

# NTIAC Newsletter

NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER

Volume 27, No. 4

A DTIC-Funded, Department of Defense Information Analysis Center May 2002

## Update on Investigation Into Crash of American Airlines Flight 587

On November 12, 2001, at approximately 9:17 a.m., American Airlines flight 587, an Airbus A-300-600, N14053, crashed into a neighborhood in Belle Harbor, New York, several minutes after taking off from Kennedy International Airport. In January the NTSB released its fourth update on the ongoing investigation, reproduced below. At the end of February, the fifth update on the investigation was released, while short of details did announce that the final phase of testing of Flight 587's tail section will begin in early March at NASA's Langley Research Center in Hampton, Virginia. The destructive tests on the stabilizer coupons will help establish whether damage induced in the stabilizer during operation and/or pre-existing flaws were contributing factors to the crash.



Figure 1. Vertical stabilizer (tail fin) attachment point

The NTSB has also arranged for the rudder and tail fin of another A300-600, involved in an in-flight incident in 1997, to be removed and inspected, and has purchased an A300-600's used rudder for the investigation.

Flight 587 Cont'd on Page 3

## Field Tip: Measurement of Residual Magnetic Fields

An important issue in magnetic particle inspections is the de-magnetization of the inspected part. Relevant MT inspection standards, including ASTM E-1444, require the part to be de-magnetized prior to returning the part to service. Among other things, a magnetized part can potentially adversely affect neighboring systems when returned to service (e.g. local electronics), and without demagnetization the possibility exists that subsequent MT or even ET inspections will be complicated by an existing magnetic field.

In some cases though it can be difficult to locate any information or conventional

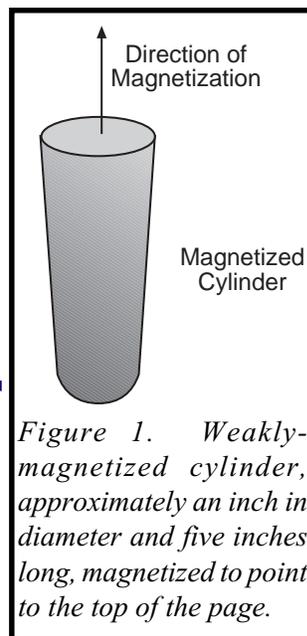


Figure 1. Weakly-magnetized cylinder, approximately an inch in diameter and five inches long, magnetized to point to the top of the page.

wisdom on how to measure the residual magnetic field of a part.

Consider a weakly-magnetized ferromagnetic structure, such as the cylinder shown in Figure 1. The cylinder is magnetized along the 90° direction, or pointing to the top of this page.

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In most MT inspections, the part is magnetized perpendicularly to the gaussmeter probe: the probe, normally consisting of a Hall effect probe but also conceivably a fluxmeter or coil in some systems, would have its "active area" or its most sensitive axis pointed directly at the part, while the part itself is typically magnetized as shown in Figure 1 (along its longest axis). Other configurations exist of course, but they will exhibit similar magnetic behavior. A Hall probe is effectively sensitive to the magnetic field in one direction only, in our scenario, it is aligned so that it is sensitive to magnetic fields in the 0° direction, or in the horizontal direction of this page. Because it is only sensitive to the field in this one direction, rather than examining the total strength of the residual field we are really only measuring  $B_n$ , the field component that is aligned along the horizontal.

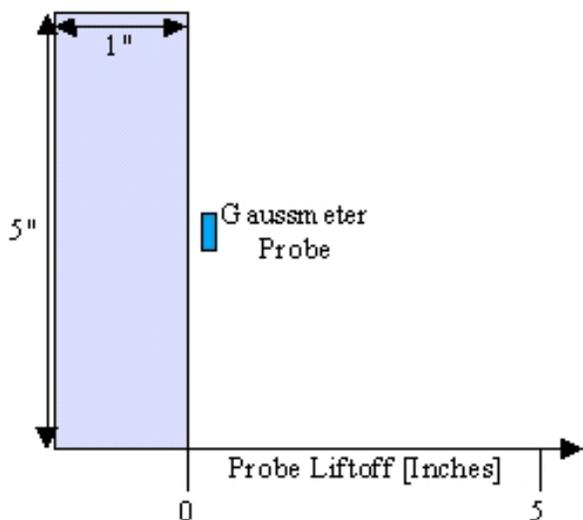


Figure 2. Geometry used for the residual field measurement with our Hall-effect probe gaussmeter.

The residual magnetic field contained within the magnetized part decreases rapidly with distance from the surface of the part. Figure 3 illustrates this point, showing that for our scenario moving two inches above the part the field has dropped to less than 50% of its strength at the surface of the magnetized component.

