NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Consideration of Comments

Project Name: 2010-05.3 Phase 3 of Protection Systems: Remedial Action Schemes (RAS) | PRC-012-2

Comment Period Start Date: 2/3/2016

Comment Period End Date: 3/18/2016

Associated Ballots: 2010-05.3 Phase 3 of Protection Systems: Remedial Action Schemes PRC-012-2 AB 3 ST, 2010-05.3 Phase 3 of Protection Systems: Remedial Action Schemes PRC-012-2 Non-binding Poll AB 3 NB

There were 43 responses, including comments from approximately 131 different people from approximately 84 different companies representing 8 of the 10 Industry Segments as shown on the following pages.

All comments submitted can be reviewed in their original format on the 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 Director of Standards, Howard Gugel (via email) or at (404) 446-9693.

The drafting team made grammatical edits and footer updates to all documents and provided additional information in the Rationale boxes and Supplemental Material section of the draft standard based on stakeholder comments.

Questions

1. **PRC-012-2: Requirements R4 and R6, Attachments 1 and 2, and the Supplemental Material section of the standard were modified for clarity and completeness. Do you agree with the proposed changes? If no, please provide the basis for your disagreement and an alternate proposal.**
2. **Implementation Plan for PRC-012-2: The drafting team revised the Implementation Plan to provide for the initial consideration of limited impact RAS, and to clarify that the initial obligation under Requirement R9 for a Reliability Coordinator that does not have a RAS database is to establish a RAS database by the effective date of PRC-012-2. Do you agree with the revised Implementation Plan? If no, please provide the basis for your disagreement and an alternate proposal.**

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

Organization Name	Name	Segment(s)	Region	Group Name	Group Member Name	Group Member Organization	Group Member Segment(s)	Group Member Region
ACES Power Marketing	Ben Engelby	6		ACES Standards Collaborators - PRC-012-2 Project	Ellen Watkins	Sunflower Electric Power Corporation	1	SPP RE
					Shari Heino	Brazos Electric Power Cooperative, Inc.	1,5	Texas RE
					Ginger Mercier	Prairie Power, Inc.	1,3	SERC
					Mark Ringhausen	Old Dominion Electric Cooperative	3,4	RF
					Caitlin Schiebel	Buckeye Power, Inc.	4	RF
					John Shaver	Arizona Electric Power Cooperative, Inc. Southwest Transmission Cooperative, Inc. and Southwest Transmission Cooperative, Inc.	1,4,5	WECC

					Bill Hutchison	Southern Illinois Power Cooperative	1	SERC
					Scott Brame	North Carolina Electric Membership Corporation	3,4,5	SERC
					Chip Koloini	Golden Spread Electric Cooperative	5	SPP RE
					Bill Hutchison	Southern Illinois Power Cooperative	1	SERC
Southwest Power Pool, Inc. (RTO)	Charles Yeung	2	SPP RE	SRC-ISONE	Charles Yeung	SPP	2	SPP RE
					Ben Li	IESO	2	NPCC
					Ali Miremadi	CAISO	2	WECC
					Greg Campoli	NYISO	2	NPCC
					Liz Axson	ERCOT	2	Texas RE
					Lori Spence	MISO	2	MRO
					Mark Holman	PJM	2	RF
Public Service Enterprise Group	Christy Koncz	1,3,5,6	NPCC,RF	PSEG	Tim Kucey	PSEG - PSEG Fossil LLC	5	RF
					Karla Jara	PSEG - Energy Resources and Trade LLC	6	RF
					Joseph Smith	PSEG - Public Service	1	RF

						Electric and Gas Co.		
					Jeffrey Mueller	PSEG - Public Service Electric and Gas Co	3	RF
Duke Energy	Colby Bellville	1,3,5,6	FRCC,RF,SERC	Duke Energy	Doug Hils	Duke Energy	1	RF
					Lee Schuster	Duke Energy	3	FRCC
					Dale Goodwine	Duke Energy	5	SERC
					Greg Cecil	Duke Energy	6	RF
SERC Reliability Corporation	David Greene	10	SERC	SERC DRS	Mei Li	Entergy	1	SERC
					Zakia El Omari	GTC	1	SERC
					Wade Richards	SCPSA	1	SERC
					Bob Jones	Southern Company Services	1	SERC
					John O'Connor	DEP	1	SERC
					John Sullivan	Ameren	1	SERC
					Tom Cain	TVA	1	SERC
					Venkat Kolluri	Entergy	1	SERC
MRO	Emily Rousseau	1,2,3,4,5,6	MRO	MRO-NERC Standards Review Forum (NSRF)	Joe Depoorter	Madison Gas & Electric	3,4,5,6	MRO
					Chuck Lawrence	American Transmission Company	1	MRO

Chuck Wicklund	Otter Tail Power Company	1,3,5	MRO
Dave Rudolph	Basin Electric Power Cooperative	1,3,5,6	MRO
Kayleigh Wilkerson	Lincoln Electric System	1,3,5,6	MRO
Jodi Jenson	Western Area Power Administration	1,6	MRO
Larry Heckert	Alliant Energy	4	MRO
Mahmood Safi	Omaha Public Utility District	1,3,5,6	MRO
Shannon Weaver	Midwest ISO Inc.	2	MRO
Mike Brytowski	Great River Energy	1,3,5,6	MRO
Brad Perrett	Minnesota Power	1,5	MRO
Scott Nickels	Rochester Public Utilities	4	MRO
Terry Harbour	MidAmerican Energy Company	1,3,5,6	MRO

					Tom Breene	Wisconsin Public Service Corporation	3,4,5,6	MRO
					Tony Eddleman	Nebraska Public Power District	1,3,5	MRO
					Amy Casucelli	Xcel Energy	1,3,5,6	MRO
Seattle City Light	Ginette Lacasse	1,3,4,5,6	WECC	Seattle City Light Ballot Body	Pawel Krupa	Seattle City Light	1	WECC
					Dana Wheelock	Seattle City Light	3	WECC
					Hao Li	Seattle City Light	4	WECC
					Bud (Charles) Freeman	Seattle City Light	6	WECC
					Mike haynes	Seattle City Light	5	WECC
					Michael Watkins	Seattle City Light	1,3,4	WECC
					Faz Kasraie	Seattle City Light	5	WECC
					John Clark	Seattle City Light	6	WECC
Southern Company - Southern	Pamela Hunter	1,3,5,6	SERC	Southern Company	Robert A. Schaffeld	Southern Company Services, Inc.	1	SERC

Company Services, Inc.					R. Scott Moore	Alabama Power Company	3	SERC
					William D. Shultz	Southern Company Generation	5	SERC
					John J. Ciza	Southern Company Generation and Energy Marketing	6	SERC
Dominion - Dominion Resources, Inc.	Randi Heise	5		Dominion - RCS	Larry Nash	Dominion Virginia Power	1	SERC
					Louis Slade	Dominion Resources, Inc.	6	SERC
					Connie Lowe	Dominion Resources, Inc.	3	RF
					Randi Heise	Dominion Resources, Inc.	5	NPCC
Northeast Power Coordinating Council	Ruida Shu	1,2,3,4,5,6,7	NPCC	RSC No HQ and Dominion	Paul Malozewski	Hydro One	1	NPCC
					Guy Zito	Northeast Power Coordinating Council	NA - Not Applicable	NPCC
					Brian Shanahan	National Grid	1	NPCC

Rob Vance	New Brunswick Power	1	NPCC
Mark J. Kenny	Eversource Energy	1	NPCC
Gregory A. Campoli	NY-ISO	2	NPCC
Randy MacDonald	New Brunswick Power	2	NPCC
Wayne Sipperly	New York Power Authority	4	NPCC
David Ramkalawan	Ontario Power Generation	4	NPCC
Glen Smith	Entergy Services	4	NPCC
Brian O'Boyle	Con Edison	5	NPCC
Brian Robinson	Utility Services	5	NPCC
Bruce Metruck	New York Power Authority	6	NPCC
Alan Adamson	New York State Reliability Council	7	NPCC
Michael Jones	National Grid	3	NPCC

					Michael Forte	Con Edison	1	NPCC
					Kelly Silver	Con Edison	3	NPCC
					Brian O'Boyle	Con Edison	5	NPCC
					Edward Bedder	Orange & Rockland Utilities	1	NPCC
					David Burke	UI	3	NPCC
					Peter Yost	Con Edison	4	NPCC
					Helen Lainis	IESO	2	NPCC
					Michele Tondalo	UI	1	NPCC
					Kathleen Goodman	ISO-NE	2	NPCC
					Silvia Parada Mitchell	NextEra Energy, LLC	4	NPCC
Southwest Power Pool, Inc. (RTO)	Shannon Mickens	2	SPP RE	SPP Standards Review Group	Shannon Mickens	Southwest Power Pool Inc.	2	SPP RE
					Jason Smith	Southwest Power Pool Inc.	2	SPP RE
					Patrick McPhail	Grand River Dam Authority	1	SPP RE
					Robert Hirchak	Cleco	1,3,5,6	SPP RE
					Jamison Cawley	Nebraska Power Public District	1,3,5	MRO

					Greg Hill	Nebraska Power Public District	1,3,5	MRO

1. PRC-012-2: Requirements R4 and R6, Attachments 1 and 2, and the Supplemental Material section of the standard were modified for clarity and completeness. Do you agree with the proposed changes? If no, please provide the basis for your disagreement and an alternate proposal.

Barbara Kedrowski - WEC Energy Group, Inc. - 3,4,5,6 - RF	
Answer	No
Comment	

We object to Generator Owners having a primary role in this standard. The nature of a RAS is not to protect individual generators, for these must have adequate protection for faults or abnormal operating situations. The RAS is typically designed to maintain the reliability of a significant area of the overall power system. As such, the Transmission Owner is the best entity to ensure that RAS are employed correctly. Unlike the GO, the TO has the "wide-area" scope of monitoring and system responsibility.

The draft standard is deficient due to the patchwork nature of responsibility for a RAS, especially when there are multiple Owners of portions of the RAS. There needs to be a single RAS Owner that has overall responsibility for ensuring the requirements of PRC-012-2 are met. This RAS Owner should be a Transmission Owner, not a Generator Owner. The TO (RAS Owner) should take the lead in developing the data needed for requirements R1 and R3, with the other RAS entities being required to provide data and equipment modifications as needed. Requirements R5 through R8 should apply to the RAS-Owner, not the RAS entities. The RAS Owner should be the point of contact with the Planning Coordinator/Reliability Coordinator, with the RAS entities having responsibility to collaborate with the RAS Owner as needed.

Likes 1	U.S. Bureau of Reclamation, 5, Doot Erika
Dislikes 0	

Response

Thank you for your comments.

The drafting team is charged with assigning the requirements of PRC-012-2 to the specific users, owners, and operators of the Bulk-Power System while incorporating the reliability objectives of all the RAS-related standards. The term RAS-entity is defined in the Applicability as the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS. For purposes of PRC-012-2, a

Generator Owner (RAS-entity) that owns RAS components is responsible to participate in the various activities identified by the requirements to the extent of its ownership. RAS-entities have the option of collaborating to fulfill their responsibilities for each applicable requirement; however, the individual RAS-entity must be able to demonstrate its participation for compliance.	
Daniel Mason - City and County of San Francisco - 5	
Answer	No
Comment	
The Standards identifies a RAS-entity as "the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS". In some cases this "part" could be as limited as a sensing device providing input to another entity's RAS logic and interupting devices. For those RAS-entities that find themselves in that situation, providing the information identified in Attachments 1 and 2 is not appropriate. The Standard should clear up reporting responsibilities for such minor RAS-entities, perhaps by employ the concept of a "RAS Reporting Agent" for each RAS.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. For purposes of PRC-012-2, the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS is a RAS-entity as defined in the Applicability. The RAS-entity is responsible to participate in the various activities identified by the requirements to the extent of its ownership. RAS-entities have the option of collaborating to fulfill their responsibilities for each applicable requirement; however, the individual RAS-entity must be able to demonstrate its participation for compliance.	
Gul Khan on Behalf of Rod Kinard, Oncor Electric Delivery - 1	
Answer	No
Comment	
Oncor does not currently provide the documents mentioned on page 21 of the PRC-012-2 draft 3 standard bullet # 1. We can provide a simple map of where a RAS will be located but if we are being requested to provide relay functional drawings or detailed 3 line	

schematics we won't have those drawings developed until the RAS is approved. Additionally even if we have the documents and do send it to ERCOT, we have a confidentiality concern as these files will get posted in a public information database. We have touched base with our RC, ERCOT, and they agree that the process we are doing today is satisfactory and is working. Hence we do not see a need to provide the documentation in attachment 1. The additional information should be optional.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. To facilitate a review that promotes reliability, the RAS-entity must provide the RC sufficient details (identified in Attachment 1) of the RAS design, function, and operation. The information described in Appendix 1 (while not identical) is similar to the information required by most Regional Entities as part of existing RAS review and approval processes. As stated in Attachment 1, if an item on this list does not apply to a specific RAS, a response of "Not Applicable" for that item is appropriate. The level of detailed information required is ultimately at the discretion of the RC. The RC may request additional information on any aspect of the RAS as well as any reliability issue related to the RAS. If Oncor and ERCOT (the reviewing RC) agree that the documentation provided for RAS review is Critical Infrastructure Information (CII), all entities involved should handle the information in accordance with all applicable CII guidelines. PRC-012-2 does not require that the RAS documentation or review be public.	
Diana McMahon - Salt River Project - 1,3,5,6 - WECC	
Answer	No
Comment	
SRP appreciates the efforts of the SDT and recommends the removal of the language in the attachments that refers to a "checklist". Initial drafts of the attachments were checklists. What is presented cannot be described as a "checklist". SRP believes this language will create confusion. SRP further recommends removing the definition for "limited impact" from the footer of the attachment. If this is to be a definition, it should be defined in the NERC Glossary of Terms.	

