

**QUICK  
CALENDAR**

- Orlando to host 79th Shock and Vibration Symposium (November 2008)
- Free Shock and Vibration Seminar (March, 2008—Charleston, SC)
- Practical Shock Analysis & Design Course (March 3-7, 2008—Hampton, VA)
- Final 78th Papers Due March 31, 2008

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**NOVEMBER 2007 SYMPOSIUM WRAP-UP ISSUE**

# 78th Shock and Vibration Symposium

*By Drew Perkins, Program Manager*

SAVIAC's 78th Shock and Vibration Symposium was held November 4 through November 8, 2007 at the Sheraton Philadelphia City Center in Philadelphia, PA. The symposium drew over 500 attendees to the three-day symposium.

The week got off to a great start on Sunday, November 4, with two days of pre-symposium tutorials. These three-hour courses were taught by experts in the fields of shock and vibration, and were extremely well attended. SAVIAC is pleased to announce that there were 24 tutorials for the 78th symposium.

Two evening events were held before the official "opening" of the symposium. On Sunday evening, all SAVIAC guests were invited to the Welcome Reception

held in the Philadelphia Ballroom. This reception was co-sponsored by PCB Piezotronics and HI-Test Laboratories. The traditional SAVIAC Program Committee reception was held on Monday evening in Horizons Rooftop Ballroom atop the Sheraton. Panoramic views of the Philadelphia skyline provided a beautiful backdrop to the reception

The 78th Shock and Vibration symposium was officially underway with the Opening Session on Tuesday, November 6. SAVIAC community members listened and watched as VIPs were recognized, awards were presented, and the SAVIAC Director, Dr. Bob Welch, delivered his remarks. The keynote address was given by Mr. Richard Sayre (SES), Director—Live Fire Test and Evaluation. In lieu of an Elias Klein lecturer for

the 78th symposium, SAVIAC was pleased to welcome Professor John Berberian (St. Joseph's University) as a guest speaker. Professor Berberian offered insight to the life and work of Professor Robert Cole who authored Underwater Explosions.

*(cont. next page)*



*Dr. Raymond Daddazio (Weidlinger Associates) presents the Henry Pusey Award during the 78th Symposium Opening Session.*

## 78th S&V Symposium Final Statistics

This year's symposium was a success due in large part to our three featured organizations. SAVIAC offers our sincerest thanks to NAVSEA (NSWC Carderock-Philadelphia), General Dynamics Electric Boat, and Lockheed Martin. The program featured some new sessions, and there were many new presenters as well. Thank you to everyone who contributed to the symposium content.

Here are the final statistics for the 78th symposium:

**Papers/Presentations**

Unlimited Distribution	95
Limited "C" Distribution	63
Classified	10
<b><u>Attendance</u></b>	
Symposium Attendees	519
Tutorial Attendees	371
Exhibits	43

**Program Breakdown**

Tutorials	24
Trainings	8
Unlimited Sessions	22
Limited Sessions	12
Classified Sessions	2
Discussion Groups	4
Panels/Fora	2
Meetings	4



Dr. Howard Gaberson Addresses Attendees During the "Shock Analysis Using the Pseudo-Velocity Shock Spectrum" Training Session



Mr. Richard Sayre (SES) Delivers the Keynote Address During the 78th Symposium Opening Session



Attendees Conducting Business Using the Internet Café Sponsored by Weidlinger Associates



A View from "A Night at the Academy" Sponsored by PCB Piezotronics and HI-Test Laboratories

# 78th Symposium (cont.)

Following the opening session, attendees were treated to true Philadelphia cuisine as the Exhibitors Luncheon offered "Philly Cheesesteaks" as the main course.

