



Zone 3 - 2012 study results

Refer to Table ZS-1 and Figure ZS-9

Summary of key findings

- Short term operation procedures are required to address the Fitchburg-Royster 69-kV line overload problems before a permanent transmission solution can be implemented,
- Maintaining reliability of service to load in and around the Madison area requires that system reactive reinforcements be implemented in the near term. Longer term, a 345-kV source on the west side of Madison will be required,
- Load growth in the Rock and Green Counties, along with the mismatch of load to generation in the area, could result in the Monroe area 69-kV network being subjected to unacceptably low voltages and thermal overloads under both normal and contingency conditions in the summer of 2011. Rebuilding the 69-kV line Y-33 from Brodhead to South Monroe will address these issues.
- Load growth in Green County, west of Rock County and south of Dane County requires one additional 69-kV source into the area. Adding the Bass Creek 138/69-kV transformation addresses a number of potential low voltage issues and transformer overloads.

In response to some single contingency low voltage problems in Zone 3, a total of 98 MVAR of capacitor banks distributed among the Femrite, Kegonsa and Spring Green substations was deemed to be the most feasible solutions in the 2011-2012 timeframe.

Studies have shown the potential for severe low voltage problems in Dane County area for the loss of certain double circuit tower outages. To address these issues in the near term, one-32.66 MVAR 138-kV Femrite capacitor bank and one-32.66 MVAR 138-kV Kegonsa capacitor bank have been installed. Also in Dane County, the Fitchburg, Cross County, Oak Ridge and Pleasant View 138-kV buses have marginal system intact voltages under certain conditions. The Femrite and Kegonsa capacitor bank projects will also improve potential system intact low voltage limitations.

The Fitchburg to Royster 69-kV line is susceptible to thermal overloads and the area experiences low voltages at Syene, Nine Springs, and Pflaum for certain single contingencies. A package of projects was proposed to address these issues. It includes upgrading the Fitchburg-Nine Springs 69-kV and Royster-Pflaum 69-kV lines, moving the AGA load to the Royster-Femrite 69-kV line and installing two 16.33 MVAR, 69-kV capacitor banks at the Nine Springs Substation in 2013. Prior to the implementation of these projects, a short-term operation procedure including potential load bridging is



10-Year Assessment

An annual report summarizing proposed additions and expansions to ensure electric system reliability.

2011

September 2011 10-Year Assessment
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available. The short-term operation procedure will be evaluated each year until the transmission projects are implemented.

ATC and the city of Madison have proposed to bury part of the two Blount-Ruskin 69-kV overhead lines underground. This project was completed in 2011.

Load growth in the Rock and Green Counties, along with the mismatch of load to generation in the area, will result in unacceptably low voltages in the Monroe area. Under several single contingency conditions, thermal overloads also arise on the Y-33 69-kV line sections Brodhead-Spring Grove-Blacksmith-South Monroe. The planned solution to address these issues is to rebuild the Brodhead-South Monroe 69-kV line (Y-33) using 138-kV construction standards and initially operate the line at 69-kV.

The Evansville and Brodhead areas are facing unacceptably low voltages under single contingency conditions. A 138/69-kV transformer at Bass Creek and the Townline Road–Bass Creek 138-kV line uprate have been put in service in 2011 to address these problems and provide an additional 69-kV source into Green and Rock Counties. These projects will also allow the delay of a new Brooklyn to Evansville 69-kV line project outside of ATC's 10-year planning horizon.

We currently mitigate several of the identified 138-kV low voltages through remote control of the 138/69-kV transformers in the affected areas. In certain instances, transformer load tap changers are adjusted to bring the 138-kV contingency voltages above the planning criteria limits while maintaining the 69-kV bus voltages above criteria limits. This is a balancing act, and as loads continue to grow the process will no longer be effective.

No performance limits were exceeded for Category A conditions for all 2012 analysis except the high voltage at Darlington 138-kV bus in the 2012 minimum load model. The Darlington high voltage issue can be addressed by adjusting the North Monroe 138/69-kV transformer LTC settings.