Case Study

Basin Electric Power Cooperative – Antelope Valley Station (AVS)

Antelope Valley Station is a lignite-fired electric generating station located seven miles northwest of Beulah, North Dakota. It has two units, each rated at 450,000 KW. The Raw Water Pipeline (RWPL) extends approximately 8 miles from Lake Sakakawea to the AVS power station. The pipeline was constructed in or around 1980. Since then, the pipeline has experienced failures and was earmarked for replacement. When AVS heard that PPIC could evaluate the condition of individual pipes within the RWPL, PPIC was contracted to assess the current condition of the pipeline and make recommendations on further strategies to continue the supply of raw water to AVS.

Figure 1
Antelope Valley Station

PPIC performed an Acoustic Emission Test (AET) inspection on the RWPL during the period of July 21, 2003 to August 29, 2003. A total of 30 locations, consisting of Combination Valves (CVs) & Air Release Valves (ARVs), on the RWPL were used to deploy the AH-4 hydrophones. Ten AET monitoring systems were initially installed at sites 1-10 along the pipeline, and data was collected for a minimum of 100 hours at these locations. The systems were moved as soon as the required number of monitoring hours was obtained. This procedure of moving and re-installing the 10 systems continued until all 30 locations were tested. After all locations were tested for 100 hrs minimum, specific sites were targeted for additional testing based on initial results.

Figure 2
PPIC's hydrophones can be installed through valves as small as 1" in diameter

The results of the AET test indicated that the RWPL was structurally sound throughout most of its length. However, as a number of localized events were recorded, testing indicated that the line was experiencing a significant degree of distress in several specific areas. The acoustic data, in conjunction with other related information sets, was presented to Basin Electric to support them in making preventive maintenance and refurbishment decisions.

Pipeline Diameter		Distance Evaluated		Reference
AET	42" ECP and LCP	AET	Approx. 8 miles	Mark Nelson Civil Engineer Basin Electric – Antelope Valley Station 294 County Rd. 15 Beulah, ND 58523-9475 Phone: 701-873-8214

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