Transmission Customer Q&A
Updated July 16, 2008

Question:

Regarding the Chanarambie 115/34.5 kV substation, please provide the following information:

1. The MISO Group 5 System Impact Study indicates that following the connection of the Group 5 projects, the three "existing" 120 MVA Chanarambie transformers are subject to post-contingent overload: outage of any one transformer overloads the remaining two units to beyond their 120 MVA ratings.
    a. Is it correct that the three Chanarambie transformers will be interconnected, so that the overload cited by MISO will actually be possible, or is it instead the case that the planned build-out at Chanarambie consists of four transformers, installed in two pairs, with no interconnection between the two pairs?
    b. Is it correct that the emergency rating of the Chanarambie transformers is 120 MVA, the same as their continuous rating?
    c. When the Chanarambie transformers were purchased, did the specification state a required overload capability?
    d. The Chanarambie transformers were specified to be equivalent units to the existing transformers at Buffalo Ridge Substation. This suggests that the Buffalo Ridge transformers also have an emergency rating of only 120 MVA. If this be true, and considering that there is a total of over 230 MW of generation connected to the Buffalo Ridge 34.5 kV buses, it is evident that for an N-1 condition similar to that being tested by MISO at Chanarambie, the remaining Buffalo Ridge transformer can be subject to loadings of over 190% of its emergency rating. Is this correct?
    e. If the Buffalo Ridge post-contingent transformer loadings exceed the applicable emergency rating, is there any project planned to address that loading criterion violation?

2. At the kick-off meeting for the G-621 Facilities Study, it was stated that the "fourth Chanarambie transformer" which G-621 (a 20 MW request) would need to sponsor would be a 120 MVA unit. The rationale stated was that this would match the existing transformers, and in any case, there is no alternate size available, because 120 MVA is Xcel Energy's only "standard" transformer size for this application. Please explain how this can be, given that the initial Chanarambie transformers #1 and #2 were 28 MVA units.
3. Xcel Energy has previously stated that replacing the existing 120 MVA transformers with larger units is not an option (though other existing and planned installations elsewhere use 160 or 167 MVA units) because of concerns regarding "excessive fault current level" on the 34 kV buses. Please provide information on what Xcel Energy considers "excessive fault current levels" and what the basis is for selection of that criterion. For example, is there a limit of 30,000 amps, and is that limit based on the rating of the circuit breakers installed in Xcel's substation, or is it based on the presumed rating of the Interconnection Customer's equipment?

Answer: The MISO group 5 study Chanarambie transformer outage is not a valid contingency and is a result of the 34.5 kV configuration not represented in the MISO model. There is no bus tie between Chanarambie # 4 transformer and Chanarambie Number 1&2 transformers. Chanarambie # 3 transformer is not presently scheduled to go in service as it is assigned to a large group 5 interconnection request that is in suspension. Chanarambie Number # 4 transformer will be in–service by the end of the year. The remaining Group 5 Interconnections at Chanarambie will be interconnected to this transformer.

There are no Network facility charges for the Chanarambie #4 transformer for G 621 as the transformer is required due to pre RECB cost allocation interconnection agreements.

NSP's standard network facility collector station transformer is 120 MVA. A 120 MVA transformer presently has a normal rating of 120 MVA and a planning emergency rating of 160 MVA.