Inc.	Yes	
Idaho Power Company	Yes	
Xcel Energy	Yes	
Independent Electricity System Operator	Yes	
Northeast Utilities	Yes	
Manitoba Hydro	Yes	
ReliabilityFirst	Yes	
Tacoma Power	Yes	
South Carolina Electric and Gas	Yes	
Entergy Services, Inc.	Yes	

Organization	Yes or No	Question 1 Comment
(Transmission)		
Southwest Power Pool	Yes	

2. **Does the Table 1: Relay Loadability Evaluation Criteria in both PRC-023-3 (Attachment C) and PRC-025-1 (Attachment 1) clearly identify the criteria for setting load-responsive protective relays? If not, provide specific detail that would improve the clarity of Table 1.**

Summary Consideration: In whole, the comments presented in this question were minority comments. Approximately, two comments representing 16 stakeholders reiterated that Requirements R7 and R8 should be removed from PRC-023. The drafting team removed the requirements and instead added the Distribution Provider and Transmission Owner to PRC-025 to avoid a gap or overlap in compliance as addresses in the above question.

The most notable minority comment by the SERC Protection Control Subcommittee identified key elements missing in PRC-025-1 that were addressed in PRC-023. That item was “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.” The drafting team agreed and added these elements to the proposed PRC-025-1, Attachment 1, Table 1.

Also, one entity objected to the use of “Regional Reliability Organization (RRO)” within the two standards due to being outdated. The drafting team re-evaluated the use of the term which was added to address an implementation gap between the MOD-025-2 standard that is pending regulatory approval and the subsequent approval of PRC-025-1. The problem stemmed from the applicable entities possibly not having an official reported value to the Transmission Planner pursuant to MOD-025-1 which could pose a compliance risk. To resolve this issue, the drafting team agreed with support of comments and regulatory staff to increase the PRC-025-1 standard Implementation Plan by one year. This would ensure that MOD-025-1 would be fully in effect (about 6 months) upon the date which entities must demonstrate compliance with PRC-025-1.

One entity suggested to the drafting team to provide references within the PRC-025-1, Table to improve the clarity. Previously, the drafting team in Table 1 and in options addressing the generator-side relay of the GSU, referenced the high-side option to help direct readers to the corresponding option. The drafting team clarified the high-side options with the same reference back to the generator-side relay of the GSU. The remaining comments, all minority comments, related to technical issues the drafting team worked through in earlier postings. Items such as using the generator nameplate, seasonal variation, or items addressed more fully in other questions in this comment report.

Organization	Yes or No	Question 2 Comment
Pepco Holdings Inc. & Affiliates	No	<p>For the PRC-025 standard the inclusion of Table 1 along with the Figures and Example Calculations in the Guidelines and Technical Basis document clearly identifies the proposed setting criteria. However, the inclusion of Table 1 in PRC-023 overly complicates the scope of PRC-023, and without inclusion of the corresponding Guidelines and Technical Basis document makes application of Table 1 criteria difficult.</p> <p>We feel strongly that all references to load responsive relays applied on generators, GSU's, UAT's and Generation Interconnection Facilities (including Table 1 and Requirements R7 and R8) should be eliminated from PRC-023 as they are already adequately covered in PRC-025. Transmission Owners that own load responsive relays on those types of facilities should be included as an Applicable Entity under PRC-025. (See comments submitted for Question 1).</p>
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</p>		
FirstEnergy	No	As stated above (Question 1) FE does not support the inclusion of Attachment C in PRC-023. See question 1 for more information. From a technical standpoint, we support Table 1 of PRC-025.
<p>Response: The drafting team thanks you for your comments; please see the above responses in question 1.</p>		
SERC Protection and Controls Subcommittee	No	There is a discrepancy between the relay functions listed in PRC-023-3 Attachment A and those identified in PRC-023-3 Attachment C Table 1 and PRC-025-1 Attachment 1 Table 1. PRC-023-3 Attachment A includes under 1.6, "Phase overcurrent supervisory

Organization	Yes or No	Question 2 Comment
		<p>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.” These schemes are not accounted for in the Table 1 of either proposed standard. Given these schemes are required to meet loadability criteria on transmission lines not meeting the “generator interconnection facility” designation (i.e. networked lines), the exclusion of the schemes from generator loadability criteria creates confusion. Loadability criteria should be included for “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” in Table 1 of both PRC-023-3 and PRC-025-1.</p>
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</p> <p>The drafting team thanks you for your comments and agrees with this suggestion and has modified the proposed PRC-025-1 standard in Attachment 1, Table 1, Options 15a, 15b, 16a, 16b, 18 and 19 to address this condition. Change made.</p>		
Dominion	No	<p>Dominion believes that the appropriate designation of “Real Power output” is the generator nameplate rating however Dominion does recognize that the addition of “gross” prior to MW is an improvement to the table wording.</p>
<p>Response: The drafting team thanks you for your comment and notes that it considered this same concern in past meetings and concluded that the Mega-Watt (MW) value reported to the Transmission Planner was the most practical approach for a basis in</p>		

Organization	Yes or No	Question 2 Comment
		<p>determining the required setting(s). The Generator Owner has flexibility in using a more restrictive setting, which would be the case of using the generator name plate. In option 1, for example, the requirement is to use 100% of the reported MW and 150% of the nameplate MW to arrive at the Mvar component of the complex power. The impedance element must be set less than the calculated impedance derived from 115% of the complex power, which is using criteria (1) and (2). The standard allows the applicable entities the flexibility to account for variable changes in the reported MW value and select a setting that best suits their specific operating history or expectation. No change made.</p> <p>Using the reported MW value accounts for environmental conditions that impact the operation of generation units and those units which operate at a level lower than their nameplate rating. This more closely achieves a loadability setting corresponding with the expected performance of the generator during field-forcing. No change made.</p>
<p>Bonneville Power Administration</p>	<p>No</p>	<p>Example: A 230kV line that is connected between a substation Terminal and a Generating station.</p> <p>(Comment 1)</p> <p>This circuit fits under 4.2.3 of PRC-023-3, so it is subject to Requirement 7. The circuit also fits under 4.2.1, so it is subject to Requirements R1 through R5. BPA believes it should only be subject to R1 through R5 or R7, not both.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the Applicability – 4.2, Circuits now provide the exclusion “except lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network.” Criterion 6 in Requirement R1 remains unused. Change made.</p>

Organization	Yes or No	Question 2 Comment
		<p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</p> <p>(Comment 2)</p> <p>R7 requires that the load responsive relays be set in accordance with PRC-023-3, Attachment C. BPA would like to point out that the phase distance relays at the substation terminal looking toward the generation are not covered by Attachment C and believes this creates a problem as it makes it impossible for these relays to be set in accordance with Attachment C. The same problem also exists for relays at the terminal of the generator step up (GSU) transformer looking toward the generation, recognizing that this is not a normal application. Based on these issues, BPA believes Attachment C should address all relays, not just those looking towards the Transmission system.</p> <p>Response: The drafting team added text to note that load-responsive protective relays directional toward the generator are not included. Also, the drafting team notes that the load-responsive protective relays directional toward the generator are not challenged by the loadability concerns for the stressed system conditions being addressed by the proposed PRC-025-1 standard; thus, criteria for these relays are not necessary. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Texas Reliability Entity	No	<p>(1) Texas RE objects to the use of the term Regional Reliability Organization (RRO) in Table 1. RRO is an obsolete term that NERC had been trying to purge from the standards, and we are somewhat alarmed to see it used in a new place in the standards. While we recognize that RRO is defined in the Glossary, it is not in the functional model and, at least in our region, it does not identify any entity and it is ambiguous. We urge you to replace the term RRO with an entity type from the functional model, or to write a description of what is intended without using the term</p>

Organization	Yes or No	Question 2 Comment
		<p>"RRO".</p> <p>Response: The reference to "...or other entity as specified by the Regional Reliability Organization (RRO)" has been removed from the standard. Change made.</p> <p>(2) Regarding the "Transformers" section on page 7 and footnote 3 on page 10, consider whether it is appropriate to use the "nameplate impedance at the nominal GSU turns ratio" in all instances. In some cases, it is more appropriate to use the calculated (i.e. with compensation) impedance that reflects the lowest value based on the de-energized tap and LTC tap positions for this purpose.</p> <p>Response: The drafting team notes that the tap impedance for older transformers may not be available for all tap positions; therefore, the drafting team is requiring the use of the nominal impedance. If entities wish to employ the actual tap impedance used or the most conservative tap impedance available, they may reflect that in the relay settings selected provided that the setting achieves the relay pick up setting criteria in Table 1. No change made.</p> <p>(3) For Options 1a, 2a, and 7a, consider using 0.9 per unit instead of 0.95 per unit, because typical disturbance (post-contingency) voltage criterion is 0.9 p.u.</p> <p>Response: The 0.95 per unit voltage specified in these options reflect the approximate generator bus voltage at a 0.85 per unit system voltage with a representative transformer impedance of 12 percent during field-forcing. No change made.</p> <p>(4) Consider clarifying that the Real Power output criteria should be based on the [highest seasonal] MW rating for the applicable unit. There can be significant seasonal variations in MW capabilities for some units. We don't expect pickup settings to be changed from season to season, so an appropriate year-round setting should be determined and applied.</p> <p>Response: 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</p>

Organization	Yes or No	Question 2 Comment
		<p>change made.</p> <p>(5) Some transmission systems have steady state stability limits that encroach into the generator capability limits. Consider adding exclusion criteria for these types of scenarios.</p> <p>Response: The drafting team notes that the generator is providing VARs to the system during field-forcing anticipated by the standard. The steady-state stability limit encroachment occurs only in the leading VAR scenario. This issue is being addressed by the NERC Board of Trustees adopted PRC-019-1 standard. No change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>AESI Inc.</p>	<p>No</p>	<p>The team is commended for an extensive effort to provide high level of detail through numerous relay setting examples summarized in Table 1 and elaborated in the document PRC_025_1_Guidelines_and_Technical_Basis_Draft_3_2013_04_24_Redline.pdf.</p> <p>Nonetheless, the following points may need further attention:</p> <ol style="list-style-type: none"> 1. The settings derived by simulations versus the settings derived by manual calculations are noticeably different, the latter being repeatedly much more conservative (e.g. 8c: 6.6 A pu versus 8a: 9.5 A pu), exposing generators to a higher risk of overloading. It would be expected that the results of manual calculations and simulations would yield closer values, at least for most of typical configurations. It appears that underlying assumptions used in the calculations and simulations may need to be fine-tuned. For example, is it realistic to have field forcing producing 1.5 pu MVAR output and at the same time generator bus voltage at 0.95 pu. <p>Response: The drafting team notes that “manual” calculations, in some cases, may be significantly more conservative than simulation results. However, the criteria specified by Options 1a, etc. reflect behavior observed for some generators in actual events and simulations. Therefore, the specified criteria are appropriate for non-simulation based</p>

Organization	Yes or No	Question 2 Comment
		<p>analysis. No change made.</p> <p>2. The settings derived by manual calculations are such the generators are exposed to a higher risk of overloading:</p> <ul style="list-style-type: none"> • Example 1a - 21 protection would operate only when unit loading exceeds approx. 280% (at rated power factor). • Example 2a - 51V protection pickup is set at equivalent of approx. 170% loading. <p>Taking into account that overcurrent relays actually react when current exceeds 1.5 pickup setting, equivalent loading on the unit would have to exceed 250% before timing is initiated. Depending on the relay characteristic, time delay can be significant.</p> <p>Response: The drafting team acknowledges that fault protective relaying may not provide adequate thermal overload protection; an exclusion is provided in the proposed PRC-025-1 standard for protection that is focused exclusively on overload protection. No change made.</p> <p>3. C37.102 states that acceptable settings for 21 function are 150% to 200% (at rated power factor). These values should guide the requirements of this standard.</p> <p>Response: The drafting team notes that for some generators a setting of 150% to 200% of the generator MVA rating at its rated power factor is insufficient and is moving beyond the general application guidance expressed in C37.102 so that load-responsive protective relays allow generators to support the system during stressed conditions to the extent possible. The drafting team also notes that while C37.102 provides general guidance on the reach for phase fault backup protection, it also provides insight regarding situations in which voltage regulator action could cause an incorrect trip. Similar to information in the Guidelines and Technical Basis for PRC-025-1, C37.102 notes that consideration should be given to reducing the reach of the relay and/or coordinating the tripping time delay with the time delays of the protective</p>

Organization	Yes or No	Question 2 Comment
		<p>devices in the voltage regulator. It also recommends that the setting of these relays be evaluated between the generator protection engineers and the system protection engineers to optimize coordination while still protecting the turbine generator, and that stability studies may be needed to help determine a set point to optimize protection and coordination. No change made.</p> <p>4. The Table specifies pickup setting criteria. It remains unclear when are the relays allowed to trip.</p> <p>Response: The drafting team notes that the impedance elements are allowed to trip at less than the pickup setting criteria and overcurrent elements are allowed to trip at greater than the pickup setting criteria. Timing considerations such as relay coordination are not addressed by this standard. No change made.</p> <p>5. Examples 7a, b, c, seem to be duplication of 1a, b, c.</p> <p>Response: Refer to Figure 4 in the Guidelines and Technical Basis. Option 1 relays are located on the generator and Option 7 relays are on the low-side terminals of the generator step-up (GSU) transformer. No change made.</p> <p>6. The following comment from the Guidelines document is not clear:=====Options 7a and 10, Table 1 - Bus Voltage, calls for a 1.0 per unit of the high-side nominal voltage for generator busvoltage, ***however due to the presence synchronous generator 0.95 per unit bus voltage will be used as (Vgen)***?:=====</p> <p>Response: The description prior to Equation 76 in the Guidelines and Technical Basis has been clarified as to why the 0.95 voltage is being used in the case of mixed synchronous and asynchronous generation. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Xcel Energy	No	<p>For 51 relay that is installed on the high side of GSU, we suggest it should be an acceptable option if the 51 relay setting meets R1 Criteria 11.</p>