Technical sessions began in the afternoon on Tuesday with a full slate of presentations. The following sessions were offered:

- Navy Test Methods and Applications
- UNDEX Numerical Applications, Methods, & Design I
- Blast Test Methods and Ground Shock
- Projectile and Gun Dynamics
- Penetration
- Multi-Shaker Vibration
- Vibration Test Methods and Applications
- Training I
- CVN Shock Testing
- DDG 1000 Shock and Vibration
- Blast Effects on Structures I & II (2 Sessions)

Margaret Tang (Weidlinger Associates) chaired the New Engineers' Forum in the early evening on Tuesday and this meeting featured Alan Klembczyk (Taylor Devices) as the guest speaker. Alan offered insight and advice (using personal symposia experiences) to help educate newer SAVIAC attendees about the value of the symposium and ways to get more involved.

A Tuesday evening event was held at the Academy of Natural Sciences. This event was sponsored by PCB Piezotronics and HI-Test Laboratories and was open to all symposium attendees. Guests were welcome to tour the facility's beautiful exhibits while enjoying a bite to eat and listening to the sounds of Ed Alexander (BAE Systems) and his band, Purgatory Creek.

Wednesday's technical sessions began at 8:00am and ran until 5:20pm. Sessions offered were:

- Shock and Vibration Numerical Applications I & II
- Structural Response
- Instrumentation
- Shock and Vibration Isolation
- Survivability of Microelectronics in High-g Environments
- Training II & III
- Energy Absorbing Structures
- Modeling and Simulation I, II, & III
- Blast: Numerical Methods and Applications I & II
- Blast: Test Methods and Weapons Effects
- COTS Equipment Shock and Vibration Panel
- Diagnostics Analysis and Modeling
- Bioengineering and Human Response
- DYSMAS Validation for Ship UNDEX Response
- Structural Analysis
- UNDEX and Vibration Test Applications
- UNDEX Numerical Methods and Applications

This year's symposium featured an "Ice Cream Social" on Wednesday afternoon. Sponsored by The VMC Group and Gibbs & Cox, symposium attendees were able to visit the sponsoring companies' exhibit booths to get these delicious refreshments.

A town-hall meeting was held early Wednesday evening. The SAVIAC community offered the SAVIAC staff numerous suggestions and comments which assists in the improvement of the annual symposium and the operation of SAVIAC in general.

With the sounds of Purgatory Creek playing in the background, symposium attendees enjoyed the SAVIAC Philadelphia Social Event on Wednesday evening. As with the exhibitors' luncheon, attendees had the opportunity to

tour the exhibit hall during this event.

Thursday's sessions began at 8:00am and ran through 12:50pm concluding with the classified sessions held at NAVSEA Philadelphia (NSWC Carderock). Sessions offered were:

- Bolted Joints Under Shock
- Blast: Numerical Methods and Applications III
- Random Vibration and Acoustics
- Blast/Ballistics: Test Applications and Numerical Methods (Classified)
- UNDEX Test and Numerical Applications / Structural Analysis, Submarine Applications (Classified)

SAVIAC offers thanks to all community members and featured organizations who helped make the 78th Shock and Vibration Symposium a success. The symposium is driven by the community and their willingness to teach tutorials or trainings, organize and/or chair sessions, and share technical information.

**Thank You to Our  
78th Symposium  
Featured Organizations**



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If you are interested in becoming more involved in the symposium, please contact Drew Perkins at (434) 581-3041 or email to: [drew.perkins@saviac.org](mailto:drew.perkins@saviac.org)

## Lifetime Achievement Award, Mel Baron Award, and Henry Pusey Award Presented During 78th Symposium Opening Session

Many awards were presented during the 78th Shock and Vibration Symposium Opening Session including SAVIAC's three most prestigious awards: Lifetime Achievement Award, Mel Baron Award, and Henry Pusey Award. The following offers an overview of each of these awards and the award recipients announced during the opening session of the 78th Shock and Vibration symposium.

**The Lifetime Achievement Award:** The Lifetime Achievement Award is made to a person whose contributions to the field of shock and vibration are of such magnitude that they significantly improved the state of the art or state of practice at the time. Such contributions can be in the form of written publications, oral presentations, inventions, or program funding that directly caused such changes. The Award may also be given in recognition of an individual whose lifetime cumulative effect has been to significantly advance the state of the art or practice in the field. Demonstrated personal leadership in the shock and vibration community is an essential qualification for the Award.

