

ASM International
Philadelphia "Liberty Bell" Chapter

Newsletter



www.asm-philadelphia.com

Thursday, October 17, 2002

Continuing Education Night



Spouses and guests are invited and welcome.

Williamson Restaurant, Easton Road, Horsham, PA

Speaker:

DR. WILLIAM FRAZIER
Naval Air System Command

Topic:

Breaking the Barriers:
Aerospace Materials-Technology Consortium

Dr. William E. Frazier is Head of the national Metals, Ceramics, and Nondestructive Evaluation Competency at the Naval Air Systems Command, Patuxent River, MD, and is the NAVAIR authority responsible for safety-of-flight issues involving metals, ceramics, and NDE. Dr. Frazier received his BS, MS, and Ph.D. degrees in Materials Engineering from Drexel University and is a graduate of the Naval Aviation Executive Institute's Senior Executive Management Development Program, and the Defense Systems Management College's Advanced Program Management Curriculum. He has authored more than 75 technical publications, edited 5 books, and holds two U.S. Patents. He serves as a Peer Reviewer for the Journal of Materials Engineering and Performance, ASM, and the Journal of Advanced Materials, SAMPE. Dr. Frazier is an ASM FELLOW, and a NAVAIR Senior Engineer Fellow.

TOPIC: *Breaking the Barriers: Aerospace Materials Technology Consortium*

The AMTC vision is one of an on-line community of government, industrial, and academic institutions. The Aerospace Materials Technology Consortium Environment (AMTCE) is the name given to an information technology product conceived by NAVAIR and sponsored by the Office of Naval Research. The objective of the AMTC is to reduce the time and cost to develop and insert new aerospace materials into products. Improvements in efficiency and productivity are achieved through the establishment of the AMTCE, a virtual online community environment in which essential information is readily available and collaborative work can be conducted from geographically disparate locations. AMTCE is designed to provide its members with the ability to rapidly organize into collaborative teams and execute projects in a secure environment. Video tele-collaboration, team calendars, document sharing, and white boarding will facilitate collaboration. The potential of remote viewing and operation of laboratory equipment will be explored as a means of reducing the cost and increasing the availability of expensive or unique resources.

Technical Chairperson

Jeff Waldman
Navmar Applied Sciences

Dinner Menu

Buffet - choice of:
Roast Top Sirloin of Beef Bordelaise
Italian Meatballs
Rolled Baked Stuffed Flounder
Sliced Virginia Baked Ham
Caesar Salad
Broccoli au Gratin
Parslied Red Skin Potatoes
Fresh Fruit Watermelon Boat
Beverage & Rolls
Strawberry Sundae

Social Hour

6:00-7:00 p.m.

Dinner

7:00 p.m. Price: Members: \$20.00
Retirees: \$12.00
Student: \$10.00



ASM Philadelphia Sustaining Members (2002-2003)

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We Thank These Companies for Their Support

Meeting sponsors for the October 2002
meeting are:

Allied High Tech Products, iNC.

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Do you have news...

that should be shared with the other members of the "Liberty Bell" Chapter? If so, please send your info to Jim Watters at his email address:

dvua2@cs.com

Be sure to add the phrase "Item to add to the ASM Chapter newsletter" in the subject line. We'll be sure to include it in the next monthly Chapter newsletter.



Chairperson's Message

October, 2002

Due to the demands of printing schedules, and associated "conventional mailing" costs (snail-mail), I am writing this October message two weeks before we have our September meeting. This fact makes one truly appreciate the technological age we live in now, for

ideally, we simply could e-mail our newsletters to the membership. Actually, several ASM chapters have elected to do just that to avoid these super-early newsletter releases and to cut expenses. We at the Philadelphia Chapter have discussed the issue, but opted not to go solely e-mail so that we can be accommodating to all.

