

System Restoration and Blackstart SAR Drafting Team

March 23, 2007

Conference Call Notes

1. Administrative Items

a. Introductions and Quorum

Dick Kafka, Chair, commenced the call at 1100. Participants on the call were:

Mike Adibi	Ed Baznik	Francis Esselman (Vice Chair)
Will Houston	Dick Kafka (Chair)	Al McMeekin
Doug Rempel	Mike Richardson	George Rodriguez
Mo Tadayon	Rick Terrill	Rod Byrnell (observer)
Ed Dobrowolski (NERC)		

b. NERC Antitrust Compliance Guidelines

The Antitrust Compliance Guidelines were previously sent out to the team. There were no questions on the guidelines.

c. Review Meeting Agenda & Objectives

The objectives of the meeting are:

- Review the draft responses to the SAR comments
- Finalize the SAR
- Set the next steps for the team

2. Review and Finalize SAR Comment Responses

Dick Kafka drafted responses to the industry comments on the SAR as a straw man for the team. The team reviewed his responses and made changes on the fly. The red-lined versions of Mr. Kafka's responses are included with these notes as **Attachment A**.

Comments from the industry seemed to generally fall into two main categories:

- Fear that the comments shown on the To Do Lists, etc., were mandatory – It was explained that they are for consideration rather than mandatory changes.

- Comments on what should actually appear in the standards – It was noted that all such comments will be passed on to the SDT.

There was a point of dissension raised concerning the ability for entities such as transmission only companies to recover costs associated with blackstart arrangements. It was agreed however that this was a point for debate during the standards drafting stage and not an issue with the SAR itself.

3. Finalize SAR

There were several minor changes made to the SAR:

- The request date was updated to the date of the call.
- Excerpts from the FERC Final Order were attached and a statement requiring consideration of these comments was added to the body of the SAR text.
- The principles were updated based on a comment received from the industry – boxes 5, 6, and 7 were checked.

The red-lined version of the SAR is included with these notes as **Attachment B**.

The team agreed that the SAR is now ready to move forward to the Standards Committee for approval.

4. Discuss Next Steps

The SAR DT was polled and all present on the call expressed their desire to continue on as the SDT. (Subsequent to the call Mark Kuras also voiced his desire to stay with the team. Mayer Sasson is going to depart due to the press of other duties.) Rod Byrnell is currently listed as an observer because he replied to the SAR DT nomination posting after the deadline. He would like to ‘upgrade’ to an official member when the project moves forward to the standards drafting stage. Dick Kafka and Francis Esselman volunteered to remain as Chair and Vice Chair respectively.

Although the SC needs to formally approve the SAR and the SDT, the SAR DT voted to continue working on the project and scheduled a meeting as shown below.

NERC staff will take care of the formal paperwork required to move the SAR to the SC.

5. Review Action Items & Project Schedule

The over-all schedule for the project shows completion in 2Q08. There is a great deal of industry interest in this project and that may cause a large number of comments and questions as the team moves forward making that schedule tight. However, the team feels that it can be met if there are no undue delays in the process.

AI – All members are required to review all material associated with this project prior to the next meeting so that they are ready to go to work on day one.

AI – Al McMeekin will supply hotel details for the next meeting.

6. Schedule Next Meetings

- a.** The next meeting of the team will be in Columbia, South Carolina at the SCG&E offices on Wednesday, April 18, 2007: 0800 – 1700 EDT, Thursday, April 19, 2007: 0800 – 1700 EDT, and Friday, April 20, 2007: 0800 – 1100 EDT. The SCG&E offices are connected via walkway to a Marriott Hotel. Al McMeekin is reserving a block of rooms at the hotel for the team's use. (Due to a large number of advanced bookings at the hotel, the only rooms available are on the Concierge level at a rate of \$199 per night including continental breakfast, plus snacks and soft drinks at night.) Meeting registration details will be sent out shortly.
- b.** A conference call and WebEx has been scheduled for May 16th between 1100 and 1400 EDT. Call-in information will be provided.

7. Adjourn

Dick Kafka adjourned the call at 1315.

Notes by Ed Dobrowolski

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

The System Restoration and Blackstart SAR Drafting Team thanks all commenters who submitted comments on Draft 2 of the System Restoration and Blackstart SAR. This SAR was posted for a 30-day public comment period from February 8 through March 9, 2007. The requesters asked stakeholders to provide feedback on the standard through a special standard Comment Form. There were 13 sets of comments, including comments from 38 different people from more than 31 companies and organizations representing 8 of the 10 Industry Segments as shown in the table on the following pages.

Based on the comments received, the drafting team is recommending that the Standards Committee authorize moving this SAR forward to the standards drafting stage of the process.

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In this "Consideration of Comments" document stakeholder comments have been organized so that it is easier to see the responses associated with each question. All comments received on the standards can be viewed in their original format at:

http://www.nerc.com/~filez/standards/System_Restoration_Blackstart.html

If you feel that your comment has been overlooked, please let us know immediately. Our goal is to give every comment serious consideration in this process! If you feel there has been an error or omission, you can contact the Director of Standards, Gerry Adamski, at 609-452-8060 or at gerry.adamski@nerc.net. In addition, there is a NERC Reliability Standards Appeals Process.¹

¹ The appeals process is in the Reliability Standards Development Procedures: <http://www.nerc.com/standards/newstandardsprocess.html>.

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

The Industry Segments are:

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

Commenter	Organization	Industry Segment									
		1	2	3	4	5	6	7	8	9	10
1. James H. Sorrels, Jr.	AEP	x				x	x				
2. Anita Lee (G1)	AESO		x								
3. Jason Shaver	ATC	x									
4. Jim Burns	BPA	x									
5. Brent Kingsford (G1)	CAISO		x								
6. Ed Thompson (G2)	ConEdison	x									
7. Steve Myers (G1)	ERCOT		x								
8. Bruno Jesus (G2)	Hydro One Networks	x									
9. Roger Champagne (G2) (I)	Hydro-Québec TransÉnergie (I)	x									
10. Ron Falsetti (G1) (I) (G2)	IESO		x								
11. Kathleen Goodman (G2) (I)	ISO-NE		x								
12. Matt Goldberg (G1)	ISO-NE		x								
13. Bill Shemley (G2)	ISO-NE		x								
14. Mike Adibi	IRD Corporation								x		
15. Brian Thumm (G3)	ITC Holdings	x									
16. Jim Cyrulewski (G3)	JDRJC Associates								x		
17. Mike Gammon	KCP&L	x									
18. Don Nelson (G2)	MA Dept of Energy and Tele									x	
19. Robert Coish	Manitoba Hydro	x		x		x	x				
20. Jason Marshall (G3)	Midwest ISO		x								
21. Bill Phillips (G1)	MISO		x								
22. Herb Schrayshuen (G2)	National Grid										
23. Randy MacDonald (G2)	NBSO		x								
24. Murale Gopinathan (G2)	Northeast Utilities	x									
25. Guy Zito (G2)	NPCC										x