SRP recommends the removal of the definition for "Functionally Modified" from the footer of the documents. Capitalized terms are to be part of the NERC Glossary of Terms and should not be located outside of that body of work.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team regards Attachments 1 and 2 as checklists and maintains they should be used as such by the RAS-entity (Attachment 1) and Reliability Coordinator (Attachment 2). The Reliability Coordinator has responsibility for the reliability of BES operations within its Reliability Coordinator Area and consequently has the responsibility to review and approve each RAS before it is implemented in its RC Area. Furthermore, the RC has the discretion to designate a RAS as limited impact, if applicable, on a case-by-case basis. The drafting team maintains that the general description and explanatory language regarding the limited impact designation does not rise to the level of a definition that should be included in the Glossary of Terms Used in NERC Reliability Standards; instead, it provides high-level guidance for the RC to consider during the RAS review. The term "functionally modified," which is incorporated into the standard by reference to Attachment 1, is only intended to provide guidance to responsible entities for complying with PRC-012-2. The footnote contains examples of what would be considered "functionally modified." The drafting team maintains that this guidance does not rise to the level of a definition that should be included in the Glossary of Terms Used in NERC Reliability Standards, and the footnote is a workable location for this information. The capitalization of the word "modified" in footnotes 2, 4, and 8 was an error and was corrected. Thank you for pointing this out.	
Jeri Freimuth - APS - Arizona Public Service Co. - 3	
Answer	No
Comment	
AZPS appreciates the efforts of the Standard Drafting Team (SDT) to date and makes the following comments:	

The materials state that a limited impact RAS is “determined by the RC”. AZPS suggests modifying the language to “…limited impact RAS as determined by the RC based on predefined regionally appropriate criteria.” An RC's determination of whether a RAS is limited impact should include an evaluation of the potential impacts of the RAS and should reference pre-defined regionally appropriate criteria defined through a regionally accepted process (e.g. via the RASRC in WECC). The Technical Justification section directed to Limited Impact states, “The reviewing RC is the sole arbiter for determining whether a RAS qualifies for the limited impact designation.” While not in direct conflict, AZPS believes that some entities may misinterpret the modified language as limiting the “The RC from requesting assistance in RAS reviews from other parties such as the PC(s) or regional technical groups (e.g., Regional Entities)” as provided for earlier in the document. AZPS requests that the “sole arbiter” sentence be clarified to address this concern. R4.1.3 is currently amended to state “for limited impact RAS, the inadvertent operation of the RAS or the failure of the RAS to operate does not cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations.” The word “contribute” should be removed because it reduces clarity to the standard. The term “contribute” is too broad and creates challenges to precisely evaluate. AZPS appreciates the DT addressing the concern of cases where a RAS crosses one or more RC Area boundaries, each affected RC is responsible for conducting either individual reviews or participating in a coordinated review by adding language in the appropriate rational and Supplemental Material sections. AZPS requests the SDT consider if this information would be more impactful as a footnote to the requirements themselves.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team maintains that the RC is the functional entity best suited to perform the RAS reviews because it has the widest area reliability perspective of all functional entities and an awareness of reliability issues in neighboring RC Areas. This Wide Area purview facilitates the evaluation of interactions among separate RAS as well as interactions among the RAS and other protection and control systems. The RC has the most comprehensive operational knowledge of the BES in its RC Area. The drafting team declines to make the suggested change of adding “based on predefined regionally appropriate criteria” as it is not necessary.	

The RC may request and consider input from various parties on any decision. The fact that the RC is responsible for making the final decision; i.e., is the "sole arbiter," does not preclude nor conflict with the RC's ability to request assistance or input; however, the drafting team made a clarifying revision to the wording in the Supplemental Material section for "limited impact".

Regarding the use of the term "contribute", the drafting team contends its inclusion is necessary. Usually, if not always, there is more than one cause or contributing factor for an event on the BES; whereby, the removal of any one of the individual contributing factors might have prevented or lessened the severity of the event. The drafting team declines to make the suggested change.

The drafting team sees no benefit in putting the existing language in a footnote and declines to make the suggested change.

Ginette Lacasse - Seattle City Light - 1,3,4,5,6 - WECC, Group Name Seattle City Light Ballot Body	
Answer	No
Comment	

Need to clarify roles and responsibilities for those RAS that are multi-jurisdictional. See Attached comments

Clarification of Roles and Responsibilities for RAS Equipment Ownership by Multiple Entities:

4.1.3 RAS-entity

The RAS-entity is any Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS. If all of the RAS (RAS components) have a single owner, then that RAS entity has sole responsibility for all the activities assigned within the standard to the RAS-entity. If the RAS (RAS components) have more than one owner, then each separate RAS component owner is a RAS-entity and is obligated to participate in various activities identified by the Requirements.

The standard does not stipulate particular compliance methods. RAS-entities have the option of collaborating to fulfill their responsibilities for each applicable requirement. Such collaboration and coordination may promote efficiency in achieving the reliability objectives of the requirements; however, the individual RAS-entity must be able to demonstrate its participation for compliance. As an example, the individual RAS-entities could collaborate to produce and submit a single, coordinated Attachment 1 to the reviewing RC pursuant to Requirement R1 to initiate the RAS review process.

Per 4.1.3 RAS-entity discussion, City Light does not agree with the current definition from within the standard or the way responsibility is assigned. Compliance responsibility is being assigned to entities that cannot, by themselves, perform required actions to achieve compliance. Instead, entities that participate in a RAS scheme must rely on the original or current designer and owner of the scheme to perform work and perform coordination efforts. Without assigning primary and secondary (minor) RAS-entity responsibilities, issues could arise that are beyond the control of obligated entities. For an entity that only has end of the line equipment involved in the scheme, such as breaker trip coils, too much obligation falls on this entity that has a minor role. A large number of entities will fall into the category of owning a very small supporting portion of a RAS scheme and who do not have the means (information they do not control or determine) to perform the required reporting. Differentiation should be made between the primary RAS-entity (owner of a RAS scheme, primary) and owners of pieces of equipment who play a minor role for the primary RAS scheme. The standard should be rewritten to differentiate between primary and secondary (minor) to clarify roles and responsibilities.

As was mentioned in previous draft comments by others, this standard works great when there is one entity that owns the entire scheme. R3, R5, R6, R7, and R8 should be revised to designate overall responsibility to an owner of the scheme, with all secondary (minor participants) involved in the scheme being required to support the owner of the scheme in their development and reporting obligations. The primary RAS-entity that designs, owns and controls the RAS should be the one responsible for coordinating and meeting these requirements from the standard.

Other possible implications:

City Light additionally suggests that the term RAS-entity only apply to this standard and not be placed in the Glossary of Terms. If City Light is labeled as a RAS-entity under this current drafted definition, we would be defined as owning some or all of a RAS. There are no approved definitions for a RAS Owner. Project 2010-05.3 PRC-012-2 RAS Seattle City Light Comments Additional Ballot and Non-Binding Poll March 16, 2016

Other standards that assign RAS responsibilities do so under the applicability verbiage of “XXXX that owns an SPS”. City Light feels this would impose undue confusion and compliance responsibility on entities that are minimally involved in a RAS. Therefore, RAS Entity should be only applicable to this standard.

We suggest adding the below defined term and language which would help serve three purposes. First to clarify who has responsibility for certain aspects of this standard. Secondly, to help clarify which entity has responsibility under current and future enforced RAS related standards such as PRC-017-1. Lastly, the proposed term would align with current WECC assignments of RAS responsibility.

RAS-owner—the Transmission Owner, Generator Owner, or Distribution Provider that is the majority owner and operator of a RAS, this is normally identified using the following prioritization;

The RAS-owner is the Transmission Owner of the scheme. Where there is not a Transmission Owner that owns a portion of the RAS, the Generator Owner becomes the RAS-owner. Where there is not a Transmission Owner or a Generator Owner that owns a portion of the RAS, the Distribution Provider becomes the RAS-owner.

In conclusion, revising the standard to clarify roles and responsibilities between the primary and secondary (participants) is crucial to the successful implementation of this standard when RAS components are owned by multiple entities.

Thanks you for your time and efforts in developing a successful standard

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

The term RAS-entity is applicable to PRC-012-2 only and will not be included in the Glossary of Terms Used in NERC Reliability Standards. For purposes of PRC-012-2, the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS is a RAS-entity as defined in the Applicability. The RAS-entity is responsible to participate in the various activities identified by the requirements to the extent of its ownership. RAS-entities have the option of collaborating to fulfill their responsibilities for each applicable requirement; however, the individual RAS-entity must be able to demonstrate its participation for compliance purposes.

The drafting team is charged with assigning the requirements of the new standard to the specific users, owners, and operators of the Bulk-Power System while incorporating the reliability objectives of all the RAS-related standards. In drafting this standard, the drafting team has worked diligently to minimize the changes that will be required from the existing processes. The drafting team recognizes that RAS with multiple owners inherently require coordination among all the participating RAS-entities from the first conceptual design through construction to operations, testing, maintenance and retirement.

For purposes of PRC-012-2, when a RAS has more than one owner, each RAS-entity is obligated to participate in the various activities identified by the requirements to the extent of its ownership. Collaboration, coordination, and communication between and among entities regarding RAS issues helps to ensure efforts are not duplicated and best serves reliability by promoting awareness. For purposes

of creating efficiencies, the drafting team maintains registered entities that currently share ownership of a RAS (RAS-entities) are in some manner already communicating, sharing information, and coordinating RAS tasks such as operations analysis, Corrective Action Plan (CAP) development, and functional testing. The drafting team is confident that entities will continue to do this after this standard is effective and that entities will communicate with each other if there is any question or doubt of responsibility surrounding any requirement.

The drafting team contends that your proposed language would cause confusion and declines to make the suggested changes.

Christy Koncz - Public Service Enterprise Group - 1,3,5,6 - NPCC,RF, Group Name PSEG	
Answer	No
Comment	

Requirement 1 – There are no clear lines of responsibility for jointly owned RASs.

The concept of a RAS-entity causes RAS-entity causes confusion for entities that have joint ownership of a RAS. While the SDT recognizes this issue by stating: " Ideally, when there is more than one RAS-entity for a RAS, the RAS-entities would collaborate and submit a single, coordinated Attachment 1to the reviewing RC". While PSEG agrees with the intent of this statement, it is included in the "Rationale" section of the draft standard and therefore that language will not be incorporated into the final standard. Furthermore, PSEG believes that PSEG that the language of R1 would still require each RAS entity to submit all information in Attachment 1to the Reliability Coordinator, which is inconsistent with the Paragraph 81 effort and the Reliability Assurance Initiative. PSEG believes such intent could be incorporated in to R1 as follows:

R1. Prior to placing a new or functionally modified RAS in-service or retiring an existing RAS, ~~each~~ the RAS-entity shall provide the information identified in Attachment 1 for review to the Reliability Coordinator(s) where the RAS is located. If there are multiple RAS-entities, the entities may delegate a single mutually agreeable RAS-entity to submit Attachment 1 on their behalf.

PSEG wishes to note that such language would not be useful in situations where the one or more of the RAS-entities that jointly own a RAS do not want to cooperate or cannot agree upon a single lead entity. Additionally, PSEG believes that a single entity (either the Reliability Coordinator or the Planning Coordinator) should be responsible for coordinating the RAS entities.

Attachment 1 – Attachment 1 should have defined roles for the Planning Coordinator (PC) or Transmission Planner (TP).

Since the requirement for new and revised remedial action schemes are likely to be initiated by the results of Transmission system planning performance assessments done by the TP or PC in compliance with TPL-001-4, one of those entities would be best suited to perform many of the activities listed under section II of Attachment 1.

Furthermore, the technical studies that are required by Attachment 1 should not be performed individually by each RAS-entity because they do not have the skills or tools available to perform such analyses. For example, if an independent generator is asked by its RC to implement a run-back scheme to resolve a stability issue, it is unlikely that that entity would have to tools available to provide the information required under Attachment 1, item II.6.

Rather, PSEG recommends that the RAS-entities' PC or (TP) conduct the assessment of the System performance of a proposed new, modified, or retired RAS. Under this construct a RAS-entity implementing a new, modified, or retired RAS would submit an application under R1 containing general information as well as details concerning the proposed components and logic of the RAS to its TP or PC and to other RAS-entities that would participate in the RAS The PC or TP in turn would conduct the assessment of the proposed RAS to determine if the proposed RAS resolves the System performance issues, and forward that information to the RC for consideration under Requirement 2.

Likes 2	Pragna Pulusani, N/A, Pulusani Pragna; PSEG - PSEG Energy Resources and Trade LLC, 6, Jara Karla
Dislikes 0	

Response

Thank you for your comments.

The drafting team declines to make the suggested change to Requirement R1. When this standard receives Board adoption, the Rationale boxes will be moved to the Supplemental Material section and will remain with the standard. PRC-012-2 is a results-based standard and not a prescriptive one; it is not the intent of the drafting team to specify how multiple RAS-entities must collaborate or coordinate. The drafting team is confident that entities will continue to communicate and work with each other as they do now. The drafting team maintains that the RAS-entity has the "flexibility" to request information or assistance from relevant entities (third parties)

The drafting team maintains that the RC is the functional entity best suited to perform the RAS review because it has the widest area perspective of all functional entities and minimizes the possibility of a conflict of interest that could exist because of business

relationships among the RAS-entity, Planning Coordinator (PC), Transmission Planner (TP), or other entities that are likely to be involved in the planning or implementation of a RAS.

The drafting team agrees that the PC and/or TP would participate in providing Attachment 1 information. It is anticipated that the associated studies will likely be performed, in whole or in part, by the TP or PC; the RAS-entity is required only to provide the compiled Attachment 1 information.

Greg Davis on Behalf of Jason Snodgrass, Georgia Transmission Corporation - 1	
Answer	No
Comment	

GTC Background:

There are multiple registered Planning Coordinators and jointly shared transmission system in GTC's Planning Area and it is important for each PC in the area to be notified prior to placing new or functionally modified RAS in-service or retiring an existing RAS. Equally as important, is for each PC in the area to be notified if CAP actions or timetables change when the CAP is completed pursuant to CAPs developed for R6. GTC's proposed considerations listed below are focused on mitigating operational and compliance risks associated with awareness and knowledge of new or functionally modified RAS where there are multiple registered PCs in a common RC Area.

R7.3:

Although R4.2 requires each impacted TP and PCs to be notified of results of a RAS evaluation, there is not a similar method for any impacted TP and/or PC to be notified in which a RAS was evaluated with identified deficiencies pursuant to CAPs developed for R6; nor when or if CAP is implemented in a timely manner or if timetables change. We propose including the phrase "and Planning Coordinators within the RAS-entity's area" in R7.3, which would read as follows: "Notify each reviewing Reliability Coordinator and Planning Coordinators within the RAS-entity's area, if CAP actions or timetables change and when the CAP is completed."

R9:

Even though it seems implied in R9 that the RAS database containing all pertinent data will be made available to impacted PCs and/or TPs in the RCs area, it is unclear. GTC proposes the following new requirement to compliment the obligations of the Planning Coordinator under requirement R4 if the aforementioned proposed changes to R7.3 are not adopted by the SDT.

R10 (proposed new requirement): Each Reliability Coordinator shall provide each Planning Coordinator in their Reliability Coordinator area a copy of the RAS database maintained in accordance with R9, at least once every twelve full calendar months.

R4.1.5:

Since a RAS is only required when the performance requirements of TPL-001-4 will not be met, is R4.1.5 essentially mandating redundancy for all RAS components? What does a single component failure constitute under Requirement R 4.1.5?

Clarification of limited impact RAS:

SERC DRS suggests a revision as to what constitutes a limited impact RAS. Currently, the language in the standard suggests that an RAS considered to be limited impact cannot:

"cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations"

We suggest revising the above language by inserting the term "widespread" before angular instability. Angular instability could be experienced by just one generating unit going out of sync. A single generating unit becoming unstable is not indicative of an unstable or unreliable BES, and we do not believe that this should remove an RAS from limited impact consideration.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

R7.3 comment: The notification of changes regarding CAP actions, timetables, or completion has a more immediate effect on the operation of the System rather than the planning of the System; therefore the standard requires the RC be notified of these changes. Because the RC is responsible for the reliability of the BES in its RC Area, the drafting team maintains that the RC has a vested interest in sharing pertinent data with functional entities that have reliability-related needs.

