REBUTTAL TESTIMONY OF RICHARD KUPREWICZ EVALUATING PG&E'S PIPELINE SAFETY ENHANCEMENT PLAN

CALIFORNIA PUBLIC UTILITIES COMMISSION
PIPELINE SAFETY RULEMAKING
R. 11-02-019

Submitted on behalf of
THE UTILITY REFORM NETWORK (TURN)
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Rebuttal Testimony of Richard Kuprewicz

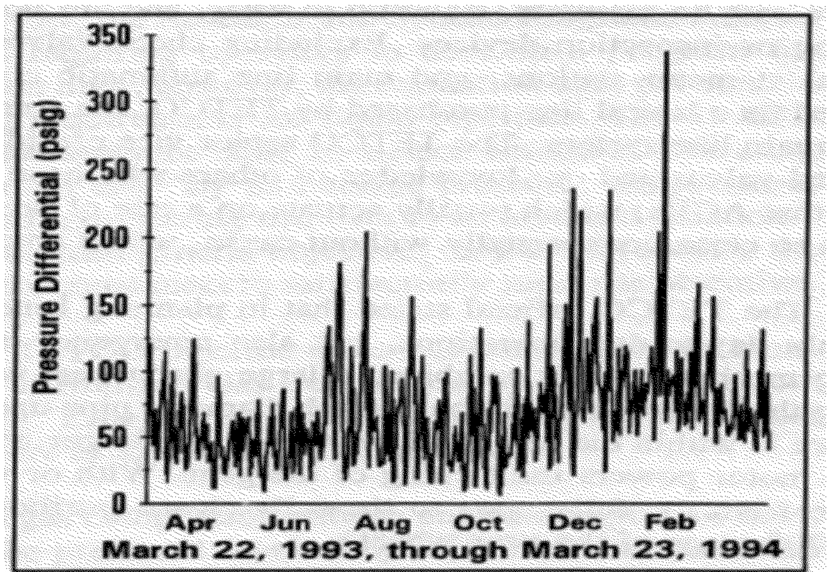
1) Response to DRA regarding Manufacturing Threats Decision Tree

The testimony of DRA witness Rondine concerning manufacturing threats recommends that for any pipe with a post-1955 strength test, the operator conduct a fatigue analysis prior to any decision to replace. (DRA-04, p. 2 and 11).

While I am in general agreement with the thrust of Mr. Rondine's recommendation that additional testing or fatigue analysis should be performed prior to any decision to replace, I cannot concur that the existence of any post-1955 strength test is sufficient to support reliance on fatigue analysis for manufacturing threats. There should be additional information showing that the test was conducted at sufficiently high pressures to support fatigue analysis.

Low-pressure, low % SMYS, hydrotesting can leave very large imperfections in the manufactured pipe seam welds that are much more susceptible to further growth to rupture failure in a relatively short time from pressure cycling than the much smaller imperfections left in high-pressure hydrotesting. This is especially true on many gas transmission pipelines that undergo considerable variations in their operating pressure, which occurs on most gas transmission pipelines. It is a myth that gas transmission pipelines do not pressure cycle. Figure 1 below is an example of a gas transmission pipeline pressure cycle spectrum (MAOP of 975 psig) in the public domain whose pipe ruptured from time -delayed damage many years after the damage occurred.[1]

Figure 1: Pressure Cycling, MAOP = 975 psig



Graph 1. Line 20 pressure changes 1993-1994.

The NTSB Report on San Bruno cited an important pressure cycle industry study,[2]

> "the risk of pressure -cycle-induced fatigue can be dismissed if and only if the pipeline has been subjected to a reasonably high -pressure hydrostatic test. Therefore, it would seem that eliminating the risk of fai lure from pressure -cycle-induced fatigue crack growth of defects that can survive an initial hydrostatic test of a pipeline requires that the test pressure level must be at least 1.25 times the maximum operating pressure."

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[1] NTSB, "Texas Eastern Transmission Corporation Natural Gas Pipeline Explosion and Fire, Edison, New Jersey March 23, 1994 Addendum stamped May 18, 2001, p. 11.

[2] NTSB San Bruno Report p. 38; citing to John F. Kiefner and Michael Rosenfeld, "Effects of Pressure Cycles on Gas Pipelines," prepared for: Process Performance Improvement Consultants, LLC and Gas Research Institute, September 17, 2004.

This NTSB citation did not mention that the cited study fatigue or pressure cycling analysis supporting the 1.25 times the maximum operating pressure was based on a hydrotest performed <u>at a minimum test pressure of 100% SMYS</u>.

Accufacts concurs with fatigue or pressure cycling analysis for manufacturing threats on gas transmission pipelines <u>only</u> if a proper high-pressure hydrotest, usually performed at a minimum pressure of 90% SMYS, a requirement <u>not defined in Subpart J or other federal minimum regulatory requirements related to hydrotesting</u> of at-risk seam pipe, has been performed <u>prior to the fatigue analysis</u>. The minimum and maximum % SMYS for the hydrotest as well as the pipe grade, minimum toughness, diameter, thickness, as well as pressure cycle spectrum play an important role in any such fatigue analysis. Given many uncertainties associated with transmission pipelines, such fatigue analysis should incorporate very large safety margins.