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Commenter	Organization	Industry Segment									
		1	2	3	4	5	6	7	8	9	10
26. Jerad Barnhart (G2)	NStar	x									
27. Greg Campoli (G2)	NYISO		x								
28. Mike Calimano (G1)	NYISO		x								
29. Ralph Rufrano (G2)	NYPA	x									
30. Al Adamson (G2)	NYSRC		x								
31. Alicia Daugherty (G1)	PJM		x								
32. Brett Koelsch	Progress Energy Carolinas	x		x		x	x				
33. Mike Pfeister	Salt River Project	x									
34. Jim Busbin (G4)	Southern Co. Transmission	x									
35. Tom Higgins (G4)	Southern Co. Transmission	x									
36. JT Wood (G4)	Southern Co. Transmission	x									
37. Marc Butts (G4)	Southern Co. Transmission	x									
38. Charles Yeung	Southwest Power Pool										x

I – Indicates that individual comments were submitted in addition to comments submitted as part of a group

G1 - IRC Standards Review Committee

G2 – NPCC CP9 Reliability Standards Working Group (NPCC CP9)

G3 – Midwest ISO Stakeholders Standards Collaboration Participants (MISO SSC)

G4 – Southern Company Transmission (Southern Co)

Index to Questions, Comments, and Responses

- 1. Do you agree with the revised scope of the proposed SAR? 5 Deleted: 3
- 2. The SAR drafting team has checked off a large number of responsible entities as being applicable entities. We have done this in order to provide sufficient flexibility to the eventual standard drafting team and due to the fact that system restoration and blackstart can potentially touch so many different functional areas of operations. Do you agree that the TOP should be responsible for securing blackstart services? 11 Deleted: 3
- 3. The SAR DT has checked off a large number of responsible entities as being applicable entities. We have done this in order to provide sufficient flexibility to the eventual SDT and due to the fact that system restoration and blackstart can potentially touch so many different functional areas of operations. Do you agree that a Generator Owner and/or Generator Operator should have a documented plan for non-blackstart units to be restarted after a blackout? 13 Deleted: 3
- 4. Do you agree that the SAR is ready to move forward to the standards drafting stage? 17 Deleted: 3

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

1. Do you agree with the revised scope of the proposed SAR?

Summary Consideration:

Question #1			
Commenter	Yes	No	Comment
ATC LLC		<input checked="" type="checkbox"/>	The SAR must describe, at a high level, the projected role each of the selected entities will play. This information will provide the industry with a greater understanding of the SAR's impact and work direction.
<p>Response: The SAR drafting team has checked off a large number of responsible entities as being applicable entities. We have done this in order to provide sufficient flexibility to the eventual standard drafting team and due to the fact that system restoration and blackstart can potentially touch so many different functional areas of operations. The Standard Drafting Team will define the responsibilities of the functional areas.</p>			
AEP		<input checked="" type="checkbox"/>	<p>Concerning Phase III/IV comments, bullets 2 & 3 require the designation of a cranking path as part of a blackstart agreement between the transmission operator and generator owner. As it is unknown a priori how the electric system may break apart during a system collapse, the designation of a cranking path as part of a blackstart agreement unduly restricts the options available during restoration and may even make restoration impossible due to a contractually imposed constraint(s).</p> <p>No 'market' based or artificially imposed constraints should be placed on the system during restoration. System restoration operations, other than providing blackstart resources, should be not be 'market' based.</p>
<p>Response: The comments in the SAR are only meant to guide the eventual Standard Drafting Team. Comments included in the SAR are issues to be addressed and not <u>mandatory requirements.</u> <u>The revised standards will state what needs to be done and not how.</u></p>			
KCPL		<input checked="" type="checkbox"/>	<p>During a system restoration (i.e. the August 2003 Blackout), the code of conduct was suspended so that orderly system restoration may occur. In other words, the market ceases to exist. Generator operators, transmission operators, market operators and load serving entities had to communicate and work together so that system restoration, using system load and generation may be restored. Therefore, on page SAR-6 under "Reliability and Market Interface Principles - Applicable Reliability Principles boxes 5, 6, and 7 should also be checked. Box 5 should be checked since communication is critical in a system restoration event. Box 6 should be checked because you need to have qualified people operating the system so that the personnel know what to do during a major system event. Box 7 should be checked since the system is unstable during the early hours of system restoration.</p> <p>Standard Number EOP-005-0 is currently not applicable to the load serving entities.</p>

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #1			
Commenter	Yes	No	Comment
			Load Serving Entities should be applicable since they are critical in system restoration. To restore a system, generation must come on, then load is restored, then more generation comes on, then more load is restored, etc. Picking up load is crucial in system restoration.
<p>Response: While a wide area view is critical for assessing reliability, the early stages of system restoration and blackstart are local phenomena. The SAR Drafting Team has <u>included the LSE Function, but recognizes that the issues may be adequately addressed by the DP Function</u>. The comments in the SAR are only meant to guide the eventual Standard Drafting Team. Comments included in the SAR are <u>issues to be addressed and not requirements. Boxes 5, 6 & 7 have been checked off.</u></p>			
MISO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	While we agree with the need for some improvement in the existing standards, there are misstatements in the SAR. The RC has defined responsibilities in the present standards. The SAR implies this isn't the case. Also, a SAR should be setting a clear scope of the end product, such that a different knowledgeable people would draft similar standards. It's unclear where this will go.
<p>Response: The SAR DT and the eventual standard drafting team must have the scope and flexibility to bring the standards to the level required by the ERO rules. The SAR drafting team has checked off a large number of responsible entities as being applicable entities, <i>including the RC</i>. We have done this in order to provide sufficient flexibility to the eventual standard drafting team and due to the fact that system restoration and blackstart can potentially touch so many different functional areas of operations.</p>			
IRD Corp.	<input checked="" type="checkbox"/>		<p>Blackstart can be divided into Local Blackstart (LB) and Remote Blackstart (RB). In LB the blackstart unit(s) and the non-blackstart unit(s) are adjacent to each other (not necessarily in the same plant), with simple interconnecting links. In RB (which is more prevalent), the blackstart unit(s) are located remote from the non-blackstart unit(s), and the path in between includes several levels of overhead and/or underground transmission lines, distribution system and the required and necessary related loads.</p> <p>Whereas LB can readily be studied, planned, simulated, scheduled, tested, timed and measured, the RB (or remote cranking) has a number of concerns and constraints requiring close coordination and agreements between a single blackstart owner (e.g., combustion turbine operator), transmission provider (for the path), distribution provider (for the necessary load), and a single (or at most two, see EdeF procedure), non-blackstart units (e.g., steam units). Experience has shown that in general remote blackstart are difficult and costly to schedule and test. The RB feasibility study requires analytical tools such as generator reactive capability program, optimal transformer tap setting program, optimal power flow program, that are needed and not readily available to optimize generator voltage set-points and the various transformer tap positions on no-load tap changers.</p>

