Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

Please use this form to submit comments on the Phase III & IV Drafting Team's third draft of the remaining standards in the first set of Phase III & IV Standards. Comments must be submitted by **January 17, 2006.** You must submit the completed form by e-mailing it to sarcomm@nerc.com with the words "Phase III & IV Standards Comments" in the subject line. If you have questions please contact Mark Ladrow at mark.ladrow@nerc.net or 609-452-8060.

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Do not use quotation marks in any data field.
Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**John Horakh_01-10-2006**	
Organization:	**MAAC**	
Telephone:	**609-625-6014**	
E-mail:	**john.horakh@pepcoholdings.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☒ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☒	2 — RTOs, ISOs, Regional Reliability Councils
	☐	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

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: This is a correction that should be made, not a suggested modification. In the Definitions section, the whole definition for Protection System was incorrectly deleted. Only the item Power Circuit Breakers should have been deleted, as intended.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: This is a clarification, not a suggested modification. In the Redline version of PRC-018-1, definitions from PRC-002-1 are provided for reference only in a yellow box, but they are the unmodified definitions. In the Clean version of this standard, these referenced definitions are not included. If the former (inclusion) was desired, the definitions should be modified as in PRC-002-1. If the later (non-inclusion) was desired, there is no correction needed.

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

☐ No

Comments:

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E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	3 — Load-serving Entities
	☐	4 — Transmission-dependent Utilities
	☐	5 — Electric Generators
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	☐	7 — Large Electricity End Users
	☐	8 — Small Electricity End Users
	☐	9 — Federal, State, Provincial Regulatory, or other Government Entities

Group Comments (Complete this page if comments are from a group.)

Group Name: **SERC EC Planning Standards Subcommittee (PSS)**

Lead Contact: Kham Vongkhamchanh

Contact Organization: Entergy Services, Inc.

Contact Segment: 1

Contact Telephone: (601) 339-2561

Contact E-mail: kvongkh@entergy.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Darrell Pace	Alabama Electric Cooperative	SERC	1
Clay Young	South Carolina Electric & Gas Co	SERC	3
Art Brown	SCPSA (Santee Cooper)	SERC	1
Pat Huntley	SERC	SERC	2
Bob Jones	Southern Company Services	SERC	1
Travis Sykes	TVA	SERC	1
Brian Moss	Duke Power Co.	SERC	1

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Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

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The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: (1). General comment for this standard and other standards. The abbreviation [e.g.] should be written as [e.g.,]. (2). To be consistent with R2.1, R3.1 needs to be revised to [Location, monitoring, and recording requirements including the following …]. (3). The section above indicated that the terms [power circuit breakers] were removed from the definition of [Protection System]. However, both the redlined and clean versions of this standard indicated that the entire definition has been deleted. Recommend that the definition of [Protection System] be re-inserted without the reference to [power circuit breakers]. (4). In R3.1.2 the word [phases] is misspelled.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

   (1). General comment for this standard and other standards. Need consistent format for referencing requirements. For example, [Requirement 1] vs. [R1] vs. [Requirement R1]. (2). Delete the term [power circuit breakers] from the reference to the definition of [Protection System] in the yellow box on page 2.

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments:

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Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Thomas Owens**	
Organization:	**Dominion Va Power - Electric Transmission**	
Telephone:	**804-257-4693**	
E-mail:	**tom_owens@dom.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT	☒	1 — Transmission Owners
☐ ECAR	☐	2 — RTOs, ISOs, Regional Reliability Councils
☐ FRCC	☐	3 — Load-serving Entities
☐ MAAC	☐	4 — Transmission-dependent Utilities
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☐ NPCC	☐	7 — Large Electricity End Users
☒ SERC	☐	8 — Small Electricity End Users
☐ SPP	☐	9 — Federal, State, Provincial Regulatory, or other Government Entities
☐ WECC		
☐ NA — Not Applicable		

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

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Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments:

   Regarding R1, Dominion-Electric Transmission suggests the abbreviation of SER be approved for use to refer to sequence of event recording equipment. As such modify the wording to say - The Regional Reliability Organization shall establish. . . Sequence of Events Recording (SER) equipment: Also modify the definition accordingly.

   Regarding R2, Dominion-Electric Transmission suggest the abbreviation of DFR be approved for use to refer to fault recording equipment. Since the requirements in PRC-002 are specifying a Comtrade file format and magnetic tape recorders cannot meet this requirement, the only type fault recorders that could then exist will be digital fault recorders (DFRs). As such modify the wording to say - The Regional Reliability Organization shall establish. . . Digital Fault Recording Equipment (DFR) equipment: Also modify the definition accordingly.

   Regarding R3.1.2, the word phrases should be changed to phases.

   Regarding R5.1, it should be stated that the Regions should specify the types of events to be captured by each type DME. The type of events to be captured by DDRs should be stated

separately from other DME. This must include what special triggers are required on the recorder to save the RMS data. Since this may affect the recorder design and software, it also should be mentioned under the sction on installation requirements. This is required because many DDRs will be of a vintage that do not have continuous recording.

Regarding R3.2.1, it states - for installations effective three years after BOT adoption, capability for continuous recording. The meaning of the word effective is unclear. Does it mean installed, in service or something else? Add or modify verbage to indicate - DDRs installed 3 years after BOT.. for example.

Regarding R1.2.2, R2.2.3 and R3.2.2, it states - The recorded time may be expressed as local time, as long as the local time zone used is clearly stated. Does the statement of local time zone need to be in the recorded data, part of the file name, displayed when viewing the comtrade record or on a cover memo? The answer may affect recorder software, analysis software and firmware. Add verbage to clarify how local time zone should be stated.

Regarding Paragraph R3.2.3, the reasons for specifying a minimum 1600 samples per second are unclear; this number is not evenly divisible by 60 (Hz). We are not sure why the minimum data sampling rate of 1600 samples per channel per second is specified. Did this number from from the IDWG proposal? Why specify such a high sample rate and only save 6 records per second? Is this to try and capture some harmonic content in the RMS calculation? Is the intent to save an average of the RMS data over several cycles of time or is the intent to just simply save 1 RMS sample every 10th cycle and ignore the 9 cycles that follow? It may be better to save more samples as opposed to saving averages. The minimum sample rate should be changed to something lower such as 960 (16 samples/cycle) which would match the minimum sample rate specified for a DFR. This number is evenly divisible by 60, has computational advantages because it has several integer factors and would include the effects of up to the 8th harmonic.

Regarding R4.2, it is assumed that the captured DME data referred to here is the archived data stored by the Regional Reliability Organization. The question is does it refer to the facility owner's stored data or to both? Add verbage to clarify to whom this requirement applies.

Regarding Paragraph R5.4, Availability of recorded Disturbance data in COMTRADE format, the COMTRADE format is structured for instantaneously sampled data; that is, a number (usually large) of digitally-sampled analog data points, which may be greater or less than zero (described in Section 3.3, C37.111 IEEE Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems (1999). Each file line containing digitized analog data includes one field for the number of digital counts that reflects the instantaneous magnitude of the signal. Several lines are needed to reconstruct a waveform. There is no provision in COMTRADE for storing RMS values, phase angles, or real and imaginary components of a signal. COMTRADE is structured to store transient data; there is no provision in the Standard to indicate that the data in a COMTRADE file is any other type. Section 1.1 of IEEE C37.111 states that the COMTRADE standard - defines a format for files containing transient waveform and event data. Paragraph R3.2.3 of PRC-002-1 states that DDRs - shall record the RMS value of electrical quantities... Since recorded RMS values do not reflect waveform data (without additional information) this type of recording falls outside the COMTRADE standard. Further, programs designed to read COMTRADE files would not properly interpret the files from DDRs. Some other file format should be used as a standard; a format suitable for importing into a database would be more practical.

Regarding Paragraph R5.5, some recorders do not presently name files in accordance with the C37.232 IEEE Recommended Practice for Naming Time Sequence Data Files. Approval of this standard is pending. Many vendors will have to make software enhancements to comply. The compliance footnote #2 should be changed to allow a period of time after the standard is approved, possibly one year later, for facility owners to become compliant with the COMNAMES naming convention.

Regarding Paragraph R5.5, it is assumed this only relates to data files that are forwarded by the facility owner to the Regions and not necessarily for files stored on the actual recorders. Add verbage to clarify.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments:

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Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Ron Falsetti**	
Organization:	**Independent Electricity System Operator (IESO), Ontario**	
Telephone:	**905 855-6187**	
E-mail:	**ron.falsetti@ieso.ca**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☒ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
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1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments:

   R3.2.2: For consistency the IESO suggests the same wording as in R 1.2.2 and R 2.2.3 be used, i.e. "….synchronized to within four milliseconds of Coordinated Universal Time."

   R3.2.3: We suggest the term "collect" be used in place of the first "sample".

   R4.2 and R5: The acronym DME needs to be defined upfront, say, in Section A, Item 3 Purpose.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

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Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Kathleen Goodman**	
Organization:	**ISO New England**	
Telephone:	**(413) 535-4111**	
E-mail:	**kgoodman@iso-ne.com**	
NERC Region		**Registered Ballot Body Segment**
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Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

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Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: The standard implies that sequence-of-events recorders must be installed. It should be up to the region whether to use this type of equipment or not.

   In R3.1.2 change …phrases… to …phases.

