



The Materials Information Society

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Santa Clara Valley Chapter

October 2002

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Wednesday, October 9

Failure Analysis: Tools, Techniques and Some Explosive Case Studies

Eric Sullivan
Aptech Engineering Services, Inc.

Please remember to indicate a meal selection when you sign up!

5:30 pm Social/Networking.....6:15 pm Dinner.....7:30 pm Speaker

Meeting Location: WYNDHAM GARDEN HOTEL
1300 Chesapeake Terrace
Sunnyvale
(408)747-0999

Dinner Cost: ASM Members \$18, Students \$8, Guests \$20
Meal Choices: Chicken Piccata, Salmon, or Vegetarian Lasagna

RESERVATIONS REQUIRED:
Stacy Ewert at (408) 742-2521 or stacy.s.ewert@lmco.com
Reservation deadline is noon on Monday, Oct 7



The Materials Information Society

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Meeting Directions

From points south: north on Lawrence Expressway, pass over 237, make the first left (Moffett Park Drive/Baylands Park), then the first left onto Chesapeake Terrace. From points east or west: Caribbean Drive (Lawrence Expressway North) exit off 237, first left at Moffet Park Drive/Baylands Park, then left on Chesapeake Terrace. In either case, once you are on Chesapeake, simply proceed to the end where you'll find The Wyndham Garden Hotel.

RETURN SERVICE REQUESTED

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Have You Moved Recently?

If so, please remember to correct your address by logging onto the national website, www.asminternational.org, where you can review and update your membership record.

About the Topic

Failure Analysis: Tools, Techniques, and Some Explosive Case Studies

The process of failure analysis is undertaken for many varied reasons, and it employs a wide variety of techniques and equipment. The goals of failure analysis are to determine the primary causes of a failure, to assess the contributory causes, and to recommend corrective actions. Although the process of failure analysis can be as widely varied as the types of cases that come up, there are certain fundamental techniques for handling failure investigations, as well as some common basic steps to analyze a "failure" in a part. These common techniques and basic tools will be described along with a couple of interesting case history examples.

The first case history that will be presented involves an interesting occurrence of unexpected corrosion in a titanium heat exchanger. The corrosion deposits were explosive, and they detonated when an attempt was made to remove them. The second case history that will be presented involves the explosion of a natural gas filter separator near Stockton, California that destroyed the entire processing facility. This case involved a wide variety of analysis techniques and demonstrates a common error of the initial visual examination, wherein the investigators incorrectly concluded that the first broken part found was the overall cause of the failure. The presentation will also include a discussion of the typical equipment that should be included in a portable field investigation kit, and techniques and equipment used for photographic documentation of the failure.

About the Speaker

Eric Sullivan

Aptech Engineering Services, Inc.

Mr. Eric V. Sullivan is a senior metallurgist at Aptech Engineering Services, Inc. and registered Professional Engineer in the field of metallurgy. He has worked as a consultant at Aptech since 1985, and has performed hundreds of failure analysis investigations on a wide range of components such as turbines, engines, pipeline ruptures, and oil spills. Mr. Sullivan has also investigated a number of fires and explosion cases, including the most recent large fire and explosion at the Chevron refinery in Richmond, California (March, 1999).

Mr. Sullivan began his metallurgy career in 1971 at the Advanced Technology electron beam welding company in Pasadena, California. While there he performed vacuum brazing and helped with welding preparations and qualification of welding procedures for refractory materials and components, such as the rocket engines for the Mars Lander. He completed his Bachelor of Science degree at the California Polytechnic state university in San Luis Obispo, California in 1980. After graduation from Cal Poly, he worked for 5 years in the Materials and Quality Services Group at Bechtel Power Corporation. At Bechtel he evaluated and reviewed materials specifications, welding procedures, and inspection processes for nuclear power plant components. At Bechtel's metallurgy laboratory, he performed numerous failure analyses and materials characterization studies for nuclear power plant components.

Yes, We Have No Meeting Sponsor!

Unfortunately we do not have a sponsor for our October meeting. In fact, we are actively seeking companies that would like to sponsor future meetings. This is a great opportunity for your company to gain visibility with the valley's top materials professionals. Specifically, you will be acknowledged here in the newsletter and on the website, and you can give a brief "pitch" at the dinner meeting. If you are interested, please contact our Sponsor Coordinator, Gabriel Toea, at gtoea@yahoo.com or (831)634-1443.

Materials Camp Report

Last month we reported on ASMI's Teachers Materials Camp 2002, the first event of its kind. This month we report on the ASMI Student Materials Camp 2002. As in the past, the event was a success, with rave reviews from all participants!