**Dr. Howard Gaberson** was presented the Lifetime Achievement Award by Mr. Ed Alexander who nominated Dr. Gaberson for the award. The following is inscribed on the award plaque: *"The SAVIAC Lifetime Achievement Award is presented to Dr. Howard A. Gaberson in recognition of a career dedicated to the improved understanding of shock and vibration processes. This Award recognizes his contributions and advancements spanning the width and breadth of shock and vibration research encompassing: noise and vibration control techniques for jet engine test systems, machinery diagnostics, wind-induced vibrations of compliant structures, blast response of structures, and more. It particularly recognizes his work in evolving the shock spectrum pseudo-velocity as a central concept for assessment of equipment fragility. SAVIAC is grateful for 40 years of Dr. Gaberson's contributions to the Shock and Vibration Community."*

**The Mel Baron Award:** This annual award was established by SAVIAC in 1998 to recognize individuals who have made outstanding technical contributions to the field of shock

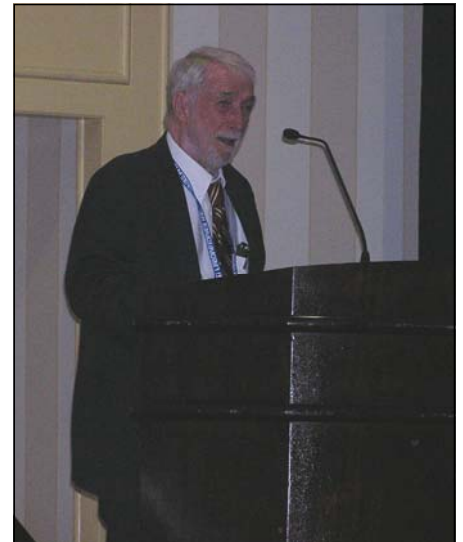
and vibration in computational structural dynamics and related specialties.

This award was established by SAVIAC to honor Dr. Melvin L. Baron for his technical contributions and leadership in computational structural dynamics and related specialties in the field of shock and vibration.

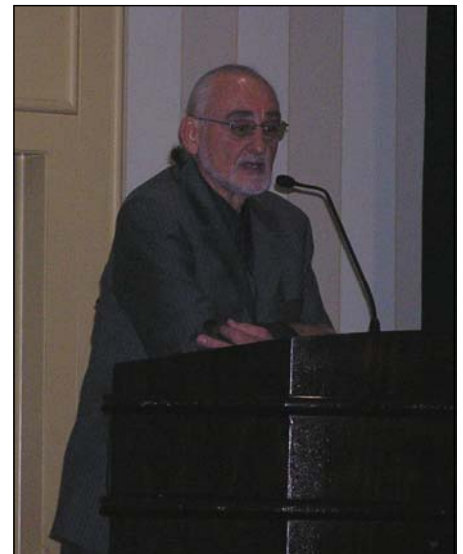
**Dr. John DeRuntz** was presented the Mel Baron Award by Professor Thomas Geers. Professor Geers nominated Dr. DeRuntz for the award. The following is inscribed on the award plaque: *"The pioneering work of Dr. John A. DeRuntz, Jr. in the development of numerical simulation methods and tools to analyze the response of submarines and surface ships, which includes the development of the Undervater Shock Analysis (USA) Code and the Cavitating Fluid Analyzer (CFA) Code, has contributed significantly to the shock and vibration community and has made Dr. DeRuntz one of this community's outstanding researchers."*

**The Henry Pusey Award:** The award is presented for the outstanding paper in the field of shock and vibration presented during the last calendar year. The award is presented at the annual Shock and Vibration Symposium. The paper is selected from the papers presented at the preceding Shock and Vibration Symposium and published in the Shock and Vibration Symposium Proceedings. Only published papers are considered. In some cases a paper may be chosen from the preceding year of Shock and Vibration Journal without an oral presentation at the Symposium. If a paper has been published in the Journal and has also been presented at the Symposium, it should be considered in the year the presentation occurred.