   Remove R3.2.1 because no requirements for continuous recording should be part of this standard. As mentioned above, continuous recording would apply to devices installed 3+ years from now, not now.

   In R4, please define which …specific system Disturbance events… data needs to be retained for or remove this statement.

   There are no implementation requirements for equipment maintenance and testing.

   R3.2.2: For consistency we suggest the same wording as in R 1.2.2 and R 2.2.3 be used, i.e. "….synchronized to within four milliseconds of Coordinated Universal Time."

   R3.2.3: We suggest the term "collect" be used in place of the first "sample".

   R4.2 and R5: The acronym DME needs to be defined upfront, say, in Section A, Item 3 Purpose.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: R2/M2, R4/M4 and R5/M5 are not addressed in the levels of non-compliance.

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

Please use this form to submit comments on the Phase III & IV Drafting Team's third draft of the remaining standards in the first set of Phase III & IV Standards. Comments must be submitted by **January 17, 2006.** You must submit the completed form by e-mailing it to sarcomm@nerc.com with the words "Phase III & IV Standards Comments" in the subject line. If you have questions please contact Mark Ladrow at mark.ladrow@nerc.net or 609-452-8060.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

DO: **Do** enter text only, with no formatting or styles added.
Do use punctuation and capitalization as needed (except quotations).
Do use more than one form if responses do not fit in the spaces provided.
Do submit any formatted text or markups in a separate WORD file.

DO NOT: **Do not** insert tabs or paragraph returns in any data field.
Do not use numbering or bullets in any data field.
Do not use quotation marks in any data field.
Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☒ SPP ☐ WECC ☐ NA — Not Applicable	☒ ☒ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	1 — Transmission Owners 2 — RTOs, ISOs, Regional Reliability Councils 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

Group Comments (Complete this page if comments are from a group.)

Group Name:	**Southwest Power Pool (SPP) System Protection & Control Working Group (SPCWG)**
Lead Contact:	Fred Ipock, Chairman (or John Boshears, Secretary)
Contact Organization:	City Utilities Springfield, MO (or Southwest Power Pool)
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Additional Member Name	Additional Member Organization	Region*	Segment*
Doug Jackson	American Electric Power-West	SPP	
Shawn Jacobs	OG&E Electric Services	SPP	
Heidt Melson	Xcel Energy	SPP	
Bob Roach	Kansas City Power & Light Co.	SPP	
Maurice Robinson	Arkansas Electric Cooperative Co	SPP	
Lynn Schroeder	Westar Energy	SPP	
Dean Sikes	Cleco Power, LLC	SPP	
John Boshears	Southwest Power Pool	SPP	

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: See attachments: Word documents - - Phase III & IV Std Comments Parts 1 & 2 (Draft 3 PRC-002-1 & PRC-018-1) SPP Response to NERC.doc

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: See attachments: Word documents - - Phase III & IV Std Comments Parts 1 & 2 (Draft 3 PRC-002-1 & PRC-018-1) SPP Response to NERC.doc

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☐ Yes

   ☒ No

Comments: See attachments: Word documents - - Phase III & IV Std Comments Parts 1 & 2 (Draft 3 PRC-002-1 & PRC-018-1) SPP Response to NERC.doc

Part One

Date: December 10, 2005
Revised: January 11, 2006

To: sarcomm@nerc.com - - Mark Ladrow
From: Southwest Power Pool System Protection & Control Working Group (SPP SPCWG)

Subject: Phase III & IV Standards Comments:
SPP SPCWG Review Comments (Part 1)
NERC Standards Draft 3 PRC-002-1 & PRC-018-1 (DME's)

The Southwest Power Pool (SPP) System Protection & Control Working Group (SPCWG) has participated in emails and telephone / conference calls to review the NERC draft #3 PRC-002-1 & PRC-018-1 standards, which relate to disturbance monitoring equipment (DME). The proposed new NERC standards were derived from old Planning Criteria. However, the proposed new NERC DME standards have incorporated several additional requirements and more specifics to the older Planning Standards requirements. These changes seemingly result in more restrictive performance mandates that the transmission and generation owners must abide by. The SPP SPCWG is concerned with these revised NERC standards and requests modifications be made to PRC-002-1 & PRC-018-1 that will facilitate compliance.

To support the SPP SPCWG request to have NERC again consider modifications to the draft #3 PRC-002-1 & PRC-018-1, this submittal contains SPCWG email (background) discussions, additional review comments, and an attempt at completing the NERC comment form for draft #3 PRC-002-1 & PRC-018-1.

I. For background information**, the following are email excerpts and discussion review comments from various SPCWG members {These SPP review comments will, per footnote, be Word document/file known as Phase III & IV Standard Comments Part 1 (Draft 3 PRC-002-1 & PRC-018-1) SPP Response to NERC.doc}:**

1. Comments related to PRC-002-1 & PRC-018-1: I have more questions than answers. I would ask who has Dynamic Disturbance Recorders? How many? Where they are located? Why were they installed, rather than a DFR? When were they installed? I may be wrong, but I am thinking this may be old technology and no one is installing these as a matter of course. Who manufactures them? I have not had manufacturer's representatives come by and try to sell me one. What does one cost? As far as writing up a criteria for the installation of these in the SPP, I would keep it very generic, such as, those lines/locations which have been identified in studies (stability - ???) as prone to power flow swings and/or oscillations or those lines/locations determined by SPP studies requiring out-of-step tripping/protection. What have other RTOs written as far as criteria related to Dynamic Disturbance Recorders and as far as where they are required to be installed, rather than a DFR? Why re-invent the wheel when some other RTO may have already done all of the dirty work.

2. A. Comments on PRC-002-1 & PRC-018-1: Currently the Southwest Power Pool (SPP) requires Disturbance Monitoring Equipment (DME) based on the necessity to determine system performance and the causes of system disturbances within the region. As defined in the SPP criteria 7.1, DME may include Sequence of Event Recording (SOE), Fault Recording Equipment (DFR), and Dynamic Disturbance Recording Equipment (DDR).

B. The proposed wording of PRC-002-1 alludes to requiring SOE and DDR regardless of a region's necessity for such equipment. It is the SPP's concern that the detailed requirements in PRC-002-1 could ultimately require members to install expensive equipment that may not be needed in the region to sufficiently determine system performance and the causes of system disturbances within the region. For example, in R1.2 it is proposing to require SOE to be synchronized to four milliseconds. While this may be appropriate for very select locations, it may not be practical at large quantities of substations.

Other examples are in R3.1 and R3.2 discussing proposed DDR requirements. The configuration of the SPP system has led to very little, if any, experience with DDR's having a resolution of 1600 samples per second that continuously store at 6 records per second. It is felt that DDR's should be required only if system studies identify locations that are likely to cause system stability issues.

C. Another area of concern (of the proposed standard requirements) is R5.5, which is proposing to require data files to be named in conformance with IEEE C37.232. Unless vendors conform to this standard, each file would need to be renamed. SPP feels that given a system disturbance, that data can be adequately identified without such file naming.

3. Attached is our first review of the SPP Criteria 7.1 compared to the proposed NERC PRC-002-1and PRC-018-1. We have included DDR into the SPP criteria and expanded the "disturbance" definition to match that of NERC. We deleted the requirement to record waveforms. Waveform recording is not mentioned in PRC-002 or PRC-018 and should not be required. Also, the SPP criteria tried to lump all DME into similar requirements. This does not work well for SER. Therefore; we attempted to separate certain SER requirements from the DFR and DDR requirements.

4. A. It appears the SPP region may be immediately out of compliance, if the draft #3 PRC-002-1 & PRC-018-1 are adopted, as presently proposed. The SPP region believed from the old NERC Planning Standards that any combination of several different classes of equipment might be utilized as disturbance monitoring equipment (DME) devices. Under the old DME requirements, the region was not required to have individual boxes and reporting for each SOE, DFR, and DDR device. The standards, as drafted, appear to mandate that the region must report on and have differing single device DME equipment to provide SOE's, DFR's, & DDR's. SPP's existing criteria, that specifies at very specific locations, one box, high end DFR/DDR equipment with channel capacity to monitor several lines at a substation, will not meet the new dynamic disturbance recorder (DDR) requirement proposed. Existing SPP DME equipment should be grandfathered, as acceptable DDR devices. Since existing SPP region DME's usually [a] have "triggered" event capture devices instead of a device with "continuous" capturing of data, [b] have data sampling at least 64 samples per cycle instead of 26-2/3 samples per cycle (1600 samples per second), [c] have Comtrade data format for newer disturbance monitoring equipment (DME), but not for older DMEs, [d] have oscillograph displays for current and voltage waveforms including status sequence for various inputs, [e] have time stamping but possibly not have the 1 millisecond time stamping resolutions proposed, it should not be reasonable to exclude these historical high end DFR's as DDR devices.

B. SCADA systems with SOE synchronized to 5 milliseconds should be acceptable. It is noted that the PRC-002-1 R1.1.2 references "protection system" devices to be monitored by SOE equipment. Since the protection system by definition does not include breakers, does this mean that breakers may be excluded from SOE reports? Protection engineers often utilize the breaker operating sequences to determine whether or not correct protection occurred for events on the power system. Breaker SOE information should be a part of the information from sequence of event records.