The implication for MT inspections and inspectors is that the residual field measurements, taken to determine whether demagnetization is necessary or not, should be conducted on the part in question if at all possible.

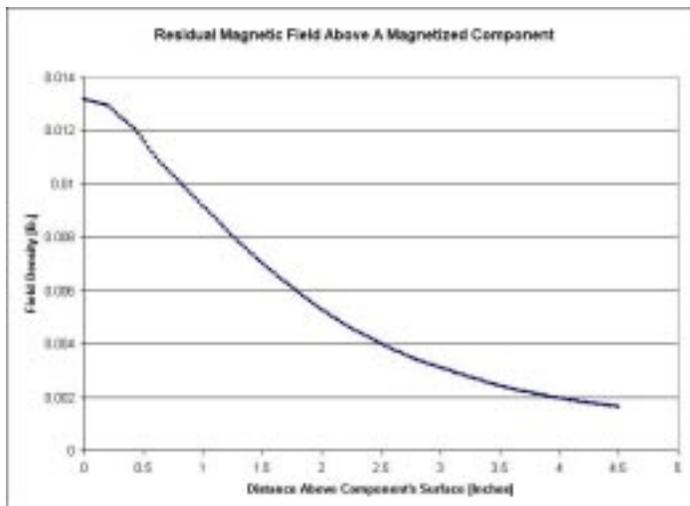


Figure 3. The field measured above a weakly-magnetized ferromagnetic cylinder, as a function of "liftoff" distance (distance above the surface of the part).

## Remembering John W. "Jack" Lincoln

Dr. Jack Lincoln, long a recognized figure in the structural integrity field, passed away in his sleep February 10 at the age of 73.

Dr. Lincoln devoted much of his professional career to the safety of aging aircraft, working at Wright-Patterson AFB from 1971-1973 as a consultant on the C-5 program. In the late 1970's, Dr. Lincoln became chief of the Structures Division of the Air Force's Aeronautical Systems Center, directing the structural assessments of every aircraft in the Air Force inventory, setting the standard for structural integrity and review. We at NTIAC extend our condolences to the Lincoln family and friends.

For information about the U.S. Department of Defense Information Analysis Centers (IACs), visit the DoD IAC HUB page at <http://iac.dtic.mil/>. This directory outlines the IAC Program as a whole including its mission and examples of the types of products and services the IACs provide. It also contains information about each individual IAC including contacts, areas of expertise, and other pertinent information.

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This document was prepared under the sponsorship of the U.S. Department of Defense, the Defense Technical Information Center, Fort Belvoir, Virginia, under Contract #SPO700-97-D-4003.

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We welcome your input. To submit your related articles, photos, notices, or ideas for future issues, please contact:  
Attn: Chris Coughlin, Editor

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## Fourth Update On NTSB Investigation Into Crash Of American Airlines Flight 587

The National Transportation Safety Board today released the following updated information on its investigation of the November 12 crash of American Airlines flight 587 in Belle Harbor, New York, which resulted in the deaths of all 260 persons aboard and 5 persons on the ground.

### Vertical Stabilizer and Rudder

The aircraft's tail section has been in NASA's Langley Research Center in Hampton, Virginia since early December. In the intervening weeks, the Safety Board has conducted a series of non-destructive tests to determine whether the vertical stabilizer and rudder had any pre-existing flaws before the accident. Some delamination has been noted, but at this time it is not known whether this occurred before impact or as a result of impact.

Contrary to recent press accounts, the Board has not ruled out either mechanical malfunction or structural defect as causing or contributing to the accident. Work at NASA Langley will take many more months and will transition to more extensive and intrusive tests of the stabilizer and rudder.

Although the flight data recorder showed significant rudder movement during the last moments of flight 587, it is not known what caused the movement - whether it was mechanically induced or pilot activated - or what role, if any, the movement played in the separation of the vertical stabilizer.

The Safety Board is surveying salvage yards for an intact A300-600 vertical stabilizer and rudder as an exemplar for potential tear down and examination. The undamaged exemplar could be helpful to investigators as they examine the accident airplane's composite materials and attachment points.

### Eyewitnesses

In the course of the NTSB's continuing investigation, over 350 eyewitnesses to some segment of the accident sequence have been identified. Those who have not already provided written statements or been interviewed by NTSB personnel will be contacted shortly. Some of these individuals mentioned observing fire or smoke before the plane impacted the ground, although the majority of them do not. Although at this time no physical evidence of an inflight explosion or fire has been discovered, the Board is taking into full consideration the observations of all witnesses. Witness statements will be made part of the public docket of this investigation.