Organization	Yes or No	Question 2 Comment
<p>Response: The drafting team thanks you for your comments notes that the criteria expressed in PRC-023-3, R1 Criterion 11, represents steady-state conditions for transmission transformers and does not represent the conditions that the GSU would see during field-forcing conditions. No change made.</p>		
Ameren	No	<p>(1) We ask the SDT to clarify that 'nameplate MVA rating' means the 'generator nameplate MVA rating'. Therefore we request that the SDT either add a statement "Unless otherwise stated, 'nameplate MVA rating' means the 'generator nameplate MVA rating' throughout Table 1", or insert 'generator' before 'nameplate MVA rating'.</p>
<p>Response: The drafting team thanks you for your comments and has added “generator” immediately prior to the applicable uses of “nameplate MVA rating” in Table 1. Change made.</p>		
American Electric Power	No	<p>PRC-023-3 must be clear in stating that, if a Transmission or Distribution line used solely to export energy directly from the GU has its own circuit breaker, then the existing R1 through R5 criteria should be applied based on the rating of the line.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the Applicability – 4.2, Circuits now provide the exclusion “except lines that are used exclusively to export energy directly from a BES generating unit or generating plant to the network.” Criterion 6 in Requirement R1 remains unused. Change made.</p> <p>PRC-023-3 appears to exclude relays directional toward the Generating Unit. For example, if you attempt to evaluate loadability for two-terminal 345kV line to a</p>

Organization	Yes or No	Question 2 Comment
		<p>windfarm, it appears to be applicable to both PRC-023-3 4.2.1 and 4.2.3. This would make it difficult to determine what Transmission lines are subject to evaluation and which requirement to apply, R1 or R7. Based on the current draft, it is not clear what criteria set to apply. The criteria in Table 1 is based on Generator’s power while the criteria in Requirement 1 is based on circuit ratings. It needs to be clarified which criteria set is to be applied.</p> <p>A second example is in a situation when a loadability evaluation is needed for a two-terminal line that is definitely not applicable to 4.2.1., but <i>is</i> applicable to 4.2.3. The intent of having two standards appears to be to have the relays on the Generating Unit end owned by the GO, set according to criteria R1 in PRC-025-1; and to have the relays on Generating Unit end owned by the TO, set according to criteria R7 in PRC-023-3. In this example, there would appear to be no criteria required to set relays on the end external to the Generating Unit, for relays owned by either the GO or TO. Clarification is needed to define responsibility based on Protection System ownership as well as to clearly convey the applicability of remote protection systems.</p> <p>Response: The drafting team added text to note that load-responsive protective relays directional toward the generator are not included. Also, the drafting team notes that the load-responsive protective relays directional toward the generator are not challenged by the loadability concerns for the stressed system conditions being addressed by the proposed PRC-025-1 standard; thus, criteria for these relays are not necessary. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Luminant Generation	No	Luminant disagrees that the criterion for setting load responsive relays is clear because of the bright line is vague. Luminant recommends that each standard be clear in addressing the relay setting criteria by its primary application.
<p>Response: The drafting team thanks you for your comment and notes that load-responsive protective relays applied on</p>		

Organization	Yes or No	Question 2 Comment
<p>"Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, "generator interconnection Facility") are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are covered under the proposed PRC-023-3 standard. Please refer to the revised Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis for further information on applications. Change made.</p>		
Luminant Energy Company LLC	No	See Luminant Generation Company LLC comments.
<p>Response: The drafting team thanks you for your comments; please see the response(s) for Luminant Generation Company LLC.</p>		
Kansas City Power and Light	No	<p>We do not think that the information that is shown in the Attachment is very easy to understand but the additional information in the Guidelines and Technical Basis section helps to understand what the table is requesting.</p> <p>Please add to the table the examples shown in the Guidelines and Technical Basis or at a minimum refer to the location the example can be found in that document. This will assist in the understanding of the table.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</p> <p>In the Guidelines and Technical Basis the calculation the previous value used for MW was based on the PF for Max Generation. In the new example the value of MW used</p>

Organization	Yes or No	Question 2 Comment
		<p>changed why did that value change?</p> <p>Response: In the previous draft of the calculations, the $P_{reported}$ and the calculated P happened to be the same value and caused confusion. Because of the identical values, the drafting team decided to use a different value for $P_{reported}$ so that the values would not be confused. No change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Western Area Power Administration	Yes	<p>Recommend adding reference to Table 1 - Options 7, 8, 9, 10, 11, 12 - Relay Type back to options 1, 2, 3, 4, 5, 6 for applications on the generator side of the GSU. The language and reference used in the Relay Type column for Options 1-6 added clarity and should be mirrored in Options 7-12.</p>
<p>Response: The drafting team thanks you for your comment and agrees that where the generator-side options refer to the high-side options, that the high-side options should also refer to the generator-side options. Change made.</p>		
ACES Standards Collaborators	Yes	<p>The table is much clearer than in past versions. However, we do recommend one minor additional change. The option numbers should be reset to 1 for every application and relay type combination since they are truly options within those combinations. Otherwise, a reader may believe they have 19 options and only have to pick one relay type and application to apply.</p>
<p>Response: The drafting team thanks you for your comment and suggestion; however, the drafting team asserts the use of sequential numbering is more beneficial and avoids confusion when referring to an option. No change made.</p>		
Operational Compliance	Yes	<p>But...see comments for Question #1.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses for question 1.</p>		

Organization	Yes or No	Question 2 Comment
Manitoba Hydro	Yes	(1) Manitoba Hydro suggests eliminating Table 1 from one of the standards and referencing it in the other standard, since both PRC-023-3 and PRC-025-1 are already very lengthy standards.
<p>Response: The drafting team thanks you for your comment and has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</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	Yes	
MRO NERC Standards Review Forum	Yes	
PPL NERC Registered	Yes	

Organization	Yes or No	Question 2 Comment
Affiliates		
Duke Energy	Yes	
Tennessee Valley Authority	Yes	
PacifiCorp	Yes	
Chelan County PUD	Yes	
Idaho Power Company	Yes	
Independent Electricity System Operator	Yes	
Northeast Utilities	Yes	
ReliabilityFirst	Yes	
Tacoma Power	Yes	
South Carolina Electric and Gas	Yes	
Ingleside Cogeneration LP	Yes	
Entergy Services, Inc. (Transmission)	Yes	

Organization	Yes or No	Question 2 Comment
Southwest Power Pool	Yes	

- 3. Does PRC-025-1, Guidelines and Technical Basis provide a clear understanding of the various criteria, including the options (e.g., 1a, 1b, 1c, 2a, etc.) for setting load-responsive protective relays? If not, provide specific detail that would improve the Guidelines and Technical Basis.

Summary Consideration: There were three significant comments in this question. One comment representing about five stakeholders suggested defining “generator interconnection Facility.” The drafting team addressed this in several comments and the summary can be found in the summary to question 1. Second, the same comment revealed minor errors in a Figure, calculation, and within the Guidelines and Technical Basis. The drafting team corrected these errors and made clarifications. Also, this commenter suggested performing calculations in per unit; however, the team disagreed that the current method was adequate.

Other minority single comments relate to issues the drafting team has worked through in earlier postings of the standard. They include the basis why transformers are being addressed, applicability of the UAT used only during startup, multi-winding example calculation, changes in the reported Real Power out to the Transmission Planner (e.g. seasonal variations), appending the Guidelines and Technical Basis back to the standard, and request for clarity in the examples.

Organization	Yes or No	Question 3 Comment
Pepco Holdings Inc. & Affiliates	No	<p>1) The new term “Generator Interconnection Facilities” is not defined in the NERC Glossary of terms, nor is it defined in the body of the standard. It is defined in the Guidelines and Technical Basis document; however, we feel this term needs to be defined within the body of the standard itself. Perhaps a footnote similar to that used to define Unit Auxiliary Transformers would be appropriate. We would suggest the same definition used in the Guidelines and Technical Basis document be inserted: “Generator interconnection Facility(ies) consists of Elements between the generator step-up transformer and the interface with the portion of the bulk Electric System (BES) where Transmission Owners take over the ownership.”</p> <p>Response: The drafting team has replaced this term with "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant." Change made.</p>

Organization	Yes or No	Question 3 Comment
		<p>2) In Figures 4 and 5 the CT's supplying the 21, 51V-R and 51V-C relays connected to the generator(s) look like they are connected to the generator neutral. To make it clear that they are supplied from CT's connected in the phase leads, a phase to neutral transition symbol (ref Fig 7.4 in IEEE C37.102) should be used to indicate the CTs are located above the neutral connection point.</p> <p>Response: Figures 4 and 5 have been modified to address this concern. Change made.</p> <p>3) In Figure 5 there is a 51 relay shown connected to the 22kV bus leads supplying the generator on the left hand side of the drawing. This 51 relay is not revered, or used, in any of the options and therefore should be removed from the drawing.</p> <p>Response: Figure 5 and Table 1, Option 5 has been revised to address this concern. Change made.</p> <p>4) Options 14a, 14b, 15a, 15b, 16a and 16b all use an MVAR value equal to 120% of the aggregate generation MW value, instead of the 150% value used when the relays are located on the generator side of the GSU transformer. Presumably this is to account for the I squared Xt MVAR loss consumed in the GSU transformer. However, there is no mention of this fact in the Guidelines and Technical Basis document. To avoid confusion as to why different MVAR criteria are used, supporting technical justification / explanation should be offered in the document.</p> <p>Response: The assumption is correct. Discussion has been added to the Guidelines and Technical Basis. Change made.</p> <p>5) The example calculations for Options 4 and 10 are combined as a single identical set of calculations. This calculation is appropriate for Option 10 but not for Option 4. Referring to Figure 5, the 21 relays for Option 4 are shown connected to each individual generator. Also the 20MVAR static compensation source is connected upstream of each generator relay. As such, the 21 relay on each individual generator (Option 4) will only see the MW and MVAR flows from a single generator, not the aggregate of all the generation plus the 20MAR reactive source. A separate</p>

Organization	Yes or No	Question 3 Comment
		<p>calculation for Option 4 should be developed. For that Option 4 case the single generator apparent power (assuming three generators of equal size) would be $102/3 = 34$ MW and $63.2/3 = 21$ MVAR, which is 40 MVA for each generator.</p> <p>Response: Figure 5 in the Guidelines and Technical Basis has been modified to account for this discrepancy and the calculation example for Option 4 and 10 have been separated. Change made.</p> <p>6) The example calculations for Option 5 appear to be incorrect. Again referring to Figure 5, the 51V-R relays for Option 5 are shown connected to each individual generator. Also the 20MVAR static compensation source is connected upstream of each generator relay. As such, the 51V-R relay on each individual generator (Option 5) will only see the MW and MVAR flows from a single generator, not the aggregate of all the generation plus the 20MAR reactive source. As such the 51V-R relay should be set to 130% of the maximum MVA rating of that individual generator. Again assuming three units of equal size, each generator would be rated 40MVA and therefore the 51V-R relay should be set to not operate below $1.3 \times 40 = 52$ MVA</p> <p>Response: The calculation for Option 5 in the Guidelines and Technical Basis has been corrected to reflect a single asynchronous generation unit and not the aggregate. Change made.</p> <p>7) The example calculations for Options 7a, 10, 8a, 9a, 11, and 12 illustrate a mixture of synchronous and asynchronous generators. However, there is no corresponding one-line drawing which corresponds to these examples. Because of this, it is difficult visualize the topology of this arrangement and where the corresponding relays would be located. If the SDT wishes to provide an example calculation where there is a mix of synchronous and asynchronous generation then we would suggest an additional figure be added (Figure 6) which would illustrate this type of connection.</p> <p>Response: Figure 5 and the calculations for Option 10 in the Guidelines and Technical Basis has been modified and corrected to reflect a mixture of synchronous and</p>

Organization	Yes or No	Question 3 Comment
		asynchronous generators (Equations 71-93). Change made.
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
PPL NERC Registered Affiliates	No	See Comments for Question #5
<p>Response: The drafting team thanks you for your comments; please see the responses for question 5.</p>		
North American Generator Forum Standards Review Team	No	See comments to question 5 below
<p>Response: The drafting team thanks you for your comments; please see the responses for question 5.</p>		
Duke Energy	No	Examples of calculations are helpful. However, more details on the root of the calculations are needed. Exclusively calculating values on a per unit basis would add more clarity.
<p>Response: The drafting team thanks you for your comment and asserts the basis for the calculations are addressed in the Guidelines and Technical Basis narrative. The drafting team also notes that Generator Owners may perform calculations in per unit or in actual values. The examples are provided in actual values. No change made.</p>		
JEA	No	While it has been demonstrated in the 2003 blackout that a small percentage of generating units did trip off line prematurely due to conservative setting of generator protection systems, no evidence has been provided that transformer tripping contributed to the cause of the generation outages. The sole purpose as stated by the SDT for including transformers is a directive from FERC. We believe that there should be some evidence as to the benefit of preforming protection modifications to