**Dr. Eric Hansen, Mr. Darren Tennant, Mr. Robert Smilowitz, and Mr. Jim Weeks** teamed together to win this year's Henry Pusey Award. Representing Weidlinger Associates, this group's paper and presentation titled "Numerical Investigation of the Vulnerability of Flat Slab Reinforced Concrete Structures to Airblast" was chosen by the Award committee among all nominated papers.



*Dr. Howard Gaberson Award Acceptance During 78th Symposium Opening Session*



*Dr. John DeRuntz Award Acceptance During 78th Symposium Opening Session*

*Nominations for Lifetime Achievement, Mel Baron, and Henry Pusey Awards are open now for 2008. If you have any questions relating to nominating procedures, please contact Drew Perkins (SAVIAC Program Manager) at 434-581-3041 or e-mail to: drew.perkins@saviac.org.*

# 78th S&V Symposium Guest Program

Sponsored  
By:  
Electric Boat

By Boo Perkins, Guest Program Chair

## November 6, 2007

We all loaded our coach with baited breath as the rain poured down in Philadelphia on Tuesday. Umbrellas under our arms, spirits were high as we headed to the Pennsylvania Dutch Country. The good thoughts paid off because as we passed the first horse and buggy in the countryside the sun had popped out and it turned into a beautiful fall day. We toured thru a replica of a traditional Amish house, farm, and school. We all learned an enormous amount about their day to day existence, traditions and religious beliefs. The highlight for me was on our way to lunch we got to see children playing in the school yard. Precious children in their traditional attire but still acting like children, what fun! Then we headed to Good and Plenty to gorge ourselves on a fabulous real Pennsylvania Dutch style lunch. During lunch we visited with friends and made lots of new ones. Winding up the trip we had to get a little shopping in so we

headed to the Kettle Kitchen in Intercourse to shop. We all enjoyed that!

## November 7, 2007

Our group traveled to the Brandywine valley on Wednesday. Our first stop was Longwood Gardens, which was the country home of the DuPont's. The grounds were spectacular and the conservatory was amazing, it went on and on. We were all in awe and loved the seasonal autumn displays of mums. I heard lots of discussions about trying to come back during the different seasons because the plants completely change. What a beautiful and amazing place! We had lunch on our own in the Terrace at Longwood. Then the group traveled to the Brandywine River Museum. Overlooking the river the museum which is located in a 19<sup>th</sup> century gristmill was a great place to experience a crisp fall day. We were fortunate to be there when Victoria better known as Vickie Wyeth was giving a tour, she is the granddaughter of Andrew Wyeth. The museum contains a collection

of American art a majority of the works are by three generations of Wyeths, including Andrew's. We benefited from her tour by hearing an inside point of view discussed between she and her grandfather. It was a great way to wrap up the day.

## November 8, 2007

Thursday we stayed in Philadelphia, but traveled back in time and did a historical tour of the city. We were the first in line to see the Liberty Bell which was wonderful we could walk around the whole bell. Then we headed across the street to Congress Hall and Independence Hall where we all got a well needed history refresher. It was incredible to be standing in the very room where the Declaration of Independence was signed. After that we went to Christ Church where we sat in the same pews that our founding fathers worshipped and learned about living history. Besty Ross's house was next where we ducked through doorways and learned about her life in relation to our country and the times she lived

in. We saw Elfreth's Alley, the longest continually occupied residential street in the country, Ben Franklin's home, print shop, and his tombstone. In a half day we traveled thru an enormous amount of time and places.

## In Closing

Thanks to everyone that participates in the tours. Although our visits are brief, I always enjoy seeing each of you and hearing about how your year has been. I am looking forward to Orlando and hope to see you all there. Thanks again, Boo Perkins



*Cindy Venne, Nancy Winnette, Linda Dyer, and Boo Perkins During the Guest Program to Longwood Gardens*

**SAVIAC  
Course**

## Shock & Vibration Winter Seminar

**Course  
Announcement**

SAVIAC invites you to attend a FREE seminar on Shock & Vibration. The course will be held on March 11, 2008 in Charleston, SC in conjunction with the SAVIAC Winter Technical Advisory Group (TAG) Meeting. SAVIAC and the featured experts in their disciplines have organized this seminar to introduce you to the SAVIAC community, while providing a valuable educational experience.