C. It is recommended that PRC-002-1 requirement R3.2.1 be dropped from the proposed standard. This requires in three years after Board of Trustees (BOT) adoption, capability for continuous recording. If continuous recording is not standard practice within the industry today, how can one assume that in three years multiple vendors will have DDR equipment proven to perform this requirement? If technology today is centered on continuous monitoring with triggered event recordings, how can a requirement be based upon emerging products? It is possible that technology will develop further and it may become reasonable to expect continuous recording. At that time the NERC reliability standard should be updated to reflect the requirement to changed technology. A similar philosophy should be taken with the naming convention. The draft IEEE naming convention still is probably a moving target as far as exactly what format the name will assume. Also, I do not believe that most manufacturers of equipment have implemented this naming convention into their products. Adding this requirement in a

new standard appears to require manual processing at this time. I do not know how the industry encourages movement towards new and improved technologies, but to mandate developing/emerging technologies be implemented when there are product development cycles going on seems unfair, especially if financial penalties may be imposed for non compliance. Are there other methods that would encourage implementing emerging technologies without the fear of becoming non-compliant because products have not been fully developed and expectations are moving targets? Is it possible that the standards might have a desired (not required) performance for good utility practices that are really emerging technologies and that, when the bugs are worked out, then the standard could become a requirement. However, it is recognized that such desires, if not a requirement, will probably not be implemented at many companies. Also a concern of the naming convention, is that companies may not desire to disclose precise location (longitude & latitude) and manufacturer information about their microprocessor protection-fault locating relays (DFR's) and/or DDR's. Since this sensitive information knowledge, if made available to the public, might enhance exposure to terrorist damage to the facility or aid in unauthorized device entry and subsequent disabling of or reprogramming of the device.

D. My company does not have any one box, substation/power plant, high end DFR event triggering, disturbance monitoring equipment (DME's), as defined by the SPP criteria. However, my company does have a SCADA system with time stamping features at all of its substations. It also has several fault locating relays on individual transmission lines, autotransformers, and buses. The newer fault locating relays with GPS time synchronizing may be wired and programmed to trigger similar to a DFR device, while the older relays are normally only fault type relays. A few of these relays do have 64 samples per cycle monitoring with triggered events and SER time stamping. Only about 6 lines out of about 50 on my company's transmission system are not covered by a fault-locating relay, on at least one end of the line. However, per SPP criteria today, these (fault locating relays and SCADA systems) are not reportable DME devices. Under the proposed NERC PRC-002-1 and PRC-018-1 draft standards these devices may become reportable. However, due to the magnitude of reporting on all microprocessor relays, it is preferred that these devices not be required to all be reported (as DFR's) under the draft NERC PRC-002-1 & PRC-018-1 standards. SPP existing criteria realized that microprocessor fault locating relays were included in the relay portion of the criteria, and that relay maintenance, testing, and tracking were covered so that separate redundant DME reporting was not necessary, if a relay provided DME functionality.

Realizing there are hundreds of fault locating relays (there were more than 10,000 terminals at 345kV when the zone 3 issue was reported upon), separate reporting of these, as DME and relay devices will significantly impact reporting and costs. NERC should permit combining of the DME reporting with the relay reporting, if the DME device is a fault-locating relay. Again it would be nice if the DFR relay report does not require the detail described in the draft standard, since knowledge made too public may result in less security, but if enough detail is not provided then how does one confirm reliability enhancement adequacy of the DFR device? SPP realized that most utility companies utilize a SCADA system with SOE capabilities, and that there is in general no routine/repeatable SCADA maintenance performed. NERC should not require periodic maintenance testing of SCADA, since it is commission tested and it is somewhat self monitoring in that SCADA either functions or it does not function. SPP in their protection equipment did not require companies to list and report on their SCADA equipment (master unit, RTU's, and software formats), unless it was considered a part of the special protection applications. Only two companies within SPP indicated they have stand alone SOE devices at a substation, and then only at a couple of locations. Some companies, in addition to the SCADA SOE capability, have programmed microprocessor relays and DFR equipment to provide SER data.

Nothing was mentioned about permitting the transmission inter-connection high-end, microprocessor revenue meters &/or power quality monitors to be classified as DFR devices. It is recommended that such meters and PQ monitors be allowed as DFR devices, if programmed and wired/set up to provide the DME information NERC desires.

E. It was recognized that that for the fault locating (DFR) functions, most companies were using digital relays capable of displaying fault data and current /voltage waveforms. The relays provided

adequate information for most line operations and for many planning studies & verifications. SPP may have assumed from NERC's old Planning Standards that the high-end DFR devices were needed for the planning engineers and for verification of modeling information, especially for swing conditions or if fault locating relays malfunctioned. Thus the SPP criteria only requires high end DFR's. (see SPP Criteria 7.1) However, it now appears NERC may not require the higher sampling rates common in DFR one box disturbance monitors. Instead they seem to want continuous recording, which is not readily available in the marketplace. Some NERC clarification is needed so the regions understand how to respond and react.

5. In the old NERC planning criteria the sequence of events recorders (SOE's), fault recorders (DFR's), and dynamic disturbance recorders (DDR's) were thought by SPP to be grouped together as a system of disturbance monitoring equipment (DME's) that provided system-monitoring capabilities. The combined devices are connected to the power system for the purpose of monitoring performance of the system. Some devices may include fault data, disturbance data, and SOE data. The SPP took a different approach to the old planning criteria than that is apparently proposed by the new reliability standard. Individual reporting (list of equipment) on each 100kV and above monitoring device was not a SPP region requirement. SPP did not require listing of some equipment and reporting, since fault locating relays were addressed in the relay section of the criteria and SCADA systems really did not have routine maintenance activities. SPP desires that NERC does not require separate reporting for three classifications of DME equipment: SOE's, DFR's, and DDR's. Some devices may do all of these functions and thus (per the proposed DME standard) may need to be listed in three different DME reports, and other reports such as relay reports. Is there a method to permit all DME's to remain under only one reporting mechanism and also permit the reporting of various devices to be streamlined?

The SPP region recognized that existing older facilities would be somewhat exempt from forced equipment replacement on 100kV and above, i.e. that grandfathering of existing equipment was permissible for the most part. SPP also recognized for new transmission and generation construction projects that about every company was installing microprocessor relays with fault recording capabilities and SCADA systems with SOE capability for major events such as breaker operations or device 86 lockout conditions. The various SPP protection engineers use the relay fault data/records and SCADA data/records to analyze their transmission system operations. It was recognized that equipment sampling rates (4, 16, 64, etc., samples per cycle) and time stamping resolution [5, 4, 1, etc. millisecond, or microsecond(s) within a device and/or synchronized to a report] differed somewhat among entities. However, for routine fault analysis each SPP member felt they generally had adequate recording equipment for fault analysis on [a] new facilities being built and [b] when upgrading older electromechanical relay equipment to microprocessor relay equipment. When necessary, SPP (& other region) engineers have exchanged event records to help each other evaluate system operations and performance during disturbances. It was recognized that different companies within SPP may have different types of "equipment, records, and reporting", but that each company's parties coordinated to evaluate the differences so that wide area disturbance analysis and reporting may be facilitated.

It was SPP's interpretation of the old DME planning criteria that NERC was actually requesting that the regions respond to the "high end DFR type of equipment", so that across the region, and region to region, that fault disturbance analysis might be improved and planning departments might have dynamic disturbance captured data to study power swings. The SPP criteria 7.1 for DME's indicate specific requirements and locations, which were to be regionally identified. (See SPP DME Criteria 7.1 and location excerpt below.) Most SPP companies that used the DDR's assumed them to be one box DFR equipment monitoring with event triggering type of application and DFR to be rated at least 64 samples per cycle and 30 cycles of data (some pre-fault or pre-disturbance and some post-disturbance). Some SPP members did not have any DDR equipment, as defined by SPP Criteria. The SPP region did not specifically require all fault locating relays to be tabulated. Some members within the region may have this relay fault locating information in a tabulation or represented on one line system drawing(s), whereas others may not have developed the fault locating relays as a DME database structure.

Because of the magnitude of the devices and locations, the SPP region did not require a listing of, and a maintaining of the list for, all SOE equipment and all fault-locating equipment. Only this type of equipment needed to be reported at designated locations, which per SPP Criteria 7 are significant facilities defined as: "Disturbance Monitoring Equipment will be required at all new EHV substations, operated at 345kV or higher, and all new generating stations of 400 MVA or greater placed in service after January 1, 2002. In addition, any new substation placed in service after January 1, 2002 containing six (6) or more lines operating at 100 kV and above will be required to have DME. However, when additional lines placed in service after January 1, 2002 are added to an existing substation that results in six (6) or more total lines, then DME shall be required for monitoring all elements within the substation as defined in 7.1.1. These requirements may be waived at SPP's discretion, if DME is already located at an adjacent substation."

Remember that for zone 3 NERC Recommendation 8a review for 230kV and above lines, there were 10,000 plus terminals. Add to this [a] redundant fault locating relays on a terminal and [b] all the beyond zone 3 related DME equipment to track and report on, and it is apparent the significant amount of work that may become necessary annually just for reporting purposes. For NERC to dictate a database segregated by each type of DME device and of the magnitude seems unnecessary embellishment and contributes to operating cost increases.

Within SPP there are very few, if any, DDR's that trigger to record for 1600 samples per second and at a rate of 6 records per second. To my knowledge and the remaining SPCWG knowledge, within SPP there are not any DDR devices that record continuously.