Organization	Yes or No	Question 3 Comment
		<p>transformers and that they should not simply be included until a study can be performed to show the cost benefit analysis and therefore recommend that transformers be excluded during this phase and be incorporated into a phase III.</p> <p>Response: FERC has already ruled on entities’ requests for clarification and rehearing on Order 733 with regard to this matter. The drafting team notes that entities may change the configuration or operation of their network to facilitate compliance but not to eliminate a compliance obligation. No change made.</p> <p>If transformers are to be included, an exception should be provided to allow the start-up transformer to be used to provide auxiliary power in case of failure of the auxiliary transformer. BES reliability is better served by allowing this exception (which will occur very infrequently) than to keep the generating unit off line for fear of being out of compliance with a standard.</p> <p>Response: The drafting team contends that if this is an anticipated operating condition, the protective relays on the alternate source of station service would need to be compliant with the standard. No change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Bonneville Power Administration</p>	<p>No</p>	<p>While the Guidelines and Technical Basis provides useful information, BPA is concerned that this document will not be approved by FERC as part of the standard and thus the standard must be capable of standing on its own. For this reason, BPA requests that clarification provided in the Guidelines and Technical Basis document be included into the standard specifically in regards to ‘generator interconnection facilities’.</p>
<p>Response: The drafting team thanks you for your comments and will re-append the Guidelines and Technical Basis document to the standard prior to filing with FERC. The documents were separated for management purposes and to facilitate editing between team members. No change made.</p>		

Organization	Yes or No	Question 3 Comment
AESI Inc.	No	Please see comments on Question 2.
<p>Response: The drafting team thanks you for your comments; please see the above responses in question 2.</p>		
Western Farmers Electric Cooperative	No	See comments to question 5
<p>Response: The drafting team thanks you for your comments; please see the responses below in question 5.</p>		
Xcel Energy	No	<p>In the last paragraph on page 19 of the clean version of the PRC-025-1 Guidelines and Technical Basis, the following sentence appears:</p> <p>"Phase time overcurrent relays applied to the UAT that act to trip the generator directly or via lockout or auxiliary tripping relay are to be compliant with the relay setting criteria in this standard."</p> <p>This typically would be the case for UAT's connected to the generator bus. However, for system connected auxiliary transformers as shown in Fig 6 on page 20, it is very unlikely that the time overcurrent relays protecting the system connected transformers will act to trip the generator directly or via lockout as this is a different zone of protection and to do so might result in an unnecessary challenge of the unit's overspeed protection. Instead, these overcurrent relays will trip the source breakers feeding the system connected auxiliary transformer but will not act to directly trip the generator. The generator will ultimately trip because of the resultant loss of power to the auxiliary system when the source breakers feeding the auxiliary transformer are tripped. The loss of auxiliary power will likely result in some form of a turbine/prime move trip and the generator breaker will be tripped open once power output drops to zero. In this manner, unit overspeed protection is not unnecessarily challenged. It seems that the quoted sentence on page 19 only serves to confuse the matter. If the goal of this setting requirement is to not to have the plant trip due to a loss of auxiliary power based on overly conservative setting of overcurrent relays, it is immaterial</p>

Organization	Yes or No	Question 3 Comment
		<p>whether the overcurrent relays act to trip the generator directly or via lockout or auxiliary tripping relay or if the plant ultimately trips because a loss of auxiliary power caused by overcurrent relays opening source breakers to the system connected auxiliary transformer. We recommend the quoted sentence be stricken from the guideline and technical basis document.</p>
<p>Response: The drafting team thanks you for your comments and contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p>		
ReliabilityFirst	No	<p>1) There appears to be an error in the Guidelines and Technical Basis document on page 23 for option 15b. It indicates that the Reactive Power output that equates 120% of the maximum gross Mvar output whereas Table 1 states 100%.</p> <p>Response: Yes, this was an error in the Guidelines and Technical Basis document for Option 15b. The value should be 100% of the output determined by simulation like the other options. Change made.</p> <p>2) A statement should be inserted that the iterative calculation stopped because the change was < 1%. This applies to options 1b & 7b on page 31 and option 2b on page 38. Also, if an entity knows the resistive and reactive impedances of the transformer, the entity could directly calculate the low-side GSU voltage from the high-side voltage, the per unit current through the GSU and the full impedance of the transformer.</p> <p>Response: This convergence of the equation is addressed for Options 1b and 7b in the calculations above Equation 14. This text was not provided in the calculation for Option 2b; therefore, it will be added to improve overall clarity. There are two variables in this calculation which depend on each other; therefore iteration is necessary. Change made.</p>

Organization	Yes or No	Question 3 Comment
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Ameren</p>	<p>No</p>	<p>(1) We request the SDT to add a multiple winding transformer example. We recommend that the SDT include an example with equally rated CTGs connected to equally rated dual secondary transformer windings stepping up to a single high voltage winding, because it is commonly used.</p> <p>Response: For the configuration above, the GSU relays will be set on an aggregated generator basis. The generator relay setting will be set on an individual generator basis. The drafting team contends that the calculations provide adequate direction for this configuration. No change made.</p> <p>(2) The MW capability reported to the Transmission Planner changes by a very small amount from time to time. As written we believe that this could trigger a significant amount of documentation. We request the SDT to show in your example (s) how an increased margin would address such a small change (e.g. a 2% increase from the originally documented value) before triggering such a review.</p> <p>Response: The drafting team contends that if an entity is concerned about minor changes in the reported capability, the entity can reflect these minor changes as increased margin in their relay setting. No change made.</p> <p>(3) On page 2 of the Guidelines and Technical Basis document, we ask the SDT to delete 'Generator Owner' from the last sentence of Figure 2 caption.</p> <p>Response: This was recognized as an error after the posting. The “Generator Owner” has been removed from the Figure 2 text. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Luminant Generation</p>	<p>No</p>	<p>Figures 1, 2, and 3 do not provide a sufficient bright line between the application of PRC-025-1 and PRC-023-3 for setting criterion. Luminant recommends that additional</p>

Organization	Yes or No	Question 3 Comment
		<p>information be added that identifies that a load responsive relays located on the transmission line breaker at Bus A and are primarily installed for transmission line protection use PRC-023-3 criterion Requirements R1 through R6 (regardless of the number of generators or transmission lines connected to Bus A). Load responsive relays located on the high side of the GSU and are primarily used for failed transmission line protection should use PRC-023-3 (Attachment C) or PRC-025 (Table 1).</p>
<p>Response: The drafting team thanks you for your comment and notes that load-responsive protective relays applied on "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, "generator interconnection Facility") are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are covered under the proposed PRC-023-3 standard. Please refer to the revised Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis for further information on applications. Change made.</p>		
Tri-State G&T	No	<p>The generator overload protection exception added to Draft 3 for extremely inverse characteristics is a major improvement, but the term "full-load current" needs clarification. 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>Response: The drafting team thanks you for your comments and notes that the phrase full load current refers to rated armature current of the generator. No change made.</p>		
Luminant Energy Company LLC	No	<p>See Luminant Generation Company LLC comments.</p>
<p>Response: The drafting team thanks you for your comments; please see the response(s) for Luminant Generation Company LLC.</p>		
Entergy Services, Inc.	No	<p>The Guidelines are still not clear about what to do with start-up transformers when</p>

Organization	Yes or No	Question 3 Comment
(Transmission)		used in lieu of the UATs (Unit Auxiliary Transformer).
<p>Response: The drafting team thanks you for your comments and contends that if this is an anticipated operating condition, the protective relays on the alternate source of station service would need to be compliant with the standard. No change made.</p>		
Tennessee Valley Authority	No	
Operational Compliance	Yes	<p>See comments for Question #1.</p> <p>In addition, Figures 1,2 and 3 could be clarified by</p> <ol style="list-style-type: none"> 1) labelling the Generator Interconnection Facility with a pointer and parentheses, 2) include table with columns for Relay Owners, Function of Owner and Applicable Standard. This way, a quick glance at the figure can clarify which standard is applicable (rather than having to decipher the caption).
<p>Response: The drafting team thanks you for your comment and notes that load-responsive protective relays applied on "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, "generator interconnection Facility") are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are covered under the proposed PRC-023-3 standard. Please refer to the revised Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis for further information on applications. Change made.</p>		
Southern Company: Southern Company Services, Inc.; Alabama Power Company; Georgia Power Company; Gulf Power Company;	Yes	

Organization	Yes or No	Question 3 Comment
Mississippi Power Company; Southern Company Generation; Southern Company Generation and Energy Marketing		
FirstEnergy	Yes	
MRO NERC Standards Review Forum	Yes	
SERC Protection and Controls Subcommittee	Yes	
Dominion	Yes	
PacifiCorp	Yes	
Idaho Power Company	Yes	
Independent Electricity System Operator	Yes	
Northeast Utilities	Yes	
Manitoba Hydro	Yes	

Organization	Yes or No	Question 3 Comment
American Electric Power	Yes	
Tacoma Power	Yes	
South Carolina Electric and Gas	Yes	
Ingleside Cogeneration LP	Yes	
Southwest Power Pool	Yes	
Kansas City Power and Light	Yes	

4. The drafting team developed an Implementation Plan for the added requirements of the proposed PRC-023-3 that aligns with that proposed in PRC-025-1. Do you agree with the proposed Implementation Plan for PRC-023-3 Requirements R7 and R8 and the proposed PRC-025-1: a. 48-months to apply load-responsive protective relay settings , where relay replacement is not required, and b. 72-months to apply load-responsive protective relay settings, where relay replacement is required? If not, provide an alternative implementation plan with specific rationale for such an alternative period.

Summary Consideration: Only a minority of commenters provided comments regarding the Implementation Plan. In past postings, a number of commenters suggested increasing the Implementation Plan due to varying factors. The drafting team was reluctant to increase the period beyond the 48 months for applying settings on relays that do not require replacement and 72 months for those relays which require replacement or removal. Four comments supported by 11 entities propose lengthening the period in these comments. However, based on other factors identified in question 2, the drafting team has lengthened the Implementation Plan from 48 to 60 months for applying settings on relays that do not require replacement and from 72 to 84 months for those relays which require replacement or removal.

One comment noted a lack of clarity on the implementation of PRC-023-3. The drafting team resolved that by removing the proposed Requirements R7 and R8 and adding the Distribution Provider and Transmission Owner to PRC-023-3. One comment suggested adding the word “removed” in the “replacement” timeframe for clarity. The drafting team agreed and made the change. Another comment disagreed with the 100 percent compliance approach. The drafting team did not have any flexibility to investigate other compliance approaches. One comment suggested a phased approach to the Implementation Plan; however, the drafting team agreed the current two-phased approach is the most practical. Last, one comment suggested adding formatting to the effective date language to draw attention to “do require replacement” and “do not require replacement.” The drafting team did not agree the suggestion provided a substantive improvement to clarity.

Organization	Yes or No	Question 4 Comment
Duke Energy	No	Duke Energy schedules some of its generating units on a 24 month cycle for minor outages and a 96 month cycle for major outages. This would make the current

Organization	Yes or No	Question 4 Comment
		Implementation Plan very expensive and difficult to comply with if relay replacements are required. [Duke Energy suggests a 48 month and 96 month Implementation Plan. This would allow for the industry to use existing outage schedules, keeping overall costs at a minimum.]
<p>Response: The drafting team thanks you for your comment and has increased the implementation period from 48 months to 60 months for applying settings on load-responsive protective relays that do not require replacement or removal, and from 72 months to 84 months for applying settings on load-responsive protective relays that do require replacement or removal to prevent an implementation gap with the MOD-25-2 standard which is pending regulatory approval. Change made.</p>		
JEA	No	Considering that applying new settings and testing will require a major outage, we believe that 48 months is not a sufficient time frame for full implementation when existing equipment can be used and relay replacement is not required. We recommend 72 months be allowed even in the case where existing equipment can be used. It may take a year or more to perform the calculations and evaluated equipment and then another 5 years for a major planned outage to occur.
<p>Response: The drafting team thanks you for your comment and has increased the implementation period from 48 months to 60 months for applying settings on load-responsive protective relays that do not require replacement or removal, and from 72 months to 84 months for applying settings on load-responsive protective relays that do require replacement or removal to prevent an implementation gap with the MOD-25-2 standard which is pending regulatory approval. Change made.</p>		
DTE Electric	No	Comments: Suggest that allowing 72 months to become 100% compliant for both 4a and 4b would better align with the unmonitored protective relay maximum maintenance interval of 6 years specified in PRC-005-2. In this way, relay setting changes or replacements could be accommodated during normal scheduled relay maintenance. Also, 48 months could be difficult to achieve for a company with a large generation fleet.
<p>Response: The drafting team thanks you for your comment and has increased the implementation period from 48 months to 60</p>		

