Balancing and Interchange Operator

Certification Examination Content Outline 2012

I. Resource and Demand Balancing (20%)

20 items *(Recall - 8, Application - 12, Analysis - 0)*

1. Adjust or re-dispatch generation to implement proposed transmission system/equipment outages.
2. Adjust generation and interchange schedules to ensure adequate reserves and regulating margins are maintained.
3. Suspend Automatic Generation Control when required.
4. Dispatch reserves when requested by a member of the Reserve Sharing Group.
5. Inform RC of generation limitation.
6. Take action to ensure dynamic schedules are within prescheduled limits.
7. Take action to minimize inadvertent interchange.
8. Monitor internal loads and adjust generation as needed.
9. Operate Automatic Generation Control (AGC) equipment and validate against all tie line data that affects AGC.
10. Provide notifications of generating unit status following a forced outage.
11. Monitor that AGC and other vital control performance equipment are functioning properly when using back-up data input sources.
12. Monitor the adequacy of resource plans to meet obligations.
13. Monitor AGC to ensure compliance with NERC CPS1 and CPS2 standards.
14. Select proper mode of automatic generation control for system conditions.
15. Manually calculate ACE.
16. Initiate manual control of generation, and maintain scheduled interchange following an AGC system component failure.
17. Adjust both short-term and future forecasts using actual load data and correction factors.

II. Emergency Preparedness and Operations (33%)

33 items *(Recall - 7, Application - 20, Analysis - 6)*

1. Analyze bulk system disturbances.
2. Analyze forced equipment outages.
3. Take action to permit re-synchronizing and re-connecting to the Interconnection.
4. Coordinate emergency actions with affected systems.
5. Coordinate restoration activities with affected entities.
6. Coordinate the re-synchronization of transmission at preplanned locations.
7. Coordinate voltage reduction as requested or directed.
8. Develop and execute corrective actions when equipment ratings or operating limits are exceeded.

9. Declare a system emergency.
10. Determine the need for manual load shedding to prevent imminent separation from the Interconnection, voltage collapse, or other adverse consequence.
11. Implement a plan for restoring the system to a safe operating condition following a forced outage.
12. Direct actions to return the system to a secure state following a major system disturbance.
13. Request a NERC Energy Emergency Alert.
14. Maintain adequate protective relaying during all phases of the system restoration.
15. Evaluate requests for emergency removal of equipment.
16. Take action to minimize cascading outages.
17. Take appropriate measures due to loss of control center functionality.
18. Request emergency assistance from neighboring systems for maintaining system reliability.
19. Report disturbances to NERC and the DOE following established guidelines.
20. Reestablish required operating reserve levels as soon as possible following a contingency that results in operating reserve usage.
21. Respond to system emergencies and frequency deviations to meet local, regional, and NERC DCS requirements.
22. Prepare for a capacity emergency by:
    a. bringing on all available generation
    b. postponing equipment maintenance
    c. scheduling emergency energy purchases
23. Maintain system connectivity to the interconnection to maximize reliability.
24. Take action to protect the system if reliability becomes endangered by remaining interconnected.
25. Report any disturbances or unusual occurrences, suspected or determined to be caused by sabotage to the appropriate systems, governmental agencies, and regulatory bodies.
26. Following a partial or total system shutdown:
    a. implement the appropriate provisions and procedures of the system's restoration plan in a coordinated manner with adjacent systems
    b. arrange for start-up and/or emergency power for generation units as required
    c. arrange for and utilize emergency (backup) telecommunications facilities as required
    d. restore the integrity of the Interconnection as soon as possible
27. Monitor and periodically test normal and emergency telecommunication systems to ensure that communications are adequate and continuous.
28. Identify and take action when partial or full system islanding occurs.
29. Identify and take actions when a partial or full system voltage collapse occurs.
30. Utilize operating reserves to assist recovery of system frequency.
31. Obtain resources to restore system frequency.
32. Formulate a plan to implement corrective actions when an operating reliability limit violation is anticipated.