SCADA typical time stamping resolution is about 5 milliseconds, not 4 milliseconds, although some SCADA time stamping may meet the 1-millisecond requirement. Not all SCADA alarms points are defined as SOE's. Typically SCADA SOE points are selected for breaker 52a contacts (open & close) and device 86's (lockouts). SOE's may be in a relay, a DRF device, SCADA record, or separate piece of equipment.

In the draft PRC-002-1 standard there is reference to "elements to be monitored" (DFR'S) versus "protection system devices to be monitored" (DDR's). There is a subtle difference in required monitoring between DFR and DDR. Is that intentional by NERC?

The proposed PRC-002-1 standard R2.1.3 requires certain electrical quantities to be recorded …sufficient to determine …. : three phase to neutral voltages, three phase and neutral currents, polarizing currents and voltages (if used), frequency, megawatts and megavars. Most fault locating relays will easily capture and display three phase to neutral voltages, three phase and neutral currents, but the other items are not generally a direct output of the relay and must be derived. Significant manpower may be required to provide this derived data, if it is requested as a result of a standard. Polarizing voltages are generally developed within the microprocessor relay and may not be capable of being easily derived. Although polarizing currents may be input to a microprocessor relay, these currents may not be easily displayed by the relay. Likewise, although frequency, watts, and vars may be shown by the relay's meter display, these quantities are not generally direct event outputs from a fault locating relay or DFR device. It is recommended the NERC standard only require the typical quantities available from a microprocessor relay or DFR device, i.e. three phase to neutral voltages, three phase and neutral currents. Again manufacturers should be made aware of NERC's desire for the other quantities to be direct outputs from relays/DRF equipment and work toward new technology that provides this information. Once the product development cycle has matured and there are ready to use, off the shelf materials from multiple vendors that can be specified and purchased, only then NERC should consider adding the requirement for polarizing currents, polarizing voltages, frequency, megawatts and megavars. The SPP does not desire to have the PRC requirements to derive values for frequency, megawatts, megavars, polarizing voltages or

polarizing currents. It is preferred that when the technology is widely available in various manufacturers' products to directly capture this information that NERC then add these requirements.

PRC-002-1 requirement R7 appears to require the Regional Reliability Organization (RRO) to provide its requirements for DME's to TO's and GO's within 30 days of approval of the NERC standard. This is much too fast a response by the RRO. The SPP SPCWG only meets about two times a year and whatever SPP Criteria changes are to be implemented because of NERC standards must be approved by the SPP Market and Operating Policy Committee (MOPC) at one of their quarterly meetings. There may be a six-month to one-year lag time to permit RRO to react to changing Criteria. Then there needs to be more lag time for projects already under design, procurement, and/or construction by the TO's and GO's. If the NERC standard is indicating that once the region has reviewed the NERC requirements and updated the SPP criteria, and then SPP has 30 days to notify the SPP members, such a 30 day notice arrangement is acceptable.

6. Looking at PRC-002-1: I would like to say that PRC-002-1 appears to be very thorough. It should be sufficient to reduce the possibility of misinterpretation and subsequent errant situations by the Regional Reliability Organization and Transmission Owners. I feel that is desirable. However, as I am a layman in several aspects of Disturbance Monitoring Equipment (such as SER and DDR equipment), I can not tell you if these requirements are "real world available today". That is, I wouldn't know if these requirements (what, where, how, when) are fully practical and functional. Essentially I have some concerns:

1. I question whether we (Transmission Owner and/or Reliability Organization) will now be able to comply or will not comply.
2. If we were to find that we were not compliant, I can not well say what it would take to become compliant and I can't tell you how much it would cost the to become compliant and
3. I can not say how much it would cost to maintain compliance (if being compliant requires enhanced equipment, or enhanced processes).

Looking at PRC-018-1**:** As noted above, I would like to say that PRC-018-1 appears to be very thorough. It should be sufficient to reduce the possibility of misinterpretations and subsequent errant situations by the Regional Reliability Organization and Transmission Owners. I feel that is desirable. In summary:

I note a strong reliance on individual Transmission Owner (TO) rather than the Region Reliability organization. The TO will need to get fully cognizant of what he needs to record, how he needs to report, when he needs to report and how long to keep records and reports.

Also I note that a significant part of the measures are somewhat trivial. In moment-by-moment confidence of whether you are in compliance. Sufficient evidence appears to be, at minimum, a copy of the email note you sent to SPP saying you are in compliance.

Yet, it seems to be nontrivial in that you need precise documentation that you said what you comply or don't comply (where an expert would need to be capable and be available to respond to "self-certification inquiries" as required). In other words, I think the Transmission Owner may need to funnel issues of compliance through the expert and not let anyone else in his organization "knee jerk reply" on these questions of compliance. I expect that they may float in unexpectedly rather than on a planned periodic basis.

II. For NERC format reporting of SPP review comments see separate Word document/file known as Phase III & IV Standard Comments Part 2 (Draft 3 PRC-002-1 & PRC-018-1) SPP Response to NERC.doc}:

Part Two

SPP SPCWG Review Comments in NERC Format
Draft # 3 NERC Reliability Standards - - Comments due 1-17-06
PRC-002-1: Define Regional Disturbance and Reporting Requirements &
PRC-018-1: Disturbance Monitoring Equipment & Installation & Data Reporting

Date: January 11, 2006

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
A		**Introduction - - PRC-002-1**	Yes		See attached supporting Word file with general comments that further explain the SPP review of this draft standard.
1		**Title Define Regional Disturbance Monitoring and Reporting Requirements**	Yes		
2		PRC-002-1	Yes		
3		Purpose: Ensure that Regional Reliability Organizations establish requirements for installation of Disturbance Monitoring Equipment and reporting of Disturbance data to facilitate analyses of events.	Yes		
4		Applicability	Yes		
4.1		Regional Reliability Organization.	Yes		
5		Proposed effective date: January 1, 2007.	Yes		Conditional on NERC standard implementation on timely basis (Adopted by NERC by targeted April 6, 2006 date and that DDR requirement is revised to be triggered events) . See Word file comments.
B		Requirements	Yes		
R1		The Regional Reliability Organization shall establish the following installation requirements for sequence of event recording equipment:	NO	X	Separation of SOEs, DFR, and DDRs seem to imply that all these devices must be individually installed and reported upon. Various single devices may include the SOE and DFR functions. The older planning standard permitted greater flexibility.
R1.1		Location & Monitoring requirement, including the following:	Yes		
R1.1.1		Criteria for equipment location (e.g. by voltage, geographic area, station size, etc.).	Yes		
R1.1.2		Protection System devices to be monitored	Yes		Add breakers as devices to be SOE monitored.
R1.2.		Equipment requirements, including the following	Yes		
R1.2.1		Each device shall record events with a resolution of one millisecond or better.	Yes		Acceptable provided existing SCADA systems with 5 milliseconds resolution are grandfathered as meeting requirements.
R1.2.2		Each device shall be synchronized to within four milliseconds of Coordinated Universal Time (UTC).	No	X	Time Sync to 5 milliseconds, not 4. Most manufacturers should ensure that their SOE/DME/DDRs have the capability to express time

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
		The recorded time may be expressed as local time, as long as the local time zone used is clearly stated.			stamping like NERC desires before making such a requirement. Most SPP companies are using their local time and that should not be an exception to the standard.
R2		The Regional Reliability Organization shall establish the following installation requirements for Fault Recording Equipment:	Yes		
R2.1		Location, monitoring and recording requirements, including the following:	Yes		
R2.1.1		Criteria for equipment location (e.g. by voltage, geographic area, station size, etc.).	Yes		
R2.1..2		Elements to be monitored at each location	Yes		Provided that additional CT's, VT's, CCVT, etc are not required to be added just to meet this disturbance standard, i.e. if normal protection or metering do not require the sensing equipment to be installed, then this standard should not be applied just to acquire DME monitoring. For example in a breaker & a half scheme there may only be one voltage sensing device for sync check and the disturbance standard shall not be used to force use of three CCVT's
R2.1.3		Electrical quantities to be recorded for each monitored element shall be sufficient to determine the following:	Yes		
R2.1.3.1		Three phase to neutral voltages	Yes		
R2.1.3.2		Three phase currents and neutral currents	Yes		
R2.1.3.3		Polarizing currents and voltages, if used	No	X	Relays with fault recording features may not easily provide polarizing current and voltage magnitudes and/or waveform information. Voltage polarization is probably not a separate VT input to a relay today, i.e. this function is performed inside the relay. If these are to be required quantities then manufacturers should develop proven relay products that yield the information NERC is requesting. If DFRs (not relays) are used, the recording of polarizing currents, if used, is not a concern.
R2.1.3.4		Frequency	NO	X	This is not a normal output of a DFR or relay when a disturbance