The seminar is free, but you must register to attend. Please RSVP to Drew Perkins, (434) 581-3041 or [drew.perkins@saviac.org](mailto:drew.perkins@saviac.org) to assure your space and note packet. The agenda will be available in December '07/ January '08 and may be subject to change.

For the Winter Seminar registration form and additional information about SAVIAC, please visit our website at [www.saviac.org](http://www.saviac.org) and use the link for the Winter Seminar and TAG Meeting.

The meeting location and hotel will be chosen in the coming weeks, and information will be posted on-line.

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## 78th Symposium Exhibitors

The 78th Shock and Vibration Symposium had a record number of exhibitors—43. Beginning on Tuesday, November 6, attendees were able to tour the exhibit hall during the “Exhibitors’ Luncheon”. The exhibit hall continued to be frequented with the “Ice Cream Social” and the “SAVIAC Philadelphia Social” on Wednesday.

The following is the list of all companies and organizations that participated as exhibitors for the 78th Shock and Vibration symposium:

Aberdeen Proving Ground  
Advanced Antivibration Components  
Air Force Research Laboratory  
Alion Science & Technology  
ATA Engineering  
Brüel & Kjaer  
CMT Dynamics  
Data Physics Corporation  
Delserro Engineering Sol.  
DTRA  
Dytran Instruments, Inc.  
Endevco  
Enidine Incorporated

GE Fanuc  
General Dynamics Electric Boat  
Gibbs & Cox  
HI-TEST Laboratories  
IDC  
Instrumented Sensor Tech  
IOTech  
Kistler Instrument Corporation  
Lansmont Corporation  
LMS North America  
M + P International Inc.  
National Technical Systems  
NAVSEA Carderock  
Noran Engineering  
Newport News Industrial Corporation  
Oldham Seals  
Oros  
Pacific Instruments, Inc.  
PCB Piezotronics  
Precision Filters, Inc.  
SEM/IMAC  
SIMULIA  
Spectral Dynamics  
Taylor Devices  
TEAM Corporation

The VMC Group  
U.S. Army Corps of Engineers ERDC  
Vibration Research Corp.  
Vibration Specialty Corp.  
Weidlinger Associates



## PRACTICAL SHOCK ANALYSIS AND DESIGN COURSE

### 2008 Schedule and Locations

March 3-7, 2008 (Hampton, VA)

*More Dates and Locations to be Announced*

#### ***About the Course***

At the first Shock and Vibration Symposium in 1947, mechanical shock was defined as "a sudden and violent change in the state of motion of the component parts or particles of a body or medium resulting from the sudden application of a relatively large external force, such as a blow or impact." Since then the specific words used have changed somewhat but the meaning remains the same. Most analysts treat shock as a transient vibration. No matter how it is described or what source produced it, the effects of mechanical shock on structures and equipment create major design problems for a wide variety of systems.

This course will provide a comprehensive treatment of practical shock design and analysis with special emphasis on applications related to the design of ship structures and equipment for shock loads produced by underwater explosions.

Participants in this course will have an opportunity to increase their knowledge and understanding of the analytical and experimental tools that are available for shock design and qualification particularly with respect to requirements that are imposed for shipboard equipment. The lectures will provide a basic review of vibration and shock theory and will present the analytical and experimental methodology in the context of particular design applications. Analytical lectures will emphasize the physical significance of the results. Examples and case histories will be used as illustrations of design approaches; workshop problems that involve class participation will be used to advantage throughout the course. Class members will be encouraged to propose real design problems. The instructors will provide guidance for solutions or the problems may be used as class exercises.