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Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #1			
Commenter	Yes	No	Comment
			<p>Testing RB is very difficult and expensive. To illustrate the difficulties, two RB cases that apparently were feasible are briefly described:</p> <ol style="list-style-type: none"> 1. In one RB trial, it took the entire morning shift operators for bulk power, electrical system, CT and SES to isolate and clear the path, start the CT, and energize the path. The test had to be abandoned at the end of the shift without having completed the RB. One positive lesson learned was that during an actual power system restoration, the hot restart (blackstart) of the steam unit should not be attempted. 2. In a second RB case, analysis and simulation showed that in spite of using several programs on an iterative basis, to optimize the CTS and SES transformer taps and generator voltage set-points, CTS could not supply nor absorb the necessary reactive power for the start up of the large induction motors in the SES. It was concluded that additional shunt reactors need to be installed to reduce the lines charging currents and thus narrow the span between over- and under-excitations demands from the CTS. <p>It should be recognized that RB is one of the basic and early restoration requirements. Generally, combustion turbines, low-head short-conduit hydro or low-head pumped storage is used to remotely blackstart the drum-type steam units. The drum-type units are usually base-loaded, are located remote from the load centers to which they are connected by HV and EHV lines, supply large portion of demand, with maximum elapsed time for hot re-start of 30-45 minutes and minimum elapsed time for hot restart of 3 to 4 hours, and they need cranking power for start-up.</p> <p>The combustion turbines are peaking units, supply daily peak loads, are located within the load centers, with cold start-up of within 5 to 10 minutes, and hot-restart of within 2 to 3 hours. They typically need no cranking power for start up, however the probability of successful cold start-up is about 30%, i.e., one in three combustion turbines. The required RB path typically includes HV and EHV transmission lines.</p> <p>RB's REACTIVE POWER PROBLEMS:</p> <p>In the course of a blackstart operation, two limiting conditions place severe demands on the reactive power capability of the blackstart source. One extreme operating condition occurs during the initial energization of the transmission path when the combustion turbine station (CTS) is called upon to absorb the charging currents of the cables, the</p>

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #1			
Commenter	Yes	No	Comment
			<p>high- and extra-high voltage connecting lines. The other extreme operating condition is when the combustion turbine generators supply the large amount of reactive power required during startup of the largest auxiliary motor in the steam electric station (SES). These under-and over-excitation demands may be met by optimum selections of the CTS step-up transformer and SES step-down auxiliary transformer tap positions, and by control of the generator voltage set points. The blackstart operation is complicated by the fact that the CTS generator step up and the SES auxiliary transformers are typically equipped with no-load (fixed) taps, and they are set for normal operation. Therefore, in the planning phase and prior to the blackstart tests or during restoration, the optimum tap positions for these transformers and the correct terminal voltage set point(s) for the generator need to be determined to satisfy the two conditions. It should also be noted that not all the no-load tap changers can remotely be repositioned.</p> <p>Here are the three lists of the RB concerns and constraints:</p> <p>A. Concerns with the Blackstart Units:</p> <ul style="list-style-type: none"> * Start-up probability; one CT in two or one in three. * Governor speed-droop, automatic or manual (if manual, it must be adjusted to less than 2% for the first unit and returned to 5% for the second unit). * Frequency Response to Sudden Increase in Load (in route loads are required to stabilize the CTS) * Power reversal relays * Cross compensation of dual CTs (load Hogging) * Under-excitation limit when energizing the path, over-excitation limit when starting the large induction motors in SES. * GSU Xfmr differential relays * GSU and Aux Xfmr tap positions <p>B. Concerns with Non-Blackstart (steam) Units:</p> <ul style="list-style-type: none"> * Start-up sequence of auxiliary induction motors (BFP, IDF, etc.) * Starting overcurrents of auxiliary motors (five times the running current) * Starting voltage dips of auxiliary motors (down to 80%) * Startup reactive power requirements of motors (max over-excitation) * Path's charging currents (max under-excitation) * Excessive negative sequence voltage and currents (not more than 4%) * Service transformer, tap position.

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #1			
Commenter	Yes	No	Comment
			<p>C. Concern the Interconnecting Path:</p> <ul style="list-style-type: none"> * Frequency Transients when energizing EHV lines * Frequency Transients when starting motors * Minimum source operation of distance relays * Reclosing schemes when energizing lines * Synchro-check relays and standing phase angle. <p>Conclusions: Implementation of each RB operation requires:</p> <ul style="list-style-type: none"> * the use of related Generation, Transmission and Distribution facilities * planning (feasibility study), analyzes, simulation, field tests, training and exercise * each blackstart source has to be matched uniquely with a non-blackstart unit(s) * long-term contracts are required between the related G, T & D ownerships <p>It can also be concluded that many apparently available RBs, are not feasible. The NERC records show that they have caused considerable delays in the restoration procedure.</p>
<p>Response: The SAR DT appreciates this input and will pass it on to the eventual standard drafting team. The comments more directly address the standards than the SAR.</p>			
Manitoba Hydro	<input checked="" type="checkbox"/>		<p>A lot of good work has been put in to drafting this SAR to identify all the significant issues from the various sources for the SDT to address. This approach is an improvement over previous SARs. However, it doesn't seem clear how the SDT is to address the "fill-in-the-blanks" elements in the existing standards.</p>
<p>Response: The eventual standard drafting team will assign responsibilities to the users, owners and operators of the system in accordance with the Functional Model.</p>			
NPCC CP9	<input checked="" type="checkbox"/>		
NYISO	<input checked="" type="checkbox"/>		
BPA	<input checked="" type="checkbox"/>		
HQTE	<input checked="" type="checkbox"/>		
ERCOT	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
IRC SRC	<input checked="" type="checkbox"/>		

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #1			
Commenter	Yes	No	Comment
ISO New England	<input checked="" type="checkbox"/>		
Progress Energy	<input checked="" type="checkbox"/>		
SRP	<input checked="" type="checkbox"/>		
ITC Holdings	<input checked="" type="checkbox"/>		
SOCO Transmission			No comment.