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
					event is captured. It should not be a requirement for a manual process to be used to determine frequency when an event occurs. If frequency is to be a required quantity for a captured event, then manufacturers should develop proven products that yield the information NERC is requesting
R2.1.3.5		Megawatts and megavars	NO	X	These are not normal outputs of a DFR or relay when a disturbance event is captured. It should not be a requirement for a manual process to be used to determine watts and vars when an event occurs. If watts and vars are to be required quantities for captured events, then manufacturers should develop proven products that yield the information NERC desires.
R2.2		Equipment requirements, including the following	Yes		
R2.2.1		Recording duration requirements.	Yes		
R2.2.2		Minimum sampling rate of 16 samples per cycle.	Yes		
R.2.2.3		Each device shall be synchronized to within four milliseconds of Coordinated Universal Time (UTC). The recorded time may be expressed as local time, as long as the local time zone used is clearly stated.	NO	X	Time Sync to 5 milliseconds not 4. Most vendors should ensure that their SOE/DME/DDR have the capability to time stamp like NERC desires before making such a requirement. Most SPP companies are using their local time and that should not be an exception to the standard.
R2.2.4		Event triggering requirements	Yes		
R.2.2.5		Data retention capabilities (e.g., length of time data is to be available for retrieval).	Yes		
R3		The Regional Reliability Organization shall establish the following installation requirements for Dynamic Disturbance Recording (DDR) Equipment[1]:	NO	X	The definition of DDR as continuous recording devices is a deviation from old planning standards. Almost all of SPP's DME devices are triggered event type of equipment. Continuous monitoring and continuous recording thereto has not been proven in the marketplace to SPP's knowledge. The region will immediately be out of compliance if continuous recording is required. Considering that financial penalties may occur for non compliance, it is not desirable to have a mandate that requires continuous recording based upon adoption of new technology &/or IEEE standards, when the products in the marketplace have not been proven and established long

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
					enough for wide acceptance. If the DDR were to relate to the one box, high end DRF recorders with triggered events of say about 30 cycles SPP has no objections. NERC needs to consider how to move the industry towards new technologies without the fear of financial penalties. Many new products must progress through a product development cycle before they become viable.
R3.1		Location and monitoring requirements including the following:	Yes		
R3.1.1		Criteria for equipment location giving consideration to the following: • Site(s) in or near major load centers • Site(s) in or near major generation clusters • Site(s) in or near major voltage sensitive areas • Site(s) on both sides of major transmission interfaces • A major transmission junction • Elements associated with Interconnection Reliability Operating Limits • Major EHV interconnections between control areas • Coordination with neighboring Regions within the interconnection	Yes		
R3.1.2		Elements and number of phrases to be monitored at each location.	Yes		Correct phrases to phases
R3.1.3		Electrical quantities to be recorded for each monitored element shall be sufficient to determine the following:	NO	X	Consider deleting reference to – sufficient to determine the following. Instead state: Electrical quantities to be recorded for each monitored element shall be:
R3.1.3.1		Voltage and current	Yes		Voltages and Currents are typical outputs of DFR type devices.
		frequency	NO	X	Although frequency may be a meter displayed quantity within a device, frequency is not typically a captured event output of a DFR device or relay. Manufacturers need to implement new technology to

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
					provide frequency as a direct quantity recorded and outputted. NERC should not require manual derivation of this quantity. If absolutely needed, it is recognized that frequency is probably derivable, but at a significant manpower cost.
R3.1.3.2		Megawatts and megavars	NO	X	Watts & vars are not typically captured event outputs of a DFR device or relay. Manufacturers need to implement new technology to provide watts & vars as a direct quantity recorded and outputted when an event is captured. NERC should not require manual derivation of these quantities. If absolutely needed, it is recognized that watts & vars are probably derivable, but at a significant manpower cost.
R3.2		Equipment requirements, including the following:	Yes		
R3.2.1		For installations effective three years after Board of Trustee adoption, capability for continuous recording.	NO	X	Technology/equipment needs developed and proven before it is a mandated requirement. There may be significant technology improvements needed (working out of equipment performance and reporting bugs, etc.) before compliance may be met and how will financial penalties be handled for non-compliance when technology has not caught up with desires?
R3.2.2		Each device shall be time synchronized to UTC within four milliseconds. The recorded time may be expressed as local time, as long as the local time zone used is clearly stated.	NO	X	Time Sync to 5 milliseconds, not 4. Most vendors should ensure that their SOE/DME/DDRs have the capability to time stamp like NERC desires before making such a requirement. Most SPP companies are using their local time and that should not be an exception to the standard. Older DME 's that may not have this accuracy in time stamping should be grandfathered as acceptable devices.
R3.2.3		Each device shall sample data at a rate of at least 1600 samples per second and shall record the RMS value of electrical quantities at a rate of at least 6 records per second.	Yes		Acceptable provided continuous recording DDR equipment is proven technology by multiple manufacturers and readily available in the marketplace today.
R4		The Regional Reliability Organization shall establish the following requirements for the storage and retention of the Disturbance data for	Yes		

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
		specific system Disturbance events.			
R4.1		Continuously recording DDRs installed after January 1, 2008 shall retain data for at least ten days.	NO	X	It is believed that NERC required external triggering in the old planning standards. Thus permit, but not require, continuous recording. However, furnish some clarifications on what & how data capturing should differ if continuous recording is required. There is confusion regarding whether or not DDR waveform capturing is required and if additional data capturing is required if utilizing continuous recording and an event occurs that should have more frequent documentation of measured quantities.
R4.2		All captured DME data for Regional Reliability Organization-identified events shall be archived for at least three years.	Yes		
R5		The Regional Reliability Organization shall establish requirements for facility owners to report Disturbance data recorded by their DME installations. The data reporting requirements shall include the following:	Yes		
R5.1		Criteria for events that require the collection of data from DMEs.	Yes		
R.5.2		List of entities that must be provided with recorded Disturbance data.	Yes		
R5.3		Timetable for response to data request.	Yes		
R5.4		Availability of recorded Disturbance data in COMTRADE format (in conformance with IEEE Std. C37.111-1999 or its successor standard).	Yes		Provided this Comtrade format requirement is readily available in multiple products and the requirement is applicable for only new installations and existing equipment not meeting the Comtrade format is grandfathered as acceptable.
R5.5		Naming of data files in conformance with the IEEE Recommended Practice for Naming Time Sequence Data Files (C37.232)2.	NO	X	Consider deleting this naming requirement. File naming, per IEEE standard, is not readily available and proven in most products that exist today. Although there may be an IEEE standard, the standard is new enough that products have not been fully developed with consistent naming provisions. There may be some concerns of security of information given to outside parties, if too precise of a

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
					location and type of equipment is furnished in the naming convention. SPP companies have not had many issues with existing file names, but we have not had to evaluate large-scale regional blackouts either.
R5.6		Data content requirements and guidelines.	Yes		
R6		The Regional Reliability Organization shall establish requirements for DME maintenance and testing.	Yes		However, SCADA systems, having SOE functionality, should not require any routine maintenance testing. Protective relays used as DFR devices should only be required to be tested, maintained, & reported under the relaying standards, so that testing, maintenance, & reporting redundancy is not required by the DME standard. When reviewing frequency of testing, one should evaluate self-monitoring DMEs capability to automatically report to SCADA any malfunction problems. This might permit extending or possibly eliminating the period for testing and maintenance.
R7		The Regional Reliability Organization shall provide its requirements (and any revisions to those requirements) including those for DME installation; Disturbance data reporting; Disturbance data storage and retention; and DME maintenance and testing to the affected Transmission Owners and Generator Owners within 30 calendar days of approval of those requirements.	Yes		Acceptable provided the RRO (SPP) has adequate time to review NERC standards, then develop and have approved more detailed SPP criteria that supports the NERC requirements.
R8		The Regional Reliability Organization shall periodically (at least every five years) review, update and approve its Regional requirements for Disturbance monitoring and reporting.	Yes		
C		Measures	Yes		
M1		The Regional Reliability Organization's requirements for the installation of Disturbance Monitoring Equipment shall address Requirements 1 through 3.	Yes		Would like to see PRC-002-1 requirements 1, 2, & 3 combined under only one requirement. Disturbance monitoring is a system of equipment that may or may not include a separate sequence of equipment device. The SOE may be associated with SCADA/RTU

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
					equipment or it may be a part of the DFR record or microprocessor relay event. Consider moving the DDR continuous recording requirement to the new standard that will address Phasor Monitoring Units. Both DDR's (continuous recording) & PMU's are relatively new technology issues.
M2		The Regional Reliability Organization's requirements for storage and retention of Disturbance data shall include all elements identified in Requirement 4.	Yes		
M3		The Regional Reliability Organization's Disturbance monitoring data reporting requirements shall include all elements identified in Requirement 5.	Yes		Except that new standard should consider eliminating the file naming format.
M4		The Regional Reliability Organization shall have requirements for the maintenance and testing of DME equipment as required in Requirement 6.	Yes		Except redundant testing, maintenance, and reporting should not be required if a DME (such as microprocessor relay used as a DFR) is tested, maintained and reported upon under a different standard.
M5		The Regional Reliability Organization shall have evidence it provided its Regional Disturbance monitoring and reporting requirements as required in Requirement 7.	Yes		
M6		The Regional Reliability Organization shall have evidence it conducted a review at least once every five years of its regional requirements for Disturbance monitoring and reporting.	Yes		
D		Compliance	Yes		
1.		**Compliance Monitoring Process**	Yes		
1.1		**Compliance Monitoring Responsibility** NERC	Yes		
1.2		**Compliance Monitoring Period and Reset Timeframe** One calendar year.	Yes		
1.3		**Data Rention** The Regional Reliability Organization shall retain documentation of its DME requirements and any changes to it for three years.	Yes		