Although this course is aimed primarily at shock design applications on ships, the analysis and design techniques presented are equally applicable to problems related to design for seismic loads or blast induced ground shock. Thus, engineers in these related areas may find the course to be useful. For all who participate, the course will provide a comprehensive coverage of shock design practice and a solid basis for further exploration of shock technology.

#### ***Instructors***

Dr. Rudolph J. Scavuzzo, Mr. Henry Pusey, Mr. G. D.Hill, Mr. Jeffery Morris

#### ***Course Topics***

|                                  |                                  |                                     |
|----------------------------------|----------------------------------|-------------------------------------|
| Review of Basic Vibration Theory | Introduction to Mechanical Shock | Shock Measurement                   |
| Underwater Shock Phenomena       | Multi-Degree-of-Freedom Systems  | Navy Shock Qualification Process    |
| Shock Qualifications by Test     | Shock Qualification by DDAM      | Shock Qualification by Extension    |
| 2-Dimensional Normal Mode Theory | Practical Design Considerations  | Special Design and Analysis Tools   |
| 3-Dimensional Normal Mode Theory | Optimum Foundation Design        | Use of Finite Element Analysis-DDAM |
| General Problem Solving Workshop |                                  | Review and Wrap-up Sessions         |

#### ***Course Registration***

The Registration Fee is \$1500 per student. The registration is transferable to any person in the same organization. The fee includes a comprehensive set of course notes, a text book entitled Naval Shock Analysis and Design by Rudolph J. Scavuzzo and Henry C. Pusey, a Certificate of completion worth 3 CEUs, as well as a Continental Breakfast, Lunch and coffee breaks daily. A Registration Form may be printed out from the SAVIAC Web Site or may be requested from Sallie or Henry Pusey. As SAVIAC Technical Services Manager, Henry Pusey will arrange for the scheduling, management and presentation of all courses. All completed registration forms should be faxed or mailed to Sallie Pusey at the address given below.

#### ***For registration information contact:***

Sallie Pusey, Course Registrar  
1877 Rosser Lane  
Winchester, VA 22601

Tel: (540) 678-8677  
Fax: (540) 678-8799  
email: [saviac@comcast.net](mailto:saviac@comcast.net)

**NOTE: Registrants will be provided details about the course location and hotel(s) as soon as the course is firmly scheduled.**

## MECHANICAL SHOCK TEST TECHNIQUES & DATA ANALYSIS

### 2008 Schedule and Locations

April 7-11, 2008 (Phoenix, AZ)

*More Dates and Locations to be Announced*

#### **About the Course**

Mechanical Shock may be defined as a sudden change in velocity and is a major design consideration for a wide variety of systems and their components. The structural response to mechanical shock must be measured and characterized during the engineering development of these systems so that they will survive all environments during their service lifetime. These environments may include (but are not limited to): handling and transportation shocks, shocks during system delivery to a target, use impact shocks and shock originating from an explosive or pyrotechnic event. These different shock environments have quite a velocity change range from about 1 meter per second to 51 meters per second (40 - 2000 ips). Conversely acceleration magnitudes range from 4 g's in earthquakes to 200,000 g's in differentiated LDV measured pyroshocks.

This course will provide a comprehensive treatment of mechanical shock test techniques and data analysis for shocks from 100 g's to 200,000 g's. Mechanical shock instrumentation from low frequency techniques for underwater explosions (digitally filtered at 250 Hz as required by the US Navy) to high frequency techniques for ballistic shock will be reviewed in detail along with the techniques and data analyses to evaluate the instrumentation measuring these shocks.

Mechanical shock test techniques from package testing to conventional mechanical shock machines to pyroshock simulations and Hopkinson bar techniques will be presented. Design procedures for mechanical shock equipment will be discussed in detail. Where possible, theoretical bases for mechanical shock test techniques are provided. Mechanical shock data analysis and interpretation will be a major focus of all presentations and discussions and will include shock data examination and editing as well as interpolation, trend removal, and integration with Matlab.

