



**System Operator - Transmission  
Certification Examination Content Outline -2009**

**I. System Reliability Coordination: 40 items** (Recall: 16, Application: 24, Analysis: 0)

1. Analyze weather to determine impact on:
  - a) load forecast.
  - b) transmission outages.
2. Monitor and respond to plant alarms/limits.
3. Support reactive testing of units.
4. Monitor frequency.
5. Evaluate frequency.
6. Monitor Area Control Error (ACE).
7. Evaluate Area Control Error (ACE).
8. Monitor and respond to PJM All-Call.
9. Coordinate unit reactive output.
10. Maintain generator voltage schedule.
11. Maintain transmission voltage schedule.
12. Adjust reactive output which can include SCADA or other electronic applications/software.
13. Model system outages in security analysis program and analyze results.
14. Coordinate real-time operations with neighboring systems as needed.
15. Determine if actual flows are within established limits, and initiate corrective action if necessary.
16. Determine if actual voltages are within established limits, and initiate corrective action if necessary.
17. Determine if reactive transfer interface flows and other IROL's are within established limits, and initiate corrective action if necessary.
18. Determine if simulated post-contingency:
  - a) flows are within established operating criteria, and initiate corrective action if necessary.
  - b) voltages are within established operating criteria, and initiate corrective action if necessary.
19. Monitor and respond to substation equipment, line alarms, and dispatch personnel if needed.
20. Monitor weather and ensure that proper temperature set is reflected in limits.
21. Analyze and respond to relay action and other system disturbances if necessary.
22. Perform routine switching on transmission system via SCADA.
23. Perform emergency switching on transmission system via SCADA.
24. Coordinate the switching and tagging of equipment with field personnel.
25. Direct the switching and tagging of equipment with field personnel.
26. Issue clearance on equipment blocked for work.
27. Switch capacitors and reactors for voltage control and system security.

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28. Perform adjustments to system equipment (e.g., PARS, LTC's).
  29. Monitor access to control room.
  30. Utilize three-part communications in real time operational messages.
  31. Ensure proper information transfer during shift turnover.
  32. Monitor regional system loads.

## **II. Emergency Operations: 35 items** (Recall: 7, Application: 7, Analysis: 21)

1. Initiate emergency procedures.
2. Respond to emergency procedures.
3. Respond to Post-Contingency Local Load Relief Warning (PCLLRW).
4. Initiate Post-Contingency Local Load Relief Warning (PCLLRW).
5. Perform manual load shedding.
6. Perform voltage reduction.
7. Implement back-up control center recovery plan.
8. Test and operate from back-up control center.
9. Implement NERC Emergency Alert Levels (e.g., EEA, TEA, SEA).
10. Respond to NERC Emergency Alert Levels (e.g., EEA, TEA, SEA).
11. Issue or respond to Heavy Load Voltage Schedule.
12. Respond to PJM issued Alerts, Warnings, and Actions.
13. Conduct all procedures related to:
  - a) capacity shortages.
  - b) light load conditions.
  - c) related to conservative operations (e.g., solar magnetic disturbances (SMDs), contingencies, actuals, thermal, reactive).
  - d) severe weather.
14. Monitor and report suspected or actual physical or cyber attacks.
15. Ascertain system status after disturbance.
16. Determine method of restoration process.
17. Disseminate information on system status.
18. Isolate any damaged equipment for prioritization and repair.
19. Implement restoration procedures.
20. Direct the operation of blackstart generating units.
21. Facilitate restoration of station light and power to critical facilities.
22. Coordinate and direct sources of cranking power to generating stations.
23. Coordinate load pick up to maintain frequency and voltage within parameters during system restoration.
24. Maintain adequate synchronous and dynamic reserves so islands can withstand largest energy contingency.
25. Observe minimum source requirements to safely energize the EHV transmission system.
26. Coordinate the synchronization of:
  - a) islands.
  - b) islands to neighboring systems.
27. Coordinate frequency and tie-line control with interconnected systems.
28. Transfer system control back to PJM when at proper stage of restoration process.

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### **III. Operations Planning and Scheduling: 5 items** (Recall: 1, Application: 3, Analysis: 1)

1. Take requests from field personnel for generation outages.
2. Analyze and prepare generation switching and tagging procedures to block equipment.
3. Coordinate requests from field personnel for transmission/substation outages.
4. Coordinate planning of transmission outages with engineering, field personnel, neighboring companies, and PJM if applicable (eDART).
5. Analyze and prepare transmission switching and tagging procedures to block equipment.

### **IV. Computer/Telecommunication Systems: 5 items** (Recall: 1, Application: 3, Analysis: 1)

1. Evaluate performance of computer systems (e.g., EMS, GMS, SCADA, Security Analysis Program).
2. Verify the integrity of data links, and quality of data.
3. Operate telecommunications equipment (e.g., phone systems, radio system, satellite phone).
4. Operate computer systems (e.g., EMS, SCADA, PC's).
5. Coordinate outages of Telemetry and Communication equipment (i.e., Phones, RTUs, Datalinks) with PJM.

### **V. Reporting: 5 items** (Recall: 2, Application: 3, Analysis: 0)

1. Validate and report Reactive Reserve Check (RRC) data.
2. Report to management and key personnel important system information/developments while observing communication protocols.
3. Report required system information/developments to governmental agencies.
4. Document system events and conditions via written/electronic logs and/or reports.
5. Report line and equipment availability/outage status both orally and electronically.
6. Monitor PJM and Reliability Coordinator Information System (RCIS) websites for constraints and other data that could affect interchange.
7. Compile and submit Supplemental Status Report (SSR).
8. Report changes in transmission equipment ratings to PJM.

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