

1 Introduction

This report has been developed in accordance with the Statement of Work and proposal submitted in response to RFP for Technical Task Order Number 8 (TTO 8), “Stress Corrosion Cracking Study.”

1.1 SCC Overview

The pipeline industry and regulatory oversight agencies are well familiar with Stress Corrosion Cracking (SCC). Report No. DTRS56-“Stress Corrosion Cracking Study” by General Physics Corporation was prepared for the Office of Pipeline Safety in May 1999. Based on a study conducted for that report, INGAA reported that SCC accounted for 1.5 percent of the reportable incidents for pipelines within the United States. This was compared to Canadian statistics where 17 percent of the reported failures were attributed to SCC. This magnitude increase in the percentage of failures may lead some to believe that SCC is a more serious problem in Canada than in the United States. However, the report further investigated average incident rates for Canada and the United States for gas transmission pipelines, and found comparable values leading to this/its conclusion:

“Comparing the incident rates shows that a stress corrosion cracking failure is almost as likely to occur on a gas transmission pipeline within the United States as in Canada. Additionally, the extensive funding provided by pipeline operators for stress corrosion cracking clearly indicates that stress corrosion cracking is a serious pipeline integrity issue of concern to operators of pipelines within the United States. The fact that stress corrosion cracking represents only 1.5 percent of reportable incidents in the United States versus 17 percent in Canada is due to the far greater occurrence of third party damage in the United States.”

1.2 SCC in Perspective

At an SCC workshop hosted by OPS in Houston, TX on December 2, 2003, information was presented which included Figure 1-1. The figure indicates that SCC is a relatively small causal factor for gas transmission pipeline incidents in the U.S. However, the frequency of occurrence of SCC relative to other failure causes is higher in Canada. The National Energy Board (NEB) reported that approximately 15 to 20 percent of the failures in Canada were attributable to SCC. The other factors contributing to pipeline failures are being addressed in various research programs, IM initiatives, and regulatory oversight directives in both the gas and liquid pipeline industry. The SCC incident rate is relatively small, yet it is a widespread phenomenon. Moreover, SCC remains a significant issue largely because the industry’s understanding of this phenomenon is still evolving and practical methods of addressing SCC are not as mature as methods for addressing other failure causes. Finally, there have been several recent occurrences of SCC failures in the United States, underlining the need for a coherent approach using the knowledge and tools currently available, as well as the need for further research.

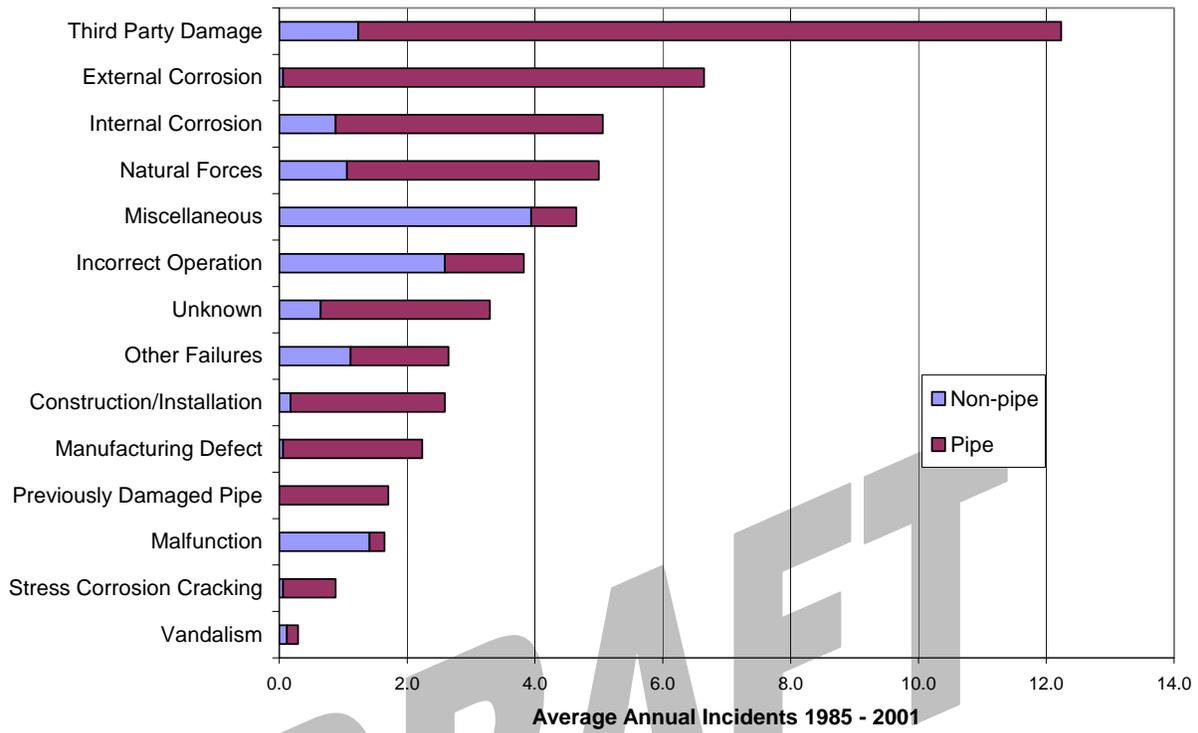


Figure 1-1 Causes of Gas Transmission Incidents (from OPS Workshop 12/2003)