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

2. The SAR drafting team has checked off a large number of responsible entities as being applicable entities. We have done this in order to provide sufficient flexibility to the eventual standard drafting team and due to the fact that system restoration and blackstart can potentially touch so many different functional areas of operations. Do you agree that the TOP should be responsible for securing blackstart services?

Summary Consideration:

Question #2			
Commenter	Yes	No	Comment
ATC LLC		<input checked="" type="checkbox"/>	<p>Depends: The TOP is currently responsible for transporting energy supplied from the Black Start generator interconnection point to restore the transmission grid as a whole under the restoration services portion of the Transmission Tariff. The costs of planning for and implementing this responsibility are currently reimbursed under the network transmission tariff.</p> <p>If by "securing blackstart services" it is intended that the TOP must contract with generators or otherwise arrange with "Black Start Generators" to provide this capability, ATC cannot support this approach unless a mechanism is also provided that will allow the TOP to include any costs that might be incurred in transmission rates.</p> <p>ATC, is willing to be responsible as the TOP to enter into agreements for Black Start Services with generators that are interconnected to ATC's transmission facilities, and anticipate making the necessary tariff filings or otherwise arrange for reimbursement for any costs incurred through the regional transmission organization.</p> <p>If the Standard is eventually written that the TOP is responsible for "procuring" or "arranging" for the service, an adequate timeframe prior to implementation of the requirement must be allowed to pursue the necessary rate and other tariff approval together with the required agreements prior to this standard becoming enforceable.</p>
ITC Holdings		<input checked="" type="checkbox"/>	<p>We are not sure what "securing" means. We also feel that generator owners/operators should be compelled by the Standards to provide blackstart services, and that the cost recovery for providing such services should not fall back on the Transmission Operator.</p>
<p>Response: The system cannot be restarted from complete blackout without blackstart units. Since the TOP is responsible for preparing a system restoration plan (EOP-005-1), the SAR DT believes that the TOP must be assured that blackstart capability is available. This question is meant to guide the eventual standard drafting team. The SAR DT has no authority to determine cost recovery for meeting the standards. Further, the SAR DT recognizes that there are differences in market and non-market areas on how this might be achieved, but such determination is not part of the standards.</p>			

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #2			
Commenter	Yes	No	Comment
MISO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	We're not sure what this means. While the TOP must have a plan that will work, the question implies there must be contractual obligations that back up all plans, and perhaps all scenarios. While it's good to have cranking paths and a plan laid out, we're concerned that this standard will preclude flexibility when the real need arises.
BPA	<input checked="" type="checkbox"/>		It is important to consider the issue of security when documenting a cranking path. The TOP should never be required to disclose the entire cranking path to other entities, like the Gen Operator. The Gen Operator does not need to know the entire cranking path in order to ensure blackstart services.
<p>Response: <u>The comments included in the SAR identify issues to be addressed by the eventual standard drafting team. The industry will have opportunities to comment on the proposals that address cranking paths.</u></p>			
ERCOT	<input checked="" type="checkbox"/>		
HQTE	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
IRC	<input checked="" type="checkbox"/>		
IRD Corp.	<input checked="" type="checkbox"/>		
ISO New England	<input checked="" type="checkbox"/>		
KCPL	<input checked="" type="checkbox"/>		
Manitoba Hydro	<input checked="" type="checkbox"/>		
NPCC CP9	<input checked="" type="checkbox"/>		
NYISO	<input checked="" type="checkbox"/>		
Progress Energy	<input checked="" type="checkbox"/>		
SOCO Transmission	<input checked="" type="checkbox"/>		
SRP	<input checked="" type="checkbox"/>		
AEP	<input checked="" type="checkbox"/>		

Deleted: **Response:** The comments included in the SAR identify issues to be addressed by the eventual standard drafting team. The industry will have opportunities to comment on the proposals that address cranking paths. ... [1]

Deleted: **Response:** Dick – I did not see a response to this comment anywhere. - Edd ... [2]

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

3. The SAR DT has checked off a large number of responsible entities as being applicable entities. We have done this in order to provide sufficient flexibility to the eventual SDT and due to the fact that system restoration and blackstart can potentially touch so many different functional areas of operations. Do you agree that a Generator Owner and/or Generator Operator should have a documented plan for non-blackstart units to be restarted after a blackout?

Summary Consideration:

Question #3			
Commenter	Yes	No	Comment
BPA		<input checked="" type="checkbox"/>	While a documented plan for the restarting of non-blackstart units is not necessary, it is important that testing of blackstart units proves that the unit is capable of starting the non-blackstart units.
SOCO Transmission		<input checked="" type="checkbox"/>	Black start of non-blackstart units should basically be the same as a normal start-up.
AEP		<input checked="" type="checkbox"/>	This is not needed. The system restoration plan provides the necessary steps to provide cranking power to non-blackstart units. Once these units have had cranking power restored, the start-up procedures are the same as if these units were returning from a scheduled/unscheduled outage during normal system operation. Is there really any need to have this documented?
<p>Response: <u>The SAR is designed to allow the eventual standards drafting team to debate the need to go beyond the cranking path and consider the restoration of the entire Interconnection. The SAR DT agrees that the start sequence for a non-blackstart unit should be substantially the same whether the unit is using normal station service supply or energy from a blackstart unit, but there are issues in system restoration, such as system frequency variations and load availability in increments such that the units can stay in their stable range, that may need to be addressed. The eventual SDT will consider capability tests for blackstart units. The industry will have opportunities to comment on such proposals.</u></p>			
HQTE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>HQT agrees that a Generator Owner and/or Generator Operator should have a plan to be ready to re-start non-blackstart units after a blackout. This readiness for energization should also apply to all distributors and loads connected to the bulk electrical system (BES) as well.</p> <p>However, a NERC standard requirement(s) to have a documented plan for generating units to be restarted after a blackout should be limited to the ‘restoration plan participants’ on the cranking path only. The cranking path to be developed in the restoration plan would include those units that must be started or resynchronized to support the integrity of the path.</p>
<p>Response: THE SAR DT agrees that the TOP plans must address the ability to have load available in steps or increments to match generation response capability as it is brought online. Draft 2 of the SAR lists <u>DPs and LSEs as responsible entities.</u></p>			
NPCC CP9	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NPCC participating members agree that a Generator Owner and/or Generator Operator should have a plan to be ready to re-start non-blackstart units after a blackout.