R9 comment: The drafting team contends that an additional requirement is not necessary, because as stated in the Rationale for Requirement R9, the RC can provide other functional entities (e.g. Transmission Operators and Planning Coordinators) high-level

information/data on existing RAS that could potentially impact the operational and/or planning activities of that entity. Because the RC is responsible for the reliability of the BES in its RC Area, the drafting team maintains that the RC has a vested interest in sharing pertinent data with functional entities that have reliability-related needs.

R4.1.5 comment: The drafting team disagrees that a RAS is required when the performance requirements of TPL-001-4 will not be met; a RAS is one possible solution to resolve that issue. Requirement R4, Part 4.1.5 requires the PC to periodically perform an evaluation of each RAS within its planning area to determine whether, except for limited impact RAS, a single component failure in the RAS, when the RAS is intended to operate does not prevent the BES from meeting the same performance requirements (defined in Reliability Standard TPL-001-4 or its successor) as those required for the events and conditions for which the RAS is designed. Requirement R4, Part 4.1.5 does not mandate that all RAS have redundant components. For example, consider the instance where a RAS is installed to mitigate an extreme event in TPL-001-4. There are no System performance requirements for extreme events; therefore, the RAS does not need redundancy to meet the same performance requirements as those required for the events and conditions for which the RAS was designed. A single component failure would be the failure of any one of the components of a RAS. A list of individual components is not practical given the variety that could be applied in RAS design and implementation. See Item 4a in the Implementation Section of Attachment 1 in the Supplemental Material section for typical RAS components for which a failure may be considered.

The drafting team avoids the use of adjectives such as “widespread” because of the ambiguity those terms introduce. The drafting team maintains that the “BES” qualifier in the statement regarding the limited impact designation modifies all of the conditions that follow; i.e., Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, and unacceptably damped oscillations. As you suggest, the instability of a single generating unit or small generating plant would not be indicative of an unstable or unreliable BES; however, the RC is the final arbiter for determining whether the RAS qualifies for limited impact status based upon review of the Attachment 1 information.

Ben Engelby - ACES Power Marketing - 6, Group Name ACES Standards Collaborators - PRC-012-2 Project	
Answer	No
Comment	

1. RAS-entity causes confusion for entities that have joint ownership of a RAS. We recommend the SDT develop guidance to support the requirements and expectations for joint owners to meet compliance. For RAS with multiple RAS-entities, who is responsible for overall coordination to assure complete and consistent data submittals in order to meet compliance with this standard?
2. For R2, we remain concerned by the term “mutually agreeable” and how it will be applied.

3. Why did the SDT give the RC the authority to determine "limited impact" RAS without providing objective criteria or guidelines? The SDT cited Local Area Protection Scheme (LAPS) in WECC and the Type 3 designation in NPCC. What about the other regions? There should be a specific set of parameters for the RC to make a decision. We suggest developing continent-wide criteria for determining limited impact RAS and not referring to only two regional approaches.
4. Why does the SDT include "limited impact" RAS as being applicable to the standard? If it has a limited impact, then it should not apply at all. This proposal by the SDT is contrary to the past two years of NERC's RAI and RBR initiatives focusing on HIGH RISK activities. By definition, "limited impact" should not matter for BES reliability. The limited impact designation creates unnecessary compliance burdens without a clear benefit to increased reliability of the BES.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

PRC-012-2 is a results-based standard and not a prescriptive one; it is not the intent of the drafting team to specify how multiple RAS-entities must collaborate or coordinate. The drafting team is confident that entities will continue to communicate and work with each other as they do now. For purposes of PRC-012-2, the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS is a RAS-entity as defined in the Applicability. The RAS-entity is responsible to participate in the various activities identified by the requirements to the extent of its ownership. RAS-entities have the option of collaborating to fulfill their responsibilities for each applicable requirement; however, the individual RAS-entity must be able to demonstrate its participation for compliance purposes.

The time frame of four full calendar months for RAS reviews is consistent with current utility and regional practices. The drafting team wrote the requirement to permit either shorter or longer time intervals for a RAS review provided all the affected parties agreed to the alternate time.

The drafting team maintains that the RC is the functional entity best suited to perform the RAS reviews because it has the widest area reliability perspective of all functional entities and an awareness of reliability issues in neighboring RC Areas. This Wide Area purview facilitates the evaluation of interactions among separate RAS as well as interactions among the RAS and other protection and control systems. Because the RC has the most comprehensive operational knowledge of the BES in its RC Area, the drafting team contends the

RC, armed with the studies and other information provided with the Attachment 1 submittal, is capable of making a well-reasoned determination of a RAS, including whether it qualifies for the limited impact designation.

WECC and NPCC were cited because those are the only two Regions that classified RAS based upon certain criteria. The SPCS-SAMS team also recognized these Regional classifications and made similar albeit different recommendations. The drafting team considered the attributes of each of these Regional classifications in creating the guidance for limited impact designation. The limited impact designation is applicable on a continent-wide basis via NERC Reliability Standard PRC-012-2.

While a limited impact RAS presents a lower risk to BES reliability, the limited impact designation should not be construed as zero impact or risk. PRC-012-2 is applicable to all RAS under the new FERC approved RAS definition. In addition, System changes could occur to cause a RAS to no longer qualify as limited impact so the designation is not permanent. Please reference Requirement R4, Part 4.1.3. The drafting team disagrees with your premise regarding the compliance burden. The RAS-entity is not obligated to request a RAS be considered for limited impact designation; i.e., provide the necessary analyses and/or studies to demonstrate that the RAS should be considered limited impact.

Teresa Czyz - Oglethorpe Power Corporation - 5	
Answer	No
Comment	

OPC agrees with GTC's comments:

There are multiple registered Planning Coordinators and jointly shared transmission system in GTC's Planning Area and it is important for each PC in the area to be notified prior to placing new or functionally modified RAS in-service or retiring an existing RAS. Equally as important, is for each PC in the area to be notified if CAP actions or timetables change when the CAP is completed pursuant to CAPs developed for R6. GTC's proposed considerations listed below are focused on mitigating operational and compliance risks associated with awareness and knowledge of new or functionally modified RAS where there are multiple registered PCs in a common RC Area.

R7.3:

Although R4.2 requires each impacted TP and PCs to be notified of results of a RAS evaluation, there is not a similar method for any impacted TP and/or PC to be notified in which a RAS was evaluated with identified deficiencies pursuant to CAPs developed for R6; nor when or if CAP is implemented in a timely manner or if timetables change. We propose including the phrase "and Planning Coordinators

within the RAS-entity's area" in R7.3, which would read as follows: "Notify each reviewing Reliability Coordinator and Planning Coordinators within the RAS-entity's area, if CAP actions or timetables change and when the CAP is completed."

R9:

Even though it seems implied in R9 that the RAS database containing all pertinent data will be made available to impacted PCs and/or TPs in the RCs area, it is unclear. GTC proposes the following new requirement to compliment the obligations of the Planning Coordinator under requirement R4 if the aforementioned proposed changes to R7.3 are not adopted by the SDT.

R10 (proposed new requirement): Each Reliability Coordinator shall provide each Planning Coordinator in their Reliability Coordinator area a copy of the RAS database maintained in accordance with R9, at least once every twelve full calendar months.

R4.1.5:

Since a RAS is only required when the performance requirements of TPL-001-4 will not be met, is R4.1.5 essentially mandating redundancy for all RAS components? What does a single component failure constitute under Requirement R 4.1.5?

Clarification of limited impact RAS:

SERC DRS suggests a revision as to what constitutes a limited impact RAS. Currently, the language in the standard suggests that an RAS considered to be limited impact cannot:

"cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations"

We suggest revising the above language by inserting the term "widespread" before angular instability. Angular instability could be experienced by just one generating unit going out of sync. A single generating unit becoming unstable is not indicative of an unstable or unreliable BES, and we do not believe that this should remove an RAS from limited impact consideration.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

Please see the drafting team's responses to the referenced comments.	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1	
Answer	No
Comment	
Requirement 4 of the standard puts the burden of performing the studies on the PC. PNM as a registered PA/PC doesn't contest the assignment of the requirement to the PC; however, the standard doesn't guarantee that the PC will be provided with the data required to perform the assessment. PNM proposes adding a requirement for the RAS entity to provide data required to assess the RAS within 30 calendar days of receiving approval from the RC so that the PC can obtain the information required to adequately assess each scheme every five full calendar years. The information provided to the RC in R5.2, R6, R7.3 would impact the R4 assessment; therefore, the PC should also be receiving this information.	
Likes 0	
Dislikes 0	
Response:	
Thank you for your comments. The drafting team maintains that the RAS-entity has a vested interest in getting the Requirement R4 review completed on time and will therefore provide the data to the PC without being mandated by a requirement. The notification of changes regarding CAP actions, timetables, or completion has a more immediate effect on the operations of the System versus the planning of the System; therefore the standard requires the RC be notified of these changes. Because the RC is responsible for the reliability of the BES in its RC Area, the drafting team maintains that the RC has a vested interest in sharing pertinent data with functional entities that have reliability-related needs. The drafting team declines to make the suggested change.	
Jared Shakespeare - Peak Reliability - 1	
Answer	No
Comment	

What is the required evaluation for the PC in R4? For the RC it is clear to follow Attachment 2 for the evaluation but the PC in R4 does not have any explicit evaluation requirement. We recommend adding language that describes the PC adhering at a minimum, but not limited to, Attachment 2 for their 5 year evaluation.

Both R4.1.4 and Attachment 1, section III, item 4 use the same language, “a single component failure in the RAS, when the RAS is intended to operate does not prevent the BES from meeting the same performance requirements (defined in Reliability Standard TPL-001-4 or its successor) as those required for the events and conditions for which the RAS is designed.” Though similar language is used in the currently effective set of reliability standards, it is confusing and unclear. We recommend providing examples in an application guideline as part of the standard itself that might help the reader understand the meaning of and intent behind this language.

Likes 0	
Dislikes 0	

Response:

Thank you for your comments.

The drafting team maintains that Requirement R4 provides the desired reliability objectives without being prescriptive or explicit regarding the methodologies used to attain them. The review of Requirement R2 focuses on the design and implementation aspects of the RAS whereas the periodic evaluations of Requirement R4 are focused on the planning analyses and System impacts related to the RAS. While aspects of Attachment 2 could be used by the PC during its evaluations, the drafting team disagrees with the suggestion to require the use of Attachment 2 in Requirement R4.

The drafting team provided examples in the Supplemental Material section for Requirement R4 as you requested.

Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy

Answer	No
Comment	

Duke Energy suggests a revision as to what constitutes a limited impact RAS. Currently, the language in the standard suggests that an RAS considered to be limited impact cannot:

"cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations"

We suggest revising the above language by inserting the term "widespread" before angular instability. Angular instability could be experienced by just one generating unit going out of sync. A single generating unit becoming unstable is not indicative of an unstable or unreliable BES, and we do not believe that this should remove an RAS from limited impact consideration.

Duke Energy also reiterates its concern regarding the compliance implications of potentially requiring the RC to be responsible for the technical correctness of an RAS-entity's information it provides in Attachment 1. An RC should only be held responsible for the "wide area purview" or conceptual appropriateness of a new or functionally modified RAS, and not be held responsible for potential mistakes made by the RAS-entity during the process.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

The drafting team avoids the use of adjectives such as "widespread" because of the ambiguity those terms introduce. The drafting team maintains that the "BES" qualifier in the statement regarding the limited impact designation modifies all of the conditions that follow; i.e., Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, and unacceptably damped oscillations. As you suggest, the instability of a single generating unit or small generating plant would not be indicative of an unstable or unreliable BES; however, the RC is the final arbiter for determining whether the RAS qualifies for limited impact status based upon review of the Attachment 1 information.

The RC cannot, under Requirement R2, be held responsible for the technical correctness of a RAS-entity's information but only that a review covering the items in Attachment 2 has been accomplished. It is possible and certainly desirable that a RC might uncover errors in a RAS-entity's information during a review exercised with appropriate diligence, but not a requirement.

Shannon Mickens - Southwest Power Pool, Inc. (RTO) - 2 - SPP RE, Group Name SPP Standards Review Group	
Answer	No
Comment	

Would suggest the drafting team develop a Standards Authorization Request (SAR) for the term 'limited impact' and propose the term be added to the NERC Glossary and Rules of Procedure (RoP) to promote consistency and clarity. During our current evaluation of this draft of the Standard and RSAW, we are concerned that the Rationale box information (page 5 of the Standard-next to the sentence) is not consistent with the Requirement R4 sub-part 4.1.3. Another concern is that we feel the sub-part states the proposed definition of 'limited impact' twice. At the first use, the term 'limited impact' is stated with a footnote-4 "A RAS designated as 'limited impact' cannot, by inadvertent operation or failure to operate, cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations" then this same information is stated again after the term. We suggest the drafting team use some different language besides "verify the limited impact designation remains applicable" which was stated in the Rationale box in order to make it clear just what the SDT intends the reviewer to do.

Additionally, we interpret that in the RSAW (note to Auditor-Section Requirement R4) there is an attempt to define the term 'Inadvertent operation'. If this is the case, we would suggest the review panel/drafting team should develop a SAR for that particular term and propose that it be included in the NERC Glossary of Terms and Rules of Procedure (RoP) as well as including that term in the Standard again to promote consistency and clarity.

For Requirement R6, we have a concern that the translation of the Rationale and Technical data (in the Standard) and the Note to Auditor information (in the RSAW) may become lost. As we have evaluated both documents, it seems more evident that the Rationale and Technical information needs to be included in the RSAW. This information has been included in the Standard to help provide a solid foundation to each Requirement to help support the auditing process. However, this information isn't included in the RSAW which leads to potential inconsistency in the auditing process. We feel that both documents need to contain the same information in order to be properly aligned.

Finally, our last concern would be having all maintenance requirements implemented into one document. Currently, we agree that Requirement R8 pertains to performing maintenance associated with Functional Testing as well as verifying proper operation of non-protection system components (system maintenance). However, we suggest moving Requirement R8 into the PRC-005 Standard for consistency in reference to maintenance requirements.

Likes 0	

Dislikes 0	

Response

Thank you for your comments.

The drafting team maintains that the general description and explanatory language regarding the limited impact designation does not rise to the level of a definition that should be included in the Glossary of Terms Used in NERC Reliability Standards; instead, it provides high-level guidance for the RC to consider during the RAS review. The drafting team notes that the commenter has the correct understanding of Requirement R4, Part 4.1.3 that the Planning Coordinator must verify the limited impact designation remains applicable for each RAS previously designated as such. The drafting team prefers to keep the existing language and therefore declines to make the suggested change.

