



Metallurgy & Failure Analysis Services

APTECH Engineering Services, Inc.'s Metallurgy and Failure Analysis (M&FA) Group is committed to providing you with the specialized expertise needed to simultaneously reduce equipment failures and operating, maintenance, or capital expenditure costs. We pride ourselves on applying the best available technologies to solve your difficult materials-related problems.



Pump Shaft Fatigue Failure



Internal wall thinning in a pipe subject to flow accelerated corrosion.

Services

- ♦ Failure Analysis
- ♦ Fractography & Microstructural Evaluation
- ♦ Corrosion Control & Analysis
- ♦ Welding & Joining Process Evaluation
- ♦ Materials Selection
- ♦ Incident Investigation
- ♦ Fitness-for-Service Evaluation
- ♦ Risk Based Inspection



Collapsed Storage Tank

Benefits

Failures of systems and components often result in costly downtime and can cause pollution, secondary damage, or injury. At such critical times, APTECH's skillful accident investigation and reconstruction will uncover the circumstances leading to the event. Our material experts have many years of industry experience and use sophisticated failure analysis techniques to identify the active damage mechanism(s) and the root cause(s) of failure. This translates into long-term cost saving benefits as well as improved safety and reliability.

APTECH Engineering Services, Inc., is an internationally recognized, high technology engineering consulting firm dedicated to the support of industrial systems, and to the prediction, prevention, investigation, and analysis of failures. APTECH specializes in the development of reliability-based strategies employing proprietary engineering techniques as well as conducting corrosion studies and failure investigations for a broad range of industries.

Related Experience

Failure Analysis for Plant Equipment in the Following Industries:

- ◆ Fossil Power (including fluidized bed boilers, gas turbines, and HRSGs)
- ◆ Nuclear Power
- ◆ Insurance and Legal
- ◆ Aerospace
- ◆ Pulp and Paper
- ◆ Petrochemical

Material Selection

Specialized Mechanical Testing:

- ◆ Strain Gaging
- ◆ Fatigue Testing
- ◆ Fracture Arrest Testing
- ◆ Stress Rupture Testing
- ◆ Custom Testing

Boiler Tube and Equipment Failure Reduction Programs

Weld Procedure Specification Reviews:

- ◆ ASME Section IX
- ◆ AWS D1.1
- ◆ Custom Procedures
- ◆ Radiograph Interpretation

Remaining Life Assessment:

- ◆ Materials Modeling (e.g., creep cracking, fatigue, stress corrosion, corrosion fatigue, creep-fatigue, corrosion)

Risk Based Inspection:

- ◆ RDMIP™ Software
- ◆ Analysis of Degradation Mechanisms
- ◆ Inspection Plans

Laboratory Facilities

Photography

- ◆ Digital and Film Photo Documentation
- ◆ Video Recording

Scanning Electron Microscopy

- ◆ JEOL JSM-35CF Electron Microscope
- ◆ Energy Dispersive X-Ray Chemical Analysis

Optical Microscopy

- ◆ Stereo Zoom Microscopes
- ◆ Reichert-Jung MeF3 Research Metallograph
- ◆ Sample Preparation and Etching

Hardness Testing

- ◆ Wilson-Rockwell Hardness
- ◆ Shimadzu Microhardness
- ◆ Equotip Portable Hardness Tester

Mechanical Testing

- ◆ MTS810 Tensile, Fatigue, and Fracture Toughness Testing
- ◆ Creep and Stress Rupture Testing
- ◆ Strain Gaging and Data Acquisition

Inspection Equipment

- ◆ Color Videoprobe with Recording
- ◆ Magnetic Particle Testing
- ◆ Ultrasonic Testing
- ◆ Penetrant Testing
- ◆ Acoustic Emission Testing
- ◆ Eddy Current Testing
- ◆ Barkhausen Noise Analysis
- ◆ Crack Depth Gage
- ◆ Surface Replication and Replica Evaluation
- ◆ Alloy Analysis

Clients (Partial List)

Alcoa of Australia Limited
Arizona Electric Power Cooperative
Associated Electric Power Cooperative
Basin Electric Power Cooperative, Inc.
California Energy Co., Inc.
Calpine Corporation
Chad Therapeutics, Inc.
Chubb Group of Insurance Companies
Cinergy Corporation
City of Burbank
Consolidated Edison Co. of New York
Dakota Gasification Company
Duke Energy North America
Eastman Chemical Company
Engen Refinery
Entergy Services, Inc.
Factory Mutual Engineering Co.
First Energy Services Corporation
Florida Power & Light Company
Florida Power Corporation
Fluor Daniel, Inc.
Ford Motor Company
Georgia Power Company
GWF Power Systems, L.P.
Hawaiian Electric Company
Huntsman Chemical Corporation
Imperial Irrigation District
Iowa Public Service Company
Kansas City Power & Light Co.
LG&E Power Systems
Los Angeles Dept of Water & Power
Louisville Gas & Electric Company
Marathon Oil Company
MidAmerican Energy Company
Mirant Delta, LLC
Montana Power Company
Nebraska Public Power District
Niagara Mohawk Power Corporation
Nooter Eriksen
NRG Cabrillo Operations, Inc.
Occidental Chemical Corporation
Omaha Public Power District
Orange & Rockland Utilities, Inc.
Owens Corning
Pacific Gas & Electric Company
Pacific Power & Light Company
Pennsylvania Power Company
PP&L Montana, LLC
Public Service Company of Oklahoma
Puerto Rico Electric Power Authority
San Diego Gas & Electric Company
Sedgwick, Detert, Moran & Arnold
Southern California Edison Company
Syncrude Canada, Ltd.
Teledyne Ryan Aeronautical
Texas Eastman
TransAlta Utilities Corporation
Tri-State Generation & Transmission
Tucson Electric Power Company
US Wind Power
Utah Power & Light Company
Valero Refining Company
Walt Disney Imagineering
Western Farmers Electric Cooperative
Winston & Strawn
Wyckoff Chemical Company, Inc.
Zurn Industries, Inc.

APTECH's strength is in the quality and expertise of its staff. Our engineers have extensive industrial experience in their technical specialties. Our staff has a broad range of related materials experience in the nuclear, fossil, geothermal, petrochemical, and chemical industries.

For more information, please contact our corporate headquarters.

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