Organization	Yes or No	Question 4 Comment
<p>months for applying settings on load-responsive protective relays that do not require replacement or removal, and from 72 months to 84 months for applying settings on load-responsive protective relays that do require replacement or removal to prevent an implementation gap with the MOD-25-2 standard which is pending regulatory approval. Change made.</p> <p>Also, it is beyond the drafting team’s control to ensure that a standard is approved and implemented in such a way to facilitate alignment with the implementation of other standards. No change made.</p>		
<p>American Electric Power</p>	<p>No</p>	<p>Regarding PRC-025-1: While AEP appreciates the factors considered by the drafting team when developing the proposed implementation plan for PRC-025-1, the plan as proposed will not afford adequate time for large Generator Owners to comply with the standards.</p> <p>AEP has 119 generating units and 2 wind farms that are applicable to PRC-025-1. The resources needed to evaluate the generating units for compliance with PRC-025-1 and PRC-023-3 will also be engaged in implementing the new NERC standards PRC-019-1 and PRC-024-1. For these reasons, AEP believes a phased implementation plan for PRC-025-1 is more appropriate. Such a plan would require entities to show that a minimum percentage of their applicable relays are compliant within a specified time frame.</p> <p>For example:</p> <ul style="list-style-type: none"> * Entities shall demonstrate that 30% of their applicable load-responsive protective relays are fully compliant with R1 within 48 months of the effective date of this standard. * Entities shall demonstrate that 60% of their applicable load-responsive protective relays are fully compliant with R1 within 60 months of the effective date of this standard. * Entities shall demonstrate that 100% of their applicable load-responsive protective relays are fully compliant with R1 within 72 months of the effective date of this standard. <p>Regarding PRC-023-3: The proposed revision could significantly impact Transmission</p>

Organization	Yes or No	Question 4 Comment
		<p>Owners. Additional research is being conducted within AEP Transmission to determine the extent of that impact. It is possible that the proposed implementation plan would not provide adequate time to achieve compliance with the standard if it is determined to impact a high volume of facilities. Additional research will be needed before a recommendation be made on the extent the additional time required.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into PRC-025-1, rather than adding Requirement R7 and R8 to PRC-023-2. All implementation will be addressed within the Implementation Plan for PRC-025-1.</p> <p>The drafting team thanks you for your comment and has increased the implementation period from 48 months to 60 months for applying settings on load-responsive protective relays that do not require replacement or removal, and from 72 months to 84 months for applying settings on load-responsive protective relays that do require replacement or removal to prevent an implementation gap with the MOD-25-2 standard which is pending regulatory approval. Change made.</p> <p>The suggested phased-in approach would be potentially unfair to small entities requiring them to become 100% compliant earlier. No change made.</p> <p>It is still unclear when TOs, GOs and DPs will be required to complete loadability evaluations for any circuits below 200kV included by the Planning Coordinator per Attachment B. It is understood that we will have 39 months to apply the initial list. There is confusion however on whether or not the 39 months applies to new inclusions to the list. AEP requests that this time frame be clarified and included in the standard, as it is information needed to maintain compliance on an ongoing basis.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities</p>

Organization	Yes or No	Question 4 Comment
		<p>will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>All implementation will be addressed within the Implementation Plan for PRC-025-1, and no changes are being made to the existing approved PRC-023-2 Implementation Plan.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Luminant Generation	No	<p>Luminant recommends that the phrase “where relay replacement is not required” and “where relay replacement is required” add the word removal; i.e., “replacement or removal”.</p>
<p>Response: The drafting team thanks you for your comments and the drafting team has revised items #7 and #8 in the General Considerations of the PRC-025-1 Implementation Plan as you suggest. Change made.</p>		
Ingleside Cogeneration LP	No	<p>Ingleside Cogeneration LP does not agree with the 100% compliance approach that the drafting team has taken in regard to PRC-025-1. Although FERC Order 733 is cited multiple times as the reliability need, there are real dollars that the industry will need to expend to analyze and replace load responsive relays for generators of any size. We do not read Order 733 the same way - and FERC has accepted exceptions for low-impact facilities in the past.</p>
<p>Response: The drafting team contends that the requirements proposed within PRC-025-1 satisfy the associated FERC directive and are appropriate and necessary. Appendix 4B, Section 2 of the NERC Rules of Procedures identify and discuss the basic principles underpinning why and how NERC and the Regional Entities will determine Penalties, sanctions, and Remedial action Directives for violations of the Requirements of the Reliability Standards. By being classified as BES, the facilities involved have been determined to have impact on the reliability of the BES. No change made.</p>		
Luminant Energy	No	<p>See Luminant Generation Company LLC comments.</p>

Organization	Yes or No	Question 4 Comment
Company LLC		
<p>Response: The drafting team thanks you for your comments; please see the response(s) for Luminant Generation Company LLC.</p>		
ACES Standards Collaborators	Yes	<p>We agree with the 48-month and 72-month implementation plan for PRC-025 and R7 and R8 in PRC-023. However, we believe the implementation plan for PRC-023 as a whole is confusing. Since PRC-023-2 has a staggered implementation plan that is still has not fully been implemented, we recommend laying out a graphical timeline or a Gantt chart that compares PRC-023-2 implementation to that of PRC-023-3.</p>
<p>Response: The drafting team thanks you for your comment and has increased the implementation period from 48 months to 60 months for applying settings on load-responsive protective relays that do not require replacement or removal, and from 72 months to 84 months for applying settings on load-responsive protective relays that do require replacement or removal to prevent an implementation gap with the MOD-25-2 standard which is pending regulatory approval. Change made.</p> <p>The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the Implementation Plan has been revised to note the specific milestones that are known to improve clarity. Change made.</p> <p>The drafting team is unable to provide a graphical timeline comparison between the standards illustrating their implementation because each is subject to NERC Board of Trustees adoption and subsequent regulatory approvals. No change made.</p>		
Operational Compliance	Yes	<p>Editorial note:</p> <p>To aid with distinguishing between options: underline the words “is necessary” and “is not necessary” for “Implementation Date” columns.</p>
<p>Response: The drafting team thanks you for your comments and contends that it is not necessary to add the emphasis suggested.</p>		

Organization	Yes or No	Question 4 Comment
No change made.		
Pepco Holdings Inc. & Affiliates	Yes	
FirstEnergy	Yes	
MRO NERC Standards Review Forum	Yes	
SERC Protection and Controls Subcommittee	Yes	
PPL NERC Registered Affiliates	Yes	
Western Area Power Administration	Yes	
Dominion	Yes	
Bonneville Power Administration	Yes	
PacifiCorp	Yes	
AESI Inc.	Yes	
Chelan County PUD	Yes	

Organization	Yes or No	Question 4 Comment
Idaho Power Company	Yes	
Xcel Energy	Yes	
Independent Electricity System Operator	Yes	
Northeast Utilities	Yes	
Manitoba Hydro	Yes	
ReliabilityFirst	Yes	
Ameren	Yes	
Tacoma Power	Yes	
South Carolina Electric and Gas	Yes	
Entergy Services, Inc. (Transmission)	Yes	
Southwest Power Pool	Yes	
Kansas City Power and Light	Yes	

5. Do you have any other comments? If so, please provide suggested changes and rationale.

Summary Consideration: The general section of the comments contain varying issues, some being majority issues that have been addressed in previous postings. There are approximately ten chief concerns. (1) About eight comments supported by 45 stakeholders disagreed that the unit auxiliary transformer (UAT) should be addressed in the standard. The drafting revised the criteria for the UAT to address only those relays on the high-side terminals of the UAT. The drafting team acknowledges the varying configurations of station service supply and agrees that addressing loadability of the UAT is best satisfied at the high-side terminals of the UAT to be responsive to the FERC directive to include them. (2) Approximately five comments represented by about 41 entities disagree with the single Violation Severity Level (VSL) of Severe. The drafting team contends it has followed the VSL Guidelines and notes that the requirement applies to each load-responsive protective relay. Violations would be evaluated on a case by case basis through the auditing and enforcement process. (3) About six comment supported by 36 stakeholders disagreed with the inclusion or impacts the standard would have on Blackstart generation units and dispersed generation. The drafting team considered these issues and determined that the governing factor should be the application of the Bulk Electric System definition which addresses whether a unit or plant is BES based on individual unit size or site aggregate capacity. (4) Four comments representing about 29 entities disagreed or requested clarity about the use of the phrase “generation interconnection Facilities.” The drafting team addressed this by rephrasing this criterion to avoid confusion with the common understanding. See Question 1 summary and comment responses for more detail. (5) Two comments supported by about 28 individuals desired an approach similar to the PRC-024 standard. The drafting team noted that PRC-024 is based on equipment potentially being damaged and the proposed PRC-025-1 standard criteria achieve its loadability goal in conditions that are not damaging to the generator. (6) Approximately three comments represented by 19 stakeholders suggested using the generator nameplate to reduce the complexity of the criteria. The drafting team addressed this in prior postings and in the above summaries. The proposed PRC-025-1 standard takes into consideration that some generation units may not operate near nameplate capacity; therefore, using a nameplate value would be result in an overly conservative setting. (7) Two comments representing 19 individuals did not agree with the intent of the standard. The drafting team is certain that it has fulfilled its responsibility in meeting the objectives of the project to address load-responsive protective relay loadability for generation Facilities. (8) Three comments supported by about 18 entities expressed concern about the proposed Requirements R7 and R8 in PRC-023-3. The drafting team removed these requirements and added the Distribution Provider and Transmission Owner in PRC-025-1. See the above summaries and comments for more detail. (9) About four comments supported by 11 stakeholders raise concerns about overloading and the application of ANSI standards in relation to the PRC-025-1

standard. The drafting team provided responses to help clarify the differences. Please see the individual responses for greater clarity on overload issues. (10) The last of the chief concerns were noted in three comments represented by 12 individuals who expressed disagreement with a Violation Risk Factor (VRF) of High. The drafting team notes that the assignment of the VRF follows VRF guidelines.

The following summary addresses concerns of two or fewer comments and less than ten individuals. Stakeholders continued to have concerns about the phrase “while maintaining reliable fault protection.” This phrase has been used in previous versions of PRC-023 and the drafting team agrees that it is clear on the expectation. Comments supported by about six entities requested terms in PRC-023-3 to be capitalized to represent NERC glossary definition terms; however, the drafting team did not address these as they are outside the scope of the approved objectives of the project. Another set of comments supported by about eight individuals requested the removal of the “Regional Reliability Organization (RRO) from the standard. The drafting removed this language and to address the potential gap in doing so, increased the Implementation Plan periods by one year. See the summary in Question 2 and individual responses for more detail. Last, single comments asked for clarification of BES generators, minor edits and corrections, Implementation Plan edits, and consideration of the Reliability Standard Audit Worksheet (RSAW) and the Cost Effective Analysis Process (CEAP). See the responses for the RSAW and CEAP for additional detail.

Organization	Yes or No	Question 5 Comment
Pepco Holdings Inc. & Affiliates	No	
Western Area Power Administration	No	
Duke Energy	No	
PacifiCorp	No	
Idaho Power Company	No	

Organization	Yes or No	Question 5 Comment
Independent Electricity System Operator	No	
Northeast Utilities	No	
South Carolina Electric and Gas	No	
Luminant Generation	No	
Luminant Energy Company LLC	No	
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	Yes	<p>2) We suggest removing Section 3.2.3 and footnote 1. UAT protection is part of the station service system and should not be in this standard. Remove the UAT from Table 1. The UAT relays are not in the category of “all load-responsive protective relays that are affected by increased generator output in response to system disturbances.” The highside overcurrent pickup should not be required to be at 150%. Settings at $> \& = 115\%$ should be allowed.</p> <p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>The specified relays are affected by the conditions being addressed by the standard, and thus need to be addressed. The drafting team has proposed a 150% multiplier for these relays rather than requiring an analysis of the connected loads for depressed voltage; the margin includes consideration for the increased current called for by these</p>

Organization	Yes or No	Question 5 Comment
		<p>loads as well as normal relay setting tolerances. No change made.</p> <p>3) We believe that the Purpose statement should end "... do not pose a risk of damaging the generator."</p> <p>Response: The Purpose statement was modified in the last draft to not be generator specific. The standard addresses generation Facilities in general and the criteria provide reasonable loadability settings that are within the capability of the equipment the standard is addressing. The purpose statement has been modified to clarify risk to associated equipment. Change made.</p> <p>4) The protection of the generator should be the paramount concern. All ANSI standards for generator and main power transformer protection should be considered to be the ruling guide for protecting the equipment. The minimum allowable settings provided in the table in the draft standard do not factor using time delays in order to provide adequate protection for generators.</p> <p>Response: 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. The drafting team further notes that the IEEE working groups that develop these standards are considering revisions to the affected standards to align with the Power Plant and Transmission System Protection Coordination document authored by the NERC SPCS. Finally, the drafting team notes that the last two bullets in the Exceptions in PRC-025-1 Attachment 1 address overload protection. No change made.</p> <p>5) The overload relay that protects the generator from overload may also be the relay that protects the GSU from overload. In the exception list of the draft standard, exception bullet #5 should take precedence over exception bullet #6.</p> <p>Response: In the example noted bullet #5 is applicable and bullet #6 is not. Therefore, the relay is exempted under bullet #5. No change made.</p>

