

BEFORE THE  
NEW YORK STATE  
PUBLIC SERVICE COMMISSION

In the Matter of the Application of Central Hudson Gas & Electric Corporation For a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law for the A and C Line Rebuild Project, Approximately 10.85 miles of 115 Kilovolt Transmission Lines in the Towns of Pleasant Valley, LaGrange, Wappinger, and East Fishkill, in Dutchess County

Case No.: 13-T-\_\_\_\_\_

CENTRAL HUDSON GAS & ELECTRIC CORPORATION  
A AND C LINE REBUILD PROJECT

EXHIBIT E-4  
ENGINEERING JUSTIFICATION

## **EXHIBIT E-4 – ENGINEERING JUSTIFICATION**

This section addresses the requirements of 16 NYCRR §88.4.

### **E-4.1 Need for the Proposed Project**

The A and C Electric Transmission Line Rebuild includes the rebuild of 10.85 miles of existing 115 kV transmission line along existing rights-of-way; minor substation modifications also are included. These lines connect the Pleasant Valley Substation in the Town of Pleasant Valley to the Todd Hill Substation in the Town of Lagrange, and the Todd Hill Substation to the Fishkill Plains Substation in the Town of East Fishkill. In addition to being the sole transmission supply for the 23.5 MWs of peak distribution load currently served from the Todd Hill Substation, the A and C Lines provide the majority of a transmission path between the Pleasant Valley and East Fishkill substations. The 345/115 kV transformers located at Pleasant Valley and East Fishkill provide the bulk power system inputs to Central Hudson's Dutchess County transmission system.

The existing 115 kV A and C Lines were installed in 1948 using 397.5 ACSR "Ibis" conductor. During 2003, several conductor samples were taken from these lines and subsequently tested by the National Electric Energy Testing, Research and Applications Center. Although this testing showed that the conductor had acceptable breaking strength, the conductor showed evidence of aluminum annealing. Such annealing can cause the conductor to lose strength and sag lower than expected, potentially resulting in National Electrical Safety Code clearance violations.

The bulk of the structures on the A and C Lines are wood, H-Frame structures that were installed in 1948. This particular type of H-Frame construction utilized "spar arms" as the crossarm members. Spar arms are a wood pole used as a horizontal crossarm instead of a sawn wood crossarm. Spar arms generally have variable strength along the length on the arm, meaning that one end of the arm is stronger than the other. This is due to the natural taper in the pole yielding a narrow end and a wider end. Since these members are wood poles in horizontal configurations, they are subject to the degradation conditions common on wood poles, such as checking and cracking. Unlike poles used in vertical configurations (standard embedded wood poles) where checking and cracking does not accumulate water, ice, and debris, such accumulations can cause accelerated rot in the spar arms. The damage associated with spar arms is often not visible from the ground during routine inspections and can result in catastrophic failure without warning. CHGE has included identification and removal of spar arms from its transmission system as part of ongoing maintenance.

### **E-4.2 Project Benefits**

The proposed rebuild will have both reliability and economy benefits.

Reliability benefits are twofold: increased reliability to the Todd Hill substation and Central Hudson system by precluding failure resulting from the observed conductor annealing; and an increase in the system load level at which the rebuilt lines would be overloaded for the (n-1) - 1 contingency loss of both East Fishkill 345/115 kV transformers.

Economy benefits would result from the increase in conductor size (i.e., 397.5 ACSR to 1033.5 ACSR). For the selection of conductor, the estimated costs of electric losses for several conductor sizes were evaluated and included in the total Project costs. The conductor option with the least total Project cost was selected. Rebuilding with the proposed 1033.5 ACSR conductor would provide future reduction in electrical (I<sup>2</sup>R) losses.

#### **E-4.3 Proposed Completion Date and Impact of Schedule Delays**

Proposed completion of work (in-service) is by December 31, 2015. If work is not completed by this date, the higher risk of a system failure due to the aging infrastructure will remain. Extended delays will result in the existing facilities continued deterioration that could result in either reduced reliability or a need to repair or replace individual structures and conductor sections; these new structures or spans may require subsequent replacement when the lines are rebuilt. Should the lines deteriorate to a state where they are unusable, Central Hudson would need to find an alternate source for the load currently supplied from Todd Hill.

#### **E-4.4 System Studies**

This proposed project will reduce each line's impedance by approximately 8% with no change in network topology. Therefore, no significant changes in historic flows and voltages are expected.

On April 18, 2012, NYISO Staff indicated that since this project is not expected to impact interface transfer limits by more than 10 MW, no System Impact Study would be required.