



Metallurgy - Failure Analysis and Expert Testimony

Introduction

EN Engineering offers metallurgical, technical, and project consulting for failure investigations, including root cause analysis and expert witness services for pipeline failures. Litigation support includes supervising laboratory testing, simulations, corrosion damage investigation, preparing expert reports, and reviewing other expert reports. In addition, our team provides technical assistance to construction project management and operations divisions regarding inspection practices, welding, materials, and repair procedures.

Overview

EN Engineering's metallurgical services are led by our chief metallurgist, Eugene Smith, who has over 50 years of experience in metallurgical and material design, welding, nondestructive inspection, failure investigations, and engineering specifications involved in the building of pipelines and related facilities. Gene has been involved in the worldwide sourcing of materials and engineered products and is experienced in establishing O&M specifications for assessing damage (mechanical or corrosion) to pipelines and related facilities and developing repair methods for O&M manuals.

Services

- Conduct investigations of various facilities, pipe, compression equipment, and pressure vessels involving failures related to stress corrosion cracking, hydrogen stress cracking (hard spots), mechanical damage, sulfide stress cracking, hydrogen blistering, pipe steel defects, fatigue cracking, and internal and external corrosion.
- Prepare and maintain core metallurgical, material, and quality control specifications for pipe, valves, fittings, pressure vessels, fabricated assemblies, meter tubes and induction bends.
- Provide quality assessments of all aspects of field welding to determine proper implementation of procedures and the number and distribution of welders.

Expert Testimony

- Land leveling case in the Federal Court of Little Rock, Arkansas. The landowner leveled his

hilly acreage to make it suitable for rice farming. As a result, soil cover was removed and the depth of cover over three parallel, large diameter pipelines did not comply with three feet minimum per Federal Regulations (CFR 192). The testimony discussed the potential for mechanical damage and failure of pipe during plowing or other heavy equipment activity due to insufficient soil cover over the pipelines. A Federal judge ruled in favor of the pipeline company, and the landowner had to restore cover.

- Rupture failure case. Gave a deposition regarding the rupture failure of a 30-inch diameter, high-pressure pipeline as a result of third-party mechanical damage. The landowner filed a lawsuit over loss of future value of the home and property because of the presence of a failed pipeline. The case was settled out of court.
- Gas main leak. Gave an expert deposition regarding a 2-3/8-inch diameter natural gas main that experienced a circumferential fracture and leak that resulted in an explosion and destruction of three homes. The fracture originated at a circumferential gouge across the bottom of the pipe caused two years earlier by a third-party contractor excavating a water main using a back hoe adjacent to the gas line. The case was settled out of court.
- Cracked gas service line. Gave a deposition regarding a 2-3/8-inch diameter natural gas service line that cracked across the bottom of the threaded pipe end where it entered a threaded coupling. The deposition involved the cause of failure. The plaintiff claimed hydrogen embrittlement caused by cathodic protection, as opposed to the defendant's finding of stress corrosion cracking. The case was settled out of court.



Affiliations

- Past voting member of API - AGA 1104 Joint Committee on Oil and Gas Pipeline Field Welding Practices. Presently corresponding member of API 1104
- Current voting member of the API Committee 5, Task Group on Line Pipe for the 'Past AGA Industry representative to American Society for Testing and Materials (ASTM)
- Current voting member of the following ASTM Committees: A-1 on Steel and Sub-committees on Pipe, Pressure Vessel Steels, Tubing, Fittings, Forgings, Castings and Bolting
- Former representative on: Pipeline Research Committee International (PRCI); Line Pipe Research Supervisory Committee (formerly NG-18 Line Pipe Research Committee; Chairman 1990-1995); Nondestructive Testing Supervisory Committee; Welding Supervisory Committee (founding chairman 1978 – 1980)
- Past member of the Gas Research Institute Technical Advisory Group on Nondestructive Evaluation
- Past Chairman, Canadian Arctic Gas Study Group, Metallurgical Task Group member and Welding Task Group Chairman
- Past member, Northern Border Metallurgical Committee