Speaking of technology, you surely want to attend our October 17th meeting, when Dr. William Frazier of Naval Air System Command will enlighten us about the Aerospace Materials Technology Consortium (AMTC). AMTC's vision is one of an on-line community of government, industrial, and academic institutions, formed to reduce the time and cost needed to develop and insert new aerospace materials into products. This is an excellent topic for our membership, and the subject matter strongly indicates that the snail-mail newsletter days are in fact numbered.

Remember, there are several great reasons to remain or become an ASM member of the Philadelphia Chapter, including:

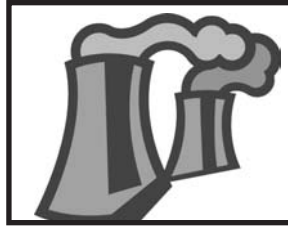
- Access to materials information, new perspectives, and new technologies.
- Networking
- Visibility
- Leadership Skills
- Career Advancement
- Member-Only Savings
- Member Synergy
- Mentoring the Next Generation

Our chapter is still one of the largest and most respected in the country. Please plan to participate in our technical and social activities that we have planned throughout the year. It will benefit all of us as a "materials community". See you October 17th!

Don Jordan
2002-2003 Chairperson

Peco Nuclear Facility Tour - Oct. 22nd

A tour of the PECO Nuclear Facility in Limerick PA has been set up for Tuesday, October 22nd at 3 pm. It is open to all ASM members. Because of 9/11, visitors are no longer allowed into the reactor building itself. However, PECO has an excellent visitor center, including models and displays. We will be given a formal presentation, and there will be time for questions and answers. If you have a technical question you can even submit it in advance. The entire program is expected to last an hour and a half. The visitor center is no longer open to the general public. It is only open by invitation. You must register at least a week in advance for this program, and you will be required to give your social security number when you do register. This is another security precaution. You should call or email Roger Jones to register at raj@solaratm.com. If you prefer not to email your social security number you can call Roger at 215-721-1502. Questions for PECO should be sent to Roger as well. PECO understands that many of us are PECO customers as well as PECO suppliers, and they plan to have technical personnel available to answer your questions.



MEI Course - "Metallurgy for the Non-Metallurgist" - Nov. 12th

The Greater Philadelphia Section of The American Society for Nondestructive Testing and The Philadelphia "Liberty Bell" Chapter of ASM International is presenting the MEI course Metallurgy for the Non-Metallurgist.

When: Tuesday evenings 12 November 2002 through 4 March 2003
6:30 to 9:00 PM

Where: SPS Technologies -- Highland Ave. Jenkintown, PA

Cost: \$270.00 includes the 15 lesson course with 2.8 CEUs,
Qualified ASMI instructors and a video presentation each week.

Who should attend:

This is an ideal first course for anyone who needs a working understanding of metals and their applications. It has been designed for those with no previous training in metallurgy, such as technical, laboratory, and sales personnel; engineers from other disciplines; management and administrative staff; and non-technical support staff such as purchasing and receiving agents who order and inspect incoming material. A basic understanding of chemistry and physics is strongly suggested.

Course overview:

- Presents a brief history of metals, providing insight into the discovery and use of pure metals and alloys thousands of years before the modern era.
- Provides an explanation of the unique physical characteristics of metals, including the reasons that metals behave differently than such non-metals as plastics, glass, wood etc.
- Explains the basis for the selection of different metals for specific engineering application.
- Describes how metals are alloyed to achieve desired properties.
- Provides details on one of the most important of all alloys - steel - and discusses how steel is heat treated to achieve various combinations of strength and ductility.
- Explains how metals are formed into the components that are used in our most important engineered machines and structures.
- Describes how metals are tested to determine critical properties, such as strength, ductility and toughness.
- Discusses why metals corrode, why different metals behave differently in corrosive environments, and how the corrosion of metals can be controlled.