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Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #3			
Commenter	Yes	No	Comment
			However, a NERC standard requirement(s) to have a documented plan for generating units to be restarted after a blackout should be limited to the 'restoration plan participants" on the cranking path only. The cranking path to be developed in the restoration plan would include those units that must be started or resynchronized to support the integrity of the path.
IESO	<input checked="" type="checkbox"/>		<p>Each generator owner and/or generator operator should typically have a plan to be ready to re-start after a trip or blackout, when the power system is reenergized and conditions warrant. This readiness for energization should also apply to all distributors and loads connected to the bulk electrical system (BES) as well.</p> <p>However, a NERC standard requirement(s) to have a documented plan for generating units to be restarted after a blackout should be limited to the 'restoration plan participants" on the cranking path only. The cranking path to be developed in the restoration plan would include those units that must be started or resynchronized to support the integrity of the path.</p>
IRC SRC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Each generator owner and/or generator operator should typically have a plan to be ready to re-start after a trip or blackout, when the power system is reenergized and conditions warrant. This readiness for energization should also apply to all distributors and loads connected to the bulk electrical system (BES) as well.</p> <p>However, a NERC standard requirement(s) to have a documented plan for generating units to be restarted after a blackout should be limited to the 'restoration plan participants" on the cranking path only. The cranking path to be developed in the restoration plan would include those units that must be started or resynchronized to support the integrity of the path.</p>
NYISO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Each generator owner and/or generator operator should typically have a plan to be ready to re-start after a trip or blackout, when the power system is reenergized and conditions warrant. This readiness for energization should also apply to all distributors and loads connected to the bulk electrical system (BES) as well.</p> <p>However, a NERC standard requirement(s) to have a documented plan for generating units to be restarted after a blackout should be limited to the 'restoration plan participants" on the cranking path only. The cranking path to be developed in the restoration plan would include those units that must be started or resynchronized to support the integrity of the path.</p>

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #3			
Commenter	Yes	No	Comment
<p>Response: THE SAR DT agrees that the start sequence for a non-blackstart unit should be substantially the same whether the unit is using normal station service supply or energy from a blackstart unit, but there are issues in system restoration, such as system frequency variations and load availability in increments such that the units can stay in their stable range, that may need to be addressed. As the system is rebuilt, it becomes more and more equivalent to the normal system. The TOP's plan should address the capability of units relied upon in the initial stages of system restoration, that is, until the system has reached a point approximating conditions for normal generator start and synchronization. THE SAR DT agrees that the TOP plans must address the ability to have load available in steps or increments to match generation response capability as it is brought online. Draft 2 of the SAR lists <u>DPs and LSEs</u> as responsible entities. These comments will be passed to the eventual SDT. The industry will have opportunities to comment on proposals during the standard drafting process.</p>			
ISO New England	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	As a general matter, ISO-NE agrees that a Generator Owner and/or Generator Operator should have a documented plan for non-blackstart units to be restarted after a blackout. However, ISO-NE is concerned about the possibility that the Standard could end up requiring an RC, TOP, etc. to become directly involved with the Generator Owner and/or Generator Operator in the development of such a plan. The SAR should be clear that an RC, TOP, etc. shall not be designated as a responsible entity with respect to the development of such a plan and it will remain the requirement of the Owner/Operator.
<p>Response: Just as the current standard EOP-009-0 has requirements strictly for the GO and GOP, the eventual standard drafting team will consider requirements that apply only to the GO and GOP. This issue is included in the SAR as one to be considered by the eventual SDT.</p>			
ERCOT	<input checked="" type="checkbox"/>		All generators should know what their role is in a system restoration or blackstart effort. If they are on the blackstart initiation, such as serving as a black start resource or as a "next start" unit, they should have a documented plan included in the applicable regional or operational area black start plan. If they are not in the initiation stage of the effort, they should have a documented procedure of how and when they would be started and re-synchronized as the restoration effort progresses.
<p>Response: THE SAR DT agrees that the start sequence for a non-blackstart unit should be substantially the same whether the unit is using normal station service supply or energy from a blackstart unit, but there are issues in system restoration, such as system frequency variations and load availability in increments such that the units can stay in their stable range, that may need to be addressed. As the system is rebuilt, it becomes more and more equivalent to the normal system. The TOP's plan should address the capability of units relied upon in the initial stages of system restoration, that is, until the system has reached a point approximating conditions for normal generator start and synchronization. These comments will be passed to the eventual SDT. The industry will have opportunities to comment on proposals during the standard drafting process.</p>			
IRD Corp.	<input checked="" type="checkbox"/>		With some reservations.
<p>Response: These comments will be passed to the eventual SDT. The industry will have opportunities to comment on proposals during the standard drafting process.</p>			
Manitoba Hydro	<input checked="" type="checkbox"/>		It was not clear where this was being proposed in the SAR. A good system restoration plan should outline options for how non-blackstart units will be started after a blackout.

Deleted: Distribution Providers
Deleted: . Load Serving Entities have been added to the responsible functions.

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #3			
Commenter	Yes	No	Comment
			These aspects of the plan should be shared with the GO/GOP and coordinated with the GO/GOP plans.
<p>Response: The SAR DT agrees that the TOP's plan should address the capability of units relied upon in the initial stages of system restoration, that is, until the system has reached a point approximating conditions for normal generator start and synchronization. We agree that GOs and GOPs of units identified in the TOP's plan should be notified and have an opportunity to coordinate. These comments will be passed to the eventual SDT.</p>			
MISO	<input checked="" type="checkbox"/>		We agree that all generator operators should have an understanding of their role and possible scenarios they will face. The generator operators should also test or train on their plan/role periodically.
<p>Response: We agree that GOs and GOPs of units identified in the TOP's plan should be notified and have an opportunity to coordinate. The eventual SDT will consider capability tests for blackstart units and whether the GO should be required to participate in TOP drills and tests. The industry will have opportunities to comment on such proposals.</p>			
ITC Holdings	<input checked="" type="checkbox"/>		In addition, the Generator Operator should demonstrate, through testing or simulation, that the non-blackstart unit can in fact be restarted using the blackout generator.
<p>Response: The eventual SDT will consider capability tests or simulations for blackstart units. The industry will have opportunities to comment on such proposals.</p>			
Progress Energy	<input checked="" type="checkbox"/>		
ATC LLC	<input checked="" type="checkbox"/>		
KCPL	<input checked="" type="checkbox"/>		
SRP	<input checked="" type="checkbox"/>		

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

4. Do you agree that the SAR is ready to move forward to the standards drafting stage?

Summary Consideration:

