



Zone 2 - 2009 study results

Refer to [Table ZS-1](#) and [Figure ZS-5](#)

Summary of key findings

- ❑ Low voltages for many critical outages in Zone 2 may be adequately addressed with capacitor bank installations or distribution power factor correction, and the addition of the Cranberry-Conover-Plains line project in 2010.
- ❑ Potential load additions in Delta County may necessitate the need for several thermal upgrades.

First contingency overloads of one Atlantic-Osceola 69-kV line, for the loss of the parallel Atlantic-Osceola 69-kV line, were observed in the 2009 study. One of the lines was rebuilt in 2008 to address existing condition issues. Clearances are also being increased on the Mass-Winona-Atlantic and M38-Atlantic 69-kV lines in the 2008-2009 timeframe.

Various first-contingency outages are expected to result in voltages less than 90 percent of nominal at the Munising, Roberts, Osceola and L'Anse 69-kV buses. To address first-contingency low voltages elsewhere in Zone 2, 138-kV capacitor bank additions are needed at the M38, Hiawatha and Perkins Substations in the 2009-2010 timeframe. The M38 capacitor bank is new to this Assessment due to higher load forecasts in the western U.P.

An approved Transmission Service Request for 35 MW from the White Pine Mine in 2008 was modeled in the 2009 study case, including the uprates of numerous 69-kV lines in that area to accommodate that service. The studies showed that the addition of this generation in the northwestern portion of the U.P. provided an additional voltage profile benefit due to the reduced level of import to this portion of the system.

Two transmission lines were identified to be limiting elements under specific shoulder peak conditions by 2009. As a result, uprates of the Empire-Forsyth 138-kV and Chandler-Cornell 69-kV lines will be completed in the 2008-2009 timeframe.

Due to age and condition issues associated with the existing facilities, the Cedar Substation is currently being rebuilt and relocated. The new Cedar Substation, renamed North Lake, will also address reliability issues in the north central Upper Peninsula.

The construction of a ring bus at Pine River and associated capacitor bank upgrades in 2009 will bolster the voltage in the Eastern Upper Peninsula under normal and single contingency conditions to acceptable levels until additional reinforcements can be implemented in the area.



In response to customer requests for new distribution interconnections, the Atlantic and M38 138/69-kV transformers will be updated in 2009.

Projects whose "Need date" doesn't match the "In-service date"

- Uprate the Delta-North Bluff 69-kV line summer normal and emergency ratings from 120 to 167 degrees F
- Uprate the North Bluff-Gladstone 69-kV line summer normal and emergency ratings from 120 to 167 degrees F
- Uprate the Masonville-Gladstone 69-kV line summer normal and emergency ratings from 120 to 167 degrees F
- Uprate the Chandler-Masonville 69-kV line summer normal and emergency ratings from 120 to 167 degrees F
- Uprate the Chandler-Delta #1 69-kV line summer emergency rating from 120 to 167 degrees F
- Uprate the Chandler-Delta #2 69-kV line summer emergency rating to from 120 to 167 degrees F

New to this Assessment and as a result of a potential load increase in Delta County, potential thermal overloads were discovered on the above six lines under single-contingency conditions. LIDAR surveys and ratings reviews on these lines will be done to determine the scope of these projects. ATC Planning will work with Project Management to determine the ultimate in-service dates of these line uprates. This will also depend upon whether there will be additional load that requires transmission service. Until transmission service is needed and can be provided, generation redispatch will be used to avert overloads.

- Uprate the Straits-Pine River ESE_6904 69-kV line ratings to 35/50 MVA summer normal/summer emergency
- Uprate the Straits-Pine River 6905 69-kV line ratings to 35/50 MVA summer normal/summer emergency

New in this Assessment, thermal overloads were discovered on the above two lines under single-contingency conditions. LIDAR surveys and ratings reviews on these lines will be done to determine the scope of these projects. ATC Planning will work with Project Management to determine the ultimate in-service dates of these line uprates. These overloads were observed in the 2008 Assessment due to projected low hydroelectric generation in the eastern U.P. which was modeled in the study cases. Dispatching local diesel generation or a return to normal hydro levels would mitigate these potential overloads.

Projects whose "Need" and "In-service" dates are to be determined



10-Year Assessment

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

2008

September 2008 10-Year Assessment
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- ❑ Convert Indian Lake-Hiawatha 69-kV line to double-circuit 138-kV operation, construct new Hiawatha 138-kV Substation
- ❑ Upgrade overhead portions of Straits-McGulpin 138-kV circuits #1 & #3 to 230 F degree summer emergency ratings

The above projects require further study to determine when and if the project(s) should be implemented.