Organization	Yes or No	Question 5 Comment
		<p>6) The protection requirements (exception bullet #5) from the ANSI standards need additional recognition, development, and emphasis in the Exceptions section. As written, it appears to be an afterthought. The ANSI standard for synchronous generator protection should be recognized, respected, and not violated. The Table 1 setting specifications which contradict the ANSI standards should be submissive to the ANSI standards and itemized in the exception criteria. Consider removing “extremely” from the “extremely inverse time” description as various vendors call the varying inverse time curve by different names.</p> <p>Response: The ANSI/IEEE standards are written from an equipment-specific perspective, and largely disregard system performance concerns. The drafting team notes that they do, in many cases, briefly 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. The drafting team intends that “extremely inverse characteristic” be applied consistently with IEEE C37.112, “IEEE Standard Inverse-Time Characteristic Equations for Overcurrent Relays.” No change made.</p> <p>7) The generator overload protection exception added to Draft 3 for extremely inverse characteristics (fifth exception bullet) is an improvement, but the term “full-load current” needs clarification. Is this the current at normal full-load turbine output and typical PF, the value determined from the generator nameplate MVA at rated voltage, or is it the base or top (no fans, no oil circulation) MVA rating of the GSU?</p> <p>Response: The drafting team notes that the phrase full load current refers to rated armature current of the generator. No change made.</p> <p>8) The wording in the sixth exception bullet of the Exceptions section is too vague. How much of an overload is considered an overload? Many vendor relay curves do not provide characteristics showing the value of current that will time out in 15 minutes. It may be difficult to prove a setting to provide 15 minute delay. Existing relays in service</p>

Organization	Yes or No	Question 5 Comment
		<p>do not have the ability to be set by this criterion.</p> <p>Response: The drafting team does not intend to define what an overload is, but instead to exempt schemes that are explicitly designed for overload protection, for which characteristics would be defined for the time period in the bullet. Load-responsive relays that respond otherwise must meet the criteria in Table 1. No change made.</p> <p>9) The Exceptions section seems to state that the exceptions are allowed only during start up and when off line, which is unacceptable. The exceptions should be allowed at all times.</p> <p>Response: The drafting team has revised the exceptions portions of Attachment 1 to address your concerns by inserting a specific numbered exception to adder relay elements that are in service only during startup. Change made.</p> <p>10) To meet the requirements of table 1 for non-51 relays (distance relays set at approximately 180% of generator MVA) and meet our protection philosophy objectives, we would have to install many new relays for overload protection.</p> <p>Response: The drafting team understands that in some cases it may be necessary to replace existing relay equipment. No change made.</p> <p>11) Determination of the pickup of the distance relays is too complicated. The calculated impedance should be based on generator nameplate MVA and pf only. The requirements make what should be a simple calculation based on generator electrical characteristics into one that will require the relay engineer to find test MW data is not readily unavailable.</p> <p>Response: The drafting team intentionally did not reference the calculation to nameplate MVA for the Real Power portion of the calculation because this would result in an overly conservative setting for units that cannot achieve the nameplate capability. The test megawatt data must be reported and should be readily available.</p>

Organization	Yes or No	Question 5 Comment
		<p>No change made.</p> <p>12) PRC-025 should be revised to "grandfather" existing protection settings that have been proven in practice for many decades not to prematurely remove equipment from service.</p> <p>Response: The drafting team has developed the standard in accordance with the regulatory directive concerning generator relay loadability, which is an outcome of the 2003 blackout report. As noted in the NERC document 'Power Plant and Transmission System Coordination' – July 2010, at least 28 generators were tripped on August 14, 2003 by load-responsive phase protection; eight of those by phase distance and 20 more by 51V protection. For many of these generators, the legacy protective equipment had been previously believed to not prematurely remove equipment. No change made.</p> <p>13) The applicability of PRC-025 should exclude small gensets that are NERC-registered solely due to being black start-capable, whose tripping 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 for restoration purposes.</p> <p>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the applicability of the standard, they may not perform as expected to facilitate system restoration. Also, 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). No change made.</p> <p>14) Voltage-restrained overcurrent relays are notorious for not having a predictable operation time under fault conditions. If they are included in the types of equipment that mis-operated in the August 2003 blackout, they should be required to be replaced with another relay type rather than requiring that the settings be relaxed to the degree</p>

Organization	Yes or No	Question 5 Comment
		<p>specified in the draft standard.</p> <p>Response: 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>15) A High VRF and a Severe VSL seems overly harsh given the compliance feasibility uncertainties.</p> <p>Response: The VRF criteria are based on the risk to the system if a requirement is violated, and the VSL criteria are based on the degree of non-compliance. Alleged difficulties in achieving compliance are not a factor in the criteria for either VRFs or VSLs. No change made.</p> <p>16) Which UATs are proposed to be included, if any, is confusing. Suggest adding diagrams to the reference document.</p> <p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>17) During the webinar there were three slides related to the different trans to Gen interconnections and who is responsible for what; suggest adding and or clarifying these in the reference documents.</p> <p>Response: The drafting team thanks you for your comment and notes that load-responsive protective relays applied on "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant" (which replaces the previously-used term, “generator interconnection Facility”) are covered under the proposed PRC-025-1 standard. Load-responsive protective relays applied on network transmission lines are</p>

Organization	Yes or No	Question 5 Comment
		covered under the proposed PRC-023-3 standard. Please refer to the revised Figures 1, 2, and 3 in the proposed PRC-025-1 Guidelines and Technical Basis for further information on applications. Change made.
Response: The drafting team thanks you for your comments; please see the above responses.		
Northeast Power Coordinating Council	Yes	In PRC-023-3, add "Each" to the beginning of R8.
Response: The drafting team thanks you for your comment and notes that the comment above is no longer relevant because: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.		
FirstEnergy	Yes	FE believes that that the term "generator interconnection Facility" should be a NERC defined term in the Glossary since it is used in other standards, ie, PRC-005, or at the very least, be defined within the standard(s). This term is only defined in the Guidelines and Technical Basis. In the Guidelines and Technical Basis, Figure 2 has a typo on the 3rd sentence and should read as follows: If the Distribution Provider or Transmission Owner owns these relay, they are responsible for them under PRC-023.
Response: The drafting team has replaced this term with "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant." Change made.		
SERC Protection and Controls Subcommittee	Yes	There were three one-line reference drawings described on the webinar. Suggest adding text to these reference drawings or add descriptive wording in reference documents to better explain responsibilities of relay owners for these various

Organization	Yes or No	Question 5 Comment
		<p>configurations. On the webinar there were repetitive questions about these configurations so this would indicate confusion. Also, would suggest adding another drawing to illustrate when you have a generating station where the GO owns GSU relays and the TO owns relays between the GSU and switchyard to clarify that the TO is only responsible for R7 in PRC023-3 and not R8 since the GSU relays are a GO asset.</p>
<p>Response: The drafting team thanks you for your comments and notes that these figures are already included in the Guidelines and Technical Basis, along with discussion. No change made.</p>		
<p>PPL NERC Registered Affiliates</p>	<p>Yes</p>	<p>: 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 hypothetical benefit that has not been observed (or has in fact been disproved) in practice.</p> <p>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.</p>

Organization	Yes or No	Question 5 Comment
		<p>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>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>2.) The generator overload protection exception added to Draft 3 for “extremely inverse characteristics” (5th bull-dot) is a major improvement, but the term “full-load current” needs clarification. 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>Response: The drafting team notes that the phrase full load current refers to rated armature current of the generator. No change made.</p> <p>3.) The overload protection exception added to Draft 3 for “extremely inverse characteristics” 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>Response: The exclusion #7 addresses transformers and is not limited to only GSUs. 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</p>

Organization	Yes or No	Question 5 Comment
		<p>time it was installed.</p> <p>Response: 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 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>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the applicability of the standard, they may not perform as expected to facilitate system restoration. Also, the drafting team notes that the standard only applies to those Blackstart resources identified in the Transmission Operator’s system restoration plan</p>

Organization	Yes or No	Question 5 Comment
		<p>(i.e., SRP). 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>Response: 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>Response: The VRF criteria are based on the risk to the system if a requirement is violated, and the VSL criteria are based on the degree of non-compliance. Alleged difficulties in achieving compliance are not a factor in the criteria for either VRFs or VSLs. No change made.</p> <p>8.) 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 concept should be applied to the PRC-025 standard to align with the direction NERC standard development is progressing.</p> <p>Response: The drafting team continues to support the proposed draft standard as currently structured. The current draft requirements allow Compliance Enforcement Authorities to take into account an entity’s process in connection with the required activities. How compliance will approach a standard is appropriate for the</p>

Organization	Yes or No	Question 5 Comment
		development of the RSAW. No change made.
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>North American Generator Forum Standards Review Team</p>	<p>Yes</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>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>2. The generator overload protection exception added to Draft 3 for extremely inverse characteristics (5th bull-dot) is a major improvement, but the term “full-load current” needs clarification. 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>Response: The drafting team notes that the phrase full load current refers to rated armature current of the generator. No change made.</p> <p>3. The exception of comment #2 above, which is presently limited to generator overloads, could be applied for UATs as well if eliminating this equipment in its entirety</p>

Organization	Yes or No	Question 5 Comment
		<p>(per comment #1 above) does not prove feasible.</p> <p>Response: The exclusion #7 addresses transformers and is not limited to only GSUs. No change made.</p> <p>4. 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>Response: 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 already eliminated any economic rationale for having black-start facilities.</p> <p>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the</p>

Organization	Yes or No	Question 5 Comment
		<p>applicability of the standard, they may not perform as expected to facilitate system restoration. Also, 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). No change made.</p> <p>6. 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>Response: 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>Response: The VRF criteria are based on the risk to the system if a requirement is violated, and the VSL criteria are based on the degree of non-compliance. Alleged difficulties in achieving compliance are not a factor in the criteria for either VRFs or VSLs. No change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Dominion	Yes	<p>PRC-025 -1 Requirement 1: remove the following words: “...while maintaining reliable fault protection.” It is not possible for entities to measure or prove this statement. The wording, “while maintaining reliable fault protection”, is also included in the Introduction section of PRC-025-1 Guidelines and Technical Basis. The inclusion “describes that the Generator Owner is to comply with this standard while achieving its desired protection goals.” Dominion believes that the Generator Owner</p>

Organization	Yes or No	Question 5 Comment
		<p>understands the compliance obligation based upon the requirements of the standards and that the inclusion of the referenced language should be excluded based on the inability of the entity to measure or provide evidence of maintaining reliable fault protection.</p> <p>Response: 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>PRC-025-1: Redline - Page 6 of 18 Table of Compliance Elements; An indication of Lower VSL. Moderate VSL or High VSL needs to be determined with regard to R1. Dominion disagrees with the “all or nothing” approach to VSLs.</p> <p>Response: The specified VSL applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL.</p> <p>PRC-023-3 Implementation plan; Redline Pages 3-6, R1-R6 the Requirement wording (in the Applicability column) does not exactly match the Requirement wording in the standard. Dominion suggests correcting the wording to match the Standard as written.</p> <p>Response: The changed suggested is not editorial and is outside the scope of the supplemental Standards Authorization Request (SAR) as approved by the Standards Committee on January 18, 2013. No change made.</p> <p>PRC-025-1 @ figure 3 - Dominion does not necessarily agree that these lines are part of networked transmission and therefore would not be considered as generator interconnection Facilities. Dominion believes the designation of the lines should be based on registration of the asset owner and will be providing supporting comments in response to the FERC NOPR in docket # RM12-16-000.</p> <p>Response: The drafting team asserts that the lines in Figure 3 can be expected to carry network flow, are not used exclusively to export energy directly from a BES generating unit or generating plant to the network, and therefore are not generator</p>

Organization	Yes or No	Question 5 Comment
		interconnection Facilities. No change made.
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Santee Cooper	Yes	<p>Unit Auxiliary Transformers (UATs) should be removed from this standard (Facilities Section 3.2.3). The purpose of this standard is “To set load-responsive protective relays associated with generation Facilities at a level to prevent unnecessary tripping of generators during a system disturbance for conditions that do not pose a risk of damage.” The intent as stated in the Application Guidelines is to pertain to relays that “are affected by increased generator output in response to system disturbances.” UATs do not fit this criteria. Addressing generating plant unit auxiliary transformers does not have to translate into creating a standard requirement for that equipment. An investigation and evaluation of the protection system for unit auxiliary transformers should be considered by the standard drafting team and deemed to be not related to generator loadability and fulfill the FERC order to address the subject.</p>
<p>Response: The drafting team thanks you for your comments and contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p>		
JEA	Yes	<p>We would like to see modifications to violation severity levels. While we recognize the SDT is following NERC binary guidelines “pass/fail”, this needs to be improved. The idea that either they “applied” or “did not apply” settings must result in a “severe” violation level does not match the reality that missing 10 out of 20 poses a greater risk to the BES than 1 out of 100.</p>
<p>Response: The drafting team thanks you for your comments and notes the specified VSL applies separately and individually to each protective relay addressed; therefore it is not possible to grade the VSL. No change made.</p>		

Organization	Yes or No	Question 5 Comment
Bonneville Power Administration	Yes	<p>Comments:</p> <p>(1) The use of the term generation interconnection facility without an official definition of the term is concerning to BPA. BPA believes that this term may have different meanings between entities. For example, the entire Bulk Electric System (BES) together with all distribution systems could be considered to be a generation interconnection facility because the purpose of the BES and distribution systems is to interconnect generation to the end user (load). Only under the Guidelines and Technical Basis is a description of what a generator interconnection facility found. BPA is concerned with this approach as it does not give an official definition, and this document is not part of the standard. Additionally, BPA believes the description of generator interconnection facility given in the Guidelines and Technical Basis creates problems. The description provided is that the generation interconnection facility consists of elements between the generator step up transformer (GSU) and the interface with the portion of the BES where the Transmission Owner (TO) takes over the ownership. In many cases the TO owns the line that connects to the generator step up (GSU) transformer and there are no elements between the GSU and the TO. According to this description there is no generation interconnection facility. Due to the ownership arrangements of transmission, generation, and their interconnection facilities throughout the country are highly variable, BPA believes it is not suitable to develop a definition of generation interconnection facilities based on ownership. Such a definition may reflect the ownership arrangements within a particular region while it does not take into account various other arrangements that may exist. BPA recommends for the drafting team to provide a definition of generation interconnection facility that takes into account the various ownership situations that may exist.</p> <p>Response: The drafting team has replaced this term with "Elements that connect a GSU to the Transmission system and are used exclusively to export energy directly from a BES generating unit or generating plant." Change made.</p>