Actually, two Student Materials Camps were conducted this year - one at the University of Washington (Seattle), and one at the ASMI Materials Engineering Institute (Cleveland). For those of you that aren't familiar with Materials Camp, it is essentially a week-long summer camp for high school students that focuses on hands-on learning in the areas of applied math and science, with, of course, an emphasis on materials science and engineering. The students that attend are selected from applicants from all over the world, and they are indeed the "best of the best". This year we are proud to have one of our own local students in attendance - **George Schnurle** of Santa Clara, who attends Woodside Priory School. **Congratulations George!**

The Materials Camp Program is one of the many ways that ASMI gives back to the community and the profession. If you know a high school student (or high school teacher) that might be interested in attending next year's Materials Camps, keep an eye on this space. We will announce the application information as soon as it becomes available (the application deadline is typically in the month of March). You can also get more information at www.asmiinternational.org/foundation.


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Upcoming Events

Oct 8: ASSE, "Differential Safety". Visit assesj.org/meetings.htm

Oct 9: IEEE-CPMT, "New Die Stacking Developments". Visit cpmt.org/scv/meetings/cpmt0210.html

Oct 13-16: "National Educators Workshop: Standard Experiments in Materials Science and Engineering". See page 6 for details, or visit <http://mst-online.nsu.edu/new>

Oct 15: AIChE, "Life in a Fishbowl: Current Issues for the University of California". Visit www.aiche-norcal.org/Meetings/oct02_north.htm

Oct 16: ASQ, "Project Management - Quality Professionals Need to Know It". Visit www.asq-silicon-valley.org/index.cfm?EventID=10571&SectionID=11

Oct 17: SME, "Stanford Linear Accelerator Tour". Visit chapters.sme.org/098/

Oct 17: AFE, "Building an Effective ERT Team. Visit www.afe39.org/index.html

Oct 19: IEEE-CPMT, "Future Directions in IC & Package Design Workshop (FDIP)". Visit www.cpmt.org/conf/index.html

Oct 21-23: IEEE-CPMT, "11th Topical Meeting on Electrical Performance & Packaging (EPEP 2002)". Visit www.cpmt.org/conf/index.html

Oct 22: IEEE-LEOS, "Direct-Light-Triggered Thyristors". Visit www.silicavalley.com

Oct 24: AIAA, "Convair B-58: World's First Supersonic Bomber". Visit www.aiaa-sf.org

View an online version of this event listing at:

www.asm-scv.org

Be a Mentor!

MentorNet, the E-Mentoring Network for Women in Engineering and Science, is seeking online mentors for this year's program. MentorNet's Mentoring Program pairs women engineering and science students with professionals working in corporations and government. During the school year, mentors and students communicate by email about career goals, balancing work and life, course work, and many other topics. MentorNet encourages applications from both women and men with an educational or professional background in engineering or science, and who are currently employed in private industry or government sectors.

To apply, visit www.mentornet.net, and click on *Community*. Sign in as a new or returning member, and follow the link for the One-on-One Mentoring Program. **The application deadline is Oct. 31, 2002.**

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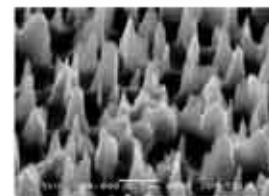
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Educators' Workshop in San Jose

The *National Educators' Workshop: Update 2002* (NEW: Update) will be held 13-16 Oct 2002 in San Jose. The NEW: Update program seeks to improve science, engineering, and technology education by providing materials educators with the latest in materials science and technology, and offering strategies and aids for improved teaching. The agenda for this year's event includes both technical and educational seminars, as well as mini-workshops with specific educational demonstrations, activities, and experiments.

This year the event is sponsored by Semiconductor Equipment and Materials International (SEMI), Ultratech Stepper, IBM Almaden Research Center, NASA Ames Research Center, NASA Langley Research Center, the Air Force Office of Scientific Research, Seagate, Lockheed Martin, San Jose State University, Norfolk State University, and ASM International.

This year the NEW: Update organizers have also compiled the results of previous workshops in a highly-accessible CD-ROM format. This CD includes over 450 peer-reviewed experiments and demonstrations. These are formatted such that teachers can easily edit them to suit their local needs. The CD also includes other valuable technical resources provided by industry and technical societies.

For more information on NEW: Update 2002 and the CD-ROM, visit <http://mst-online.nsu.edu/new>.



ASM International has refocused their efforts recently so that they can be considered *The Materials Information Society* of choice. As part of this effort, they have made major improvements their information systems and the ASMI website.

To bring you up to speed on these improvements, we present...

