System Reliability Coordination

1  **Cognitive Terminal (R)**  Given the daily load and weather forecast, evaluate your operating strategy in accordance with the appropriate PJM manuals
   
   1.1  **Cognitive Enabler**  Identify impacts to the load forecast based on actual and forecasted weather.
   
   1.2  **Cognitive Enabler**  Identify impacts to transmission equipment operation based on the actual and forecasted weather

2  **Cognitive Terminal (R)**  Given a notification (verbal or electronically) of a problem with BES equipment, determine the appropriate actions and notifications required in accordance with PJM manuals
   
   2.1  **Cognitive Enabler**  Identify when adjustment of transmission facility operating limits are required and notify PJM.

3  **Cognitive Terminal (R)**  Given a reactive resource within PJM, support its operation, reporting and testing in accordance with PJM manuals
   
   3.1  **Cognitive Enabler**  Evaluate changes in Generator Reactive Output/Capability
   
   3.2  **Cognitive Enabler**  Validate and report changes in the status of Capacitors/ Reactors/ SVC’s/ LTC’s
   
   3.4  **Cognitive Enabler**  Complete switching of capacitors and reactors for voltage control
   
   3.5  **Cognitive Enabler**  Complete adjustment of PARS & LTCS and other system equipment as needed
   
   3.6  **Cognitive Enabler**  Support the required reactive testing of units to verify unit capability

4  **Cognitive Terminal (R)**  When given a Directive, respond in accordance with PJM manuals
   
   4.1  **Cognitive Enabler**  Identify what PJM currently considers a Directive
   
   4.2  **Cognitive Enabler**  Identify company member responsibilities once PJM has issued a Directive

5  **Cognitive Terminal (R)**  Given a monitored facility, ensure actual and post contingency parameters are within established limits and initiate corrective action as directed by PJM in accordance with PJM manuals
   
   5.1  **Cognitive Enabler**  Determine if actual operational parameters (MW/MVAR flows, voltages, etc) are within established limits and initiate corrective actions if necessary
   
   5.2  **Cognitive Enabler**  Determine if simulated post contingency operational parameters (MW/MVAR flows, voltages, etc) are within established operating criteria and initiate corrective actions if necessary

6  **Cognitive Terminal (R)**  Given a request for PJM operational information, respond in accordance with PJM manuals
   
   6.1  **Cognitive Enabler**  Validate and submit Reactive Reserve Check (RRC) data
   
   6.2  **Cognitive Enabler**  Compile and submit Supplementary Status Report (SSR)
Emergency Operations

7 Cognitive Terminal (R)  Given a capacity emergency, respond to Emergency Procedures in accordance with PJM manuals

   7.1  Cognitive Enabler  Respond to a PJM issued Alert and take the appropriate action

   7.2  Cognitive Enabler  Respond to a PJM issued Warning and take the appropriate action

   7.3  Cognitive Enabler  Respond to a PJM issued Action and take the appropriate action

7.4 Cognitive Terminal (R)  Given a Voltage Emergency, respond to Emergency Procedures and take appropriate action in accordance with PJM manuals

   7.4.1  Cognitive Enabler  Respond to a PJM issued Low Voltage Alert and take the appropriate action

   7.4.2  Cognitive Enabler  Respond to a PJM issued Heavy Load Voltage Schedule Warning and take the appropriate action

   7.4.3  Cognitive Enabler  Respond to a PJM issued Heavy Load Voltage Schedule Action and take the appropriate action

   7.4.4  Cognitive Enabler  Respond to a PJM issued High System Voltage Message and take the appropriate action

9 Cognitive Terminal (R)  Given the need for conservative operations, respond to PJM instructions and take appropriate action in accordance with PJM manuals

   9.1  Cognitive Enabler  Identify the triggers that would prompt PJM to adopt conservative operations

   9.2  Cognitive Enabler  Respond to PJM adopting conservative operations

10 Cognitive Terminal (R)  Given the requirement to have a back-up control center, maintain and test it in accordance with NERC standards, and PJM manuals

   10.1  Cognitive Enabler  Identify the requirements for annual testing of back-up control centers to practice implementation and verify operational effectiveness

11 Cognitive Terminal (R)  Given a restoration condition, operate in accordance with the established restoration procedures and the appropriate PJM manuals.