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
		The Compliance Monitor will retain its audit data for three years.			
1.4		**Additional Compliance Information** The Regional Reliability Organization shall demonstrate compliance through providing its documentation of Disturbance Monitoring and Reporting requirements or self certification as determined by the Compliance Monitor.	Yes		
2		**Levels of Non-Compliance**	Yes		
2.1		**Level 1:** There shall be a level one non-compliance if either of the following conditions exist:	Yes		
2.1.1		Disturbance reporting requirements were not specified as required in R5.1 through R5.5.	Yes		Except for grandfathering old DMEs without Comtrade formats & except for IEEE standard for naming data files.
2.1.2		DME maintenance and testing requirements were not specified.	Yes		Except allow for reference to a relay testing and maintenance record if the DFR data is acquired from a relay. Eliminate redundancy in testing and maintenance if a device has multiple uses and is tested under a differing standard.
2.2		**Level 2:** There shall be a level two non-compliance if any of the following conditions exist:	Yes		
2.2.1		Equipment characteristics were not specified for one or more types of DMEs	NO	X	SPP desires to recognize: a system of devices provide the DME data, separate SOE boxes/equipment are not necessary considering this is available as a part of other equipment, and that reporting should be streamlined and not redundant.
2.2.2		Time synchronization requirements were not specified for one or more of the DMEs as required in R1.2.2, R2.2.3, and R3.2.2.	Yes		Provided existing equipment is grandfathered.
2.2.3		Requirements do not provide criteria for equipment location or criteria for monitored elements or monitored quantities as required R1.1, R2.1 and R3.1.	Yes		
2.3		**Level 3:** Disturbance data storage and retention	Yes		

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
		requirements were not specified for one or more of the DMEs as required in R4.			
2.4		**Level 4:** Disturbance monitoring and reporting requirements were not available or were not provided to Transmission Owners and Generator Owners.	Yes		
E		Regional Differences			
		None identified.			
A		**Introduction - - PRC-018-1**	Yes		See attached supporting Word file with general comments that further explain the SPP review of this draft standard.
1		**Title: Disturbance Monitoring Equipment Installation and Data Reporting**	Yes		
2		**Number** PRC-018-1	Yes		
3		**Purpose:** Ensure that Disturbance Monitoring Equipment (DME) is installed and that Disturbance data is reported in accordance with regional requirements to facilitate analyses of events.	Yes		
4		**Applicability**	Yes		
4.1		Transmission Owner.	Yes		
4.2		Generator Owner.	Yes		
5		**Proposed Effective Dates:** Requirement 1: − 25% compliant by April 1, 2008 − 50% compliant by April 1, 2009 − 75% compliant by April 1, 2010 − 100% compliant by April 1, 2011 Requirement 2 through Requirement 5: − 100% compliant by October 1, 2007 for already installed DME			

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
B		**Requirements**	Yes		
R1		The Transmission Owner and Generator Owner shall install DME in accordance with the Regional Reliability Organization installation requirements (Reliability Standard PRC-002 Requirements 1 through 3).	Yes		However, agreement is conditional upon changes recommended in SPP comments submitted for PRC-002-1, i.e. do not have separate reporting requirements 1, 2, & 3 for SOEs, DFRs, & DDRs. Consider DMEs as a group of equipment.
R2		The Transmission Owner and Generator Owner shall maintain, and report to the Regional Reliability Organization on request, the following data on its installed DME:	Yes		
R2.1		Type of DME (sequence of event recorder, fault recorder, or dynamic disturbance recorder).	Yes		Acceptable provided one DME report is required and not separate device (SOE, DFR, DDR) reports.
R2.2		Make and model of equipment	Yes		
R2.3		Installation location.	Yes		Acceptable provided not too precise of coordinates (such as longitude & latitude) are required.
R2.4		Resolution of time synchronization.	Yes		
R2.5		Monitored Elements.	Yes		
R2.6		Monitored protection System Devices.	NO	X	Consider deleting this requirement or better explain. This is confusing as to what is really desired. Disturbance monitoring equipment (DMEs) if they are DFR relays, are a part of the protection system devices, which are relays and associated communications system, voltage & current sensing devices, batteries and DC control circuits. Voltage and current sensing are part of the monitored electrical quantities in R2.7.
R2.7		Monitored electrical quantities.	Yes		
R2.8		Operational status.	Yes		It was assumed this meant in-service and functional versus out of service or not properly functional.
R2.9		Date last tested.	Yes		
R3		The Transmission Owner and Generator Owner shall each store and retain its Disturbance data (recorded by	Yes		Except consider eliminating the continuous recording requirement.

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
		DMEs) in accordance with its Regional requirements (PRC-002 Requirement R4).			
R4		The Transmission Owner and Generator Owner shall each provide Disturbance data (recorded by DMEs) in accordance with the Regional requirements (PRC-002 Requirement R5).	Yes		Except consider eliminating the IEEE naming convention requirement.
R5		The Transmission Owner and Generator Owner shall have DME maintenance and testing program in accordance with the Regional requirements Reliability Standard PRC-002Requirement R6).	Yes		Except consider eliminating the redundant maintenance and testing if relays are the device providing the DRF data and relays are tested and maintained by another standard.
C		**Measures**	Yes		
M1		The Transmission Owner and Generator Owner shall each have evidence that its DME is installed in accordance with its associated Regional Reliability Organization's requirements.			
M2		The Transmission Owner and Generator Owner shall each maintain the data listed in Requirement 2.1 through 2.9 on all its installed DME, and shall have evidence it provided this data to its Regional Reliability Organization within 30 calendar days of a request.	Yes		Consider eliminating R2.6
M3		The Transmission Owner and Generator Owner shall each have evidence it stored and retained its recorded Disturbance data in accordance with its associated Regional Reliability Organization's requirements.	Yes		
M4		The Transmission Owner and Generator Owner shall each have evidence it provided recorded Disturbance data to all entities in accordance with its associated Regional Reliability Organization's requirements	Yes		

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
M5		The Transmission Owner and Generator Owner shall each have evidence its DME maintenance and testing program is in accordance with its associated Regional Reliability Organization's requirements.	Yes		
D		**Compliance**	Yes		
1.		**Compliance Monitoring Process**	Yes		
1.1		**Compliance Monitoring** Responsibility Regional Reliability Organization.	Yes		
1.2		**Compliance Monitoring Period and Reset Timeframe** One calendar year.	Yes		
1.3		**Data Retention** The Transmission Owner and Generator Owner shall retain any changes to the data on DME installations and any Disturbance data provided to the Regional Reliability Organization for three years.	NO	X	Consider deleting reference to retaining DME installation data after changes have been made. Only current as built installation data should be retained. Obsolete installation data because of changes may be confusing information if retained and accessed by field &/or office personnel. This old information may create a working hazard & cause safety problems. As DFR equipment changes occur (such as installation drawings and software/programming updates), old records normally need purged to prevent obsolete information from accidentally being used improperly. Only brief drawing change or setting change revision notes should be retained. As far as captured DME event data submittal to RRO being retained, that is not normally an issue.
1.4		**Additional Compliance Information** The Transmission Owner and Generator Owner shall demonstrate compliance through self-certification or audit (periodic, as part of targeted monitoring or initiated by complaint or event), as determined by the Compliance Monitor.	Yes		
2		**Levels of Non-Compliance**	Yes		
2.1		**Level 1:** There shall be a level one non-compliance if either of the following conditions is present:	Yes		Acceptable provided existing DMEs are grandfathered & SPP existing location criteria are not impacted by the revised DME standard.

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
2.1.1		DME that meets all Regional installation requirements (in accordance with Requirement 1) were installed at 75% or more but not all of the locations.	Yes		
2.1.2		Recorded Disturbance data that meets all Regional data requirements (in accordance with Requirement 3) was provided for 75% or more but not all of the locations.	Yes		
2.2		**Level 2:** There shall be a level two non-compliance if either of the following conditions is present:	Yes		Acceptable provided existing DMEs are grandfathered & SPP existing location criteria are not impacted by the revised DME standard.
2.2.1		DME that meets all Regional installation requirements (in accordance with R1) were installed at 50% or more but less than 75% of the locations.			
2.2.2		Recorded Disturbance data that meets all Regional data requirements (in accordance with R3) was provided for 50% or more but less than 75% of the locations.			
2.3		**Level 3:** There shall be a level three non-compliance if either of the following conditions is present:	Yes		Acceptable provided existing DMEs are grandfathered & SPP existing location criteria are not impacted by the revised DME standard.
2.3.1		DME that meets all Regional installation requirements (in accordance with R1) were installed at 25% or more but less than 50% of the locations.			
2.3.2		Recorded Disturbance data that meets all Regional data requirements (in accordance with R3) was provided for 25% or more but less than 50% of the locations.			
2.4		**Level 4:** There shall be a level four non-compliance if either of the following conditions is present:	Yes		Acceptable provided existing DMEs are grandfathered & SPP existing location criteria are not impacted by the revised DME standard.
2.4.1		DME that meets all Regional installation			

Standard Sections		NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired
		requirements (in accordance with R1) were installed at less than 25% of the locations.			
2.4.2		Recorded Disturbance data that meets all Regional data requirements (in accordance with R3) was provided for less than 25% of the locations.			
E		**Regional Differences**			
		None identified.			

SPP SPCWG Review Comments in NERC Format Date: January 11, 2006
Draft # 3 NERC Reliability Standards - - Comments due 1-17-06
PRC-002-1: Define Regional Disturbance and Reporting Requirements &
PRC-018-1: Disturbance Monitoring Equipment & Installation & Data Reporting

Standard Sections	NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired

The NERC PRC-002-1 & PRC-018-1 review comment form contained the below clarifications, but comments could not be added on the NERC form for these clarifications. Thus, SPP SPCWG comments are shown below in Italics relative to information on NERC's form.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:
During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
  SPP SPCWG agrees with this action.

