

Form for Selection of Transmission Analysis-Identified Projects for Non-Transmission Alternative Evaluation

Identity of the proposed upgrade (description or project number):

Addition of two 60 MVAR shunt reactors at the Coolidge 345 kV substation, one 60 MVAR shunt reactor at the New Haven 345 kV substation, and relocation of the existing 60 MVAR shunt reactor from the New Haven 345 kV substation to the Vernon 345 kV substation

1. Is the proposed project's cost expected to exceed \$2,000,000? (See note.)

Yes

If so, check "Yes" and continue to question 2; otherwise, check "No" and discontinue the alternative analysis screening.

2. Could elimination or deferral of all or part of the upgrade be accomplished through the use of non-transmission alternatives? (See note.)

...q

No...q

If so, check "Yes" and continue to question 3; otherwise, check "No" and discontinue the alternative analysis screening.

Non-transmission alternatives are not technically viable solutions to address steady state voltage concerns, particularly the high voltage concerns addressed by the shunt reactors.

Adjusting electrical demand is a less effective method of adjusting reactive loading, and is inconsistent with engineering principles. In the case of this specific project, load reductions will aggravate the high voltages.

The shunt reactors provide a reactive range of 0 MVAR to 240 MVAR. Assuming a generator, with a typical 0.95 power factor, is installed to provide that capability, the generator would have to be sized at approximately 700 MW. Such a generator or set of generators is not a feasible option. Synchronous condensers of the same size as the proposed shunt reactors can provide reactive support without serving electrical demand, i.e. no mechanical energy applied to the generator through a prime mover. However, synchronous condensers are transmission alternatives and they are considered only when shunt devices are insufficient to resolve the voltage concerns. Synchronous condensers are more costly, more difficult to operate, and require more maintenance than shunt devices.

Running generators for the sole purpose of controlling voltage is undesirable. Power factor compensation is more reasonably accomplished by installing shunt devices, such as capacitor banks or shunt reactors, which effectively inject or absorb reactive power associated with power flows. When there is no need to run generators to serve electrical demand, generators are kept out of service for many reasons that include avoiding burning fuel, which is costly and environmentally harmful. During one previous generator maintenance season, system voltages increased above acceptable levels. As a result, ISO-NE dispatched available generators for the sole purpose of reducing system voltages. Since these generators would have otherwise remained out of service, the cost associated with running these generators was charged to the affected regions, which included Vermont. Our impression is that this charge was received disapprovingly by the VT utilities.

3. Is the likely reduction in costs from the potential elimination or deferral of all or part of the upgrade greater than \$1,000,000? (See note.) Yes...q
No...q

If so, check "Yes" and proceed to define the scope and timing of non-transmission Alternative analysis; otherwise, check "No" and discontinue the alternative analysis screening.

This analysis performed by: Hantz A. Presume 2-1-2011 on
Name Date

Hantz A. Presume
Print Name