The RSAW is a document used as a guide for auditors to assess compliance with the standard and includes the statement: "Inadvertent operation refers to an operation of the RAS when the RAS is not intended to operate." The drafting team maintains the dictionary definition of the term "inadvertent," which is "not intended or planned" is clear and unambiguous.

Information in the Rationale boxes and Supplemental Material section of the draft standard is important to explain the foundation for each requirement of the standard; whether or not that same information is included in the RSAW is not the drafting team's decision. The determination of the final RSAW content belongs to the RSAW Task Force, the Regional Entities and NERC compliance groups. The draft RSAW will be reviewed by the RSAW Task Force and all comments submitted on the RSAW will be evaluated prior to the RSAW being finalized.

The drafting team appreciates your understanding of the fundamental differences between the functional testing of RAS (performance evaluation of the scheme) versus maintenance of Protection System (maintaining components; i.e., relays, etc.). The drafting team contends that Requirement R8 should remain in PRC-012-2, as is.

Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company

Answer	No

Comment

The list of qualifications for the designation of limited impact states that a limited impact RAS cannot cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations. The

term angular instability needs to be clarified further. Currently it implies that if the RAS was installed to prevent a 40 MW generator from becoming unstable, then it cannot be designated as limited impact. The term should be qualified as follows: system angular instability. This would give the RC the leeway to judge that a small unit going unstable would not negate the designation limited impact.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team avoids the use of adjectives such as “widespread” because of the ambiguity those terms introduce. The drafting team maintains that the “BES” qualifier in the statement regarding the limited impact designation modifies all of the conditions that follow; i.e., Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, and unacceptably damped oscillations. As you suggest, the instability of a single generating unit or small generating plant would not be indicative of an unstable or unreliable BES; however, the RC is the final arbiter for determining whether the RAS qualifies for limited impact status based upon review of the Attachment 1 information.	
Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	
Answer	No
Comment	
ERCOT is supportive of the “limited impact” RAS designation, and is also supportive of a periodic evaluation of RAS to determine if these still qualify for the limited impact designation. However, ERCOT disagrees with the language of requirement subpart 4.1.3. Clarification on the intention of 4.1.3 in this context is requested. A Planning Coordinator (PC) with limited impact RAS (ex. a RAS set up to reduce BES flows by ramping down or tripping generation) should be allowed discretion to utilize screening studies as a threshold test to determine the necessity of evaluating a RAS for uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations. For limited impact RAS that only have local impacts, 4.1.3 as written requires costly and unnecessary studies. ERCOT suggests that the SDT consider imposing a MW threshold for each interconnection below which the PC would be required to conduct only a power flow study. Alternatively, ERCOT requests clarification—in either 4.1.3 itself or in the rationale—that the PC has	

discretion in the type of studies it can use to satisfy the evaluations required to determine if the reliability impact of the RAS has changed over time.

ERCOT also asks for clarification on the "Supporting Documentation for RAS Review" in Attachment 1. The introductory statement in Attachment 1 implies that the Reliability Coordinator (RC) has discretion in determining exactly what information it would like to receive from an RAS-entity with the statement "If an item on this list does not apply to a specific RAS, a response of "Not Applicable" for that item is appropriate." The RAS-entity and the RC typically work together to determine what is required to approve an SPS or a RAS. The RC's discretion in determining what information a RAS-entity must submit under Attachment 1 is sufficient for the evaluation of the RAS.

ERCOT suggests the SDT make the RC's discretion explicit through the following language modification to the Attachment 1 introduction:

"The following checklist identifies important Remedial Action Scheme (RAS) information for each new or functionally modified RAS that the RAS-entity must document and provide to the reviewing Reliability Coordinator(s) (RC), *as required by the RAS-entity's Reliability Coordinator*"

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

PRC-012-2 is a results-based standard and not a prescriptive one; it is not the intent of the drafting team to specify how the PC provides the desired reliability objective of Requirement 4, Part 4.1.3. The PC can use its discretion regarding the methodology used to evaluate the RAS. The drafting team modified the Rationale for Requirement R4 to state: "Requirement 4, Part 4.1.3 explicitly requires the periodic evaluation of limited impact RAS to verify the limited impact designation remains applicable; the PC can use its discretion as to how this evaluation is performed."

The drafting team maintains that the RAS-entity can decide what information in Attachment 1 is "Not Applicable." For example, Item II.4 concerns "Information regarding any future System plans that will impact the RAS." The RAS-entity may not have any future plans which impact the RAS; therefore, a response of "Not Applicable" is appropriate for this item. The drafting team declines to make the suggested change.

Andrew Pusztai - American Transmission Company, LLC - 1

Answer	No
Comment	

ATC has several recommendations for improvement or clarification on the draft Standard, for consideration by the SDT as listed below:

- R4.1.3 and R4.1.4 – These requirements refer to 'single component malfunction' and 'single component failure' respectively. However, the standard does not contain any identification or clarification of which types of components must be included and which may be excluded in RAS evaluations. This deficiency could be addressed by including text in the Supplemental Material section under Requirement 4 that the drafting team developed for a response in its Consideration of Comments for Draft 1 of PRC-012-2.

"An exhaustive list of components is not practical given the variety that could be applied in RAS design and implementation. See Item 4a in the Implementation Section of Attachment 1 in the Supplemental Material section for typical RAS components for which redundancy may be considered. The RAS-entity should have a clear understanding of what components were applied to put a RAS into service and which were already present in the system before a RAS was installed. The RC will make the final determination regarding which components should be regarded as RAS components during its review".

- R5 – This requirement does not obligate RAS-entities to provide their results of the operational performance analysis of a RAS event to impacted Transmission Planners and Planning Coordinators. However, this action should be proposed in the Supplemental Material section.

- R6 – This requirement does not obligate RAS-entities to provide their Corrective Action Plans to impacted Transmission Planners and Planning Coordinators. However, this action should be proposed in the Supplemental Material section.

- R8 - The purpose of Version 6 of PRC-005 was to consolidate all maintenance and testing of relays under one Standard. Having RAS testing within PRC-012-2 would be contrary to that end. ATC proposes to address this concern as follows:

Functional testing of RAS (as stated in Requirement 8 of PRC-012-2) is a maintenance and testing activity that would be better included in the PRC-005 standard. The present PRC-005-6 Reliability Standard is the maintenance standard that replaces PRC-005-1, 008, 011 and 017 and was designed to cover the maintenance of SPSs/RASs. However, the current Reliability Standard PRC-005-6 lacks intervals and activities related to non-protective devices such as programmable logic controllers. ATC recommends that a requirement for

maintenance and testing of non-protective RAS components be added to a revision of PRC-005-6, rather than be an outlying maintenance requirement located in the PRC-012-2 Standard. If the requirement is not removed and placed in PRC-005 standard, then we suggest that wording be added to R8 to refer the entity to meet the maintenance and testing interval obligations in the latest version of the PRC-005 standard.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team included language as you suggested in the Supplemental Material section of the draft standard for Requirement R1. It is not the intent of Requirement R4 that the PC performing the evaluation examine the physical implementation of the RAS, but rather to assess the System impacts of a failure to operate or an inadvertent operation. If redundant components were used to implement the RAS such that a single component failure would not prevent the RAS from operating, this would be confirmed by the RC during the initial review and then verified by subsequent functional testing, and should not need to be re-examined during the periodic evaluation per Requirement R4. However, if the RAS is designed to meet the "failure to operate" or "inadvertent operation" objectives by over-arming of load or alternate actions, the continued effectiveness of these alternative actions should be evaluated. There is nothing in the standard preventing the RAS-entity from sharing the results of its operational analysis with their TP or PC. It is anticipated that in many cases, the TP or PC will be involved in performing the analysis. The Rationale for Requirement R5 notes that RAS-entities may need to collaborate with their associated Transmission Planner to comprehensively analyze RAS operational performance. The drafting team declines to make the suggested change. There is nothing in the standard preventing the RAS-entity from sharing its CAP with their TP or PC. It is anticipated that in many cases, the TP or PC will be involved in developing the CAP. The Rationale for Requirement R6 notes that the RAS-entity may request assistance with CAP development from other parties such as its Transmission Planner or Planning Coordinator. The drafting team declines to make the suggested change. As stated in the current version of PRC-005-6, the purpose of the Standard is: "To document and implement programs for the maintenance of all Protection Systems, Automatic Reclosing, and Sudden Pressure Relaying affecting the reliability of the Bulk Electric	

System (BES) so that they are kept in working order." The only applicability for RAS components in the current version is under the Facilities section 4.2.4 with "Protection Systems installed as a Remedial Action Scheme (RAS) for BES reliability". As a result, PRC-005-6 is not applicable to non-Protection System components, such as RAS controllers. The drafting team has identified various components that may be used in RAS that are not Protection Systems, such as programmable logic controllers (PLCs), personal computers (PCs), multi-function programmable relays used as a PLC, remote terminal units (RTUs), and logic processors.

Given the potential impact RAS may have on the BES, the drafting team contends that functional testing is necessary to maintain BES reliability. The reliability objective of Requirement R8 is to maintain the non-Protection System components of a RAS; i.e., the controllers (programmable logic controllers (PLCs), personal computers (PCs), multi-function programmable relays, remote terminal units (RTUs), and logic processors), and to verify the overall performance of the RAS through functional testing. Functional tests validate RAS operation by ensuring System states are detected and processed, and that actions taken by the controls are correct and occur within the expected time using the in-service settings and logic (functional testing by default operates the processing logic and infrastructure of a RAS). Functional testing should not be confused with the component focused maintenance of PRC-005 Protection System Maintenance. PRC-005 is not applicable to non-Protection System components such as RAS controllers. RAS designated as limited impact have functional testing intervals of up to twelve full calendar years. However, all other RAS have up to six full calendar year intervals because of the higher risk they pose to negatively impact BES reliability should they operate incorrectly or fail to operate. The drafting team recognizes that PRC-005 extends the maintenance interval for monitored multifunction programmable relays to twelve calendar years; however, the drafting team asserts that the inadvertent operation or failure of a RAS subject to the six year functional test interval poses too much risk to the reliability of the BES to extend the test interval beyond six years.

Douglas Webb on Behalf of Jessica Tucker, Great Plains Energy - Kansas City Power and Light Co. - 3, 6, 5, 1	
Answer	No
Comment	

Kansas City Power & Light Company appreciates this opportunity to share its comments regarding concerns the company has with the proposed revisions to the Standard.

As used in the proposed revisions to Standard PRC-012-2, the term "limited impact" creates an ambiguous enforceable provision and needs to be a defined NERC Glossary term to establish a clear compliance threshold.

The Standard Drafting Team (SDT) is empowered by the NERC Standards Process Manual (SPM) to "…propose to add, modify, or retire a defined term in conjunction with the work it is already performing." SPM, Sec. 5 Preamble. We respectfully request the SDT exercise that authority to define "limited impact" for the following reasons.

"Limited impact" establishes an enforceable provision: The proposed revisions use "limited impact" in the language of the Requirements and attachments to the Standard that are incorporated by reference. By the regular use of the term, and the context in which it is used, a conclusion is easily drawn: The term is material to the Standard and required to evaluate compliance and, ultimately, enforcement of the Standard.

"Limited impact" creates an uncertain compliance obligation: The term "limited impact" is undefined and ambiguous and, as such, creates uncertainty in an entity's compliance obligation. The word "limited" suggests a range of values. When used with "impact," the range of values is used to affect the determination of the degree of impact. The proposed revisions to the Standard seek to establish the range of values in multiple ways. First, by referencing information found in the stated underlying source of the term, WECC and NPCC classification schemes; secondly, offering an explanation what is intended by the term; third, explaining what the term is not intended to reflect; and, lastly, a lengthy discourse on the term, as found in the Attachments. Taken together, all the information may seem to provide guidance as to the meaning of the term, "limited impact," but in the end the term remains undefined and creates a compliance obligation that is unclear and promotes a spectrum of interpretations as to what values fall within the "limited" range.

Policy promotes relevant Regional Defined Terms be considered for the NERC Glossary Term: The NERC Standards Process Manual (SPM) states:

"Some NERC Regional Entities have defined terms that have been approved for use in Regional Reliability Standards, and where the drafting team agrees with a term already defined by a Regional Entity, the same definition should be adopted if needed to support a NERC Reliability Standard." SPM Sec. 5.1.

The proposed revisions to the Standard provide that the source of the term "limited impact" is taken from the WECC and NPCC classification schemes. Whether the term is a regionally defined term by WECC and NPCC or not, the spirit of the SPM is to apply terms equally, that if a term is used by Regional Entities in a North American Standard, then it is appropriate for the term be considered for adoption as a defined term to support that Standard.

Below is a Catalog of the Term "limited impact" as used in Proposed PRC-012-2 Standard

The Standard's language uses "limited impact" in Requirements R4 and R8, and multiple times in the three attachments that are incorporated by reference in the Standard.

WECC and NPCC Classification Schemes—R4 Rationale cites to the WECC and NPCC classification schemes as how the "…limited impact designation is modeled…;" *Technical Justification* for the term "limited impact" states, "Because the drafting team modeled the limited impact designation after the WECC and NPCC classifications…"

Description of what the term, "limited impact," is not—R4.1.3. Footnote to "limited impact." See also Att. 1, Sec. I.4.g Footnote to "limited impact"; Att. 2, Sec. I.6 Footnote to "limited impact"; Att. 3, Sec. 7 Footnote to "limited impact"; *Technical Justifications for Attachment 1 Content Supporting Documentation for RAS Review*, Sec. I.4.g Footnote to "limited impact"; *Technical Justifications for Attachment 3 Content*, Sec. 7 Footnote to "limited impact."

"Limited impact" Citations in Standard—The use of the term "limited impact" in R4; R8; Att. 1, Sec. I.4.g; Att. 1, Sec. II.5; Att. 1, Sec. II.6; Att. 1, Sec. III.4; Att. 2, Sec. I.6; Att. 2, Sec. I.7; Att. 2, Sec. II.2; Att. 3, Sec. 7; *Supplemental Material*, R4, R8; *Technical Justifications for Attachment 1 Content Supporting Documentation for RAS Review*, Sec. I.4.g, Sec. II.5, Sec. II.6, Sec. III.4; and *Technical Justifications for Attachment 3 Content*, Sec. 7.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

The drafting team disagrees with the premise that the term limited impact creates an ambiguous enforceable provision and should be a defined term in the Glossary of Terms Used in NERC Reliability Standards. The drafting team maintains that the general description and explanatory language regarding the limited impact designation does not rise to the level of a definition that should be included in the Glossary of Terms Used in NERC Reliability Standards; instead, it provides high-level guidance for the RC to consider during the RAS review. The Reliability Coordinator has responsibility for the reliability of BES operations within its RC Area and consequently has the responsibility to review and approve each RAS before it is implemented in its RC Area. Furthermore, the RC has the discretion to designate applicable RAS as limited impact, on a case-by-case basis. The drafting team asserts an entity's compliance obligations regarding a limited impact RAS are clear and unambiguous. For each RAS designated by the RC as limited impact, the entity must be compliant with each applicable requirement of PRC-012-2.