Organization	Yes or No	Question 5 Comment
		<p>(2) BPA believes the use of the word associated in the purpose statement of PRC-025-1 as well as in Section 3.2 Facilities is too vague and recommends this term be changed to “whose function is the protection of generation Facilities...” in the purpose statement and Section 3.2 be rewritten to read “3.2 Facilities: The following Bulk Electric System Elements, including those generating units and generating plants identified as Blackstart Resources in the Transmission Operator's system restoration plan:”</p> <p>Response: The Purpose statement was modified in the last draft to not be generator specific. The standard addresses generation Facilities in general and the criteria provide reasonable loadability settings that are within the capability of the equipment the standard is addressing. The purpose statement has been modified to clarify risk to associated equipment. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Tennessee Valley Authority	Yes	<p>Is the intent of this standard to identify the lines in their normal configuration and not for contingency events? For example, referring to Figure 3 from the Webinar, if a line is lost, causing the system configuration to change to what is shown in Figure 1, does this mean that the configuration then is considered to fall under R7?</p>
<p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>The intent of the standard is based on lines in the normal configuration as being presented in the Figures. No change made.</p>		
ACES Standards Collaborators	Yes	<p>(1) We are not convinced that applicability of PRC-023 R7 and R8 to a Distribution Provider is necessary. It would be unusual for a generator that meets BES definition criteria and compliance registry criteria to be connected to a Distribution Provider.</p>

Organization	Yes or No	Question 5 Comment
		<p>Both criteria require a single generator to be 20 MVA or a plant site to be 75 MVA. From a practical perspective, this could actually be a detriment to reliability by distracting the Distribution Provider from reliability activities because they have to focus on documenting that they do not have any applicable generators connected. How does including the Distribution Provider as an applicable entity benefit reliability?</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>Even though it may be unlikely that such a Facility would be connected to a Distribution Provider, the drafting team contends that providing for such a condition in PRC-025-1 would assure that no gaps exist for this situation.</p> <p>(2) The High VRFs for PRC-023 R7 and R8 and PRC-25 R1 and R2 are inconsistent with established NERC criteria. In order to meet the High criteria, a single violation of the requirement “could directly cause or contribute to bulk electric instability, separation or a cascading sequence of failures.” A single failure to have a relay set to avoid loadability concerns on a single generator could not lead to instability, separation or cascading without violating other standards. For example, TOP-004-2 R2 already require N-1 operation so a single generator tripping due to relay loadability issues would require at least two standards requirements violations. This cannot be viewed as “directly” causing.</p> <p>Response: 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</p>

Organization	Yes or No	Question 5 Comment
		<p>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. No change made.</p> <p>(3) We believe the VSLs for PRC-023 R7 and R8 and PRC-25 R1 and R2 are written inconsistent FERC guideline 3 which states that the VSL cannot change the requirement. The plain language of the requirements is written in a plural format as though the requirement considers all relays are considered simultaneously. The VSLs are written such that each relay that is not set appropriately is a separate violation. The VSLs, in essence, change the requirements. For example, the Requirement for PRC-023 R7, states "shall set their load responsive relays," while the VSL essentially modifies the requirement to state "shall set each load responsive relay." We recommend modifying the VSL to be in better alignment with the requirement.</p> <p>Response: PRC-025-1 has only one Requirement R1 (not R2) which applies separately and individually to each protective relay (singular) addressed; therefore it is not possible to grade the VSL. No change made.</p> <p>The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. In removing Requirements R7 and R8 from PRC-023-3, the plural use of "relays" is no longer relevant. Change made.</p> <p>(4) The wording in the second sentence of the second paragraph in PRC-023 Attachment C needs to be fixed. There seems to be an extra "Facilities."</p>

Organization	Yes or No	Question 5 Comment
		<p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. The comment is no longer relevant; however, the drafting team updated the similar occurrence in the PRC-025-1 Attachment 1 to “Elements” which more correctly identifies those Facilities which are subject to the standard. Change made.</p> <p>(5) RRO is used throughout both standards. It should be Regional Entity, as stated in NERC’s legal memorandum on the “Use of ‘Regional Reliability Organization’...” The memo states that in general, drafting teams can replace “RRO” with “RE,” provided the functions being performed by the RE are related to their delegated duties. Reliability Standards that refer to REs are legally binding on the REs by operation of Rule 100 of NERC’s Rules of Procedure and by the delegation agreements that NERC has entered into with each RE.</p> <p>Response: The reference to “...or other entity as specified by the Regional Reliability Organization (RRO)” has been removed from the standard. Change made.</p> <p>(6) Please strike “other entity as specified by the Regional Reliability Organization (RRO)” that is used throughout Attachment C in PRC-023 and Attachment 1 in PRC-025. It creates compliance uncertainty and provides the Regional Entity far too much discretion. If the purpose is an attempt to document from other standards where the nameplate rating is communicating, we suggest that the drafting team perform a search of the other standards and explicitly document the entities. Otherwise, the Regional Entity, as the standard is worded, could simply decide to move the dates.</p>

Organization	Yes or No	Question 5 Comment
		<p>FERC has ordered NERC to remove regional discretion from standards development, such as the revision of the BES definition.</p> <p>Response: The reference to “...or other entity as specified by the Regional Reliability Organization (RRO)” has been removed from the standard. Change made.</p> <p>(7) We appreciate the relay elements that are identified for exclusion in PRC-023 Attachment C. However, we believe that the exclusion should be identified explicitly in Attachment A as well. Attachment A is referenced in applicability section. We are concerned since attachment C is not referenced in the applicability section that exclusion of the relay elements could be lost.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</p> <p>(8) We disagree with the applicability of 3.2.5. We not understand how applicability to a 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 understand inclusion of the main GSU for a large site but not the individual collector elements.</p> <p>Response: The drafting team intends that the Applicability for Facilities associated with aggregated generation aligns with the definition of the BES. The drafting team notes that all feeders and individual generators within an aggregated site will require similar</p>

Organization	Yes or No	Question 5 Comment
		load-responsive protective relay settings because they will be challenged by the same loadability during the system conditions being addressed by PRC-025-1; therefore, they will respond as a group, emphasizing that the criteria needs to be applied throughout the aggregated Facility. No change made.
Response: The drafting team thanks you for your comments; please see the above responses.		
AESI Inc.	Yes	This draft of the standard uses 0.85 pu transmission system voltage as a benchmark for determining the settings. The latest version of PRC-024-1 defines post-disturbance voltage profile where the system voltage is below 0.85 pu up to 3 seconds. Is there a need to take that into consideration for this standard.
Response: The drafting team has coordinated the concern with the generation verification standard drafting team working on PRC-024-1 under Project 2007-09. The result was that load-responsive protective relay functions (i.e., "...impedance relays, voltage controlled overcurrent relays...") were removed from the PRC-024-1 standard in footnote 1. No change made.		
Chelan County PUD	Yes	<p>1. Please, reconsider the applicaiton to small units that are "black start" or auxiliary units in a BES plant. Application of these requirements to a small (750kW) hydro unit that is black start is problamatic particularly due to the age of many of these units. It is difficult to see where loss of a unit of small size would impact the BES during this type of event. Please, consider a minimum size threshold for units where these requirements would be applicable. Perhaps 20MW as is used in the BES definition would be appropriate. Consider also an exclusion for a small unit, say less than 5MW, that is part of an aggregate plant of larger units that exceeds the 75MW plant threshold. An example is our 750kW hydro unit that is in the plant with ten 25MW units. It seems excessive to apply this to the 750kW unit.</p> <p>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the applicability of the standard, they may not perform as expected to facilitate system</p>

Organization	Yes or No	Question 5 Comment
		<p>restoration. Also, 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). No change made.</p> <p>The applicability is consistent with the definition of the BES. No change made.</p> <p>2. 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>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>3. Clarify UAT and station service transformers. Footnote 1 says "Loss of these transformers will result in removing the generator from service." Does that mean it only applies to SS transformers that loss of will remove a unit from service? What about provisions for backup, multiple transformers and busses? Consider an hydro plant with 4 sation service busses and 12 generating units. Would this standard apply to all? This is very different from thermal stations where a unit would have a dedicated transformer that without its power the unit will trip. Consider limiting this only to transformers where loss would cause a direct trip of a BES unit, or eleminate</p>

Organization	Yes or No	Question 5 Comment
		<p>UAT ans SS transformers completely per comment 2.</p> <p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>4. The generator overload protection exception added to Draft 3 for extremely inverse characteristics (5th bull-dot) is a major improvement, but the term “full-load current” needs clarification. 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 FERC hydro nameplate criteria at best gate?</p> <p>Response: The drafting team notes that the phrase full load current refers to rated armature current of the generator. No change made.</p> <p>5. 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>Response: 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>

Organization	Yes or No	Question 5 Comment
		<p>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. Consider a VSL based on the size of the generating unit or amount of generation that would be lost if the standard were not properly applied. A 20MVA unit would have a much lower impact on the reliability of the BES than a 500MW unit.</p> <p>Response: 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 contends 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; therefore the VSL is binary regardless of the size of the generating unit. No change made.</p> <p>The drafting team contends that the requirements proposed within PRC-025-1 satisfy the associated FERC directive and are appropriate and necessary. Appendix 4B, Section 2 of the NERC Rules of Procedures identify and discuss the basic principles underpinning why and how NERC and the Regional Entities will determine Penalties, sanctions, and Remedial action Directives for violations of the Requirements of the Reliability Standards. By being classified as BES, the facilities involved have been determined to have impact on the reliability of the BES. No change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		

Organization	Yes or No	Question 5 Comment
Western Farmers Electric Cooperative	Yes	<p>Many generation Facilities, that are part of the Bulk Electric System, became commercial in the 1950’s, 1960’s, 1970’s, 1980’s and 1990’s. These Facilities should be Grandfathered in. Many of these units, although reliable, it may not be cost effective to obtain compliance with PRC-025-1. Many of these Facilities would be forced to either:</p> <ul style="list-style-type: none"> (1) implement very expensive upgrades to existing equipment, (2) replace existing equipment, (3) retire the Facility. <p>It’s my opinion this is not consistent with the economic rational NERC is attempting to achieve.</p> <p>Response: 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>Secondly, the Violation Risk Factor of High, seems extreme because several other standards address generator reliability (Under-frequency, Misoperations, Protection System Maintenance and Testing, Generator Verification). These standards, have resulted in many generation Facilities having undergone relay coordination studies to prevent an occurrence similar to the 2003 “blackout.”</p> <p>Response: These other standards do not address the conditions being addressed by this standard. No change made.</p>

Organization	Yes or No	Question 5 Comment
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Xcel Energy</p>	<p>Yes</p>	<p>1) Applicability: In the applicability sections, we suggest you replace the phrase "BES generating unit or generating plant" with "BES generating unit or BES generating plant" to be more clear.</p> <p>Response: The drafting team contends that the adjective, "BES" clearly applies to both the generating unit and the generating plant. No change made.</p> <p>2) M1: We recommend you add "simulation results" as acceptable evidence in Measure M1. (reason: Some people may choose to do PRC023 check in the CAPE simulation.)</p> <p>Response: This is existing approved content within PRC-023-2 and outside the scope of this project. No change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Manitoba Hydro</p>	<p>Yes</p>	<p>(1) Section 3.1.1, PRC-025-01 - the repeated word "Facilities" seems unnecessary. For clarity, remove the last instance of the word "Facilities" in the statement: "Generator Owner that applies load-responsive protective relays at the terminals of Facilities listed in 3.2, Facilities."</p> <p>Response: The first occurrence of Facilities should have been "Elements" to refer to the numbered list under the section 3.2, Facilities. Change made.</p> <p>(2) Section 3.2 - it would be useful to add criteria that define which generator units should be included as associated with the BES. Alternatively, should this standard refer to the BES definition for which generator units in this standard will apply to?</p> <p>Response: This standard includes all generating units and generating plants that are part of the BES, as established by application of the approved definition of Bulk Electric System (BES). No change made.</p>

