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.

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]

There was one change made to the SAR as a result of the comments received — additional reliability principles were checked off as suggested. In addition, words were added to the SAR to include the recent FERC Order 693 as it referred to the standards in question. No minority opinions were received.

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

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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	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									

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Commenter	Organization	Industry Segment									
		1	2	3	4	5	6	7	8	9	10
25. Guy Zito (G2)	NPCC										x
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

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

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? 14

4. Do you agree that the SAR is ready to move forward to the standards drafting stage?19

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

Summary Consideration: The majority of the comments received had to do with the inclusion of certain entities in the SAR. The SAR DT included all entities that might be included in the eventual standard in order to provide the eventual SDT with sufficient flexibility to do their job without worrying about scope changes. It was explained that the SDT will still have the capability to pick the specific entities that are truly applicable once they have drafted the standard itself. Other comments received were on procedural matters or were items for the SDT to decide. The SAR DT believes that we have responded to all comments.

Question #1			
Commenter	**Yes**	**No**	**Comment**
ATC LLC		☑	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.
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.			
AEP		☑	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). 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.
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 mandatory requirements. The revised standards will state what needs to be done and not how.			
KCPL		☑	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

Question #1			
Commenter	**Yes**	**No**	**Comment**
			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. Standard Number EOP-005-0 is currently not applicable to the load serving entities. 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.
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 included the LSE Function, but recognizes that the issues may be adequately addressed by the DP Function. 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 requirements. Boxes 5, 6 & 7 have been checked off.			
MISO	☑	☑	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.
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, *including the RC*. 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.			
IRD Corp.	☑		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. 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

Question #1			
Commenter	**Yes**	**No**	**Comment**
			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. Testing RB is very difficult and expensive. To illustrate the difficulties, two RB cases that apparently were feasible are briefly described: 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. 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. 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. RB's REACTIVE POWER PROBLEMS:

Question #1			
Commenter	**Yes**	**No**	**Comment**
			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 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. Here are the three lists of the RB concerns and constraints: A. Concerns with the Blackstart Units: * 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 onduction motors in SES. * GSU Xfmr differential relays * GSU and Aux Xfmr tap positions B. Concerns with Non-Blackstart (steam) Units: * Start-up sequence of auxiliary induction motors (BFP. IDF, etc.) * Starting overcurrents of auxiliary motors (five times the running current)

Question #1			
Commenter	**Yes**	**No**	**Comment**
			* 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. C. Concern the Interconnecting Path: * 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. Conclusions: Implementation of each RB operation requires: * the use of related Generation, Transmission and Distribution facilities * planning (feasibility study), analyzes, simulation, field tests, training and exercise * each blalkstart source has to be matched uniquely with a non-blackstart unit(s) * long-term contracts are required between the related G, T & D ownerships 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.
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.			
Manitoba Hydro	☑		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.
Response: The eventual standard drafting team will assign responsibilities to the users, owners and operators of the system in accordance with the Functional Model.			
NPCC CP9	☑		
NYISO	☑		
BPA	☑		
HQTE	☑		

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Question #1			
Commenter	**Yes**	**No**	**Comment**
ERCOT	☑		
IESO	☑		
IRC SRC	☑		
ISO New England	☑		
Progress Energy	☑		
SRP	☑		
ITC Holdings	☑		
SOCO Transmission			No comment.

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: All of the comments received had to do with the inclusion of certain entities in the SAR. The SAR DT included all entities that might be included in the eventual standard in order to provide the eventual SDT with sufficient flexibility to do their job without worrying about scope changes. It was explained that the SDT will still have the capability to pick the specific entities that are truly applicable once they have drafted the standard itself. The SAR DT believes that we have responded to all comments.

Question #2			
Commenter	**Yes**	**No**	**Comment**
ATC LLC		☑	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. 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. 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. 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.
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			

Question #2			
Commenter	**Yes**	**No**	**Comment**
such determination is not part of the standards.			
ITC Holdings		☑	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.
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.			
MISO	☑	☑	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.
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.			
BPA	☑		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.
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.			
ERCOT	☑		
HQTE	☑		
IESO	☑		
IRC	☑		
IRD Corp.	☑		
ISO New England	☑		
KCPL	☑		
Manitoba Hydro	☑		
NPCC CP9	☑		
NYISO	☑		

Question #2			
Commenter	**Yes**	**No**	**Comment**
Progress Energy	☑		
SOCO Transmission	☑		
SRP	☑		
AEP	☑		

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: The SAR DT included all entities that might be included in the eventual standard in order to provide the eventual SDT with sufficient flexibility to do their job without worrying about scope changes. It was explained that the SDT will still have the capability to pick the specific entities that are truly applicable once they have drafted the standard itself. The SAR DT believes that we have responded to all comments.

Question #3			
Commenter	**Yes**	**No**	**Comment**
BPA		☑	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.
Response: 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.			
SOCO Transmission		☑	Black start of non-blackstart units should basically be the same as a normal start-up.
Response: 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.			
AEP		☑	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?
Response: 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.			

Question #3			
Commenter	**Yes**	**No**	**Comment**
HQTE	☑	☑	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. 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.
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 DPs and LSEs as responsible entities.			
NPCC CP9	☑	☑	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. 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.
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 DPs and LSEs 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.			
IESO	☑		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. 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

Question #3			
Commenter	**Yes**	**No**	**Comment**
			restoration plan would include those units that must be started or resynchronized to support the integrity of the path.
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 DPs and LSEs 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.			
IRC SRC	☑	☑	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. 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.
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NYISO	☑	☑	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. 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

Question #3			
Commenter	**Yes**	**No**	**Comment**
			support the integrity of the path.
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 DPs and LSEs 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.			
ISO New England	☑	☑	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.
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.			
ERCOT	☑		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.
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.			
IRD Corp.	☑		With some reservations.
Response: These comments will be passed to the eventual SDT. The industry will have opportunities to comment on proposals during the standard drafting process.			
Manitoba Hydro	☑		It was not clear where this was being proposed in the SAR. A good system restoration

Question #3			
Commenter	**Yes**	**No**	**Comment**
			plan should outline options for how non-blackstart units will be started after a blackout. These aspects of the plan should be shared with the GO/GOP and coordinated with the GO/GOP plans.
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.			
MISO	☑		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.
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.			
ITC Holdings	☑		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.
Response: The eventual SDT will consider capability tests or simulations for blackstart units. The industry will have opportunities to comment on such proposals.			
Progress Energy	☑		
ATC LLC	☑		
KCPL	☑		
SRP	☑		

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

Summary Consideration: All of the comments received basically agree that the SAR is ready to move forward. There were some references to previous comments that were answered above. The SAR DT believes that we have responded to all comments.

Question #4			
Commenter	**Yes**	**No**	**Comment**
AEP		☑	See items 1 & 3 above.
ATC LLC		☑	See our comments in questions 1 and 2.
IRC SRC	☑		Provided our comment in Q3 can be addressed in the final SAR that will be used by the SDT.
Response: The SAR DT believes it has addressed your issues.			
ISO New England	☑	☑	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.
Response: The SAR DT believes it has addressed your issues.			
MISO	☑	☑	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.	☑		By and large. 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: 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) 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

Question #4			
Commenter	**Yes**	**No**	**Comment**
			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.
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.			
BPA	☑		
ERCOT	☑		
HQTE	☑		
IESO	☑		
KCPL	☑		
Manitoba Hydro	☑		
NPCC CP9	☑		
NYISO	☑		
Progress Energy	☑		
SRP	☑		
ITC Holdings	☑		
SOCO Transmission			No comment.