The drafting team agrees that the term limited impact is not defined. The drafting team maintains that the general description and explanatory language regarding the limited impact designation provides high-level guidance for the RC to consider during the RAS review. WECC and NPCC were cited because those are the only two Regions that classified RAS based upon certain criteria. The System Protection and Control Subcommittee-System Analysis and Modeling Subcommittee team also recognized these Regional classifications and made similar albeit different recommendations. The drafting team considered the attributes of each of these Regional classifications in creating the guidance for limited impact designation. The limited impact designation is applicable on a continent-wide basis via NERC Reliability Standard PRC-012-2.

Oshani Pathirane on Behalf of Payam Farahbakhsh, Hydro One Networks, Inc. - 1, 3	
Answer	No
Comment	

Comment 1 - R4.1.5 - In TPL-001-4, loss of a single line due to a fault is “Single Contingency” (Category P1), but the failure of a breaker or protection relay following that single contingency is recognized as “Multiple Contingency” (Category P4 and P5) and has a different performance requirement compared to the initial P1 event. Similarly, the system performance following a RAS failure to operate after an event should not be required to meet the exact same requirements as those for the original event.

Therefore, we suggest deleting 4.1.5 and instead revising 4.1.4 to say “Except for limited impact RAS, the possible inadvertent operation of the RAS, resulting from any single RAS component malfunction, or a single component failure in the RAS, when the RAS is intended to operate, satisfies all of the following:”

Comment 2 - R5.1 – The wording “*participate*” which is used in the R5.1 does not define accountability or a definite action. For consistency, we suggest using verbiage similar to that used in PRC-004-4’s description of accountabilities in the case of owning Shared Protection Systems.

Comment 3 - R5.1.3 & R5.1.4 are related to performance of RAS and its impact on BES system. This assessment is better suitable for the PC or RC to conduct

Comment 4 – In R5.2, in case of a RAS being owned by more than one RAS-Entity, it is unclear which RAS-Entity is accountable to communicate with the RC and maintain evidence. The requirement needs to clearly identify who is accountable for what, similarly to how PRC-004-4 describes accountabilities in case of Shared Protection System.

Comment 5 – Similar to R5, the wording "*participate*" used in R6 does not define accountability or a definite action. For consistency, we suggest using verbiage similar to that used in PRC-004-4's description of accountabilities in the case of owning Shared Protection Systems.

Comment 6 - Similar to comment R5 above, R6 does not clearly define accountabilities in the case of a RAS being owned by more than one RAS-Entity. In such case, which Entity is accountable to communicate with the RC and maintain evidences?

Comment 7 – It is unclear from the wording whether the RAS-entity would "Participate in analyzing the RAS operational performance" with the RC, or only mutually agree upon a schedule for such activity with the RC.

Comment 8 - R8 is vague and subject to interpretation. There are references in the supplemental material that suggest maintenance checking all of the logic in a PLC on a periodic basis is required and yet in PRC-005, it's clear that there is no need to perform periodic maintenance on relay logic. For monitored components, such as microprocessor relays, the "*verification of settings [as] specified*" in PRC-005 (i.e., performing a settings compare) should be sufficient rather than implying that all logic needs to be re-verified. For RAS not designated as limited-impact, R8 does not distinguish between monitored and unmonitored components of the RAS such as in PRC-005, which would allow a RAS-entity to have a 12-year maintenance interval for monitored components.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

COMMENT 1: The drafting team is not persuaded by the reasoning/example provided by the commenter to advocate that System performance after a RAS failure to operate should be different (i.e. less stringent) than the System performance requirement for the original contingency event for which the RAS is intended to operate. The drafting team asserts that the RAS failure to operate event cannot be considered analogous to the breaker or protective relay failure to operate events (i.e. P4 and P5 contingencies) in Table 1 of TPL-001-4. This is because implementing/installing a RAS is essentially the mitigation identified in the Corrective Action Plan required by TPL-001-4 to demonstrate meeting the System performance for planning events. Please note that several examples of corrective actions listed in TPL-001-4, Requirement 2, Part 2.7.1 are fully aligned with the RAS definition.

2.7.1. List System deficiencies and the associated actions needed to achieve required System performance. Examples of such actions include:

- Installation, modification, or removal of Protection Systems or Special Protection Systems

- Installation or modification of automatic generation tripping as a response to a single or multiple Contingency to mitigate Stability performance violations.
- Installation or modification of manual and automatic generation runback/tripping as a response to a single or multiple Contingency to mitigate steady state performance violations.

Allowing less stringent system performance for failure of RAS (except for limited impact RAS) to operate due to single component failure would essentially be equivalent to rendering the RAS an inadequate mitigation for the very same System performance deficiencies identified in TPL-001-4 that triggered the RAS implementation. Therefore, the System performance due to a RAS failure to operate must be the same as for the original contingency event for which it was designed, and it may be a higher System performance bar than is allowed for inadvertent RAS operation for certain contingency events. Consequently, the drafting team declines to merge Requirement R4, Parts 4.1.4 and 4.1.5.

COMMENTS 2, 5, and 6: The drafting team is charged with assigning the requirements of the new standard to the specific users, owners, and operators of the Bulk-Power System while incorporating the reliability objectives of all the RAS-related standards. In drafting this standard, the drafting team has worked diligently to minimize the changes that will be required from the existing processes. The drafting team recognizes that RAS with multiple owners inherently require coordination among all the participating RAS-entities from the first conceptual design through construction to operations, testing, maintenance and retirement. For purposes of PRC-012-2, when a RAS has more than one owner, each RAS-entity is obligated to participate in the various activities identified by the requirements to the extent of its ownership. Collaboration, coordination, and communication between and among entities regarding RAS issues helps to ensure efforts are not duplicated and best serves reliability by promoting awareness. For purposes of creating efficiencies, the drafting team maintains registered entities that currently share ownership of a RAS (RAS-entities) are in some manner already communicating, sharing information, and coordinating RAS tasks such as operations analysis, Corrective Action Plan (CAP) development, and functional testing. The drafting team is confident that entities will continue to do this after this standard is effective and that entities will communicate with each other if there is any question or doubt of responsibility surrounding any requirement. From the NERC Drafting Team Reference Manual, Version 2, January 2014, Attachment A — Verbs Used in Reliability Standards: “When developing a new or revised standard, DTs should try to use terms that have already been defined or terms that are already used in other Reliability Standards to achieve a high degree of consistency between standards. To that end, the Standards staff, working with key DT members, put together the following list of verbs and their associated definitions. These verbs are all used in requirements in existing Reliability Standards. This verb list and its definitions are not in the Glossary of Terms used in NERC Reliability Standards but these verbs and their definitions should serve as a reference for DTs who are trying to minimize the introduction of new terms into Reliability Standards. Participate is defined as “To take part or share in something.”

COMMENT 3: The RAS-entity(ies) may need to collaborate with its associated Transmission Planner to comprehensively analyze RAS operational performance. This is because a RAS operational performance analysis involves verifying that the RAS operation was triggered correctly (Part 5.1.1), responded as designed (Part 5.1.2), and that the resulting BES response (Parts 5.1.3 and 5.1.4) was consistent with the intended functionality and design of the RAS. However, similar to the responsibility assigned to the RAS-entity and the possible collaboration with the TP in R1, the drafting team contends that the RAS-entity is the suitable entity responsible for compliance to R5.

COMMENT 4: The term RAS-entity is defined in the Applicability as the Transmission Owner, Generator Owner, or Distribution Provider that owns all or part of a RAS. If all of the RAS (RAS components) has a single owner, then that RAS-entity has sole responsibility for all the activities assigned within the standard to the RAS-entity.

The standard does not stipulate compliance methods. RAS-entities have the option of collaborating to fulfill their responsibilities for each applicable requirement. Such collaboration and coordination should promote efficiency in achieving the reliability objectives of the requirements; however, the individual RAS-entity must be able to demonstrate its participation for compliance. As an example, the individual RAS-entities could collaborate to produce and submit a single, coordinated Attachment 1 (acknowledging all RAS-entities that participated in the provision of data) to the reviewing RC pursuant to Requirement R1 to initiate the RAS review process.

COMMENT 7: The drafting team contends that the wording of Requirement R5 clearly states that each RAS-entity shall participate in the analyses of its RAS operations (with other RAS-entities, not the RC). The RAS-entity must perform the analyses and provide it to its RC only if deficiencies in the RAS are found.

COMMENT 8: The reliability objective of Requirement R8 is to maintain the non-Protection System components of a RAS; i.e., the controllers (programmable logic controllers (PLCs), personal computers (PCs), multi-function programmable relays, remote terminal units (RTUs), and logic processors), and to verify the overall performance of the RAS through functional testing. Functional tests validate RAS operation by ensuring System states are detected and processed, and that actions taken by the controls are correct and occur within the expected time using the in-service settings and logic (functional testing by default operates the processing logic and infrastructure of a RAS). Functional testing should not be confused with the component focused maintenance of PRC-005 Protection System Maintenance. PRC-005 is not applicable to non-Protection System components such as RAS controllers. RAS designated as limited impact have functional testing intervals of up to twelve full calendar years. However, all other RAS have up to six full calendar year intervals because of the higher risk they pose to negatively impact BES reliability should they operate incorrectly or fail to operate. The drafting team recognizes that PRC-005 extends the maintenance interval for monitored multifunction programmable relays to twelve calendar years;

however, the drafting team asserts that the inadvertent operation or failure of a RAS subject to the six year functional test interval poses too much risk to the reliability of the BES to extend the test interval beyond six years.	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	No
Comment	

Regarding R4:
BPA believes that limited impact RAS should not be singled out to be exempt from meeting the performance requirements.

While the level of review could be lower, BPA believes a “limited impact” RAS should still be designed such that failure or inadvertent operation of the RAS does not have an adverse impact on an adjacent TP or PC beyond the performance criteria for which the system is planned.

Additionally, regarding R2:
BPA maintains that allowing an RC up to four months to complete the RAS review is longer than necessary and not in line with current practice, which requires the information to be submitted to the RAS Reliability Subcommittee two weeks prior to the meeting where it will be reviewed and approved or disapproved. Allowing four months could delay energization of new or functionally modified RAS by 14 weeks.

BPA also remains concerned by the term “mutually agreeable” and how it will be applied.

Likes 0	
Dislikes 0	
Response	

The drafting team included the limited impact recognition in the standard to capture the intent of the RAS classification as suggested in the SPCS-SAMS report. The limited impact designation is intended to recognize that RAS vary in complexity and impact on the BES. All RAS (limited impact and others) must be considered in TPL assessments. In no instance does the limited impact designation exempt a RAS from satisfying TPL-001-4 performance requirements.

The drafting team asserts that the RC will take such impacts into account in its determination of limited impact status. Any RAS that causes adverse impacts on adjacent systems beyond the performance criteria for which the RAS is planned strongly implies a scheme exhibiting more than limited impact.

The time frame of four full calendar months is consistent with current utility and regional practices. The drafting team wrote the requirement to allow for time intervals longer or shorter than four full calendar months by including the phrase "mutually agreed upon schedule" among the affected parties. All RCs are required to have situational awareness of and responsibility for operational issues adversely affecting BES reliability. Both awareness and responsibility provide an incentive to pre-empt and/or mitigate such operational issues and any related operation limits when possible. When a RAS-entity's Attachment 1 filing identifies such near-term operational issues and demonstrates how the proposed RAS implementation would address them, it is difficult to believe that the RC would choose to wait another 14 weeks to complete the RAS review when it is clear that delaying the RAS implementation would adversely impact the BES reliability or capability.

Nicolas Turcotte - Hydro-Qu?bec TransEnergie - 1	
Answer	No
Comment	

As a general comment, HQT is in the view that PRC-012-2 should not address the details of how RAS entities should perform their analysis according to requirement R8. Each RAS entity has systems operation applicability adapted to their particular topology and some systems cannot withstand invasive actions (maintenance and testing activities) because of such topology. Therefore, PRC-012-2 requirements should allow a certain level of flexibility to this effect, which HQT has commented further below.

Regarding comments specific to the wording of PRC-012-2 requirements, Footnote 2 in Attachment 1 is a definition, and it should be treated as such. Also, the fourth bullet under footnote 2 reads “Changes to RAS logic beyond correcting existing errors” needs clarification. What are the existing errors? The RAS should not have been approved if there were errors, and if it was approved with the errors then those errors might be preventing the RAS from meeting its intended functionality. Suggest removing this bullet, and revising the second bullet to read: Changes to the logic that affects the actions the RAS is designed to initiate. The preceding is also applicable to Footnote 4 on page 25 for Attachment 2. Footnote 3 on page 23, footnote 5 on page 25, and footnote 6 on page 27 are not needed because of the first comment above regarding Requirement R4.

In addition, on page 27 in the Supplemental Material section, shouldn't the Planning Coordinator, because of its wide-area view be included in determining if a RAS can be designated limited impact?

In the two paragraphs preceding Requirement R1 on page 29 of the Supplemental Material section it should be emphasized that the actions of the limited-impact RAS do not lead to the more severe BES consequences that would preclude a RAS from being defined a limited-impact RAS. On page 34, same comment as in the preceding paragraph concerning "Changes to RAS logic beyond correcting existing errors". On page 34 of the Supplemental Material section in the third paragraph under Requirement R4, shouldn't the Planning Coordinator, because of its wide-area view, be involved in the designation of a RAS as limited-impact?

Also, on page 45 for the Technical Justifications for Attachment 1 Content Supporting documentation for RAS Review, comments pertaining to footnote 8 the same as above for the comments regarding footnote 2.

HQT also has specific comments on requirements R5 and R8 as follows.

Firstly for NPCC, the Type '3' should be written 'III'. Also, VSL of R5 requests to 'perform' analysis. R5 mentioned only to 'participate'. In the Rationale section, at R4: references to Parts 4.1.3.1-4.1.3.5 should be corrected to 4.1.4.1-4.1.5. HQT is in the opinion that Lower VSL of R7 should be High VSL because RC must be notified if CAP has changed since changes in action or timetables may require the RC to intervene to maintain reliability.

Secondly, HQT suggests to remove footnote 3 on page 23, footnote 5 on page 25, and footnote 6 on page 27 by modifying the Applicability section 4.2.1 in section 4.2 entitled Facilities by the following: ''Remedial Action Schemes (RAS) not designated as "limited impact". A RAS designated as "limited impact" cannot, by inadvertent operation or failure to operate, cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations.''

Thirdly, regarding requirement R8, as mentioned in HQT's general comments above, as for protection systems, invasive actions (maintenance and testing activities) may introduce a higher number of misoperations which can stress the electrical system. As recognized in PRC-005, new technology may offer the benefits to avoid this type of activities. Thus, from a reliability perspective, a RAS Entity should decide which technique is most appropriate to verify the RAS integrity according to the complexity of their design. If for some reason, a RAS entity would prefer to dynamically extract and compare the settings file of the RAS components instead of doing functional tests, it could be another acceptable method to meet the intent of requirement of R8 without doing invasive actions that could adversely affect the reliability of the system.

