	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013


Attachment A- New Black Start Generator (BSG) Capability, Assessment and Selection Checklist

Table of Contents

New Black Start Generator (BSG) Capability, Assessment and Selection Checklist	2
Attachment A Revision History	11

*This document is controlled when viewed on the ISO New England Internet web site. When downloaded and printed, this document becomes **UNCONTROLLED**, and users should check the Internet web site to ensure that they have the latest version. In addition, a Controlled Copy is available in the Master Control Room procedure binders at the ISO.*

The information contained in this document is for use by ISO New England staff and the Local Control Centers and is subject to modification. ISO New England Inc. is not responsible for any reliance on this document by others, or for any errors or omissions or misleading information contained herein.

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations	Approved by: M/LCC Heads	
		Review Due Date: January 20, 2013

New Black Start Generator (BSG) Capability, Assessment and Selection Checklist


(Reference NERC Reliability Standard EOP 005 - System Restoration)

Unit ID: _____ UNIT NAME: _____ DATE: _____

1 Black Start Generator (BSG) Facility Data - Unit Ratings

(@ ambient temperature 50 degrees F)

Gross Unit Rating (MW)	MW	
Net Unit Rating (MW)	MW	
Station Service (MW)	MW	
Minimum Low Operating Limit	MW	
Emergency Low Operating Limit	MW	
Ramp Rate per minute	MW	
Gross Lagging (MVAR)	MVAR	
Gross Leading (MVAR)	MVAR	
Station Service (MVAR)	MVAR	
Notification Time (Cold)	Hours	
Notification Time (Hot)	Hours	
Time From Breaker Closed To Minimum Low Operating Limit	Minutes	
Minimum Excitation Limit Trip Setting	Amps	
Loss of Field Limit Trip Setting	Amps	

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013

2 BSG Start Capable Means

What is the means by which this stand-alone generating unit is Black Start Capable:


Check

- Air Compressors _____
- Air Tanks _____
- Batteries/Chargers _____
- DC Motors _____
- DC Controllers _____
- DC/AC Inverters _____
- Hydro _____
- Pony Motor - Hydro Pump Storage _____
- Wind _____
- Diesel _____
- Jet _____
- Other _____

3 How Does the Designated Entity (DE) Dispatch the BSG On-Line in a System Emergency

What key operating dispatch aid is utilized by the DE to order the BSG online :

- Telephone - Public Switch Network Yes/No _____
- Telephone - Direct Ring Down Network Yes/No _____
- SCADA Yes/No _____
- Manual Start Yes/No _____
- Radio Yes/No _____


	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013

4 BSG Capability

- a What is your minimum station service requirement? MW _____
- b How long can you stay at your minimum MW loading? Hours _____
- c Can you provide your own MW loading? Yes/No _____

5 Generator Step-Up Transformers (GSU) Data and Rating

- Low Side Voltage Rating (LV) - Generator Side kV _____
- High Side or System Voltage Rating (HV) kV _____
- Tertiary Voltage (TV) kV _____
- kVA Self cooled / Maximum Nameplate Power Rating kVA _____
- Winding Connections (Low Volt/ High Volt / Tertiary Volt) Delta/Wye _____
- Power (Single Phase Transformer Unit) Yes/No _____
- Power (Three-Phase Transformer Unit) Yes/No _____
- Transformer Impedance: _____ % kVA Base _____
- Transformer Fuse Data: Type _____ Size _____ Speed _____
- Location and or source of system ground/neutral _____
- Over Voltage and or High Frequency trip setting _____

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013

6 GSU Interconnecting Circuit Breaker Data and Rating


Type of Breaker	Type	_____
Load Rating	Amps	_____
Interrupting Rating	Amps	_____
Trip Speed	Cycles	_____
Are there any problems with back energizing the GSU?	Yes/No	_____
Are you willing to test back energizing the GSU and generator lead?	Yes/No	_____
Can close GSU line side breaker to a live-dead transmission bus?	Yes/No	_____
Can close GSU line side breaker to a dead-live transmission bus?	Yes/No	_____

7 Voice Communication Requirements

Agree

Immediately following a system wide black-out the LCC or ISO system operator shall contact the BSG to determine unit availability or status.

- | | | | |
|---|--|--------|-------|
| a | Once notified by the ISO or LCC the BSG will be on-line and providing startup cranking power within 90 minutes. | Yes/No | _____ |
| b | If the BSG has not been contacted by the system operator within 30 minutes following a system wide power failure then the BSG agrees to attempt contacting its LCC or ISO immediately. | Yes/No | _____ |
| c | BSG are required to install, maintain, operate, test and fund a voice communications system that is independent of the public switched telephone network for the purposes of communicating with the LCC System Operator during a power system restoration event. | Yes/No | _____ |
| d | BSG shall have an emergency back-up radio communication system to its Local Control Center (LCC). | Yes/No | _____ |

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013

8 Communication Data/Metering equipment requirements Agree


- a The following BSG instantaneous metering data shall be telemetered to the ISO and LCC by RTU:
- a Frequency Yes/No _____
 - b Voltage Yes/No _____
 - c MW Yes/No _____
 - d MVAR Yes/No _____

9 Maintain 60 HZ Agree

- a The BSG unit is capable of maintaining 60 Hz under varying load. This may be demonstrated by picking up isolated block of test load. Yes/No _____
- b Provide BSG governor droop. % _____
- c The Generator is capable of changing frequency set-point and maintaining new set-point (60.3 ~ 59.7 Hz). Yes/No _____

10 Maintain Voltage Agree

- By actual testing or simulation the BSG unit is capable of maintaining automatic or manual voltage control under the following conditions:
- This may be demonstrated by picking up an isolated load. Yes/No _____
 - By producing both leading and lagging VARs by varying the voltage setting. Yes/No _____
 - By varying the voltage setting while the unit is synchronized to the system. Yes/No _____
 - By appropriate dynamic offline testing of the voltage controls. Yes/No _____

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations	Approved by: M/LCC Heads	
	Review Due Date: January 20, 2013	

11 VAR absorption capability has been demonstrated to adequately control reactive power during black start restoration test conditions:

Yes/No _____

Yes/No _____

12 BSG Fuel Inventory Capability

a Primary Fuel:

	<i>Check</i>		<i>Check</i>
<i>Hydro (Run of the River)</i>	_____	<i>Gas (Propane)</i>	_____
<i>Hydro (Pump Storage)</i>	_____	<i>Diesel</i>	_____
<i>Oil</i>	_____	<i>Kerosene</i>	_____
<i>Light Oil</i>	_____	<i>Wind</i>	_____
<i>Gas (Natural)</i>	_____	<i>Other</i>	_____


b BSG units are required to maintain an adequate on-site fuel supply and inventory plan:

At maximum storage capacity, how many MW-Hours of on-site primary fuel storage do you have for one unit operation? *MWh* _____

How long can you operate one unit at maximum load? *Hours* _____

How long can you operate one unit at minimum load? *Hours* _____

Are there any specific air permitting concerns for operating at your secondary fuel for a long duration? Yes/No _____

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations	Approved by: M/LCC Heads	
	Review Due Date: January 20, 2013	

c Secondary Fuel:

Do you have back-up fuel capability? Yes/No _____

Are there any specific air permitting concerns for operating at your secondary fuel for a long duration? Yes/No _____

Back-up fuel type? Fuel Type _____

Fuel supply shortages may occur, what is your swap over time for changing fuels? Min/Hrs _____

d Gas fired BSG should have in place special arrangements with the local gas provider for the following emergency support: **Agree**


Electric power supply feed to local gas gate connection and valves? Yes/No _____

Sustained gas compressor supply for multiple hours during the restoration process? Yes/No _____

e Hydro BSG Station Operation:

MWh of capability with a full pond? Summer MWh _____

Winter MWh _____

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013

13 Training for BSG and System operators

Agree

a During the BSG annual test period, generator and system operators will coordinate operations, including the review and update of its restoration plan at least annually.

Yes/No _____

b All deficiencies found during the actual / real-time or simulated restoration black start testing shall be corrected and the plan updated.

Yes/No _____

14 BSG specific performance standards

Agree

a Each BSG owner must maintain procedures for the startup of black start generation station.

Yes/No _____

b This procedure shall remain in effect for the duration of the commitment.

Yes/No _____

c Each BSG shall execute an unaltered agreement "Signature Page" for Schedule 16 of NEPOOL OATT with NEPOOL/ISO.


Yes/No _____

15 Annual BSG performance testing

Agree

Right to Observe Testing - BSG operator shall notify the ISO and LCC in advance of its annual black start performance.

Yes/No _____

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations	Approved by: M/LCC Heads	
	Review Due Date: January 20, 2013	

- 16 Provide ISO / LCC with the following restoration documents: **Agree**
- a Copy of the BSG start up operating instructions. Yes/No _____
- b Copy of BSG station one-line diagram from generator to transformer high-side breaker. Yes/No _____

NOTES:

Testing, Inspection and Verification

The ISO and LCC has the right, at its own expense, to observe such testing.

SRWG Assessment and Training requirements

Both the ISO and the LCC will maintain a copy of the BSG start-up procedure. This procedure shall be reviewed and updated annually by owner, ISO and LCC. The BSG start up instruction and cranking path procedures shall be incorporated into the ISO New England SRWG system operator training.


Company Name: _____

Company Address: _____

Company Representative: Name: _____

Title: _____

Date: _____

	© ISO New England, Inc. 2011	Master/ LCC Procedure # 11 Verification of New England System Restoration Plan, Attachment A
		Revision Number: 3 Revision Date: January 20, 2011
Contact: ISO Director, Operations		Approved by: M/LCC Heads
		Review Due Date: January 20, 2013

Attachment A Revision History

Rev. No.	Date	Reason
Rev 0	05/25/07	Original Checklist
Rev 1	09/20/07	Revisions requested by SRWG
Rev 2	03/16/09	Biennial Review by Procedure Owner; Changed header, from Manager to Director; Changed header Review Due Date: from a fixed calendar date to 24 months from the Revision Date;;
Rev 3	01/20/11	Biennial review by procedure owner; Minor editorial changes: added Table of Contents, minor format changes, updated Header copyright date, replaced all Footer page numbers with Page X of Y format Section 1 modified items 10 and 11 and added new data item 12 "Time From Breaker Closed To Minimum Low Operating Limit" & " Minutes" Section 9 Added new item c data line: "The Generator is capable of changing frequency set-point and maintaining new set-point (60.3 ~ 59.7 Hz)." & "Yes/No"