Organization	Yes or No	Question 5 Comment
		<p>(3) Section 3.2.5 - It is unclear what elements should be included in this section - Collector lines only? What size (MVA) of generating source that the collector line has to be on to qualify as one of these elements?</p> <p>Response: The drafting team intends that the Applicability for Facilities associated with aggregated generation aligns with the definition of the BES. The drafting team notes that all feeders and individual generators within an aggregated site will require similar load-responsive protective relay settings because they will be challenged by the same loadability during the system conditions being addressed by PRC-025-1; therefore, they will respond as a group, emphasizing that the criteria needs to be applied throughout the aggregated Facility. No change made.</p> <p>(4) Implementation Plan, PRC-023-3 - it would be helpful to include the implementation plan within the standard</p> <p>Response: The Implementation Plan is posted as a separate document with supporting information for industry consideration. Generally, once the standard is NERC Board of Trustees adopted, the effective date information is re-inserted into the standard; however, an entity should always consult the implementation plan for additional information. No change made.</p> <p>(5) PRC-023-3, Purpose - suggest re-wording to the following “...not interfere with a system operators ability to take remedial action to protect system reliability....”.</p> <p>Response: The changed suggested is not editorial and is outside the scope of the supplemental Standards Authorization Request (SAR) as approved by the Standards Committee on January 18, 2013. No change made.</p> <p>(6) PRC-023-3, Purpose - capitalize “system operator” because it appears in the Glossary of Terms.</p> <p>Response: Capitalizing a term in the standard to represent the NERC Glossary defined term introduces the need for additional technical and industry vetting and is not</p>

Organization	Yes or No	Question 5 Comment
		<p>editorial.</p> <p>The changed suggested is not editorial and is outside the scope of the supplemental Standards Authorization Request (SAR) as approved by the Standards Committee on January 18, 2013. No change made.</p> <p>(7) PRC-023-3, Applicability, Functional Entity - capitalize “protection system” because it appears in the Glossary of Terms.</p> <p>Response: Capitalizing a term in the standard to represent the NERC Glossary defined term introduces the need for additional technical and industry vetting and is not editorial.</p> <p>The changed suggested is not editorial and is outside the scope of the supplemental Standards Authorization Request (SAR) as approved by the Standards Committee on January 18, 2013. No change made.</p> <p>(8) PRC-023-3, 4.2.1.3 - ‘BES’ should be written Bulk Electric System (BES) since it is the first appearance of the word.</p> <p>Response: The drafting team added exclusion text to the Applicability section 4.2.1.1 which occurs before the above referenced section 4.2.1.3; therefore, the BES acronym has been more fully listed as “Bulk Electric System (BES)” in section 4.2.1.1 rather than 4.2.1.3. Change made.</p> <p>(9) PRC-023-3, 4.2.3.1 - should Transmission lines be written “Transmission lines (and paths)”?</p> <p>Response: Making such a change introduces the need for additional technical and industry vetting and is not editorial.</p> <p>The changed suggested is not editorial and is outside the scope of the supplemental Standards Authorization Request (SAR) as approved by the Standards Committee on January 18, 2013. No change made.</p>

Organization	Yes or No	Question 5 Comment
		<p>(10) PRC-023-3, R1, 4 - capitalize the words “power transfer capability” because it appears in the Glossary of Terms.</p> <p>Response: This phrase is not a NERC Glossary term and perhaps it is being confused with “Total Transfer Capability” (TTC). No change made.</p> <p>(11) PRC-023 and PRC-025 - capitalize the words “transmission lines” throughout the document(s).</p> <p>Response: Capitalizing a term in the standard to represent the NERC Glossary defined term introduces the need for additional technical and industry vetting and is not editorial.</p> <p>The changed suggested is not editorial and is outside the scope of the supplemental Standards Authorization Request (SAR) as approved by the Standards Committee on January 18, 2013. No change made.</p> <p>The phrase “transmission lines” is not used in the proposed PRC-025-1.</p> <p>(12) PRC-023 and PRC-025, D. Compliance 1.1 - the paraphrased definition of ‘Compliance Enforcement Authority’ from the Rules of Procedure is not the standard language for this section. Is there a reason that the standard CEA language is not being used?</p> <p>Response: The language used in the standard in section D. Compliance 1.1, “Compliance Enforcement Authority” is the exact definition taken directly from the NERC Rules of Procedure, Appendix 2, Definitions Used in the Rules of Procedure effective March 5, 2013. No change made.</p> <p>(13) PRC-023-3 - Attachment B, Circuits to Evaluate - replace the acronym “BES” with the words “Bulk Electric System”.</p> <p>Response: Change made.</p> <p>(14) PRC-023-3 - Attachment B, Criteria, B2 - write out the words for “IROL” then use</p>

Organization	Yes or No	Question 5 Comment
		<p>the acronym thereafter.</p> <p>Response: Change made.</p> <p>(15) PRC-023-3 - Attachment C - use the acronym “RRO” after the first instance of the words “Regional Reliability Organization”.</p> <p>Response: In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated; therefore the comment is no longer relevant. Change made.</p> <p>The reference to “...or other entity as specified by the Regional Reliability Organization (RRO)” has been removed from the standard. Change made.</p> <p>(16) PRC-025-1 - Attachment 1: Relay Settings - use the acronym “RRO” after the first instance of the words “Regional Reliability Organization”.</p> <p>Response: The reference to “...or other entity as specified by the Regional Reliability Organization (RRO)” has been removed from the standard. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
ReliabilityFirst	Yes	<p>1) In Attachment 1, it is not clear that the fifth bulleted exception regarding protection systems that detect generator overloads needs or should be as specific as to cite the 7 seconds at 218% of full-load current operating point or characteristic curve. Typically for a fault right on the generator terminals, the current decays in a couple of seconds to around full load current even with the AVR in service. Even during field forcing, it is more likely that the field overcurrent relay would operate rather than a generator overload relay. Therefore, the exclusion does not appear to be needed. If the exclusion is needed, it is recommended that the exclusion be stated in a more general way such as the following: Protection systems that detect generator overloads that are designed to coordinate with the generator short-time capability by utilizing a relay characteristic set to operate no faster than the capability curve and supervised to</p>

Organization	Yes or No	Question 5 Comment
		<p>prevent operation below 115% of full-load current.</p> <p>Response: Generator thermal overload protection may be provided by an overcurrent relay as described in clause 4.1.1.2 of IEEE standard C37.102-2006, <i>IEEE Guide for AC Generator Protection</i>. This application must be coordinated with the generator thermal capability and would be in conflict with PRC-025-1 unless this exclusion is provided. The drafting team notes that the specific values in exclusion 6 describe a boundary for setting this protection consistent with the generator short time capability and is not prescriptive. No change made.</p> <p>2) The word ‘Each’ appears to be missing in Requirement R8 of PRC-023-3. ‘Each’ should be inserted at the beginning of the requirement before Transmission Owner and Distribution Provider.</p> <p>Response: The comment is no longer relevant because the drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p> <p>3) Since there are cases where redundant UATs that allow a generator to continue to remain in service when one UAT trips, this may be rationale to revise 3.2.3 of the Applicability section to indicate exclusion for these configurations. Alternatively, it could be addressed in the Guidelines and Technical Basis document.</p> <p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p>

Organization	Yes or No	Question 5 Comment
		<p>4) The Regional Reliability Organization (RRO) is referenced within both standards and it was ReliabilityFirst’s understanding that the term RRO was to be removed from all the standards. In Order 693, Paragraphs 146-148 and paragraph 157 state “The Commission adopts the NOPR proposal to eliminate references to the regional reliability organization as a responsible entity in the Reliability Standards. We conclude that this approach is appropriate because, as explained in the NOPR, such entities are not users, owners or operators of the Bulk-Power System. NERC indicates that it can remove such references, except that the Regional Entity should be identified as the compliance monitor where appropriate.” ReliabilityFirst suggests replacing the RRO with the Planning Coordinator (PC) or other registered function the SDT determines to have the wide area view and be responsible for determining what these settings and or values should be.</p> <p>Response: The reference to “...or other entity as specified by the Regional Reliability Organization (RRO)” has been removed from the standard. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Ameren	Yes	<p>(1) The generator overload protection exception on page 8 for “extremely inverse characteristics” (5th bullet-dot) is a major improvement, but we believe that the term “full-load current” needs clarification. We ask the SDT, is this current at 100% of the gross MW capability reported to the TP, 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 the smallest of these?</p> <p>Response: The drafting team notes that the phrase full load current refers to rated armature current of the generator. No change made.</p> <p>(2) We believe that Blackstart Resources should be excluded because there is no technical basis for including them. On the contrary, it is more important to assure Blackstart Resources are adequately protected and available for restoration in the</p>

Organization	Yes or No	Question 5 Comment
		<p>extremely unlikely event that a wide-area blackout occurs. Also, we believe that there is no evidence that the tripping of a Blackstart Resources has contributed to widespread outages. In our experience, these resources are below the 20MVA threshold and even if they were on-line and tripped their impact to the BES are minimal.</p> <p>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the applicability of the standard, they may not perform as expected to facilitate system restoration. Also, 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). No change made.</p> <p>(3) In addition to our comments, we also agree with the SERC Protection & Control Subcommittee (PCS) comments and include them by reference.</p> <p>Response: Please see the responses to the SERC PCS comments.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
American Electric Power	Yes	<p>System fed auxiliary transformers whose loss would not result in an instantaneous generating unit trip, and for which operators would have opportunity to reconfigure the plant auxiliary load before a unit trip occurs, should be excluded from this standard. However, if the SDT intends the standard to be applicable to all system fed auxiliary transformers, we recommend removing the text “...that trips the generator either directly or via an interposing/lockout relay” from the standard. This statement is similar to language that entities have used to exclude system fed auxiliary transformers that initiate a process shutdown trip from the scope of other NERC PRC standards.</p> <p>During a disturbance in which system voltage becomes depressed, the generator will</p>

Organization	Yes or No	Question 5 Comment
		<p>respond by increasing excitation in an effort to compensate for the voltage loss. This will result in the generator terminal voltage being greater than the system voltage. For this reason, AEP recommends that settings for applicable relays installed on the generator side of the GSU be based on a generator bus voltage of 1.0 per unit at the generator terminals, rather than a generator bus voltage calculated from 0.85/0.95 per unit of the GSU high-side nominal voltage.</p>
<p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made</p> <p>The drafting team acknowledges that the generator terminal voltage during field-forcing will be higher than the transmission system voltage; the drafting team accounted for this in the voltage criteria. No change made.</p>		
Tacoma Power	Yes	<p>Comments 1-4 below pertain to PRC-025-1.</p> <p>1. Referring to Attachment 1, are phase fault detectors used in current-based local breaker failure schemes excluded from PRC-025-1?</p> <p>Response: Yes. The breaker failure relay will assert only if other components fail and is not addressed in the standard; therefore, the associated fault detector is not included. No change made.</p> <p>2. Referring to Attachment 1, Footnote 3 still has the terms “no-load tap changers (NLTC)” and “on-load tap changers (OLTC).”</p> <p>Response: Change made.</p> <p>3. Referring to page 22 of 68 of the redlined Guidelines and Technical Basis, the first paragraph after “Generator Interconnection Facilities (Synchronous Generators) Phase Distance Relays - Directional Toward Transmission System (21) (Options 14a and 14b),” change “...for these relay...” to “...for these relays...” (There are also other instances of</p>

Organization	Yes or No	Question 5 Comment
		<p>this issue.)</p> <p>Response: The editorial suggestion is correct. Change made.</p> <p>4. Referring to page 20 of 68 of the redlined Guidelines and Technical Basis, would the UATs shown in Figure 6 necessarily be applicable to PRC-025-1? It seems that phase time overcurrent relays applied to UATs like these might not “act to trip the generator directly or via lockout or auxiliary tripping relay.”</p> <p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>5. Referring to Attachment C, why are only two of the bulleted exceptions shown in PRC-025-1 Attachment 1 brought over?</p> <p>Response: In removing the previously proposed Requirements R7 and R8 in PRC-023-3, Attachment C and its Table 1 have been eliminated. Change made.</p> <p>6. Referring to page 12 of 13 of the redlined Implementation Plan, change “...were added to address to situations...” to “...were added to address situations...”</p> <p>Response: In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the Implementation Plan has been revised to note the specific milestones that are known to improve clarity. Change made.</p> <p>7. Referring to page 13 of 13 of the redlined Implementation Plan, last row in the table, are references to R7 supposed to be references to R8? Additionally, change “...equally and efficient...” to “...equally efficient...”</p> <p>Response: In removing the previously proposed Requirements R7 and R8 in PRC-023-3, the Implementation Plan has been revised to note the specific milestones that are</p>

Organization	Yes or No	Question 5 Comment
		known to improve clarity. Change made.
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Tri-State G&T	Yes	<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>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>2. 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>Response: 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</p>

Organization	Yes or No	Question 5 Comment
		<p>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>3. 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 already eliminated any economic rationale for having black-start facilities.</p> <p>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the applicability of the standard, they may not perform as expected to facilitate system restoration. Also, 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). No change made.</p> <p>4. 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>Response: The drafting team agrees, in general, 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. The threshold criteria in PRC-025-1 are necessary to prevent tripping from generator load-responsive protective relays for short-time overloads during the field-forcing</p>

Organization	Yes or No	Question 5 Comment
		conditions of the generator, for which the equipment was designed. No change made.
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
Ingleside Cogeneration LP	Yes	<p>In the previous posting, the project team requested our estimated compliance costs and comments on the RSAW. Both of these projects are components of risk-based compliance - which Ingleside Cogeneration LP fully supports. However, it appears that these are not considerations at all in the latest postings.</p> <p>We are not sure what has changed in the intellectual basis of risk-based compliance, but it seems we have taken a step backwards. The rationale for far too many of the project team’s consideration of comments was that FERC Order 733 mandated some action. Since FERC has been generally supportive of the risk-based initiative, this type of response is inconsistent with their position in our view.</p>
<p>Response: 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 (http://www.nerc.com/pa/Stand/Pages/Project-2010-13-2-Phase-2-Relay-Loadability-Generation.aspx). No change made.</p> <p>Also, NERC Compliance provided the industry comments to the drafting team from the RSAW which was posted contemporaneously with the draft 3 posting of PRC-025-1. Revisions made to the RSAW were provided to NERC Compliance for consideration and reposting; however, NERC Compliance elected to wait as they are currently working toward a more defined process for RSAW posting and commenting. No change made.</p>		
Entergy Services, Inc. (Transmission)	Yes	<p>The implementation plan may be challenging to meet and an alternative implementation plan may need to be provided based on the population of load-responsive protective relays determined affected by this standard and the subset of which that will require replacement relays. Additional resources will be required to</p> <p>(1) determine the population of load-responsive relays at each generating station,</p>