HQT notes that there is actually no difference made in PRC 005 for limited impact RAS components. However, HQT agrees with PRC 012-2 regarding the fact that limited impact RAS represents a low reliability risk to the BULK power system. For those RAS, HQT agrees that less

stringent criteria can be applied. In PRC-005, there is no mention of limited impact RAS components, this concept should be incorporated within the standard. Finally, in light of the above comments, HQT is of the view that the maximum allowable interval between functional tests should be twelve full calendar years for RAS that are not designated as limited impact RAS.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

PRC-012-2 Requirement R8 requires the periodic completion of functional tests to verify the overall performance of the RAS but is not prescriptive regarding the methods used to perform the tests. As described in the Rationale box and Supplemental Material section of the standard for Requirement R8, entities have the flexibility to utilize end-to-end or overlapping segment testing.

Regarding the wording of footnote 2 and the term “functionally modified,” it is intended to be a list of examples of RAS modifications to provide guidance to responsible entities. An example of an existing error is a previously undetected logic error made during implementation of the RAS. The drafting team declines to make the suggested change.

The Planning Coordinator (PC) or Transmission Planner (TP) is the entity that performs the planning studies and most often identifies the need for a RAS and/or determines the necessary RAS characteristics, including the proposal and justification for limited impact designation. These studies are included in the Attachment 1 information supplied by the RAS-entity to the Reliability Coordinator (RC) for RAS review and approval. Because the PC is involved in developing the studies and/or evaluations, the drafting team did not include them as mandatory participants in the RAS review and approval process where they would be responsible for judging and approving their own work. Moreover, the drafting team contends that the limited impact description within the standard is sufficient to address the case where the RAS actions lead to severe BES consequences.

The drafting team is satisfied with the language pertaining to limited impact RAS and its location in the footnote. The drafting team sees no benefit by including limited impact RAS in the Applicability/Facilities section of the standard and declines to make the suggested change.

The drafting team corrected the references to NPCC Type III. The drafting team declines to make the suggested change in the VSLs for Requirement R5. The use of “performed” is correct, “participate” is incorporated by the phrase “in accordance with Requirement R5.” The drafting team corrected the reference to the Parts (4.1.4.1-4.1.4.5) in the Rationale for Requirement R4. The drafting team disagrees with the suggested change to the VSL for Requirement R7. Failing to update the CAP or not notifying the RC following a CAP update or completion does not meet the criteria established for a Severe VSL. The drafting team agrees that PRC-005 does not make a distinction for components related to limited impact RAS. The limited impact recognition is referenced only in PRC-012-2. The reliability objective of Requirement R8 is to maintain the non-Protection System components of a RAS; i.e., the controllers (programmable logic controllers (PLCs), personal computers (PCs), multi-function programmable relays, remote terminal units (RTUs), and logic processors), and to verify the overall performance of the RAS through functional testing. Functional tests validate RAS operation by ensuring System states are detected and processed, and that actions taken by the controls are correct and occur within the expected time using the in-service settings and logic (functional testing by default operates the processing logic and infrastructure of a RAS). Functional testing should not be confused with the component focused maintenance of PRC-005 Protection System Maintenance. PRC-005 is not applicable to non-Protection System components such as RAS controllers. RAS designated as limited impact have functional testing intervals of up to twelve full calendar years. However, all other RAS have up to six full calendar year intervals because of the higher risk they pose to negatively impact BES reliability should they operate incorrectly or fail to operate. The drafting team recognizes that PRC-005 extends the maintenance interval for monitored multifunction programmable relays to twelve calendar years; however, the drafting team asserts that the inadvertent operation or failure of a RAS subject to the six year functional test interval poses too much risk to the reliability of the BES to extend the test interval beyond six years. The drafting team declines to make the suggested change to the functional testing interval.

Larry Heckert on Behalf of Kenneth Goldsmith, Alliant Energy Corporation Services, Inc. - 4	
Answer	Yes
Comment	

Alliant Energy supports comments submitted by the MRO NERC Standards Review Forum.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. Please see the drafting team's responses to the referenced comments.	
Rick Applegate - Tacoma Public Utilities (Tacoma, WA) - 6	
Answer	Yes
Comment	
In the Supplemental Material, on p. 30 of 55 of the redlined document, please clarify what is meant by "…affected by the contingency." Specifically, is this the contingency that would require RAS operation, or is the contingency the overloading of the BES Element? Outside of the scope of the survey question -- in Measurement M5, please consider changing "…with participating RAS-entities and…" to "…with participating RAS-entities, if applicable, and…"	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. This is the Contingency which results in an overload that the RAS is intended to mitigate. The drafting team does not see any additional benefit from your suggested change. No change made to the standard.	
David Greene - SERC Reliability Corporation - 10, Group Name SERC DRS	

Answer	Yes
Comment	

SERC DRS suggests a revision as to what constitutes a limited impact RAS. Currently, the language in the standard suggests that an RAS considered to be limited impact cannot:

"cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations"

We suggest revising the above language by inserting the term "widespread" before angular instability. Angular instability could be experienced by just one generating unit going out of sync. A single generating unit becoming unstable is not indicative of an unstable or unreliable BES, and we do not believe that this should remove an RAS from limited impact consideration.

The comments expressed herein represent a consensus of the views of the above-named members of the SERC EC Dynamics Review Subcommittee only and should not be construed as the position of SERC Reliability Corporation, its board, or its officers.

Likes 0	
Dislikes 0	
Response	

Thank you for your comments.

The drafting team avoids the use of adjectives such as "widespread" because of the ambiguity those terms introduce. The drafting team maintains that the "BES" qualifier in the statement regarding the limited impact designation modifies all of the conditions that follow; i.e., Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, and unacceptably damped oscillations. As you suggest, the instability of a single generating unit or small generating plant would not be indicative of an unstable or unreliable BES; however, the RC is the final arbiter for determining whether the RAS qualifies for limited impact status based upon review of the Attachment 1 information.

Emily Rousseau - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO-NERC Standards Review Forum (NSRF)

Answer	Yes
Comment	

However, the NSRF proposes including the following opinion in the Supplemental Material section: R4 – This requirement refers to 'single component malfunction' and 'single component failure'. However, the standard does not contain any qualification of which types of components must be included in RAS evaluations or what entity ultimately makes the component inclusion determination. Therefore, to avoid making elaborate component inclusion qualifications or letting there be uncertainty over which entity makes the final component inclusion determination, add text to the Supplemental Material section such as, "The RC will make the final determination regarding which RAS components are included in the RAS evaluation during its review".	
Likes 0	
Dislikes 0	
Response	
The drafting team included language as you suggested in the Supplemental Material section of the draft standard for Requirement R1. It is not the intent of Requirement R4 that the PC performing the evaluation examine the physical implementation of the RAS, but rather to assess the System impacts of a failure to operate or an inadvertent operation. If redundant components were used to implement the RAS such that a single component failure would not prevent the RAS from operating, this would be confirmed by the RC during the initial review and then verified by subsequent functional testing, and should not need to be re-examined during the periodic evaluation per Requirement R4. However, if the RAS is designed to meet the "failure to operate" or "inadvertent operation" objectives by over-arming of load or alternate actions, the continued effectiveness of these alternative actions should be evaluated.	
William Temple on Behalf of Mark Holman, PJM Interconnection, L.L.C. - 2	
Answer	Yes
Comment	
PJM supports the comments submitted by the ISO/RTO Council.	
Likes 0	
Dislikes 1	Public Service Enterprise Group , 1,3,5,6, Koncz Christy
Response	
Thank you for your comment.	

Please see the drafting team's responses to the referenced comments.	
John Pearson on Behalf of Michael Puscas, ISO New England, Inc. - 2	
Answer	Yes
Comment	
Requirement R4.1.3 includes language from the associated footnote verbatim. The language in the footnote should be deleted. The requirement also seems to define a limited impact RAS. The NERC Glossary should include the definition of a limited impact RAS.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team disagrees that the footnote should be deleted and that Requirement R4, Part 4.1.3 is redundant with the footnote. The drafting team has determined that the general description of limited impact RAS, which only describes actions to which a RAS cannot cause or contribute and be considered limited impact, does not rise to the level of a definition that should be included in the Glossary of Terms Used in NERC Reliability Standards. Rather, the explanation of a limited impact RAS is only high level guidance that must be considered by an RC when using its discretion and its wide area perspective to determine whether a limited impact designation is appropriate for a given RAS.	
Erika Doot - U.S. Bureau of Reclamation - 5	
Answer	Yes
Comment	
The Bureau of Reclamation agrees with the changes proposed by the drafting team.	
Likes 0	
Dislikes 0	

Response	
Thank you for your support.	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7 - NPCC, Group Name RSC No HQ and Dominion	
Answer	Yes
Comment	
Footnote 1 in Requirement R4 is not needed as written. It just reiterates the wording of sub 4.1.3. Same applies to footnote 9 on page 46 as the wording in sub 4.1.3 pertains to the entire document. An appropriate footnote would read that NPCC Type 3 classification and the WECC LAPS classifications will be recognized as limited-impact RAS.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team disagrees that the footnote should be deleted and that Requirement R4, Part 4.1.3 is redundant with the footnote. The drafting team has determined that the general description of limited impact RAS, which only describes actions to which a RAS cannot cause or contribute and be considered limited impact, does not rise to the level of a definition that should be included in the Glossary of Terms Used in NERC Reliability Standards. Rather, the explanation of a limited impact RAS is only high level guidance that must be considered by an RC when using its discretion and its wide area perspective to determine whether a limited impact designation is appropriate for a given RAS. The drafting team declines to make the suggested change to the footnote.	
John Fontenot - Bryan Texas Utilities - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	

Response	
Michael DeLoach - AEP - 3	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Michael DeLoach - AEP - 3	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Randi Heise - Dominion - Dominion Resources, Inc. - 5, Group Name Dominion - RCS	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	

Response	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2, Group Name SRC-ISONE	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Mike Smith - Manitoba Hydro - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 5	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	

Response	
Allie Gavin on Behalf of Michael Moltane, International Transmission Company Holdings Corporation - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Joel Wise - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	

Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
sean erickson - Western Area Power Administration - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	

Response
Rachel Coyne - Texas Reliability Entity, Inc. - 10
Answer
Comment

Texas RE noticed the SDT did not specifically address its comments submitted on January 8, 2016. Texas RE respectfully requests the SDT to respond to its comments.

As previously stated in comments submitted on January 8, 2016, Texas RE does not agree with the provision that a RAS can be designated as "limited impact". Texas RE recommends the SDT reconsider and treat all RASes, that affect the reliability of the Bulk Electric System (BES) equally.

However, if the SDT elects to keep the limited impact designation, Texas RE is concerned the proposed criteria for determining a "limited impact" RAS is vague and ambiguous (e.g. "… BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations). Absent clear criteria, the RC may designate certain RASes as limited impact that would be more properly characterized as a RAS. Because limited impact RASes are subject to reduced reliability-related considerations by the Reliability Coordinator (i.e. Attachment 2) and limited evaluation performed by the Planning Coordinator (i.e. Requirement 4), the improper characterization of RASes may lead to potential reliability gaps on the BES.

Texas RE inquires as to what the SDT used as technical basis (such as industry reports, recommendations from task forces or working groups, field studies, etc) in determining to create a requirement to designate limited impact RASes.

TPL-001-4

In Requirement R4.1.5, Texas RE is concerned the planning requirements in TPL-001-4 do not distinguish between limited impact RAS and RAS. For example under TPL-001-4, a PC must consider an operation of a RAS, including a limited impact RAS, that results in an applicable Facility Rating being exceeded. Texas RE understands planning and RAS evaluation are separate obligations for the PC with separate requirements. However, the language in R4.1.5 specifically identifying the "same performance requirements" as defined in TPL-001-4 potentially blurs these two obligations with respect to limited impact RAS. Texas RE suggests eliminating the phrase "Except for limited impact RAS" in R4.1.5 so PRC-012-2 and TPL-001-4 cannot be interpreted to potentially conflict with each other.

Degraded RAS

Texas RE submitted comments on October 5, 2015 stating its concern there is no requirement to report the degraded RAS to the RC. The SDT responded:

The status of a degraded RAS is required to be reported (in Real-time) to the Transmission Operator via PRC-001, Requirement R6, then to the RC via TOP-001-3, Requirement R8. See Phase 2 of Project 2007-06 for the mapping document from PRC-001 to other standards regarding notification of RC by TOP if a deficiency is found during testing. Consequently, it is not necessary to include a similar requirement in this standard.

Texas RE does not agree this issue is handled in the standards identified by the SDT in its response. As an initial matter, TOP-001-3 R8 does not necessarily require the TOP to inform the RC. TOP-001-3 R8 is specifically limited to Emergencies, which do not necessarily include degradation of a RAS. Does the SDT envision treating all RAS degradations as Emergencies as defined by the NERC Glossary of Terms in order to trigger the TOP-001-3 R8 reporting obligations?

TOP-001-3 also uses the term "Transmission Operator Area" which, by definition, does not necessarily include DP and GO, which are "RAS-entities", equipment if used in a RAS. This is a gap in reliability.

In addition, other related standards do not appear to require RAS-entities to report degraded RASes to the RC in all circumstances. For example, TOP-003-3 discusses having a data specification and distributing the data specification. However, this Standard does not explicitly include notification of actual degradation of a RAS to an RC or explicitly require entities to provide actual data. In particular, TOP-003-3 R3 states "Each Transmission Operator shall distribute its data specification to entities that have data required by the Transmission Operator's Operational Planning Analyses, Real-time RAS monitoring, and Real-time Assessment." Moreover, TOP-003-3 R3 explicitly covers the "Operations Planning" Time Horizon (not Real-time or Same-Day Operations). TOP-003-3 R5 also states "Each Transmission Operator, Balancing Authority, Generator Owner, Generator Operator, Load-Serving Entity, Transmission Owner, and Distribution Provider receiving a data specification in Requirement R3 or R4 shall satisfy the obligations of the documented specifications…". Again, under this Standard, there is no explicit requirement that entities provide the RC that is reviewing and approving the RAS the actual data regarding the "current Protection System and Special Protection System status or degradation that impacts System reliability."

Misoperations

The definition of Misoperation that becomes effective on July 1, 2016 does not include RASes. Texas RE recommends clarifying R5 by defining misoperation to align with PRC-004-4. If misoperation is not defined, entities might not do the actions outlined in R 5.1. The

SCPS drafted a RAS template to describe misoperations which were never officially approved. Texas RE recommends adding a definition of misoperations for RASes in the Standard or NERC Glossary based on the SCPS RAS template and the language in R5.

Also, while reporting of Protection Systems Misoperations will be contained within the Section 1600 Data Request for PRC-004, neither PRC-012-2 nor the Section 1600 data request provides a corresponding reporting requirement for RAS misoperations to the Regional Entities or NERC. Texas RE recommends the SDT consider adding a requirement, either to PRC-012-2 or to the Section 1600 data request, for Registered Entities to report misoperations of RASes to regional entities.