Question #4			
Commenter	Yes	No	Comment
AEP		<input checked="" type="checkbox"/>	See items 1 & 3 above.
ATC LLC		<input checked="" type="checkbox"/>	See our comments in questions 1 and 2.
IRC SRC	<input checked="" type="checkbox"/>		Provided our comment in Q3 can be addressed in the final SAR that will be used by the SDT.
ISO New England	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ISO-NE agrees that the SAR is ready to move forward to the standards drafting stage if the concern expressed in our response to Question 3 above is addressed.
MISO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Again, we agree for some improvement, but we have difficulty in understanding where this is going.
Response: The SAR DT believes it has addressed your issues.			
IRD Corp.	<input checked="" type="checkbox"/>		<p>By and large.</p> <p>The SAR in its present form is abstract. Both the non-black-start and black-start units need to be defined. The non-black-start units should cover types (e.g., no nuclear) and sizes (e.g., small and DG) of prime movers. And the black-start sources should include:</p> <ol style="list-style-type: none"> 1. Combustion Turbine (local and remote) 2. Run-of-the-River Hydro (remote) 3. Pump-Storage Hydro (remote) 4. Low Frequency Isolation Scheme (LFIS) 5. Full Load Rejection (FLR) <p>It is a matter of records that in the aftermath of New York's 1977 blackout, FERC required that all utilities develop restoration plans. In the process of developing such a plan, one mid-Atlantic utility tried to provide black-start source for one of its large coal-fired plants. The choices were between (1) installing combustion turbines, (2) providing a low frequency isolation scheme, or (3) equipping the base-loaded unit with full-load rejection capability. The full-load rejection alternative was selected as providing the best balance between cost and reliability. Subsequently, following a major power disturbance, the FLR successfully tripped to house load. It can be concluded that the LFIS and FLR should also be considered as the black-start source. It should be recognized that testing of remote black-start, LFIS or FLR is extremely difficult and expensive.</p>

Consideration of Comments on 2nd Posting of System Restoration and Blackstart SAR

Question #4			
Commenter	Yes	No	Comment
<p>Response: The SAR DT agrees that the TOP's plan should address the capability of units relied upon in the initial stages of system restoration, that is, until the system has reached a point approximating conditions for normal generator start and synchronization. We agree that GOs and GOPs of units identified in the TOP's plan should be notified and have an opportunity to coordinate. The SAR has sufficient flexibility to permit the eventual SDT to consider a range of restoration resources. These comments will be passed to the eventual SDT.</p>			
BPA	<input checked="" type="checkbox"/>		
ERCOT	<input checked="" type="checkbox"/>		
HQTE	<input checked="" type="checkbox"/>		
IESO	<input checked="" type="checkbox"/>		
KCPL	<input checked="" type="checkbox"/>		
Manitoba Hydro	<input checked="" type="checkbox"/>		
NPCC CP9	<input checked="" type="checkbox"/>		
NYISO	<input checked="" type="checkbox"/>		
Progress Energy	<input checked="" type="checkbox"/>		
SRP	<input checked="" type="checkbox"/>		
ITC Holdings	<input checked="" type="checkbox"/>		
SOCO Transmission			No comment.

Page 12: [1] Deleted

3/23/2007 11:46:00 AM

Response: The comments included in the SAR identify issues to be addressed by the eventual standard drafting team. The industry will have opportunities to comment on the proposals that address cranking paths.

Page 12: [2] Deleted

3/23/2007 11:45:00 AM

Response: Dick – I did not see a response to this comment anywhere. - Edd

Standard Authorization Request Form

Title of Proposed Standard	Revisions to System Restoration and Blackstart Standards Project 2006-03
Request Date	<u>March 23, 2007</u>

Deleted: January 18, 2007

SAR Requestor Information	SAR Type <i>(Check a box for each one that applies.)</i>
Name Richard J Kafka	<input type="checkbox"/> New Standard
Primary Contact Richard J Kafka	<input checked="" type="checkbox"/> Revision to existing Standards EOP-005, EOP-006, EOP-007, EOP-009
Telephone (301) 469-5274 Fax (301) 469-5235	<input checked="" type="checkbox"/> Withdrawal of existing Standard
E-mail rjkafka@pepcoholdings.com	<input type="checkbox"/> Urgent Action

Standards Authorization Request Form

Purpose (Describe the purpose of the standard — what the standard will achieve in support of reliability.)

EOP-005-1 — System Restoration Plans

EOP-006-1 — Reliability Coordination - System Restoration

EOP-007-0 — Establish, Maintain, and Document a Regional Blackstart Capability Plan

EOP-009-0 — Documentation of Blackstart Generating Unit Test Results

The purpose of revising the above four standards is to:

1. Provide an adequate level of reliability for the North American bulk power systems - the standards are complete and the requirements are set at an appropriate level to ensure reliability.
2. Ensure they are enforceable as mandatory reliability standards with financial penalties - the applicability to bulk power system owners, operators, and users, and as appropriate particular classes of facilities, are clearly defined; the purpose, requirements, and measures are results-focused and unambiguous; the consequences of violating the requirements are clear.
3. Consider other general improvements described in the standards development work plan. (See attachments)
4. Consider stakeholder comments received during the initial development of the standards and other comments received from Electric Reliability Organization (ERO) regulatory authorities, as noted in the attached review sheets.
5. Satisfy the standards procedure requirement for five-year review of the standards.

Industry Need (Provide a detailed statement justifying the need for the proposed standard, along with any supporting documentation.)

When all else fails, the bulk power system requires a clearly defined and comprehensive set of standards to ensure the ability to successfully restore the integrity of the system. The existing standards lack specificity and measures to guide the industry in a consistent and reliable manner for system restoration.

EOP-005 was a Version 0 standard that was modified to add some requirements that were translated from the Phase III & IV measures thus creating a -1 version standard; EOP-006 is a -1 standard as of January 1, 2007; EOP-007, and EOP-009 are Version 0 standards. As the Electric Reliability Organization begins enforcing compliance with reliability standards under Section 215 of the Federal Power Act in the United States and applicable statutes and regulations in Canada, the industry needs a set of clear, measurable, and enforceable reliability standards. The current standards, while a good foundation, were translated from historical operating and planning policies and guides that were appropriate in an era of voluntary compliance. The Version 0 standards, Phase III & IV standards, and recent updates were put in place as a temporary starting point to start up the Electric Reliability Organization and begin enforcement of mandatory standards. However, it is important to update the standards in a timely manner, incorporating improvements to make the standards more suitable for enforcement and to capture prior recommendations that were deferred during the Version 0 and Phase III & IV translations.

In addition, FERC indicated it will not propose to accept or remand EOP-007-0, as it applies only to regional reliability organizations.

Brief Description (Describe the proposed standard in sufficient detail to clearly define the scope in a manner that can be easily understood by others.)

This project involves reviewing and revising the four referenced standards including:

- Resolving the issue of associating compliance measures with Attachment 1-EOP-005 elements,
- EOP-005 only requires the TOP and the BA to have a system restoration plan. The role of these and other entities, especially the Reliability Coordinator, needs to be defined.
- Both EOP-005 and EOP-006 contain a mix of requirements that address advance planning and real-time operations. The Standards Drafting Team (SDT) should consider the need to clearly delineate the two processes within the standards requirements.
- The elimination of 'fill-in-the-blank' components in EOP-007-0 and EOP-009.
- Other improvements to the standards deemed appropriate by the drafting team, with the consensus of stakeholders, consistent with establishing high quality, enforceable standards and consistent with establishing technically sufficient bulk power system blackstart and restoration standards.

