

## INTEROFFICE CORRESPONDENCE

**To:** Robert Perea  
**From:** Lewis Thomas  
**Subject:** Serve National Enrichment Facility near Eunice *64MW*  
**Date:** January 14, 2005  
**Cc:** John Fulton, Frank Trujillo, Scott Davis, Brad Sparks, Jeff Stebbins, Ronnie Walker, Reader File, Study File # 50110

### Background

The purpose of this study is to evaluate the doubling of the load at National Enrichment Facility (NEF) to 64 MW. The customer has requested redundant service for this new load. The same 115 kV circuits that were used in the first study were used again to determine if the 115 kV system could serve NEF after increasing their load to 64 MW. The load studied was 64 MW with a 95% power factor. Cost estimates are not being provided in this report. The cost will vary some from the first report, but not enough to include them at this time.

### Study Methodology

The 2010 summer peak model was used to study the new addition of 64 MW on the 115 kV systems near Eunice. This model was used because it includes the improvements planned for the SPS transmission network and this project is estimated to take six to seven years before Phase I is completed. Before any additions were made to the model, a base case # 10SP(--)-50101-0000 was run using n-1 contingencies. With the system intact all equipment loading must be within their normal rating and bus voltages are within 5% of their nominal voltage. During n-1 contingencies the equipment loading must be within their emergency rating and the bus voltages are not lower than 10% of nominal after voltage regulation has occurred. The new load was added to the model (case # 10SP(--)-50110-0064 using 95% power factor; case # 10SP(CAPS)-50110-0064 added 1-28.8 MVAR capacitor bank; and case # 10SP(2-CAPS)-50110-0064 added 2-28.8 MVAR capacitor banks. These three cases were compared to the base case. Adding the two 28.8 MVAR capacitor banks with the new load of 64 MW corrected the voltage violations. There are not any overloads associated with this project.

### Considerations and Assumptions

In the 2010 summer peak base case model, there are not any violations in the area where this new load is being added. After the load is added, there are voltage violations. This can be corrected by adding two 28.8 MVAR capacitor banks at the new NEF substation. If the power factor changes from the 95% used in this study, it could alter how much compensation is

required. The customer has requested the 115 kV line be protected by a sensitive high-speed line differential fault detection equipment for both phase and ground faults and work with Xcel Energy to minimize disruptions during reclosing. Also, the customer wants the distribution transformers equipped with sensitive high-speed differential fault detection equipment.

#### **Study Results**

There are no overloads on the 115 kV lines serving the new NEF substation. During n-1 contingencies, the most these lines are loaded is about 75%, which leaves 38 MW available. The construction of the two 115 kV lines are estimated to be 11.6 miles and 11.2 miles respectively. These distances may vary after the ROW has been acquired and purchased. These 115 kV lines would expand the existing 115 kV loop system providing redundant service. This 115 kV system can provide service to a load of 84 MW.

#### **Conclusion**

Serving this customer with redundant service to the NEF Substation is very realistic. There are not any problems serving this customer during n-1 contingencies except for the voltage violations, which are corrected with capacitor banks on the 115 kV systems. The customer needs to check to determine if the capacitor banks at the substation will cause them any problems with their harmonics (Highly Confidential).