III. Systems Operations (35%)

35 items *(Recall - 14, Application - 21, Analysis - 0)*

1. Analyze generating unit outage requests to ensure system reliability.
2. Analyze transmission facility outage requests to ensure system reliability.
3. Analyze and respond to SCADA inputs (e.g., system voltage, line loading, and system alarms etc.).
4. Analyze the impact of protection equipment outages on system reliability.
5. Approve/deny system voltage regulating equipment outages.
6. Ensure special protective systems and remedial action schemes are enabled when needed for system reliability.
7. Communicate planned equipment outages to affected entities and RC's.
8. Communicate forced outages and unusual system events to affected entities and RC's.
9. Comply with RC directives.
10. Coordinate the response to forced outages to ensure system reliability.
11. Coordinate next-day study model changes with RC Area BAs.
12. Coordinate planned transmission and generation outages with all impacted systems for system reliability.
13. Coordinate Reliability must run unit requirements.
14. Coordinate switching with affected systems.
15. Coordinate with adjacent BA on outage of tie line metering.
16. Develop a contingency plan responding to equipment outages.
17. Monitor regional reactive reserve availability, including dynamic resources.
18. Monitor generating unit outputs during normal and abnormal conditions.
19. Develop operating plans based on the results of a contingency analysis.
20. Direct the energizing of new facilities.
21. Communicate equipment loading issues with Reliability Coordinator.
22. Monitor system conditions to determine actual or potential threats to system reliability.
23. Evaluate the impact of current and forecast weather conditions on system operations.
24. Respond to conditions that may lead to voltage collapse.
25. Initiate hotline calls as appropriate to share reliability information.
26. Maintain constant communications with all affected areas to ensure reliable and secure operation of the bulk electric system.
27. Monitor actual or contingent system operating limit violations and respond as required.
28. Take action in response to alarms from special protective schemes.
29. Monitor and respond to telecommunication alarms or failures.
30. Monitor Interconnection frequency and investigate causes of unexpected deviations.
31. Monitor and maintain defined voltage profiles/limits to ensure system reliability.
32. Re-dispatch generation as directed by the RC.
33. Direct generation re-dispatch to ensure transmission reliability limits are not violated.
34. Restore dynamic reactive reserves as soon as possible after use.
35. Provide notifications for computer system hardware and software failure.

36. Respond to light load conditions.
37. Schedule system telecommunications, telemetering, protection, and control equipment outages to ensure system reliability.
38. Monitor the status and availability of generator voltage regulators and/or power system stabilizers, and respond as required to deficiencies that may impact system reliability.
39. Utilize reactive resources from transmission and generator owners to maintain acceptable voltage profiles.

IV. Interchange Scheduling and Coordination (12%)

12 items *(Recall - 5, Application - 7, Analysis - 0)*

1. Calculate inadvertent interchange.
2. Coordinate with adjacent entity as to actual and scheduled interchange values.
3. Perform checkout of daily and hourly scheduled and actual interchange.
4. Enter interchange schedule into the AGC system.
5. Take action to minimize the impact of interchange schedules across constrained interfaces.
6. Monitor tagging system for new, revised, and adjusted interchange transaction.
7. Ensure the accuracy of hourly tie line readings.
8. Manually enter schedule interchange value due to system failure.
9. Manually enter telemetered tie line data due to signal failure with tie point.
10. Monitor ramping capability for requested interchange schedules.
11. Manually calculate net interchange
12. Monitor status of NERC interchange transaction tags to ensure timely approval and implementation.
13. Protect the confidentiality of all interchange transaction information.
14. Curtail tags for reliability.
15. Ensure that the ramp rate, start and end times, energy profile, and losses are communicated to all parties in the transaction.
16. Reestablish curtailed interchange transactions with affected balancing authorities or transmission operators.