Work is not to be limited to the 'To Do Lists'. Those items shall be considered but are not mandatory revisions. [Consideration will also be given to the comments on the appropriate EOP standards in FERC Order #693, issued March 16, 2007.](#)

Throughout the process, the SDT should identify any conflicts that are found with other existing standards and bring them to the attention of the Standards Committee for resolution.

Reliability Functions

The Standard will Apply to the Following Functions <i>(Check box for each one that applies.)</i>		
<input checked="" type="checkbox"/>	Reliability Coordinator	Responsible for the real-time operating reliability of its Reliability Coordinator Area in coordination with its neighboring Reliability Coordinator's wide area view.
<input checked="" type="checkbox"/>	Balancing Authority	Integrates resource plans ahead of time, and maintains load-interchange-resource balance within its metered boundary and supports system frequency in real time.
<input type="checkbox"/>	Interchange Authority	Ensures communication of interchange transactions for reliability evaluation purposes and coordinates implementation of valid and balanced interchange schedules between Balancing Authority Areas.
<input checked="" type="checkbox"/>	Planning Coordinator	Assesses the longer-term reliability of its Planning Coordinator Area.
<input type="checkbox"/>	Resource Planner	Develops a (>one year) plan for the resource adequacy of its specific loads within its portion of a Planning Coordinator area.
<input type="checkbox"/>	Transmission Planner	Develops a (>one year) plan for the reliability of the interconnected Bulk Electric System within its portion of the Planning Coordinator area.
<input checked="" type="checkbox"/>	Transmission Service Provider	Administers the transmission tariff and provides transmission services under applicable transmission service agreements (e.g., the pro forma tariff).
<input checked="" type="checkbox"/>	Transmission Owner	Owns and maintains transmission facilities.
<input checked="" type="checkbox"/>	Transmission Operator	Ensures the real-time operating reliability of the transmission assets within a Transmission Operator Area.
<input checked="" type="checkbox"/>	Distribution Provider	Delivers electrical energy to the End-use customer.
<input checked="" type="checkbox"/>	Generator Owner	Owns and maintains generating facilities.
<input checked="" type="checkbox"/>	Generator Operator	Operates generation unit(s) to provide real and reactive power.
<input type="checkbox"/>	Purchasing-Selling Entity	Purchases or sells energy, capacity, and necessary reliability-related services as required.
<input type="checkbox"/>	Market Operator	Interface point for reliability functions with commercial functions.

Standards Authorization Request Form

<input checked="" type="checkbox"/>	Load-Serving Entity	Secures energy and transmission service (and related reliability-related services) to serve the End-use Customer.
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Reliability and Market Interface Principles

Applicable Reliability Principles <i>(Check box for all that apply.)</i>	
<input checked="" type="checkbox"/>	1. Interconnected bulk electric systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input type="checkbox"/>	2. The frequency and voltage of interconnected bulk electric systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input type="checkbox"/>	3. Information necessary for the planning and operation of interconnected bulk electric systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input checked="" type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk electric systems shall be developed, coordinated, maintained and implemented.
<input checked="" type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk electric systems.
<input checked="" type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk electric systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input checked="" type="checkbox"/>	7. The security of the interconnected bulk electric systems shall be assessed, monitored and maintained on a wide area basis.
Does the proposed Standard comply with all of the following Market Interface Principles? <i>(Select 'yes' or 'no' from the drop-down box.)</i>	
1. The planning and operation of bulk electric systems shall recognize that reliability is an essential requirement of a robust North American economy. Yes	
2. An Organization Standard shall not give any market participant an unfair competitive advantage. Yes	
3. An Organization Standard shall neither mandate nor prohibit any specific market structure. Yes	
4. An Organization Standard shall not preclude market solutions to achieving compliance with that Standard. Yes	
5. An Organization Standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards. Yes	

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Related Standards

Standard No.	Explanation
PER-002	Applicable personnel must be trained in restoration and blackstart procedures.
EOP-001	R3.4 may be redundant after this project is completed.

Related SARs

SAR ID	Explanation

Regional Differences

Region	Explanation
ERCOT	
FRCC	
MRO	
NPCC	
SERC	
RFC	
SPP	
WECC	

Standard Review Form		
Project 2006-03 System Restoration and Blackstart		
Standard #	EOP-005-0	Comments
Title	System Restoration Plans	Okay
Purpose		Okay
Applicability		Okay
Requirements	<i>Conditions</i>	Interconnection is capitalized.
	<i>Who?</i>	Okay
	<i>Shall do what?</i>	R2 mentions simulated exercises – where did that come from? R3 – isn't this a function of the extent of the outage? R5 – define periodically R6 – provide training requirements R8 – how do you verify? R115.2 – what does considered mean R11.5.3 – depends on extent
	<i>Result or Outcome</i>	Missing
Measures		2 M for 11 R
To Do List	<p>FERC NOPR</p> <ul style="list-style-type: none"> o Include Measures; and o Identify time frames for training and review of restoration plan requirements to simulate contingencies and prepare operators for anticipated and unforeseen events. <p>FERC staff report</p> <ul style="list-style-type: none"> o Periodicity of training o Lack of Measures <p>Regional Fill-in-the-Blank Team Comments</p> <ul style="list-style-type: none"> o Drafting team should address EOP-005, EOP-006 EOP-007 and EOP-009 concurrently. Primarily, references in EOP-005, EOP-006, and EOP-009 to meet RRO/Regional requirements need to be modified and EOP-007 needs to be more specific. o See notes for EOP-007 <p>V0 Industry Comments</p> <ul style="list-style-type: none"> o Priority to integrity of interconnection o BA does not have all required information o Interdependency of planning and implementation missing as well as between functional entities o LSE & GO should have plans o Additional element consideration o Can't really test plan <p>Phase III/IV comments</p> <ul style="list-style-type: none"> o Add LSEs to Applicability o Add a requirement for a blackstart agreement between the transmission operator and the generator owner - include items such as identification of generator owner/operator facilities required to participate in the blackstart plan; when and how quickly a blackstart unit must respond; and what cranking path requires energization o Add a requirement for a cranking path agreement between the transmission operator and the generator owner/operator o Condense the requirements and measures - R1 the requirement to develop the restoration plan and all the components required of that plan; and R2 the requirement to prove and document that the plan 	