   11.1  Cognitive Enabler  Direct the operation of a blackstart generating unit

   11.2  Cognitive Enabler  Determine method of restoration process based on conditions

   11.3  Cognitive Enabler  Explain when it would be necessary to facilitate restoration of power to Priority 1 Critical Loads

   11.4  Cognitive Enabler  Explain how to coordinate and direct sources of cranking power to Critical Steam Units

   11.5  Cognitive Enabler  Explain how to coordinate load pick up to maintain frequency and voltage during system restoration

   11.6  Cognitive Enabler  Explain how to maintain adequate synchronous and dynamic reserves

   11.7  Cognitive Enabler  Identify minimum source requirements to safely energize the EHV transmission system
Objective Hierarchy
Transmission Owner

11.8 **Performance Enabler** Demonstrate how to coordinate the synchronization of islands to neighboring systems

11.9 **Performance Enabler** Demonstrate how to coordinate frequency and tie line control with interconnected systems

11.10 **Cognitive Enabler** Identify when to transfer control back to PJM at a certain stage of the restoration process

11.11 **Cognitive Enabler** Interpret and monitor frequency signal across your system during the restoration process

**Ops Planning, Scheduling, & Reporting**

12 **Cognitive Terminal (R)** Given an equipment outage request, ensure that all appropriate information is conveyed in accordance with the appropriate PJM manuals

12.1 **Cognitive Enabler** Explain how to communicate a transmission equipment outage request to PJM

12.2 **Cognitive Enabler** Explain how to modify outage requests with PJM

12.3 **Cognitive Enabler** Coordinate operations with neighboring systems and PJM

12.4 **Cognitive Enabler** Given an equipment outage request, model the outages in network study program and analyze results in accordance with the appropriate PJM manuals

13 **Cognitive Terminal** Given an event or occurrence which has mandatory reporting requirements, make those notifications in accordance with NERC Standards and the appropriate PJM manuals

13.1 **Cognitive Enabler** Determine when completion of the OE-417 report for an incident and/or disturbance is required

13.2 **Cognitive Enabler** Explain how to complete the OE-417 report for an incident and/or disturbance and forward to the DOE, NERC & the RFC within the established timeframes

13.3 **Cognitive Enabler** Determine when completion of the NERC Interconnection Reliability Operating Limit and Preliminary Disturbance Report is required

13.4 **Cognitive Enabler** Explain how to complete the NERC Interconnection Reliability Operating Limit and Preliminary Disturbance Report form within the established timeframes

13.5 **Cognitive Terminal** Given a critical asset, monitor, recognize and report actual or suspected incidents in accordance with NERC CIP Standards, company procedures and the appropriate PJM manuals

**Computer / Telecommunications**

14 **Cognitive Terminal (R)** Given operating control systems & data exchange requirements, evaluate the integrity of the data in accordance with the appropriate PJM manuals

14.1 **Cognitive Enabler** Recognize and correct any inaccuracies in data reported via EMS

15 **Cognitive Terminal (R)** Given telecommunication requirements, ensure appropriate equipment is available and functional in accordance with the appropriate PJM manuals.

15.1 **Cognitive Enabler** Explain the back-up satellite phone testing process and requirements
15.2 Cognitive Enabler  Explain the process of coordinating outages of telemetry and communication equipment with PJM (RTUs, datalinks, etc.)

15.3 Cognitive Enabler  Explain the function and use of the PJM All-Call System

16 Cognitive Terminal (R)  Given the need for communication, ensure that the exchange is made in accordance with the appropriate NERC Standards and PJM manuals

   16.1 Cognitive Enabler  Respond to a PJM All-Call message for Operational, Scheduling and/or Emergency situations

   16.2 Cognitive Enabler  Demonstrate use of 3-part communication in real-time operational messages and/or instructions

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