

## LETTER OF CONCERN

### CERTIFIED MAIL - RETURN RECEIPT REQUESTED

October 21, 1998

Mr. Bob Banick  
Williams Gas Pipeline - Central  
1 Williams Center, 30<sup>th</sup> Floor  
Tulsa, Oklahoma 74172

Dear Mr. Banick:

**CPF 58020C**

On July 7, 1998, and September 1, 1998, a representative of the Western Region, Office of Pipeline Safety, inspected your Rawlins and Colby Division's pipeline facilities at Rawlins, Wyoming and Colby, Kansas, respectively.

The facilities and records reviewed during the inspection did not reveal any probable violations of the Federal Pipeline Safety Regulations, Title 49, Code of Federal Regulation, Part 192. Our field inspection did, however, disclose some concerns for voltage (IR) drop consideration methods in your cathodic protection procedures. We hope you find this information and our concern worthy of your attention.

1. **§192.463 External corrosion control: Cathodic protection.**
  - (a) **Each cathodic protection system required by this subpart must provide a level of cathodic protection that complies with one or more of the applicable criteria contained in Appendix D of this part. If none of these criteria is applicable, the cathodic protection system must provide a level of cathodic protection at least equal to that provided by compliance with one or more of these criteria.**

**Appendix D: Criteria for Cathodic Protection and Determination of Measurements.**

**II. Interpretation of voltage measurement.**

**Voltage (IR) drops other than those across the structure electrolyte boundary must be considered for valid interpretation of the voltage measurement in paragraphs A(1) and (2) and paragraph B(1) of section I of the appendix.**

Williams Gas Pipeline Central's Operation and Maintenance procedures manual for External Corrosion Control, Cathodic Protection Monitoring and Criteria states the following:

“5.1.1. A negative (cathodic) potential or voltage of at least 0.85 volts with a cathodic protection applied and with respect to a saturated copper/copper sulfate reference electrode or half cell contacting the electrolyte (soil). The voltage drops, other than those across the structure-to-electrolyte boundary, must be considered for valid interpretation of this potential or voltage measurement [.]

NOTE: Consideration shall be understood to mean the application of sound engineering practice in the determination of voltage drops by one or more of the methods listed below:

5.1.1.1. Measuring the voltage drop (IR Drop) by one or more of the following methods:

A) Half-cell placement - The amount of IR Drop will be the difference between placing the half-cell on the surface directly above the pipeline and then placing the half-cell next to the pipe at the structure-soil interface.

B) Interruption - This method requires that all current sources are simultaneously interrupted and that a potential measurement is taken immediately after the current is interrupted and then compared to the “On” reading. The difference between the two readings is the IR or voltage drop.

C ) Coupons - When suitable commercially available coupon is installed, the interruption method can be used on only the coupon and then the IR Drop measurement from the coupon can be related to the structure that the coupon has been attached to. (Caution - Coupons have not been endorsed by OPS/DOT as an approved method or IR Drop compensation at this time. They can be used as an indicator, in accordance with current industry practices.)”

First, It was noted during the records and performance review of Williams Gas Pipeline Central's (WGPC) pipeline and facilities that voltage (IR) drop considerations are not correctly applied to pipe-to-soil (P/S) measurements. WGPC's corrosion personnel have indicated that only one permanent reference copper-copper sulfate half cell, installed seven or eight years ago, is being used as a reference to monitor the voltage (IR) drop free potential for 430 miles of transmission line (from Rawlins, Wyoming to Colby, Kansas). IR Drops are greatest near rectifiers and can attenuate to very small values in between two rectifiers. Also, IR Drops change due to changes in soil conditions, resistivity, and PH, etc. Since one cannot extrapolate soil resistances by taking one reading, it is hard to understand how one can extrapolate IR Drops across 430 miles of pipeline by taking one reading.

The second method in WGPC's External Corrosion Procedures manual is the use of current interrupters. During the records review of the annual P/S surveys, it was noted that the "Instant Off" (current interruption) potentials were not being recorded. OPS is concerned in that WGPC's corrosion personnel say that they are using "Instant Off" potentials for IR Drop consideration but can not demonstrate this with written documentation. "Instant Off" is the preferred method for obtaining IR Drop free readings.

The third method in WGPC's External Corrosion Procedures manual is the use of coupons. Coupons only indicate what's happening on the pipe at that location and, as yet, cannot be used to indicate voltage (IR) drops between cathodic protection test stations.

We hope that you will consider and address this area of concern to further improve your level of safety. If we can answer questions, or be of any help, please call me at 303-231-5701.

Sincerely,

Chris Hoidal  
Director

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