- Definition of protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system. **SPP SPCWG agrees with this action. However, for the SOE time stamping feature of a DME device, breakers should be included.**

- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs).
  SPP SPCWG agrees with this action. Also NERC should consider removing DDR continuous recording as a DME requirement and include that under the PMU standard or another future standard.

- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
  SPP SPCWG disagrees and requests that a 5-millisecond time synchronizing be allowed.

- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
  SPP SPCWG disagrees and requests that continuous recording be removed form the current DME standard. If continuous recording must be retained as a part of the standard then be very restrictive (i.e. define where NERC thinks these devices need to be located) as to where it is required. Can SCADA systems

Standard Sections	NERC Draft 3 Standard Description	Agree	Disagree	Modifications Desired

sample at less frequency (say every few seconds) and capture/store the data desired so that a large investment is not required for separate continuous recording equipment?

- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.
  If continuous recording is a DDR requirement, then this change is acceptable.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.
For some existing equipment, records in Comtrade formats may be a problem, and SPP requests that existing equipment, which does not meet the Comtrade format, be grandfathered, as acceptable. Although new equipment will have Comtrade format, manual alignment of data and coordination among different DMEs are still issues. There needs to be product development to display many vendors Comtrade records on the same report / graphs.

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

Please use this form to submit comments on the Phase III & IV Drafting Team's third draft of the remaining standards in the first set of Phase III & IV Standards. Comments must be submitted by **January 17, 2006.** You must submit the completed form by e-mailing it to sarcomm@nerc.com with the words "Phase III & IV Standards Comments" in the subject line. If you have questions please contact Mark Ladrow at mark.ladrow@nerc.net or 609-452-8060.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

DO: **Do** enter text only, with no formatting or styles added.
Do use punctuation and capitalization as needed (except quotations).
Do use more than one form if responses do not fit in the spaces provided.
Do submit any formatted text or markups in a separate WORD file.

DO NOT: **Do not** insert tabs or paragraph returns in any data field.
Do not use numbering or bullets in any data field.
Do not use quotation marks in any data field.
Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Mark Kuras**	
Organization:	**PJM/MAAC**	
Telephone:	**610-666-8924**	
E-mail:	**kuras@pjm.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☒ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☒	2 — RTOs, ISOs, Regional Reliability Councils
	☐	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

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: The standard implies that sequence-of-events recorders must be installed. It should be up to the region to use this type of equipment or not. In R3.1.2 change …phrases… to …phases. Remove R3.2.1 because requirements for continuous recording should be part of this standard as mentioned as a major change to this standard above. In R4, please define which …specific system Disturbance events… data needs to be retained for or remove this statement. There are no implementation requirements for equipment maintenance and testing.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: R2/M2, R4/M4 and R5/M5 are not addressed in the levels of non-compliance.

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

☐ No

Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

Please use this form to submit comments on the Phase III & IV Drafting Team's third draft of the remaining standards in the first set of Phase III & IV Standards. Comments must be submitted by **January 17, 2006.** You must submit the completed form by e-mailing it to sarcomm@nerc.com with the words "Phase III & IV Standards Comments" in the subject line. If you have questions please contact Mark Ladrow at mark.ladrow@nerc.net or 609-452-8060.

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Do submit any formatted text or markups in a separate WORD file.

DO NOT: **Do not** insert tabs or paragraph returns in any data field.
Do not use numbering or bullets in any data field.
Do not use quotation marks in any data field.
Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	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

Group Comments (Complete this page if comments are from a group.)

Group Name: **ISO/RTO Council**

Lead Contact: Bruce Balmat

Contact Organization: PJM

Contact Segment: 2

Contact Telephone: 610-666-8860

Contact E-mail: balmatbm@pjm.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Anita Lee	AESO		2
Lisa Szot	CAISO		2
Sam Jones	ERCOT		2
Ron Falsetti	IESO		2
Peter Brandien	ISONE		2
William Phillips	MISO		2
Michael Calimano	NYISO	`	2
Charles Yeung	SPP		2

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: The standard implies that sequence-of-events recorders must be installed. It should be up to the region whether to use this type of equipment or not.

   In R3.1.2 change …phrases… to …phases.

   Remove R3.2.1 because no requirements for continuous recording should be part of this standard. As mentioned above, continuous recording would apply to devices installed 3+ years from now, not now.

   In R4, please define which …specific system Disturbance events… data needs to be retained for or remove this statement.

   There are no implementation requirements for equipment maintenance and testing.

   R3.2.2: For consistency the IRC suggests the same wording as in R 1.2.2 and R 2.2.3 be used, i.e. "….synchronized to within four milliseconds of Coordinated Universal Time."

   R3.2.3: We suggest the term "collect" be used in place of the first "sample".

   R4.2 and R5: The acronym DME needs to be defined upfront, say, in Section A, Item 3 Purpose.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: R2/M2, R4/M4 and R5/M5 are not addressed in the levels of non-compliance.

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

Please use this form to submit comments on the Phase III & IV Drafting Team's third draft of the remaining standards in the first set of Phase III & IV Standards. Comments must be submitted by **January 17, 2006.** You must submit the completed form by e-mailing it to sarcomm@nerc.com with the words "Phase III & IV Standards Comments" in the subject line. If you have questions please contact Mark Ladrow at mark.ladrow@nerc.net or 609-452-8060.

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Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Greg Mason**	
Organization:	**Dynegy**	
Telephone:	**217 872-2301**	
E-mail:	**gregory.mason@dynegy.com**	
NERC Region		**Registered Ballot Body Segment**
☒ ERCOT ☒ ECAR ☐ FRCC ☐ MAAC ☒ MAIN ☐ MRO ☐ NPCC ☒ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	3 — Load-serving Entities
	☐	4 — Transmission-dependent Utilities
	☒	5 — Electric Generators
	☐	6 — Electricity Brokers, Aggregators, and Marketers
	☐	7 — Large Electricity End Users
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Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments:

   1.To ensure clarity, the definition of Protection System should be modified to read as follows: "Protective relays and their associated …..(rest of current definition)"

   2.R5.4,R5.5 and R5.6-These items should be revised to reflect the fact that existing equipment may not be able to comply with these requirements(i.e. provide data in COMTRADE format). Suggest adding wording to exempt existing equipment from these requirements.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

   1.Section D2-The calculation of the percent numbers in this section needs to be clarified. Are the referenced %'s calculated for each entity responsible for installation of DME's and providing Recorded Disturbance data?

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☐ Yes

   ☒ No

   Comments:

   1.The dates need to be set relative to when the RRO procedures are approved and issued(i.e. as written the standard assumes 1/1/07 but it may be later than that).

   2.The timetable for R1 compliance needs to only be 100% by 4/1/11 for Generation Owners…installation of DME's at Generators will require coordination with plant outages and many plants are on a 3 year outage schedule.

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Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**John E. Sullivan**	
Organization:	**Ameren**	
Telephone:	**(314) 554-3833**	
E-mail:	**JSullivan@ameren.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	3 — Load-serving Entities
	☐	4 — Transmission-dependent Utilities
	☐	5 — Electric Generators
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	☐	8 — Small Electricity End Users
	☐	9 — Federal, State, Provincial Regulatory, or other Government Entities

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: Regarding Requirement R1: Existing requirements established by MAIN do not require sequence of event recording equipment. This could result in significant upgrade costs.

   In Requirements R1.2.2, R2.2.3, and R3.2.2, the time synchronization should remain at one millisecond. Four millisecond synchronization (one quarter cycle) is not as useful.

   Regarding Requirement R2.1.3: Existing requirements established by MAIN do not require the ability to determine polarizing currents and voltages (R2.1.3.3), frequency (R2.1.3.4), and megawatts and megavars (R2.1.3.5) from DFR data. These additional requirements could result in significant upgrade cost.

   Regarding Requirement R5.4 and R5.5: Many older DFRs may not support the COMTRADE format or the renaming of files. Existing requirements established by MAIN allow hard-copy and Facsimile, email, and COMTRADE submittals. While this does not appear to be a significant issue for Ameren, it may be a significant issue for other entities.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☐ Yes

   ☐ No

   Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

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Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT	☐	1 — Transmission Owners
☐ ECAR	☐	2 — RTOs, ISOs, Regional Reliability Councils
☐ FRCC	☐	3 — Load-serving Entities
☐ MAAC	☐	4 — Transmission-dependent Utilities
☐ **MAIN**	☐	5 — Electric Generators
☐ MRO	☐	6 — Electricity Brokers, Aggregators, and Marketers
☐ NPCC	☐	7 — Large Electricity End Users
☐ SERC	☐	8 — Small Electricity End Users
☐ SPP	☐	9 — Federal, State, Provincial Regulatory, or other Government Entities

Group Comments (Complete this page if comments are from a group.)

