

Executive Summary

The development of a new generating facility has been proposed by a developer; this facility will be located in northeastern Minnesota within the Iron Range. The first phase of the G477 project is currently planned to become operational in the spring of 2010 and to consist of three generating units with an expected net output of 531 MW during the summer. This project, MISO project number G477, is proposed as an IGCC facility with two combustion turbines and one steam turbine. The developer has proposed to connect the facility to the Forbes Substation with the construction of 40 miles of a new 345-kV transmission line and the installation of a 600-MVA 345/230-kV transformer at the Forbes Substation.

In the MISO process of generator interconnection, an Energy Resource (ER) request has to mitigate only the thermal injection overloads identified in the steady state analysis. Although the customer requested Network Resource (NR) interconnection service for G477, it was treated as ER for the purpose of this study. Additional deliverability analysis is required to evaluate if G477 can be certified as NR. As the Midwest ISO reaches the point in the queue process where the generator deliverability analysis can be performed for any generator requesting Network Resource Integration Service, additional generator deliverability studies will be performed at that time.

The purpose of this interconnection feasibility study is to identify potential adverse impacts that G477 will have on the transmission system. In this analysis, steady state performance was evaluated for various system intact and contingency conditions that could affect the outlet capability at Forbes Station in particular and the surrounding transmission system in general. The proposed use of the output of G477 is to displace other generation for Xcel Energy; for this study, the displaced generation was from the Blue Lake and High Bridge generating facilities.

The initial efforts in this steady state analysis considered the system with all facilities in service. With the addition of G477, there is one circuit that would become overloaded, the 115-kV circuit between Silver Bay and Waldo. In addition, there are several other 115-kV circuits that would be more overloaded, although with TDFs under 2%, due to the operation of G477 with all facilities in operation.

The transmission elements that would be adversely impacted by G477 under base case conditions are summarized in Table ES-1.