Functional Testing – R8

Texas RE is concerned PRC-012-2 R8 does not address the scenario where a RAS is owned by different companies. In particular, PRC-012-2 R8, as currently drafted, does not require simultaneous testing each separately-owned component of the RAS-system simultaneously so that entities can verify that the RAS properly operates. For example, there are instances in Texas where a GO and TO own part of the same RAS. Under the current Standard language, the GO will test the receipt signal and the TO will test sending signal. However, there is no requirement for the GO and TO to coordinate the tests of their individual components to ensure that signal is sent and received. Put differently, although each individual component may be tested, there is no corresponding test of to ensure the entire RAS will operate as intended. Texas RE is concerned a reliability gap will occur if the two tests are not conducted simultaneously and in such a way the GO and TO can view the results of the test on the entire RAS.

Full Calendar Months

The SDT introduces a new term “full calendar months” that is neither defined in the Standard nor the NERC Glossary and is inconsistent with other Reliability Standards. Texas RE noticed a definition in the PRC-012-2 RSAW, but the definition should be in the NERC Glossary or within PRC-012-2 itself instead. Texas RE recommends the SDT provide the definition within the Standards process while considering other definitions already in place (such as “Calendar Year” in PRC-005-6).

Corrective Action Plan

As previously submitted on January 8, 2015, Texas RE recommends revising PRC-12-2 R7 to place at least minimal criteria around modifications to Corrective Action Plans (CAP) or corresponding CAP timetables. As currently drafted, PRC-12-2 R7 could be interpreted to permit RAS-entities to perpetually update their CAPs if “actions or timetables change” and then merely notify the RC of such changes. Texas RE recommends that the SDT consider some minimal criteria that RAS-entities must satisfy in order to update a CAP under PRC-12-2 R7.2. For instance, PRC-12-2 R7.2 could be revised to read: “Update the CAP for any reasonable changes in the required actions or implementation timetable.” In turn, PRC-12-2 R7.3 could be revised to read: “Notify each reviewing Reliability Coordinator and

provide a reasoned justification for changes in CAP actions or timetables, and notify each reviewing Reliability Coordinator when the CAP is completed."

Feedback Mechanism

Texas RE noticed there is no feedback mechanism in the current standard for PCs to incorporate RC approved RAS modifications in subsequent planning processes. Texas RE understands this might not appropriate for the scope of this project, but requests the SDT to consider this issue in future reviews of applicable standards.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

The drafting team disagrees with your premise that the limited impact designation creates a reliability gap. As the drafting team has previously stated, we included the limited impact recognition in the standard to capture the intent of the RAS classification as suggested in the SPCS-SAMS report. The limited impact designation is intended to recognize that RAS vary in complexity and impact on the BES. All RAS (limited impact and others) must be considered in TPL assessments.

The drafting team developed the following to explain the relationship between TPL-001-4 and PRC-012-2.

1. All RAS (limited impact and non-limited impact) must be considered in TPL assessments. **In no instance does the limited impact designation exempt a RAS from satisfying TPL-001-4 requirements.** As far as TPL assessments are concerned, all RAS are assumed to operate correctly and the possible incorrect operation of RAS are not addressed by TPL-001-4. PRC-012-2 addresses this issue as described in #3 below.

2. Adherence to the TPL performance requirements is presupposed by PRC-012-2. PRC-012-2 further assures RAS compliance to TPL performance requirements (where applicable to planning events) by documenting the design and performance of the RAS through Attachment 1, Section II, item 3. The RC will verify that RAS actions satisfy performance objectives for the scope of events and conditions that the RAS is intended to mitigate according to the complementary portion of Attachment 2, Section I, item 1.

3. PRC-012-2 requires RAS to meet design and implementation requirements in addition to any applicable TPL-001-4 performance requirements. These design and implementation requirements pertain to inadvertent operation and failure to operate, and are included in the information required by Attachment 1, Section II, item 6 and Section III, item 4. The complementary portion of Attachment 2 used by the RC during the RAS review is Section I, items 5 and 7 and Section II, item 2.

4. RAS vary widely in their complexity and impact on the reliability of the BES. For RAS on the low end of the BES impact range, the standard allows for exemptions on the design and implementation requirements that are more appropriate for high-impact RAS. These exemptions are permitted only for these low impact (i.e., limited impact) RAS. As stated in the Supplemental Material section of the draft standard, requiring RAS with minimal impact to the BES to satisfy the single component failure and single component malfunction tests would add complexity to the RAS design and implementation with minimal benefit to BES reliability.

5. The RAS-entity provides justification for any RAS proposed as limited impact via Attachment 1, Section II, item 5. The RC will use the complementary portion of Attachment 2, Section I, item 6 to verify the RAS qualifies for limited impact designation.

6. The RC is responsible for reviewing all of the Attachment 1 information, including studies regarding any proposed new or functionally modified RAS. The RC is the functional entity best suited to perform the RAS review and make the limited impact designation because it has the widest area operational and reliability perspective of all functional entities and an awareness of reliability issues in any neighboring RC Area. A RAS designated by the RC as limited impact cannot, by inadvertent operation or failure to operate, cause or contribute to BES Cascading, uncontrolled separation, angular instability, voltage instability, voltage collapse, or unacceptably damped oscillations. If the RAS is not deemed to be limited impact, then the additional documentation associated with a RAS single component malfunction (Attachment 1, Section II, item 6) and a RAS single component failure (Attachment 1, Section III, item 4) is required.

7. PRC-012-2, Requirement R4 mandates that all RAS will be periodically evaluated to verify the continued effectiveness and coordination of the RAS, as well as to verify that, if a RAS single component malfunction or single component failure were to occur, the requirements for BES performance would continue to be satisfied. A periodic evaluation is required because changes in system topology or operating conditions may change the effectiveness of a RAS or the way it impacts the BES. Requirement R4, Part 4.1.3 requires that limited impact RAS be evaluated for the inadvertent operation of the RAS or the failure of the RAS to operate to ensure that the RAS still warrants the limited impact designation. If the RAS is not deemed to be limited impact, then the additional evaluations associated with RAS single component malfunction (Requirement R4, Part 4.1.4) and a RAS single component failure (Requirement R4, Part 4.1.5) are required.

TPL-001-4: It is correct to state that TPL-001-4 does not distinguish between limited impact and other RAS. The actions of both types of RAS must be taken into account in the evaluation of Contingency events on the System in the System assessment required by TPL-001-4. The System performance requirements in TPL-001-4 must be met considering the actions of both types of RAS. The intent of Requirement R4, Part 4.1.5 is to verify that a single component failure in a RAS, other than limited impact RAS, when the RAS is intended to operate, does not prevent the BES from meeting the same performance requirements (defined in Reliability Standard TPL-001-4 or its successor) as those required for the events and conditions for which the RAS is designed. This analysis is needed to ensure that changing System conditions do not result in the single component failure requirement not being met. Requirement R4, Part 4.1.5 exempts the PC from evaluating limited impact RAS with regards to single component failure. The drafting team declines to make the suggested change.

Degraded RAS: The drafting team reiterates that the RC will be notified of degraded RAS. Please see the Mapping Document for Project 2007-06.2 Phase 2 of System Protection Coordination for Requirement R6 of PRC-001-1.1(ii) which logically maps out how the reliability objective of Requirement R6 is accomplished by requirements in other Reliability Standards.

Misoperations: The drafting team agrees that the definition of Misoperations for Protection Systems does not and should not include references to RAS because RAS are not Protection Systems. The drafting team constructed Requirement R5 such that all RAS operations, partial operations, and failure of RAS to operate when expected must be analyzed. The drafting team contends that Requirement R5 is clear and unambiguous as-written without a formal definition of a RAS misoperation being developed. NERC and the Regional Entities can request information at any time using a Section 1600 Data Request, so the addition of another requirement in PRC-012-2 is not necessary.

Functional Testing – R8: The standard requirements do not specify compliance methods, only the reliability objective(s). Requirement R8 mandates the overall RAS performance be verified, not that an overall test be conducted. Functional testing may be accomplished with end-to-end testing or a segmented approach. For segmented testing, each segment of a RAS must be tested. Overlapping segments can be tested individually negating the need for complex maintenance schedules and outages. When a RAS has more than one owner, each RAS-entity is obligated to participate in the various activities identified by the requirements to the extent of its ownership. Collaboration, coordination, and communication between and among entities regarding RAS issues helps to ensure efforts are not duplicated and best serves reliability by promoting awareness. For purposes of creating efficiencies, the drafting team maintains registered entities that currently share ownership of a RAS (RAS-entities) are in some manner already communicating, sharing information, and coordinating RAS tasks such as operations analysis, Corrective Action Plan (CAP) development, and functional testing. The drafting team is confident that entities will continue to do this after this standard is effective and that entities will communicate with each other if there is any question

or doubt of responsibility surrounding any requirement. Because Requirement R8 mandates that RAS-entities verify the overall RAS performance and the proper operation of non-Protection System components, overlapping segment testing is required if segment testing is utilized rather than end-to-end testing. Your example appears to neglect the use of overlapping segment testing.

Full Calendar Months: The drafting team does not consider “full” to be a definitional term, rather a clarifying term used with a time interval. The drafting team uses the clarifier ‘full’ to be clear that partial time increments are not counted. For example, for four calendar months, if the starting point is in the middle of a calendar month (October 15), four full calendar months would begin November 1 and continue through February 28 (the last day of the month of the stated period).

Corrective Action Plan: As discussed in the Rational for Requirement R6 and R7, the implementation of a properly developed CAP ensures that RAS deficiencies are mitigated in a timely manner. The A RAS deficiency may require the RC to impose operating restrictions so the System can operate in a reliable way until the CAP is completed. The drafting team contends that the probable operating restrictions will incent the RAS-entity to complete the CAP as quickly as possible. It is conceivable that an entity may have a “reasoned” justification to defer the end of a CAP; but as the drafting team just stated, there should be no reliability implications associated with the delay.

Feedback Mechanism: RAS modifications approved by the RC should be captured in subsequent PC planning processes in the same way as any other future planned reinforcement projects. The owner of the RAS would be expected to provide applicable steady-state, dynamic, and short circuit modeling data to its TP and PC according to the data requirements and reporting procedures developed per MOD-032-1, and a PC would incorporate this information into its planning models per TPL-001-4 Requirement R1, Part 1.1.3.

2. Implementation Plan for PRC-012-2: The drafting team revised the Implementation Plan to provide for the initial consideration of limited impact RAS, and to clarify that the initial obligation under Requirement R9 for a Reliability Coordinator that does not have a RAS database is to establish a RAS database by the effective date of PRC-012-2. Do you agree with the revised Implementation Plan? If no, please provide the basis for your disagreement and an alternate proposal.
Nicolas Turcotte - Hydro-Qu?bec TransEnergie - 1

Answer	No
Comment	
In light of the above comments, HQT is of the view that the maximum allowable interval between functional tests should be twelve full calendar years for RAS that are not designated as limited impact RAS.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The reliability objective of Requirement R8 is to maintain the non-Protection System components of a RAS; i.e., the controllers (programmable logic controllers (PLCs), personal computers (PCs), multi-function programmable relays, remote terminal units (RTUs), and logic processors), and to verify the overall performance of the RAS through functional testing. Functional tests validate RAS operation by ensuring System states are detected and processed, and that actions taken by the controls are correct and occur within the expected time using the in-service settings and logic (functional testing by default operates the processing logic and infrastructure of a RAS). Functional testing should not be confused with the component focused maintenance of PRC-005 Protection System Maintenance. PRC-005 is not applicable to non-Protection System components such as RAS controllers. RAS designated as limited impact have functional testing intervals of up to twelve full calendar years. However, all other RAS have up to six full calendar year intervals because of the higher risk they pose to negatively impact BES reliability should they operate incorrectly or fail to operate. The drafting team recognizes that PRC-005 extends the maintenance interval for monitored multifunction programmable relays to twelve calendar years; however, the drafting team asserts that the inadvertent operation or failure of a RAS subject to the six year functional test interval poses too much risk to the reliability of the BES to extend the test interval beyond six years.	

Douglas Webb on Behalf of Jessica Tucker, Great Plains Energy - Kansas City Power and Light Co. - 3, 6, 5, 1	
Answer	No
Comment	
In consideration of our comments relating to the term “limited impact,” we are unable to support the Implementation Plan. The alternative proposal is incorporate into the Implementation Plan a future defined NERC Glossary term for “limited impact.”	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team maintains the description of limited impact is sufficient and declines to make the suggested change to the Implementation Plan.	
Elizabeth Axson - Electric Reliability Council of Texas, Inc. - 2	
Answer	No
Comment	
ERCOT signs on to the IRC SRC comments for Question 2. The SRC comments are as follows: The rationale for R2 states that RC review “minimizes the possibility of a conflict of interest that could exist because of business relationships among ….” This explanatory purpose for R2 is not needed and in fact could prove untrue as not all RCs are independent from TOs, GOs, etc. The R3 rationale inserts the idea of “lack of dependability”. This can be understood differently by different parties. For a hardware supplier, it can mean the equipment or technology is unreliable. And if taken to an extreme, this seems to open the path to requiring the RC to decide which generators should run based on the individual generators’ forced outage rate (dependability rate?). We suggest this phrase be stricken from the R3 explanatory.	

For R4 the limited impact designation explanation, please clarify whether the reference to regions is meant to be an example of how the SDT came to its decision for R4 or whether it is a reference of the authority of what regions can do. We believe it is the former and the language should be improved. The concept of 4.1.2 to "avoid adverse interactions" would seem to need some criteria for evaluating what "avoid" means. Rather than state "avoid", we suggest this requirement to be rewritten to state: "The RAS does not adversely impact the performance of other RAS, and protection and control systems." · 4.1.4.4. BES voltages shall be within post-Contingency voltage limits and post-Contingency voltage deviation limits as established by the Transmission Planner and the Planning Coordinator. Some Planners don't use voltage deviation criteria. This should it not be rewritten to state "BES voltages shall be within the Planning Coordinator's voltage criteria under pre and post contingency conditions".	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The Rationale for Requirement R2 states that the RC review "minimizes" the possibility of a conflict of interest; it does not say that it "eliminates" the possibility. The drafting team maintains that the RC is the functional entity best suited to perform the RAS review because it has the widest area perspective of all functional entities and minimizes the possibility of a conflict of interest that could exist because of business relationships among the RAS-entity, Planning Coordinator (PC), Transmission Planner (TP), or other entities that are likely to be involved in the planning or implementation of a RAS. The phrase "lack of dependability" in the Rationale for Requirement R3 is an example of one of the possible reliability issues with the RAS that the RC review is intended to discover. WECC and NPCC were cited because those are the only two Regions that classified RAS based upon certain criteria. The SPCS-SAMS team also recognized these Regional classifications and made similar albeit different recommendations. The drafting team considered the attributes of each of these regional classifications in creating the guidance for limited impact designation. The limited impact designation is applicable on a continent-wide basis via NERC Reliability Standard PRC-012-2. Based on your comment, the drafting team modified the language in the Rationale box.	

