AVISTA CORPORATION
SPOKANE, WASHINGTON
MR. GARY CASEY, TRANSMISSION MANAGER

PROJECT COST: $221,515
COMPLETION DATE: 2002
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Project Experience Resume

PROJECT DESCRIPTION

Electrical Consultants, Inc. (ECI) was retained by the AVISTA Corporation to determine the "Maximum Operating Temperature" (MOT) of Noxon - Pine Creek (43 miles) , Pine Creek – Benewah (42.5 miles), Benewah – Moscow (44 miles), and Moscow – Hatwai (17.9 miles) 230 kV Lines.

The study was based on the use of aerial laser survey data gathered by John Chance Survey Company. This system is capable of collecting millions of points along the right-of-way. The data is filtered and cleaned prior to merging it into the PLS-CADD model. PLS-CADD uses the data to construct models of each circuit. Each model was then used to extrapolate the survey data to determine electrical clearances within the limits of existing obstructions or ground.

KEY FACTS & HIGHLIGHTS

- **147.4 MILES RE-RATING DESIGN**
- **FLI-MAP & PLS-CADD DESIGN**
- **WORK IDENTIFIED 117 BELOW CLEARANCE SPANS**

The conductor data was gathered at the time of the aerial survey. The specific ambient and conductor temperature, wind velocity, and line ampacity were measured. This field data is then entered in an IEEE program to calculate the conductor temperature carrying the given ampacity. The calculated temperature would then be evaluated for use in the PLS-CADD model. Most often the calculated temperatures are greater than the measured temperatures. The lowest temperature is used in evaluating the transmission line using PLS-CADD. The temperature of the conductor was then adjusted to 203 for AAC or 212 for ACSR conductors for the study.

A summation of the spans that were identified with less than the required clearance are listed below:

Noxon – Pine Creek ..... 21 Spans
Pine Creek – Benewah ..... 45 Spans
Benewah – Moscow ..... 35 Spans
Moscow – Hatwai ..... 16 Spans

There are spans where clearances fail to meet the clearance requirements ranging from 32 degree to 203/212 degrees Fahrenheit based on the “Maximum Operating Temperature” study. Many of

230 kV Line Re-Rating Project

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the spans have multiple locations that do not provide adequate clearance. The most critical spans are identified with maximum operating clearances of 32 degrees Fahrenheit.

The violations are based on the minimum ground clearance requiremens of the National Electric Safety Code (NESC) plus two (2) feet. The additional two feet is recognition of the inherent +/- error that may occur. These values are based on conductor clearance to ground points or TIN locations.

All four of the lines are in fairly rugged terrain. The TIN is an idealized representation of the survey points collected. There may be variation between the TIN points and the actual ground. We strongly recommend a field verification of all spans that have clearances less than the maximum, prior to any site engineering or mitigation implementation.

The results have been provided in two forms. The first is a summary of all violations beginning with the most severe violation to the least. The second form is a violation summary by span. The span summary has a profile and plan extraction to illustrate the area where the violation occurred.