2006-03 System Restoration and Blackstart

	<p>works. Then, two measurements would follow: one to assess the contents of the plan and one to assess the simulation or testing of the plan.</p> <ul style="list-style-type: none">○ Need to resolve the issue of the elements on the Attachment – are these mandatory or not – there is a mismatch between R1 and levels of non-compliance○ R3 – revise to place emphasis for TOP on restoring local transmission system as preparation for restoring the integrity of the Interconnection.○ R4 – Add LSEs○ R5 – replace ‘periodic’ with a specific periodicity for testing○ R6 – add specificity to frequency and scope of required training○ R11.5 - replace the word, ‘may’ with: The affected Transmission Operators shall not resynchronize the isolated area(s) with the surrounding area(s) until the following conditions are met: the voltage, frequency, and phase angle permit, the affected reliability coordinator(s) and the adjacent areas are notified, and reliability coordinator approval is given.○ Delete R11.5.4. It does not seem reasonable or logical for a control area to be required to shed 5,000 MWs of load, for example, in order for their neighbor to reconnect 1,000 MWs of their own load.○ R11.5. Should exclude islands within a system that do not affect surrounding areas <p>VRF comments</p> <ul style="list-style-type: none">○ R1, 5 & 8 – Does not just apply to local restoration○ R2 – Could be broken up into 2 requirements○ R11.4 – Ambiguous○ R11.5 - This needs to be looked at for 30 days - should be done prior to access being granted.
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Standard Review Form		
Project 2006-03 System Restoration and Blackstart		
Standard #	EOP-006-0	Comments
Title	Reliability Coordination – System Restoration	Okay
Purpose		Don't need names. Interconnection is capitalized.
Applicability		Okay
Requirements	<i>Conditions</i>	Okay
	<i>Who?</i>	Okay
	<i>Shall do what?</i>	R5 – burden is capitalized R6 – define actions
	<i>Result or Outcome</i>	Missing
Measures		Addressed by CESDT.
To Do List	FERC NOPR <ul style="list-style-type: none"> o Require that the reliability coordinator be involved in the development and approval of restoration plans; and o Include Measures and Levels of Non-Compliance FERC staff report <ul style="list-style-type: none"> o RC should be involved in approving TO & BA plans o Expect new standard in November Regional Fill-in-the-Blank Team Comments <ul style="list-style-type: none"> o Drafting team should address EOP-005, EOP-006 EOP-007 and EOP-009 concurrently. Primarily, references in EOP-005, EOP-006, and EOP-009 to meet RRO/Regional requirements need to be modified and EOP-007 needs to be more specific. o See notes for EOP-007 	
Misc. Items		Compliance not specified but appears in CESDT version

Standard Review Form		
Project 2006-03 System Restoration and Blackstart		
Standard #	EOP-007-0	Comments
Title	Establish, Maintain, and Document a Regional Blackstart Capability Plan	Too long
Purpose		Need benefit or value proposition.
Applicability		Need to check applicability for RRO as per SAR.
Requirements	<i>Conditions</i>	Okay
	<i>Who?</i>	Okay
	<i>Shall do what?</i>	R1.1 – quicker if unit status changes
	<i>Result or Outcome</i>	Missing
Measures		M1 – need to spell out measures M2 – define evidence
To Do List	FERC NOPR <ul style="list-style-type: none"> o Commission will not propose to accept or remand EOP-007-0, as it applies only to regional reliability organizations. FERC staff report <ul style="list-style-type: none"> o Appropriateness of RRO questioned Regional Fill-in-the-Blank Team Comments <ul style="list-style-type: none"> o R1 & R2 considerations VO Industry Comments <ul style="list-style-type: none"> o Clarify testing requirements 	
Misc. Items		Question reasonability of simulation as proof of capability.

Standard Review Form		
Project 2006-03 System Restoration and Blackstart		
Standard #	EOP-009-0	Comments
Title	Documentation of Blackstart Generating Unit Test Results	'Documentation of' could probably be dropped.
Purpose		Title and purpose do not align. Same purpose as EOP-008.
Applicability		Need to check applicability for GO & GOP as per SAR.
Requirements	<i>Conditions</i>	Okay
	<i>Who?</i>	Okay
	<i>Shall do what?</i>	R1 – do we need MW values? R2 – within how many days?
	<i>Result or Outcome</i>	Missing
Measures		M1 only applies to R2 and needs to define evidence.
To Do List	FERC NOPR o No changes identified. FERC staff report o Lack of periodicity for testing Regional Fill-in-the-Blank Team Comments o Region mentioned in Requirements VO Industry Comments o Distinction between RA & TO vs. RRO for test results	

Excerpts from FERC Final Order 693

System Restoration Standards

EOP-005-1

630. ...the Commission directs the ERO to develop a modification to EOP-005-1 through the Reliability Standards development process that identifies time frames for training and review of restoration plan requirements to simulate contingencies and prepare operators for anticipated and unforeseen events

EOP-006-1

638. ...the Commission directs the ERO to develop a modification to EOP-006-1 through the Reliability Standards development process that ensures that the reliability coordinator, which is the highest level of authority responsible for reliability of the Bulk-Power System, is involved in the development and approval of system restoration plans.

EOP-007-0

647. EEI, FirstEnergy and MRO offer suggestions for improving the Reliability Standard. The Commission directs the ERO to consider these suggestions in future revisions to improve EOP-007-0, through the Reliability Standards development process.

648. Accordingly, the Commission will not approve or remand EOP-007-0 at this time.

642. EEI suggests that EOP-007-0 be rewritten so that compliance obligations are assigned directly to those entities that provide the data and other information.

643. FirstEnergy and MRO state that the reliability coordinator, not the Regional Entity, should be responsible for the regional blackstart plan for its area of responsibility. Further, FirstEnergy states that the blackstart plan developed for a region should be consistent with NRC requirements, should recognize that nuclear units have no blackstart capability and should recognize that nuclear units must have priority access to off-site power for safety reasons. FirstEnergy requests that the Commission direct NERC to revise the definition of a blackstart unit to mean a “diesel, hydro, pump storage, or the combustion turbine generating unit that is used to provide cranking power to a larger steam generating unit designed to restore load” or to mean a “larger steam generating unit designed to restore load.” MRO states that arrangements for coordination of blackstart capability should be addressed in a contract between appropriate entities.

EOP-009-0

674. ...Xcel states that the Reliability Standard should provide details on what constitutes a blackstart test and FirstEnergy states that EOP-009-0 should be consolidated with EOP-007-0 because the Requirements of EOP-009-0 already exist in EOP-007-0.

676. ...The Commission directs the ERO to take these suggestions into consideration when revising the Reliability Standard through the Reliability Standards development process.