The drafting team maintains that the current language “avoids adverse interactions” is clear and that the suggested language does not provide additional clarity.

Requirement R5 of TPL-001-4 requires PC’s and TP’s to have criteria for post contingency voltage deviations.

Rachel Coyne - Texas Reliability Entity, Inc. - 10	
Answer	No
Comment	

Implementation Plan

Texas RE recommends reducing the implementation period. This is a series of processes that already exist in some form or fashion and should not require a new construct that would take three years. In Requirement R9, the SDT indicates requirements follow “industry practice” which is a twelve month periodicity. Does the SDT contend that there are RASes in place that an RC or PC does not know about?

Texas RE recommends that the SDT *eliminate the proposed implementation period or at least shorten the proposed three-year implementation period for PRC-12-2 to six months*. Alternatively, the SDT should link the 60-full-calendar month (currently revised to “5 full calendar years”) compliance window in PRC-12-2, R4 and the six- and twelve-year compliance periods in PRC-12-2, R8 to the effective date of PRC-12-2 and not the extended date (if any) set forth in the proposed implementation plan.

The proposed PRC-12-2 establishes a process for reviewing new, functionally modified, or retiring RAS. As the SDT has recognized, failing to implement such a RAS review process could result in a significant gap in reliability. Specifically, the SDT stated in the rationale for Requirement R1 that RAS “action(s) can have a *significant impact on the reliability and integrity of the Bulk Electric System (BES)*.” Given the importance of the RAS review scheme for reliability, Texas RE believes that three years is too long to implement the process contemplated in the proposed PRC-12-2.

Review Process Timeline

Texas RE also believes that the nature of the review process itself also counsels in favor of a shorter review period. For example, PRC-12-2, R1 – R3 establishes the basic framework for RAS review. These requirements mandate that RAS-entities provide certain information

regarding RAS to their respective Reliability Coordinators (RC), a minimum four full calendar month period for the RC to review this information, and then a subsequent obligation for the RAS-entity to resolve any reliability issues identified by the RC prior to installing, functionally modifying, or retiring a particular RAS. Accordingly, these requirements do not contemplate immediate changes to existing physical assets, significant internal process transformations, or other issues that could potentially justify a three-year implementation period. Rather, they largely focus solely on the exchange and review of documentation, such as one-line drawings, for each RAS that is likely already be in the RAS-entity's possession today. RAS-entities and their associated RCs should therefore be able to begin the RAS review process with only minimal lead time following the adoption of PRC-12-2. Texas RE would further note that although RCs may need additional compliance resources to perform the RAS reviews contemplated under PRC-12-2, the existing language in PRC-12-2, R2 already provides RCs and RAS-entities with the flexibility to extend the review period if necessary based on a "mutually agreed upon schedule."

A similar rationale applies to the misoperation review and correction process in PRC-12-2, R5. As the SDT notes, "[t]he correct operation of a RAS is important for maintaining the reliability and integrity of the BES. *Any incorrect operation of a RAS indicates that the RAS effectiveness and/or coordination has been compromised.*" Texas RE agrees with this statement. In light of this fact, however, Texas RE believes that RAS-entities should begin RAS operational performance assessments following a RAS failure or misoperation immediately upon adoption of PRC-12-2 in order to avoid a significant reliability gap.

If the SDT elects to retain an implementation period of any length, Texas RE recommends that such implementation plan not apply to PRC-12-2, R4 and R8. These requirements already have significant time periods for RAS-entities to complete their compliance obligations embedded within them. For example, RAS-entities have six years under PRC-12-2, R8 to complete initial functional tests of their RAS (and 12 years for limited impact RAS if that definition is retained). Given that PRC-12-2, R4 and R8 already provide extended compliance horizons, Texas RE does not believe that additional time is necessary to implement these requirements. Instead, the 6-full-calendar month period in PRC-12-2, R4 and the six- and twelve-year periods in PRC-12-2, R8 should begin on the effective date of PRC-12-2 itself.

Additionally, the Implementation Plan contains the same "limited impact" language Texas RE has concerns about.

Texas RE requests the SDT provide justification for the testing timelines.

Likes 0	
Dislikes 0	

Response

Thank you for your comments.

Review Process Timeline

The notion that entities could use the "mutually agreed upon schedule" clause in the Standard assumes that all entities are already able to meet all the requirements of the Standard. The drafting team is unable to make this assertion and expects that many functional entities will need to establish new frameworks which could include the hiring and training of personnel to ensure the requirements of Reliability Standard PRC-012-2 are met. The drafting team asserts that the 36 month implementation period is reasonable and appropriate.

Entities are encouraged to begin work prior to the effective date of the Standard. For example, an entity may choose to work with their RC prior to the effective date of the Standard to submit the information to determine that a RAS is limited impact prior to implementation, but that designation does not become relevant until the effective date of PRC-012-2.

The existing NERC PRC-016-1 Remedial Action Scheme Misoperations will not be retired until the effective date 36 months after PRC-012-2 is approved by the appropriate authority. Therefore, the drafting team contends that no reliability gap will exist.

The effective date of the Standard is the first day of the first calendar quarter that is thirty six (36) months after the effective date of the applicable governmental authority's order approving the standard. The drafting team declines to make the suggested change because the drafting team feels that the implementation period, as drafted, provides a necessary period for preparation for compliance and because this time period is consistent with the implementation period for the rest of the standard.

The Reliability Coordinator has responsibility for reliability of operations within its Reliability Coordinator Area and has discretion to designate a RAS as limited impact on a case-by-case basis. The drafting team has determined that the general description of limited impact RAS, which only describes actions to which a RAS cannot cause or contribute and be considered limited impact, does not rise to the level of a NERC Glossary definition. Rather, the explanation of a limited impact RAS is only high level guidance that must be considered by an RC when using its discretion and its wide area perspective to determine whether a limited impact designation is necessary for a given RAS.

The drafting team reviewed PRC-005-6 and selected the functional testing interval in an attempt to build synergy between the two Standards. The drafting team believes the same maintenance and testing groups will participate in the component testing of PRC-005-6 and the functional testing of PRC-012-2. The drafting team understands that PRC-005-6 provides variable maintenance intervals to up to twelve calendar years for multifunction programmable relays dependent on monitoring; however, the drafting team asserts that the inadvertent operation or failure of a RAS subject to the six year functional test interval poses too much risk to the reliability of the BES to

extend the test interval beyond six years (12 years for RAS determined to have a limited impact) regardless of the monitoring in place. The drafting team attempted to balance the reliability interest of frequent functional testing with the resources required to perform that testing, which can be significant, and believes that six years is a reasonable compromise.	
Joel Wise - Tennessee Valley Authority - 1,3,5,6 - SERC	
Answer	Yes
Comment	
There was no general comment section provided this round, so TVA is providing the following comments to support our negative votes on the ballot: TVA continues to believe that the responsibility for reviewing and approving new or functionally modified RAS schemes belongs with the Planning Coordinator and not the Reliability Coordinator. Oversight of the planning of the Bulk Electric System or the entities responsible for Bulk Electric System planning belongs with the Planning Coordinator. From TVA's perspective, the proposed standard, as written, is in direct conflict with the Functional Model, and requires a compelling reason to justify the deviation. The facts that there are fewer Reliability Coordinators (as opposed to Planning Coordinators) and that the Reliability Coordinators have the "widest-area view" do not support a significant deviation from the Functional Model. Moreover, such analysis would beyond the normal Reliability Coordinator functions, the Reliability Coordinators would not have the expertise to conduct RAS analysis in the planning horizon. Simply put, Reliability Coordinators do not have trained personnel or the appropriate tools to complete a comprehensive assessment. Planning Coordinators have oversight over all other aspects of planning of the Bulk Electric System, and there is no reason to treat Remedial Action Schemes differently.	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The drafting team acknowledges that the need for a RAS and/or the determination of RAS characteristics are most often identified through planning studies performed by the Planning Coordinators or Transmission Planners. The NERC Functional Model is a guideline for the development of standards and their applicability and does not have compliance requirements. The drafting team is not precluded from developing Reliability Standards that address functions not described in the model. Reliability Standard requirements take	

precedence over the Functional Model. For reference, please see the Introduction section of NERC's Reliability Functional Model, Version 5, November 2009. The drafting team maintains that the Reliability Coordinator (RC) is the best-suited functional entity to perform the RAS reviews because the RC has the widest-area reliability perspective of all functional entities and an awareness of reliability issues in neighboring RC Areas. The RC is also more likely to be independent of the entities involved in planning and implementing the RAS. The drafting team does not, by virtue of assigning the RAS review to the RC, expect the RC to possess more information or ability than anticipated by their functional registration as designated by NERC. As the drafting team stated in the Rationale and Supplemental Material section of the standard, the RC has the "flexibility" to request information or assistance from relevant entities (third parties) to participate in the review if they believe it will enhance the quality and efficiency of the review process. The ability of the RC to solicit assistance in performing the RAS review does not indicate that the RC is not equipped to perform the RAS review, or that another party should be chosen to perform the review. To the contrary, this flexibility allows the RC to perform a more robust review.
Ben Engelby - ACES Power Marketing - 6, Group Name ACES Standards Collaborators - PRC-012-2 Project

Answer	Yes
Comment	
We agree with the SDT that the implementation plan is appropriate.	
Likes 0	
Dislikes 0	
Response	

William Temple on Behalf of Mark Holman, PJM Interconnection, L.L.C. - 2

Answer	Yes
Comment	

PJM supports the comments submitted by the ISO/RTO Council.	
Likes 0	
Dislikes 0	
Response	
Charles Yeung - Southwest Power Pool, Inc. (RTO) - 2, Group Name SRC-ISONE	
Answer	Yes
Comment	

The rationale for R2 states that RC review "minimizes the possibility of a conflict of interest that could exist because of business relationships among ….". This explanatory purpose for R2 is not needed and in fact could prove untrue as not all RCs are independent from TOs, GOs, etc.

The R3 rationale inserts the idea of "lack of dependability". This can be understood differently by different parties. For a hardware supplier, it can mean the equipment or technology is unreliable. And if taken to an extreme, this seems to open the path to requiring the RC to decide which generators should run based on the individual generators' forced outage rate (dependability rate?). We suggest this phrase be stricken from the R3 explanatory.

For R4 the limited impact designation explanation, please clarify whether the reference to regions is meant to be an example of how the SDT came to its decision for R4 or whether it is a reference of the authority of what regions can do. We believe it is the former and the language should be improved.

The concept of 4.1.2 to "avoid adverse interactions" would seem to need some criteria for evaluating what "avoid" means. Rather than state "avoid", we suggest this requirement to be rewritten to state: "The RAS does not adversely impact the performance of other RAS, and protection and control systems."

4.1.4.4. BES voltages shall be within post-Contingency voltage limits and post-Contingency voltage deviation limits as established by the Transmission Planner and the Planning Coordinator. Some Planners don't use voltage deviation criteria. This should it not be rewritten to state "BES voltages shall be within the Planning Coordinator's voltage criteria under pre and post contingency conditions".	
Likes 0	
Dislikes 0	
Response	
Thank you for your comments. The Rationale for Requirement R2 states that the RC review "minimizes" the possibility of a conflict of interest; it does not say that it "eliminates" the possibility. While it is true that not all RCs are independent from RAS-entities, RCs are more likely to be independent from RAS-entities than other functional model entities that would be more likely to be involved with the planning or implementation of a RAS. The phrase "lack of dependability" in the Rationale for Requirement R3 is referring only to the RAS. This is just an example of one of the possible reliability issues with the RAS that the RC review is intended to uncover. WECC and NPCC were cited because those are the only two Regions that classified RAS based upon certain criteria. The SPCS-SAMS team also recognized these Regional classifications and made similar albeit different recommendations. The drafting team considered the attributes of each of these regional classifications in creating the guidance for limited impact designation. The limited impact designation is applicable on a continent-wide basis via NERC Reliability Standard PRC-012-2. Based on your comment, the drafting team modified the language in the Rationale for Requirement R4. The drafting team maintains that the current language "avoids adverse interactions" is clear and declines to make the suggested change. The drafting team worded Requirement R4, Part 4.1.4 to reflect Requirement R5 of TPL-001-4 which requires PCs and TPs to have criteria for post contingency voltage deviations.	
Larry Heckert on Behalf of Kenneth Goldsmith, Alliant Energy Corporation Services, Inc. - 4	
Answer	Yes

Comment	
Alliant Energy supports comments submitted by the MRO NERC Standards Review Forum.	
Likes 0	
Dislikes 0	
Response	
Ruida Shu - Northeast Power Coordinating Council - 1,2,3,4,5,6,7 - NPCC, Group Name RSC No HQ and Dominion	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
sean erickson - Western Area Power Administration - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Karie Barczak - DTE Energy - Detroit Edison Company - 3	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Andrea Jessup - Bonneville Power Administration - 1,3,5,6 - WECC	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Oshani Pathirane on Behalf of Payam Farahbakhsh, Hydro One Networks, Inc. - 1, 3	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Andrew Pusztai - American Transmission Company, LLC - 1	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Pamela Hunter - Southern Company - Southern Company Services, Inc. - 1,3,5,6 - SERC, Group Name Southern Company	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Laura Nelson - IDACORP - Idaho Power Company - 1	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Colby Bellville - Duke Energy - 1,3,5,6 - FRCC,SERC,RF, Group Name Duke Energy	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Jared Shakespeare - Peak Reliability - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Erika Doot - U.S. Bureau of Reclamation - 5	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Laurie Williams - PNM Resources - Public Service Company of New Mexico - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Allie Gavin on Behalf of Michael Moltane, International Transmission Company Holdings Corporation - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
John Pearson on Behalf of Michael Puscas, ISO New England, Inc. - 2	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Teresa Czyz - Oglethorpe Power Corporation - 5	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Greg Davis on Behalf of Jason Snodgrass, Georgia Transmission Corporation - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Christy Koncz - Public Service Enterprise Group - 1,3,5,6 - NPCC,RF, Group Name PSEG	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Thomas Foltz - AEP - 5	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Mike Smith - Manitoba Hydro - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Ginette Lacasse - Seattle City Light - 1,3,4,5,6 - WECC, Group Name Seattle City Light Ballot Body	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Emily Rousseau - MRO - 1,2,3,4,5,6 - MRO, Group Name MRO-NERC Standards Review Forum (NSRF)	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Diana McMahon - Salt River Project - 1,3,5,6 - WECC	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Randi Heise - Dominion - Dominion Resources, Inc. - 5, Group Name Dominion - RCS	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Rick Applegate - Tacoma Public Utilities (Tacoma, WA) - 6	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Gul Khan on Behalf of Rod Kinard, Oncor Electric Delivery - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Michael DeLoach - AEP - 3	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Michael DeLoach - AEP - 3	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
John Fontenot - Bryan Texas Utilities - 1	
Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	
Daniel Mason - City and County of San Francisco - 5	

Answer	Yes
Comment	
Likes 0	
Dislikes 0	
Response	