For more information call Fred Klock or Bob Rich at 215 572 3485 Fax 215 572 3725

Return the lower portion of this form, with a check payable to "Philadelphia ASMI" to Fred or Bob at SPS Technologies; Highland Ave.; Jenkintown, PA 19046-2299 before 5 November 2002.

Name: _____ Work phone: _____

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Co. Address: _____

Your Position: _____ ASM Member # (If Ap.) _____

Home phone & address: _____

The American Society for Nondestructive Testing recently ran a very interesting article about the manufacturing and testing of the Liberty Bell. Since it gives insight into the art of metallurgy in colonial times, we have decided to reprint it for our newsletter. It is too long to fit in one issue. What follows is Part 1.

The Liberty Bell

The Liberty Bell is owned by the City of Philadelphia, but the responsibility for day-to-day care belongs to the National Park Service. As curator for the Liberty Bell, the National Park Service has employed various nondestructive testing techniques to assess its overall condition and stability. The bell was first inspected with radiography in 1975 in preparation for a move from Independence Hall to a new pavilion built for the American bicentennial. It was inspected again in 2001 to assess damage caused when a vandal struck the bell.

Birth of the Bell

Long before it became recognized as an American icon, the Liberty Bell played a utilitarian role in the daily life of Philadelphians. It was originally hung as the State House bell on June 11, 1753, almost a quarter of a century before it would ring to call the people of Philadelphia to hear the first public reading of the Declaration of Independence on July 8th, 1776. The bell we know today is the third in a series of three castings. The Pennsylvania Assembly ordered the first casting from an English firm, Whitechapel Foundry, to embellish their new - and very grand - State House. It broke "...cracked by a stroke of the clapper without any other violence as it was hung up to try the sound." (Isaac Norris, Assembly Speaker and Chairman of the State House Superintendents - March 10, 1753). The second and third castings were made by two American entrepreneurs eager for the opportunity to recast the new State House bell right in its own backyard.

Physical Description

The bell weighed 2,080 pounds when it was cast for the third time. It's somewhat less than that now. A section of the bell was removed (drilled) in an attempt to keep the famous Liberty Bell crack from propagating and, unbelievably, over the years, bits and pieces of the bell were collected as souvenirs. It's three feet tall and twelve feet in circumference at the widest point. Thickness will vary at a consistent height around the bell but generally, it's about an inch and a quarter thick at the crown and about three inches thick at the lip or sound bow. It is bronze with a copper to tin ratio that varies point to point around the bell. It also contains lead, zinc and nickel as is typical in a bronze alloy with small traces of iron, silver, antimony, arsenic and gold.

Foundry Technology in the Colonies

American foundrymen John Pass and John Stow (those are their names blazoned across the bell below the inscription) broke up the cracked English bell, added an ounce and a half of copper for every pound of the old bell to adjust for what they construed as its brittle condition and recast it - no small feat. It meant heating 2,000 pounds of metal to a molten state.

Liberty Bell *cont'd from page 3*

Foundry technology of the day couldn't accommodate a single pour of that magnitude. Multiple small crucibles were used in an ongoing series of pours over a period of about forty-eight hours. Upon completion, the Pass and Stow bell was hoisted to the State House belfry. However, "Upon trial, it seems that they have added too much copper. They were so teased with the witticisms of the town that they will very soon make a second essay." (Isaac Norris - March 29, 1753). The bell tone was not bright and clear. It was closer to a thud. Pass and Stow carted the bell back to the foundry for another try. The third casting was in place on June 11, 1753. There was still controversy about the tone of the bell and the Philadelphia Assembly ordered another Whitechapel bell but when the two were compared, it was decided that the English bell sounded no better than the Pass and Stow bell. The Whitechapel bell was made part of the clock mechanism and rang the hours. The Pass and Stow bell kept its place in the tower as the State House bell. Thus began the life of the Liberty Bell.
Continued in ASM November Newsletter.

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Upcoming Events...

October 22	PECO Nuclear Plant Tour
November 12	MEI Course

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