Group Name: **WECC Reliability Subcommittee**

Lead Contact: Steve Rueckert

Contact Organization: WECC

Contact Segment: 2

Contact Telephone: 801 582-0353

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*
Jim Whitaker	PSCO	WECC	1
Rebecca Berdahl	BPA-PBL	WECC	5
Steve Rueckert	WECC	WECC	2
Brian Keel	SRP	WECC	1
Leonard York	WAPA	WECC	1
Chuck Matthews	BPAT	WECC	1
Mohan Kondragunta	SCE	WECC	1
Julie Reichle	NWE	WECC	1
Mike Sidiropoulos	PAC	WECC	1
Baj Agrawarl	APS	WECC	1
Ben Morris	PG&E	WECC	1
Daniel Cretu	CDWR	WECC	
Don Deberry	SMUD	WECC	1
Jeff Billinton	AESO	WECC	2

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: In the list of changes to PRC-002 above, it is indicate that "power circuit breakers" was removed from the definition of Protection System. However, in the redline version and the clean version, the entire definition has been deleted. What was the actual intent? It is also indicated that the requirement of "continuous" recording equipment was removed. A reference to "continuously" recording DDR is then added under R4.1

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

☐ No
Comments: Effective dates should be tied to approval date rather than hard dates. This is a general comment that should be applied to all standards in the event that development and approval is delayed.

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Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Charlie Fink**	
Organization:	**Entergy**	
Telephone:	**504 365 3645**	
E-mail:	**cfink@entergy.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☒ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☒	1 — Transmission Owners
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Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: We agree with the revision to include equipment specifications to cover existing type devices that could qualify as a DDR. However, we do not agree with excluding PMUs from this standard. We believe the majority of PMU related stakeholder comments were more concerned with having to invest in PMUs, rather than eliminating them from the standard. It seems a bit extreme to go from an equipment specification that only applies to PMU type devices, and then revise the standard to eliminate PMUs altogether. Allow the Regions and/or individual stakeholders the flexibility to decide which type of device they wish to pursue. Suggest that PMUs be put back into the document with either the previous draft document PMU requirements or the existing proposed specifications.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: ..

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

☒ Yes

☐ No

Comments:

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Organization:		
Telephone:		
E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	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

Group Comments (Complete this page if comments are from a group.)

Group Name: **SERC Protection and Control Subcommittee (PCS)**

Lead Contact: Bridget Coffman

Contact Organization: SCPSA (Santee Cooper)

Contact Segment: 1

Contact Telephone: (843) 761-8000 x5519

Contact E-mail: blcoffma@santeecooper.com

Additional Member Name	Additional Member Organization	Region*	Segment*
Russell W. Patterson	TVA	SERC	1
Gary Kobet	TVA	SERC	1
Barry Jackson	Duke Power Co.	SERC	1
Charlie Fink	Entergy	SERC	1
Hong Ming Shuh	Georgia Transmission Corporation	SERC	1
Jay Farrington	Alabama Electric Cooperative	SERC	1
Nathan Lovett	Georgia Transmission Corporation	SERC	1
Marion E. Frick	South Carolina Electric and Gas	SERC	1
Mike Gazda	MEAG Power	SERC	1
Ernesto Paon	MEAG Power	SERC	1
Phil Winston	Georgia Power	SERC	1
Ronnie Bailey	Dominion Virginia Power	SERC	1
Victoria L Bannon	Duke Power Co.	SERC	1
Steven E. Waldrep	Georgia Power	SERC	1
Susan Morris	SERC	SERC	2

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: Footnote 1 referenced in R3 should be written as follows:

   "These requirements do not address Phasor Measurement Units (PMUs), however PMUs that meet the requirements in this Standard may qualify as DDRs."

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

Please use this form to submit comments on the Phase III & IV Drafting Team's third draft of the remaining standards in the first set of Phase III & IV Standards. Comments must be submitted by **January 17, 2006.** You must submit the completed form by e-mailing it to sarcomm@nerc.com with the words "Phase III & IV Standards Comments" in the subject line. If you have questions please contact Mark Ladrow at mark.ladrow@nerc.net or 609-452-8060.

ALL DATA ON THIS FORM WILL BE TRANSFERRED AUTOMATICALLY TO A DATABASE.

DO: **Do** enter text only, with no formatting or styles added.
Do use punctuation and capitalization as needed (except quotations).
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Do submit any formatted text or markups in a separate WORD file.

DO NOT: **Do not** insert tabs or paragraph returns in any data field.
Do not use numbering or bullets in any data field.
Do not use quotation marks in any data field.
Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Murale Gopinathan**	
Organization:	**Northeast Utilities**	
Telephone:	**(860)665-6896**	
E-mail:	**gopinm@nu.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☒ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☒	1 — Transmission Owners
	☐	2 — RTOs, ISOs, Regional Reliability Councils
	☐	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

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments:

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

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Do not use quotation marks in any data field.
Do not submit a response in an unprotected copy of this form.

Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:	**Jonathan Sykes**	
Organization:	**SALT RIVER PROJECT**	
Telephone:	**602-236-6442**	
E-mail:	**jasykes@srpnet.com**	
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT	☒	1 — Transmission Owners
☐ ECAR	☐	2 — RTOs, ISOs, Regional Reliability Councils
☐ FRCC	☐	3 — Load-serving Entities
☐ MAAC	☐	4 — Transmission-dependent Utilities
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☐ MRO	☐	6 — Electricity Brokers, Aggregators, and Marketers
☐ NPCC	☐	7 — Large Electricity End Users
☐ SERC	☐	8 — Small Electricity End Users
☐ SPP	☒	9 — Federal, State, Provincial Regulatory, or other Government Entities
☒ WECC		
☐ NA — Not Applicable		

Group Comments (Complete this page if comments are from a group.)

Group Name:

Lead Contact:

Contact Organization:

Contact Segment:

Contact Telephone:

Contact E-mail:

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
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Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: Some clarification and cautions should be included on the use of a protective relay as a fault recorder. The definition of DME includes a reference of protective relays used for Fault Recorders, however it would be difficult for a protective relay to meet the requirements of a Fault Recorder as described in PRC-002. The emphasis of a protective relay has always been protection and other applications such as remote communications, SCADA functions and data recording have taken a secondary roll. If a protective relay is used as a fault recorder then maintenance, redundancy, testing, outages and many other issues should be considered. Various NERC standards would now apply to the same device.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments:

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

☐ Yes

☐ No

Comments:

Comment Form for Draft 3 of Part of Set One of Phase III & IV Standards

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Individual Commenter Information **(Complete this page for comments from one organization or individual.)**		
Name:		
Organization:		
Telephone:		
E-mail:		
NERC Region		**Registered Ballot Body Segment**
☐ ERCOT ☐ ECAR ☐ FRCC ☐ MAAC ☐ MAIN ☐ MRO ☐ NPCC ☐ SERC ☐ SPP ☐ WECC ☐ NA — Not Applicable	☐	1 — Transmission Owners
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	☐	8 — Small Electricity End Users
	☐	9 — Federal, State, Provincial Regulatory, or other Government Entities

Group Comments (Complete this page if comments are from a group.)

Group Name: **NERC Standards Evaluation Subcommittee**

Lead Contact: Bill Bojorquez

Contact Organization: ERCOT

Contact Segment:

Contact Telephone: 512-248-3036

Contact E-mail: bbojorquez@ercot.com

Additional Member Name	Additional Member Organization	Region*	Segment*

* If more than one Region or Segment applies, indicate the best fit for the purpose of these comments. Regional acronyms and segment numbers are shown on prior page.

Major Changes to PRC-002 and PRC-018 Following 2nd Posting:

During the second posting of PRC-002 and PRC-018, the drafting team asked stakeholders if the requirements for Dynamic Disturbance Recorders should be removed from PRC-002 and PRC-018 and placed into two new standards. Most commenters indicated that the requirements should remain in PRC-002 and PRC-018 and requested that the requirements be modified to ensure that many existing installations could meet the standards' requirements.

The drafting team made the following major changes to PRC-002:

- Definition of Disturbance Monitoring Equipment: Removed the requirement of 'continuous' recording.
- Definition of Protection System: Removed, 'power circuit breakers' from the list of elements considered to be part of a protection system.
- Removed requirements that are more characteristic of new Phasor Measurement Units (PMUs)
- Changed the time synchronization requirements for sequence of event recorders and dynamic disturbance recorders so they both require that the device be synchronized to within four milliseconds of Coordinated Universal Time (UTC).
- Modified the requirement for continuous recording to indicate that this only applies to devices installed more than 3 years beyond the date the Board of Trustees adopts the standard.
- Modified the recording requirements of DDRs from 30 samples/second to 6 records/second.

Some commenters suggested that data cannot be provided in COMTRADE format. The drafting team would like to know if this is a significant issue.

The drafting team did not make any significant changes to PRC-018, however the changes in PRC-002 have an impact on the requirements of PRC-018, and the drafting team wants stakeholders to review and consider these standards as a set. The drafting team asks you to consider your acceptance of the above changes as you respond to the following questions.

Please Enter All Comments in Simple Text Format.

Insert a "check' mark in the appropriate boxes by double-clicking the gray areas.

1. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-002-1 — Define Regional Disturbance Monitoring and Reporting Requirements (Modified Version 0)

   Comments: The SES offers no revisions to the proposed standard.

2. Please identify anything you believe needs to be modified before this standard is balloted:
   - PRC-018-1 — Disturbance Monitoring Equipment Installation and Data Reporting

   Comments: The SES offers no revisions to the proposed standard.

3. Do you agree with the proposed implementation plan for PRC-002 and PRC-018? If no, please identify specifically what you feel needs to be modified.

   ☒ Yes

   ☐ No

   Comments: