Pelton, David

From: Johnson, Paul
Sent: Tuesday, May 25, 2004 3:27 PM
To: Pelton, David
Subject: FW: Master Satellite Procedure #1

MS 1-With VY Attachment.doc (2...

-----Original Message-----
From: Johnson, Paul
Sent: Tuesday, May 25, 2004 2:14 PM
To: Pelton, David
Subject: FW: Master Satellite Procedure #1

Dave,

I just received a copy of M/S #1 with the VY Appendix.

Paul Johnson

-----Original Message-----
From: Bertagnolli, Dave [mailto:dbert@iso-ne.com]
Sent: Tuesday, May 25, 2004 1:21 PM
To: Johnson, Paul
Subject: Master Satellite Procedure #1

Paul,

Here's the latest version of M/S #1 with the VY appendix. Let me know if you need more info.

Dave Bertagnolli
ISO-New England

A-203

ISO New England, Inc.	Master/Satellite Procedure
	Revision Number: 0 Revision Date: 06/06/03
Contact: Dave Bertagnolli	Approved by: M/S Heads

Master/Satellite Procedure #1

Nuclear Plant Transmission Operations

1. Objective

The objective of this procedure is to recognize the special needs of New England's four Nuclear Power stations, document the responsibilities of the ISO New England (ISO) in maintaining proper grid support for the stations as well as document communication paths in the event of grid degradation.

Compliance with this procedure ensures that minimum voltage requirements are maintained following a plant trip or other system disturbance. In emergency situations, this document ensures that plants are well informed and can transfer station loads to their auxiliary power in a timely fashion to ensure safe shutdown of the reactor.

2. Background

Nuclear plants are required to comply with Nuclear Regulatory Commission rules regarding the safe operation of station power generation and safety systems. To comply, each station counts on a reliable grid that supplies a required number of off-site power sources as well as the minimum voltage levels needed to operate station equipment to allow the plant to be taken to and remain in a safe shutdown condition.

Communication between Satellites, Plants and the ISO is imperative to keep the Nuclear stations operating within their offsite power design limits.

3. Responsibilities

1. ISO and Satellite staff must posture the bulk power system in order to:

    a. Maintain voltage at or above the minimum voltage levels at each plant post-contingency. Contingencies that may cause voltage to drop include loss of the nuclear unit itself, loss of line(s) or loss of another local generator.

    b. Maintain the required number of off-site power sources both in the planning stages and in real-time operations

2. ISO and Satellite Operations staff must communicate with Nuclear Plant staff should the voltage or required sources of off-site power be in jeopardy at any given time.

3. Nuclear Plant Operations staff shall coordinate the scheduling of High Risk Testing with Satellite and ISO Control Rooms prior to conducting any High Risk test that could directly result in a plant trip. The Satellite and ISO operators will confer and may decide to reschedule the test if system conditions warrant (i.e. – capacity emergency, two plants requesting high risk test at the same time, etc.)

4. Glossary of Nuclear Terms and Acronyms

1. *Delayed Access Power Source (DAPS)*: Offsite power source that is available to supply station loads within a predetermined period of time following a unit trip or planned shutdown.

2. *Design Basis*: Nuclear plants have been designed to withstand phenomena such as earthquakes, tornadoes, hurricanes and floods as well as postulated station events without loss of systems and structures necessary to ensure public health and safety.

3. *High Risk Testing*: Any test performed by a nuclear plant that increases the risk of a plant trip.

4. *Immediate Access Power Source (IAPS):* Offsite power source that is available to supply station loads within a few seconds following a plant trip, concurrent with worst-case bus loading conditions.

5. *Limiting Condition of Operation (LCO):* Lowest functional capability or performance level of equipment required for safe operation of the plant.

6. *Loss of Coolant Accident (LOCA):* Accidents that result in a loss of reactor coolant or the systems that control reactor coolant.

7. *Operating Modes*: Reactors are classified into several modes of operation depending upon the combination of core reactivity condition, power level and average reactor coolant temperature. Modes differ depending upon whether the reactor is a Pressurized Water Reactor (PWR) or a Boiling Water Reactor (BWR).

   a. Pressurized Water Reactor Modes

      (i) Mode 1: Power Operation

      (ii) Mode 2: Startup

      (iii)Mode 3: Hot Standby

      (iv)Mode 4: Hot Shutdown *

      (v) Mode 5: Cold Shutdown*

      (vi)Mode 6: Refueling**

   b. Boiling Water Reactor Modes

      (i) Mode 1: Power Operation

      (ii) Mode 2: Startup

      (iii)Mode 3: Hot Shutdown*

      (iv)Mode 4: Cold Shutdown*

      (v) Refueling**

*All reactor vessel head closure bolts are fully tensioned

**One or more reactor vessel head closure bolts are less than fully tensioned.

5. Instructions

See attachments for Plant specific procedures.

6. Attachments

Attachment B: Vermont Yankee Nuclear Station

(Boiling Water Reactor 550 MW)

VOLTAGE

1. The Vermont Yankee (VY) 345kV switchyard must be maintained at or above 342kV, post-contingency, to ensure the safe shutdown of the reactor.

2. The VY 115kV switchyard must be maintained at or above 115kV, post-contingency, to ensure the safe shutdown of the reactor. This requirement is especially important following a trip of the VY Generator as station loads then transfer to the T-3-1A and T-3-1B Startup Transformers.

3. To maintain proper voltages at the VY 115kV and 345kV switchyards, REMVEC II and ISO operators shall:

   a. Utilize the two capacitors located at the Coolidge substation for 115kV support.

   b. Utilize capacitors at Brudies Road and Vernon Road.

   c. Upon loss of the VY terminal of the N186 line SPS at Vernon Rd will actuate. See the SPS write-up for more details.

   d. Utilize new capacitors at Chestnut Hill when installed (Spring 2003).

   e. For 345kV support, utilize the capacitors at Sandy Pond and Scobie as well as VAR capability at Northfield.

4. In the event that post-contingency voltages cannot be maintained at the VY 115kV and 345kV switchyards, the REMVEC II operator shall notify the VY Control Room so the plant can assess the situation and take action if necessary.

   a. If the 345kV/115kV voltage cannot be restored, VY may have to enter into a LCO for inoperability of the Immediate Access Power Source (See Offsite Power section 1.a.). This action requires the unit to shutdown within the following 7-day period.

   b. The 115kV voltage is critical because all station loads are supplied from the T-3-1A and T-3-1B Startup Transformers following a trip of the VY generator or a planned shutdown of the reactor.

5. If the 345kV switchyard voltage cannot be maintained at or above 342kV following a trip of the VY generator, VY may have to enter into a LCO for inoperability of the Delayed Access Power Source. This action,

concurrent with the inoperability of the Immediate Access Power Source, requires the station to enter into a 24-hour shutdown LCO.

OFFSITE POWER SUPPLY

1. VY has two sources of off-site power.

   a. T-4-1A Autotransformer: (Immediate Access Power Source). This source is supplied from the 345kV Transmission System through the T-4-1A Autotransformer and the T-3-1A and T-3-1B Startup Transformers (115kV/4kV). In the event of a plant trip, station loads automatically transfer to this power source.

   b. T-1-1A Main Transformer: (Delayed Access Power Source). This source is manually established within one hour via the back-feed of the 345kV Transmission System through the T-1-1A Main Transformer (345kV/22kV) and the T-2-1A Auxiliary Transformer (22kV/4kV). The GD-1 Main Generator Disconnect Switch must be opened to establish back-feed.

2. In the event that one of the above sources is out of service and the unit enters a LCO, the VY Control Room shall notify ISO and REMVEC II Operators.

3. In the event that the T4 transformer is removed from service, the ISO Operator shall notify the VY Control Room. The ISO and REMVEC II Operator shall also reference the attached **"Guidelines for Operating the Vermont Yankee 115kV System with the T4 Transformer Out of Service"**. This document provides the necessary information to determine the capability of the N186 line to support a controlled plant shutdown of VY.

Station Black Out Source

1. VY considers the 13L2 Feeder from Vernon Hydro as a Station Black Out Source. In the event that all Off-Site Power Sources (see sect. Off-Site Power Sources) are out of service, and the on-site diesels have failed to start, VY can utilize the generation from Vernon Hydro to power station service loads in the event of a plant trip.

2. In the event that the 13L2 feeder is out of service, the REMVEC II Operator shall notify the VY Control Room.

3. Loss of the Station Black Out source does not affect an LCO at VY.

Vermont Yankee 345kV Transmission Lines

1. There are three 345kV transmission lines leaving the VY station.
   a. 379 VY to Scobie via Amherst
   b. 340 VY to Coolidge
   c. 381 VY to Northfield
2. REMVEC II Operations staff shall notify the Vermont Yankee Control Room if one or more of the lines above and/or the Coolidge transformer are to be removed from service.
3. ISO and REMVEC II Operators shall reference the line out stability guides if one or more of these lines are out of service.
4. As referenced in the 379-1 Stability guide, the 381 breaker may be opened to eliminate the need for a reduction in plant output due to stability limitations with the Coolidge line. In this configuration, a plant trip leaves the 340 line as the sole source of power to the T-4-1A transformer (Immediate Access Power Source). Therefore, for this configuration, REMVEC II Operators will need to confirm that the combination of the 340 line and the K186 line will provide a minimum of 115kV to the VY 115kV switchyard as follows:
5. VY Cooling Towers in Operation: REMVEC II Operators must confirm that 115kV is maintained following a trip of the VY generator concurrent with a combined station load of 30MW and 18MVAR (inductive) applied at the T-3-1A and T-3-1B Startup Transformers.
6. VY Cooling Towers Secured: REMVEC II Operators must confirm that 115kV is maintained following a trip of the VY generator concurrent with a combined station load of 20MW and 12 MVAR (inductive) applied at the T-3-1A and T-3-1B Startup Transformers.

Vermont Yankee 345kV Switchyard Diagram