NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

NPCC - Lesson Learned

Area Control Error Event

Primary Interest Groups
Reliability Coordinator (RC)
Transmission Operator (TOP)
Transmission Owner (TO)
Balancing Authority (BA)
Reserve Sharing Group (RSG)
Generator Owner (GO)
Generator operator (GOP)

Problem Statement
Following the simultaneous trip of two generating units due to the loss of gas supply, the Area Control Error (ACE) failed to return to its pre-disturbance value within the required 15 minutes.

Details
The primary finding was that a number of generation resources either did not respond to the System Operator's electronic dispatch instructions, or they underperformed in meeting their share of the ten-minute reserve requirement based on their submitted parameters. The under- performance was observed with both off-line (non-spinning) and on-line (spinning) resources.

A secondary finding was that, coincident with the conclusion of the 15 minute Disturbance Control Standard (DCS) period, the System Operator issued an economic (non-emergency) electronic dispatch instruction. This had the effect of dispatching down, or halting some of the on-line units ramping up, and instead, dispatched additional non fast-start units to come on-line. This electronic dispatch instruction delayed the ACE recovery to its pre-disturbance value.

Corrective Actions

- Increased Ten-Minute Operating Reserve "reserve bias" by 10% (equivalent to 110% of the first contingency loss total Ten-Minute Operating Reserves).
- Increased the minimum Ten-Minute Spinning Reserve requirement from 25% to 50% of the first contingency. In conjunction with the increase in the reserve bias to 110% this will actually result in the minimum Ten-Minute Spinning Reserve being 55% of the first contingency.
- Required the System Operators to maintain a mix of Shared Activation of Reserves (SAR) and non-performance factor (the amount of reserves called on in addition to the source loss

assuming less than 100% performance of requested resources) of at least 140% of First Contingency Loss. Meaning, that for a loss of 1,000 MW, a call of 1,400 MW of reserves from internal and external resources would be made.

- Issued guidance to the System Operators to only approve an "economic" electronic dispatch solution, following an "emergency" electronic dispatch solution, when the contingency has been resolved.

Lesson Learned

System Dispatch

- BAs should periodically audit the response rates of all generation that provide operating reserves and not be over reliant on a few large, fast-start generators.
- For BAs utilizing security-constrained economic dispatch, the System Operator should be aware that executing an economic dispatch case during the recovery of the ACE may dispatch some generators down slowing the ACE recovery.
- BAs and RSGs should monitor their individual (or group) ACE to ensure they are on track to meet the 15 minute disturbance recovery period.

Utilization of Electronic Dispatch Equipment

- BAs should have information readily available on displays identifying which GOPs have not acknowledged electronic dispatch instructions (e.g., start-up, emergency) so as to increase awareness of operations in field.
- RSGs should receive some acknowledgment that the BAs have implemented their appropriate portion of Contingency Reserves.
- BAs should establish requirements for how electronic dispatch instructions will appear on GOP displays.

The Establishment of Regional Operating Procedures

- All GOP personnel operating units in a market should conduct training on operating in accordance with BA operating procedures.
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For more Information please contact:

NERC – Lessons Learned (via email)	John G. Mosier (via email) or (212) 840-1070
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