



You are Invited to a Failure Analysis Tutorial for Pipelines, Piping, and Pressure Equipment

Two Dates from which to Choose:

Tuesday, July 10 or Wednesday, July 11, 2007

Location: CCT&DNV's Houston Office at 16340 Park Ten Place, Houston, TX 77084

Mark Your Calendar, and Register Now!

This tutorial will be a 1-day event, classroom style, providing approximately 6 hours of training in failure analysis. **Please specify if you would like to attend on July 10 or July 11.**

Outline of Topics

- ⇒ Establishment of an action plan for performing failure analyses and using their results
- ⇒ Common types of failures in mechanical equipment, including piping, pressure vessels, tanks, valves, fittings, and rotating machinery
- ⇒ Common material failure mechanisms, including corrosion, stress-corrosion cracking, brittle fracture, fatigue, high-temperature creep, wear, and hydrogen embrittlement
- ⇒ General steps involved in performing a failure analysis
- ⇒ Methods for root-cause analysis
- ⇒ Procedures for metallurgical examination
- ⇒ Examples of typical failure analyses

Who Will Benefit

Engineers, technicians, and managers involved with failure analysis, maintenance, integrity, and reliability assessments. People from the oil & gas, transmission pipeline, and chemical processing industries will find this tutorial beneficial.

Registration

To register for this tutorial, send an e-mail to Valerie Mays at valerie.mays@dnv.com or call (614) 761 1214.

The fee for the tutorial is \$150, which includes a binder with notes, and lunch. Make your check payable to CC Technologies, Inc. and mail it to CC Technologies, Inc., 5777 Frantz Road, Dublin, OH, 43017. Attendance will be limited to 20-30 participants on each day, so please register early.

More information is available at www.cctechnologies.com.

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Instructors

The tutorial will be led by Michiel P. Brongers, P.E., and John A. Beavers, Ph.D., F NACE, from CC Technologies in Dublin, Ohio.

Mr. Brongers has been with CC Technologies since 1997 and has performed numerous failure analyses. He holds a masters degree in Materials Science and Engineering from Delft University of Technology in the Netherlands. Mr. Brongers is a Registered Professional Engineer in the states of Ohio and West Virginia.

Dr. Beavers holds a Ph.D. in Metallurgical engineering from the University of Illinois and is a Fellow of NACE International. He is the Director of the Failure Analysis Department at CC Technologies. During his tenure, he has helped operators develop data to enhance their integrity management programs and optimize testing and inspection activities. In addition, he has directed numerous research and engineering programs for failure analysis and laboratory and field evaluations.

For technical information, contact john.beavers@dnv.com or michiel.brongers@dnv.com.

Tutorial Agenda

8:30-8:45	Welcome and Introductions
8:45-10:00	Chapter 1: Action Plan: Be Ready When a Failure Occurs Chapter 2: Review of Common Failure Types
10:00-10:15	Break
10:15-11:30	Chapter 3: General Steps of a Failure Analysis Chapter 4: Kepner-Tregoe Root Cause Analysis
11:30-12:30	Lunch
12:30-1:45	Chapter 5: Metallographic Examination Chapter 6: Laboratory Analysis of Samples Other Than the Failed Part
1:45-2:00	Break
2:00-3:15	Chapter 7: Examples of Failure Analyses I
3:15-3:30	Break
3:30-4:15	Chapter 7: Examples of Failure Analyses II
4:15-4:30	Closing



CCT&DNV specialize in engineering, research, and testing for corrosion control, fitness-for-service, pipeline/plant integrity analysis, corrosion monitoring, materials evaluation and selection, management systems approaches, and instrumentation and software design and development. Our one-of-a-kind, innovative solutions allow us to combine practical engineering expertise and fundamental scientific approaches to solve engineering problems and accomplish research projects that lead to practical, cost effective solutions.

DNV Energy

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Web: www.cctechnologies.com
Rev.0 (06 June 07)

Registration for Failure Analysis Tutorial

Please respond by Tuesday, July 3rd, 2007

Please complete and return this registration form to attend the Failure Analysis Tutorial. Include your payment of \$150.00 with your registration and be sure to designate which of the two dates you plan to attend.

This form may be sent by mail to

Valerie A. Mays
CC Technologies, Inc.
A DNV Company
5777 Frantz Road
Dublin, OH 43017-1386
Phone: 614.761.1214 – ext. 6906

By email to:

Valerie.Mays@dnv.com

Or by fax to:

Attention: Valerie A. Mays
CC Technologies, Inc.
A DNV Company
Fax: 614.761.1633

Tutorial Location: Det Norske Veritas (DNV) 16340 Park Ten Place Houston, TX 77084		For directions to DNV Houston Call 800.638.9003	
Name:		Name for Badge:	
Title:			
Company:			
Street/Box:			
City/State/Zip/Country:			
Phone/Fax/E-mail:			
Please indicate Special Needs and/or Food Preferences/Allergies:			
I plan to attend the Failure Analysis Tutorial on			
<input type="checkbox"/> Tuesday, July 10, 2007		<input type="checkbox"/> Wednesday, July 11, 2007	