Organization	Yes or No	Question 5 Comment
		<p>(2) determine the settings of the existing load-responsive relays,</p> <p>(3) calculate load-responsive relay settings per the reliability standard,</p> <p>(4) compare the existing load-responsive relay settings to the calculated load-responsive relay settings to determine the population which are acceptable as-is, the population that require a settings change, and the population that requires replacement,</p> <p>(5) schedule the population of load-responsive relays for settings change,</p> <p>(6) order replacement load-responsive relays for the population determined incapable of meeting the reliability standard and schedule relay replacement. The resulting calculations and set-point datasheets will form the basis for the load-responsive relay settings and evidence for meeting the standard’s requirements.</p>
<p>Response: The drafting team thanks you for your comments and contends that the Implementation Plan establishes the deadlines by which the standards must be implemented. Individual steps to achieve implementation are left to the entity to determine and manage. No change made.</p>		
Public Service Enterprise Group	Yes	The SDT needs to confirm that UATs that are energized from the system (not the GSU) at high-side voltages that are below 100 kV are part of the BES before imposing standards on UAT load-responsive relay settings.
<p>Response: The drafting team thanks you for your comments and notes that NERC Reliability Standards may be applicable to equipment that is not part of the BES if necessary to support reliable operation of the bulk power system. No change made.</p>		
Seminole Electric Cooperative Inc.	Yes	Seminole Electric reasons that the NERC SDT has not provided sufficient evidence to warrant a High VRF and a Severe VSL for penalties associated with proposed Standard PRC-025-1.
<p>Response: The drafting team contends that the High VRF is correct, as it fully satisfies the associated criteria from the VRF</p>		

Organization	Yes or No	Question 5 Comment
<p>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 contends 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. No change made.</p>		
<p>Flathead Electric Cooperative</p>	<p>Yes</p>	<p>Do not support including Elements utilized in the aggregation of dispersed power producing resources. This seems to have the potential to rope very small generators into significant compliance burdens for very little reliability benefit.</p>
<p>Response: The drafting team intends that the Applicability for Facilities associated with aggregated generation aligns with the definition of the BES. The drafting team notes that all feeders and individual generators within an aggregated site will require similar load-responsive protective relay settings because they will be challenged by the same loadability during the system conditions being addressed by PRC-025-1; therefore, they will respond as a group, emphasizing that the criteria needs to be applied throughout the aggregated Facility. No change made.</p>		
<p>Southwest Power Pool</p>	<p>Yes</p>	<p>For the sake of clarity, I would suggest adding the phrase 'to the generator' at the end of the Purpose of PRC-025-1. This is implied in the existing language but it wouldn't hurt to add this and specifically indicate what damage you're referring to.</p> <p>Response: The Purpose statement was modified in the last draft to not be generator specific. The standard addresses generation Facilities in general and the criteria provide reasonable loadability settings that are within the capability of the equipment the standard is addressing. The purpose statement has been modified to clarify risk to associated equipment. Change made.</p> <p>For consistency within the requirements and between the requirement and corresponding measure in this situation, please add 'Each' at the beginning of Requirement R8. This makes R8 consistent with the rest of the requirements and with</p>

Organization	Yes or No	Question 5 Comment
		<p>Measure M8.</p> <p>Response: The drafting team has decided to integrate Transmission Owner and Distribution Provider into the proposed PRC-025-1, rather than adding Requirement R7 and R8 to the proposed PRC-023-3 to establish a bright line between the two standards. The owner of load-responsive protective relays applied to generation-related Facilities will be in PRC-025 and owner of load-responsive protective relays network-related Facilities in PRC-023 regardless of ownership of the Facilities. Change made.</p>
<p>Response: The drafting team thanks you for your comments; please see the above responses.</p>		
<p>Kansas City Power and Light</p>	<p>Yes</p>	<p>Generators and Generator step up transformers are critical elements of the BES and have very long lead times for replacement or major repair. However, the Transmission Relay load ability standard has less stringent load ability requirements than the Generator load ability standard. Transmission lines are allowed to trip at 150% of four hour rating or 115% of 15 minute rating. We do not understand the newly added portion of the Exceptions of PRC-025-1 why is there only the option of a specific curve type specified for the Generator. There is no exception available for the GSU or Aux Transformers therefore the GSU and Aux transformers that would allow them to be set like large auto transformers it is not our belief that these transformers should be required to be set with more Stringent settings. We believe that these transformers should be set similar to the large auto transformers.</p>
<p>Response: The drafting team thanks you for your comment and notes that Exclusion #7 addresses transformers and is not limited to only GSUs. No change made.</p> <p>This exclusion is different than Exclusion #6 (applicable to generators) to reflect the differences in thermal overload capability. The drafting team asserts the time frames in these exclusions are therefore appropriate. No change made.</p>		
<p>MRO NERC Standards</p>		<p>The NSRF remains concerned that the proposed calculations for the distance relays will</p>

Organization	Yes or No	Question 5 Comment
Review Forum		<p>adversely affect reliability of the BES by requiring generators to pull back distance reaches too far which could lead to reduced rely coverage (at least for backup relaying) or longer delays for coordination. Some sample calculations performed by NSRF members show that distance reaches need to be pulled back more than 30%. The NSRF members believe that this is most likely due to the more conservative relay load limit angle calculations at 30 degrees rather than former MidContinent Area Power Pool (MAPP) criteria which used line Maximum Torque Angle calculations which typically averaged near 70 - 85 degrees. Sample MAPP Relay Load Limit Calculation: $(0.85 * kV)^2 / (Z1_{max} * \cos(\text{max torque angle} - \text{line power factor angle}))$ NSRF sample calculations show that many generators may require 21 distance setting changes based upon this proposed standard, potentially resulting in potential reductions of relay backup coverage for lines leaving some generating stations. This will put a much higher risk and responsibility on the TO too have extremely reliable protection for the lines. We will no longer be able to trip the generator off in a backup mode if the TO does not clear the phase fault at end of line. This appears to conflict with R1, unless the standard is mandating the installation of additional equipment such as redundant relays systems to maintain reliable fault protection.</p> <p>The NSRF would ask the NERC Standard drafting team to work with NSRF members to help verify the basis for the new calculations and if this does in fact reduce relay coverage or require entities to install additional relaying to maintain system reliability as mandated in R1.</p>
<p>Response: The drafting team thanks you for your comments and notes the basis for the calculations for the generator protective relays in proposed PRC-025-1 is well established by observed behavior during disturbances and by simulations, and the observed behavior verifies the simulations. The various options (...a, ...b, and ...c) represent varying degrees of calculation complexity, wherein the most conservative criterion represents a very simple calculation, and the complexity increases as the criteria becomes less conservative. No change made.</p> <p>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</p>		

Organization	Yes or No	Question 5 Comment
<p>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>Texas Reliability Entity</p>		<p>Texas RE generally supports this standard as written, other than the use of the term *Regional Reliability Organization* in Table 1 as described above. Our other comments are provided for consideration by the drafting team.</p>
<p>Response: The reference to “...or other entity as specified by the Regional Reliability Organization (RRO)” has been removed from the standard. Change made.</p>		
<p>Exelon and its affiliates</p>		<p>The Constellation Energy Nuclear Generation (CENG) 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.” Section 3.2.3 of PRC-025-1 requires clarification simply because the Unit Auxiliary Transformers (UAT’s) are not necessarily directly connected to the generator, but there are indirect link to the generator operation. The UAT’s are ok to be included to the applicability of this standard, but section 3.2.3 could use more detailed explanation. Moreover, the webinar on 5/15/13 pointed out 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 drawn 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 hypothetical benefit that has not been observed (or has in fact been disproved) in</p>

Organization	Yes or No	Question 5 Comment
		<p>practice.</p> <p>CENG state that Facilities, UAT’s in Section 3.2.3 is appropriate to include it, but there need to be a specific explanation as to the affect of MW due to grid disturbance affect the generator output. 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.</p>
<p>Response: The Purpose statement was modified in the last draft to not be generator specific. The standard addresses generation Facilities in general and the criteria provide reasonable loadability settings that are within the capability of the equipment the standard is addressing. The purpose statement has been modified to clarify risk to associated equipment. Change made.</p> <p>The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p>		
Consumers Energy	Yes	<p>Page 3 of 20, 3.2: Blackstart Resources that would not otherwise be defined as part of the BES should not be included in the Facilities. Although voltage swings will occur during restarting of the system, the detailed planning to control the electrical paths and the placement of operating personnel to key substation locations preclude the need for loadability criteria for these small generators. Blackstart Resources should be removed from the list of Facilities.</p> <p>Response: The drafting team contends that during Blackstart conditions the generator may experience extreme voltage and loading swings; therefore, Blackstart units are included and apply to the standard. If such generators are excluded from the applicability of the standard, they may not perform as expected to facilitate system restoration. Also, 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). No change made.</p>

Organization	Yes or No	Question 5 Comment
		<p>Page 8 of 20, Exceptions: The Drafting Team has added one bullet item to and modified one in the list of Exceptions. The first one recognizes the need to operate within generator short time capabilities and is acceptable. The second exclusion attempts to place an operator response time of 15 minutes or greater to a transformer overload condition. While a system disturbance may continue for extended periods, we believe that the 15 minute time frame far exceeds the practical relay operate time of standard electromechanical, static or digital protective relays. The operate time characteristics for most relays, as drawn on the manufacturers’ time-current curves, are much faster than 15 minutes. Traditional relay curves are drawn to begin at 1.5 times pickup. The maximum relay operate times at that defined relay pickup is typically in the 2-5 minute range. Considering that the relay curves do not extend beyond a few minutes, a time specification beyond 5 minutes is unrealistic. The wording of the last exception should be changed to exclude: “Protection systems that detect transformer overloads and are designed to respond in time periods which are greater than 2 minutes”</p> <p>Response: The drafting team intends to exempt schemes that are explicitly designed for overload protection, for which characteristics would be defined for the time period in the bullet. Load-responsive relays that respond otherwise must meet the criteria in Table 1. The proposed change to 2 minutes in the referenced exclusion may not be sufficient to allow the system voltage to recover for the conditions being addressed by this standard. No change made.</p> <p>Page 14-15 of 20, 8a, 8b and 8c: The standard Pickup Setting Criteria for the step-up transformer overcurrent element pickup is stated as 115% of any of three calculated currents. In these cases the step-up transformer can probably withstand the high currents for a short period of time, however all generators cannot be expected to operate up to this percent current. It should be recognized that the control functions set to protect the generator short time capabilities may supersede the operation of the overcurrent element. Therefore any dynamic modeling of a generator must include the excitation limitations. If the overcurrent element is set to operate to protect the generator, then the pickup criteria must be changed to limits of the particular</p>

Organization	Yes or No	Question 5 Comment
		<p>generator. A fourth alternative 8d should be created to recognize generator limits and allow for setting the pickup and timing of the overcurrent element to protect the generator.</p> <p>Response: Proposed PRC-025-1 is based on system conditions where the generator is expected to provide full field forcing until such a time as the excitation system controls act to bring the generator back to within its steady state capability curve. Options 8a, 8b, and 8c establish that the GSU shall not trip for the identical conditions for which the generator criteria are established. No change made.</p> <p>Page 17 of 20, 13a and 13b: Unit auxiliary transformers are normally sized to carry all of the station power loads for the expected range of the generator operating voltage. A transformer high side overcurrent relay should be set to allow the transformer loading, with margin. Since the standard is based upon “widely depressed” system voltage and the standard recognizes that the generator will be supplying VARs to the system, the generator terminal voltage will most likely be at or above rated. The pickup criteria are unnecessarily complicated by the inclusion of 13b. We recommend retaining 13a and the removal of 13b.</p> <p>Response: The drafting team contends that the load-responsive protection for any UAT that supplies “running station power” to the plant, such that tripping of the UAT will cause the generator to trip, should be addressed by the draft standard. The drafting team has revised the Table 1 criteria for UAT protection in the Standard and the Guidelines and Technical Basis discussion accordingly. Change made.</p> <p>The UAT can be connected at a variety of points; for system-connected UAT, the UAT primary winding will see approximately 0.85 p.u. voltage; for unit-connected UAT, the drafting team estimates that this voltage will be 0.9 to 0.95 p.u. voltage.</p> <p>The drafting team has proposed a 150% margin for these relays rather than requiring an analysis of the connected loads for depressed voltage; the margin includes consideration for the increased current called for by these loads as well as normal relay</p>

Organization	Yes or No	Question 5 Comment
		setting tolerances. Some entities have indicated that 13b may be useful; therefore the drafting team has decided to not remove it. No change made.
Response: The drafting team thanks you for your comments.		

END OF REPORT