#### **Instructors**

Dr. Vesta Bateman, Dr. Howard Gaberson, Mr. Jeffery Morris

#### **Course Topics**

|                                                                                 |                                                                           |                                                              |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------|
| Introduction to Mechanical Shock                                                | Data Acquisition System Calibration/Use                                   | Accelerometer, MEMS, and Materials                           |
| Mechanical Shock Measurement                                                    | Matlab Data Analysis                                                      | Evaluations                                                  |
| Mechanical Shock Instrumentation                                                | Conventional Shock Testing Machines for                                   | Hopkinson Bar Theory                                         |
| Certification of Shock Instrumentation/<br>Measurement Devices                  | Components and Full Scale Systems                                         | Hopkinson Bar Certifications                                 |
| Time Domain Shock Specifications                                                | Underwater Explosion Testing                                              | Hopkinson Bar Materials and Configurations                   |
| Frequency Domain Shock Specifications                                           | Navy Mechanical Shock Machines                                            | Commercial Laser Doppler Vibrometer use<br>and Certification |
| Shock Analysis using the Acceleration Shock<br>Response Spectrum                | Pyroshock Testing and Simulation                                          | Uncertainty Analysis                                         |
| Revolutionary Treatment of Pyroshock with<br>the Pseudo Velocity Shock Spectrum | Full-Scale Pyroshock Tests and Simulations                                | Review and Wrap-up Sessions                                  |
|                                                                                 | Component Pyroshock Simulations Including<br>Apparatus and Fixture Design |                                                              |

#### **Course Registration**

The Registration Fee is \$1500 per student. The registration is transferable to any person in the same organization. The fee includes a comprehensive set of course notes, a compilation of papers by Instructors Bateman and Gaberson, a text book entitled *Shock Data Analysis* by Rudolph J. Scavuzzo and Henry C. Pusey, a Certificate of completion worth 3 CEUs, as well as a Continental Breakfast, Lunch and coffee breaks daily. A Registration Form may be printed out from the SAVIAC Web Site or may be requested from Sallie Pusey, SAVIAC Course Registrar (Contact Information below). A Registration Form (available mid-Dec '07) may be printed out from the SAVIAC Web Site or may be requested from Sallie or Henry Pusey. As SAVIAC Technical Services Manager, Henry Pusey will arrange for the scheduling, management, and presentation of all courses. All completed registration forms should be faxed or mailed to Sallie Pusey at the address given below.

#### **For registration information contact:**

Sallie Pusey, Course Registrar  
1877 Rosser Lane  
Winchester, VA 22601

Tel: (540) 678-8677  
Fax: (540) 678-8799  
email: saviac@comcast.net

**NOTE: Registrants will be provided details about the course location and hotel(s) as soon as the course is firmly scheduled.**

SAVIAC / HI-Test Laboratories, Inc.  
PO Box 165  
1104 Arvon Road  
Arvon, VA 23004

## A LOOK INSIDE THE NOVEMBER 2007 *CURRENT AWARENESS*



### 78th Shock and Vibration Symposium

- Wrap-Up
- Statistics
- Awards
- Guest Program
- Exhibitors

### Course Announcements

- SAVIAC's Shock and Vibration Winter Seminar
- SAVIAC's Practical Shock Analysis & Design
- SAVIAC's Mechanical Shock Test Techniques & Data Analysis

### PCB Piezotronics Advertisement

### Other Conference & Course Announcements

The Current Awareness newsletter is published by the Shock and Vibration Information Analysis Center, which is operated by HI-Test Laboratories, Inc., under contract to the U.S. Army Engineer Research and Development Center.

SAVIAC Main Office  
1104 Arvon Road  
Arvon, VA 23004  
(434) 581-3041-Ph (434) 581-3037-Fx

Program Manager  
Drew Perkins  
drew.perkins@saviac.org

Program & Event Coordinator  
Ashley Sharpe  
ashley.sharpe@saviac.org

Manager of Technical Services  
Henry Pusey  
(540) 678-8678  
saviac@comcast.net

SAVIAC Director  
Dr. Charles Robert Welch  
U.S. Army Engineer Research & Development Center  
Vicksburg, MS 39180  
charles.r.welch@erd.c.usace.army.mil