

From: Allen, Meredith  
Sent: 11/19/2012 3:55:26 PM  
To: 'Walker, Cynthia' (cynthia.walker@cpuc.ca.gov); henry.pielage@cpuc.ca.gov  
(henry.pielage@cpuc.ca.gov)  
Cc:  
Bcc:  
Subject: AL-4066 & AL 4058: Data Response

Cynthia, Henry,

As we discussed on Friday, below is PG&E's response to Q3. Please let me know if you have questions or need additional information.

Thanks,

Meredith

3. PG&E seeks to start construction on the two Advice Letters. DRA has questions on the certainty of clearance violations described as follows:

a. As discussed by teleconference, the ground elevations on the Contra Costa-Moraga line include the tower centerline which should be eliminated. The other two ground elevations are not identified. There may be cases where a violation is shown where there is none. Please provide a corrected analysis.

The referenced drawings were created for discussion purposes only and are independent of the actual analysis that was performed. The analysis is performed in a 3-Dimension model using the industry standard PLS-CADD software. This software allows us to model, analyze, and design transmission lines using the collected survey data and compare results using design specific weather/clearance criteria. Although the centerline elevations are displayed on the discussed drawings, only the ground elevations directly under the conductor are used in the analysis. The analysis procedure is to check 0.1 feet on either side of the conductor to determine where potential issues exist. The tower centerline ground profile shown on the drawing is for reference use only and is not used to analyze the ground clearance.

b. PG&E uses a Light Detection and Ranging (LIDAR) device to perform the survey. Depending on the LIDAR model's Wavelength, vegetation may or may not be transparent. The Plan Views of the analysis show green areas which were identified in teleconference as vegetation. Thus it is possible that ground clearance was not being measured. Please provide a description of the LIDAR used and verification that ground clearance was being measured.

LIDAR surveying technology allows for the detection of multiple return wavelengths from a single laser pulse. This allows the laser to penetrate vegetation to ensure that true ground elevations are identified in vegetated areas. Individual survey points are classified based on the wavelength detected to determine what type of feature was identified. Although vegetation features are identified in the survey, they were disregarded for clearance calculations throughout the NERC assessment.

c. A helicopter was used as the platform for the LIDAR device. In PG&E's report, clearance violations varied from fractions of feet to several feet. DRA is concerned about the helicopter's ability to hold altitude to better than 3 to 5 feet. Please provide the altitude accuracy percentage and how it was determined and the base survey altitude and how it was determined.

Gyro-stabilization of sensors on the aircraft is utilized to maintain accurate and consistent data readings throughout the survey regardless of any pitching or rolling during the flight. In addition, the accuracy of data collected during the flight is verified with traditional ground survey methods. The Aerial LIDAR Survey Specification for this project specified a vertical accuracy of 15 cm (at 2 sigma). The absolute vertical accuracy achieved was 6 cm (at 2 sigma) and 3 cm (at 1 sigma).