The Top Ten Things You Can Do on www.asminternational.org

10. Get news updates

See the latest in materials-related business news, culled straight from the day's headlines. (*Home...News*)

9. Network with other members

Search the ASMI Membership directory on any combination of criteria. (*Home...Membership...Member Login*)

8. Buy a book

Browse the ASMI's technical book catalog online, and order online as well. (*Home...Bookstore*)

7. Take an online course

Metallurgy for the Nonmetallurgist and *Corrosion* are two initial offerings, with more to follow. (*Home...Training*)

6. Read an ASMI magazine article

Full versions of articles from *Advanced Materials & Processes* and *Heat Treating Progress* are available online. (*Home...Magazines*)

5. View the ASM Handbook

The Desk Edition of both the *Engineered Materials Handbook* and the *Metals Handbook* are available online. (*Home...Membership...For Members Only*)

4. Get a technical question answered

ASMI sponsors discussion groups in Failure Analysis, Heat Treating, and Surface Engineering. (*Home...Ask ASM*)

3. Find a job

Search ASMI's database of materials-related technical jobs, or link to the listings of *metal.monster.com*. You can also post a job opening. (*Home...Career Center*)

2. Update your member information

Update your interest areas or personal information, such as address and e-mail. (*Home...Member Login*)

And the number one thing you can do at www.asminternational.org...

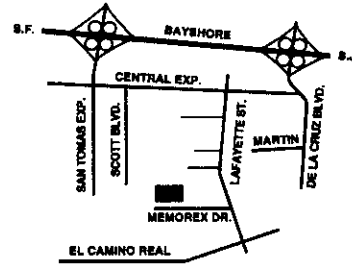
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Chapter Information & Upcoming Activities

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| Vice Chair: HuiHui Lin | (408)256-1072 |
| Treasurer: Stacy Ewert | (408)742-2521 |
| Secretary: Jacques Matteau | (650)591-7787 |

Executive Committee

| | |
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Special Positions

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| SVEC Rep: Ed Kaminski | (408)241-4842 |
| Newsletter Editor: Scott Dickerson | (408)584-1013 |

Thanks to our ASMI-SCV Sustaining Members:

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|------------------------|--------------------|-------------|
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| CSU—Fresno | Henry Madden | Fresno |
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*Would your company like to support the chapter by being a sustaining member?
To find out more, contact Janine Kardokus at (408)986-7568.*

Executive Committee Meetings: 4th Wednesday of September, October, January, March and May at 6:00 pm, Round Table Pizza at El Camino & 237. Any member can attend! Call Janine Kardokus at (408)986-7568 to confirm the schedule and reserve a seat at the table.

Website Update!

Try as we might, we unfortunately did not have our chapter website up in time to announce last month's meeting. However, the situation should be corrected by the time you read this. Our address remains unchanged: www.ASM-SCV.org

Also, because the down site affected our chapter's e-mail service, we used the e-mail tool on ASMI's national website. This highlighted the fact that many of you have not been updating your e-mail address with ASMI's database! If this is the case, we encourage you to visit www.asminternational.org and update your e-mail address (and any other information that is out-of-date). This will insure that you are receiving the latest news from both ASMI and your local chapter. The volume of e-mail from each source is quite low, but rest assured you can opt out of either (or both) if you so desire.

2002-2003 Technical Program

| | | |
|--------|---|---|
| Sep 11 | Lead-Free Soldering: A Global Contract Electronic Manufacturer's Perspective <i>Jasbir Bath, Solectron Corporation</i> | <i>Past Chair's Night</i> |
| Oct 9 | Failure Analysis -Interesting Case Studies <i>Eric Sullivan, Aptech Engineering Services, Inc.</i> | |
| Nov 13 | Surface Engineering: The Interactions Between Thermal Spray Materials, Processes, and Applications <i>Andrew Nicoll, FASM, Sulzer Metco</i> | <i>Trustee's Night</i> |
| Dec 11 | TBD | <i>Companion's Night</i> |
| Jan 15 | Procedure and Use of Tribo-metrology <i>Dr. Norm Gitis, Center for Tribology</i> | <i>SCV Fellow's Night</i> |
| Feb 12 | Ceramics: Aluminum Oxide and Anodizing <i>Dr. Frank Anderson, CoorsTek</i> | <i>Joint with ACerS</i> |
| Mar 12 | TBD | |
| Apr 9 | Microfluidics <i>Dr. Nghia Chiem, Teragenics</i> | <i>Student Posters & Scholarship Awards</i> |
| May 14 | Laser Shock Peening <i>Dr. Lloyd Hackel, Lawrence Livermore National Laboratory</i> | <i>Awards & Elections Night</i> |