As previously announced, the Safety Board has established an e-mail address (AA587wit@ntsb.gov) for eyewitness statements. All persons who can provide eyewitness testimony about this accident who have not yet been in contact with Safety Board personnel should contact the NTSB through this e-mail.

### Flight Data Recorder

The flight data recorder continues to be analyzed. That process is taking a little longer in this case because signals for some parameters

on this aircraft are "filtered" before they reach the flight recorder. The filtering operation is used to smooth data that drive cockpit displays so that the needle (or other indicator) does not jump around. This filtering is accomplished by averaging the data over time. When large, rapid movements are made, this averaging will distort the recorded data; rapid, extreme control movements are clipped off. As a result, the readings on the recorder show what the gauges were telling the pilots, not necessarily what was actually occurring on a real-time basis to the aircraft. This will require some aircraft testing and then further computations by Board staff to get the true readings on some parameters of interest like rudder, elevator, and aileron movement. Although this has added to the workload of investigators, it is not expected to affect the quality or the timing of the Board's final product.

In 1994, the Safety Board recommended to the FAA that such filtering systems be removed from information sent to flight data recorders. The FAA told the NTSB that its 1997 final rule amending FDR requirements "precludes the use of a filter and specifies the seconds-per-sampling interval for all parameters." Based on that information, the Safety Board closed its recommendation as "Acceptable Action" on August 9, 2000. The Safety Board has alerted Airbus and the FAA of the problem noted on the recorder recovered from American Airlines flight 587.

NTSB Advisory  
National Transportation Safety Board  
Washington, DC 20594  
January 15, 2002 

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## 2001 John W. Lincoln Award Presented to Dr. James C. Newman

Dr. James C. Newman, Jr., Professor, Department of Aerospace Engineering, Mississippi State University, Mississippi State, Mississippi and recently retired from NASA Langley Research Center, Hampton Virginia, was presented the 2001 John W. Lincoln Award, in recognition of his outstanding work over the years in advancing the technology of fatigue and fracture mechanics and applying it to aircraft structural integrity. The Award was presented at the 2001 USAF Aircraft Structural Integrity Program (ASIP) Conference in Williamsburg Virginia on December 11, 2001. The Award, which consists of a gold medal and a certificate of recognition, was named in honor of Dr. John W. Lincoln of the USAF Aeronautical Systems Center, Wright-Patterson Air Force Base, Ohio. Dr. Lincoln, who recently passed away, was a pioneer and major contributor to the development and application of durability and damage tolerance design to ensure the safety and longevity of both military and commercial aircraft. The Award has been presented previously to Dr. Lincoln (1996), Charles Tiffany (1997), Thomas Swift (1998), Professor Jaap Schijve (1999) and to Professor Alten F. Grandt Jr. (2000). A plaque with the names of the recipients is on display at Wright-Patterson Air Force Base, Ohio. 

## PUBLICATIONS

### ASTM Publishes New NDE Reference Data Book

*The American Society for Testing and Materials (now known as ASTM International) has published a new NDE reference data book, available for online ordering from their website at <http://www.astm.org> or through the regular channels.*

### DS 68

### Handbook of Reference Data for Nondestructive Testing

Editor(s): Leonard Mordfin

Pages 176

Published 2002 (Soft Cover)

\$49 North America, \$54 Elsewhere

For the first time in one convenient handbook — NDT reference data for the experienced and knowledgeable professional practitioner.

This unique book provides the NDT practitioner with the reference data needed to carry out on-site work properly. The data are provided in tables, charts, graphs, and equations that are compiled from many books and standards. This is the only volume that brings such diverse information together for the first time in one convenient handbook for the experienced and knowledgeable professional, without extraneous text and tutorial material. This resource will help the NDT professional to plan and to carry out on-site tests that are likely to produce reliable results.

Since a substantial amount of NDT work is carried out in the field, (e.g. power plants, ships, bridges, pipelines, etc) it will be especially beneficial to have these reference data in one easy-to-carry volume, that can be kept in your toolbox.

Audience: An invaluable reference tool for the NDT professionals, Level I and II technicians, and Level III certificate holders.

ISBN:0-8031-2092-3

Stock#:DS68

## JANNAF Interagency Propulsion Joint Subcommittee Meeting

*Of interest to NDE professionals within the Department of Defense, the 13<sup>th</sup> NDE Subcommittee (NDES) Meeting will be held this August in San Antonio, Texas. We present here both the announcement and the topics of interest to the NDES.*



### JANNAF

13th Nondestructive Evaluation  
22nd Rocket Nozzle Technology  
35th Structures & Mechanical Behavior  
Joint Subcommittee Meeting

### Announcement And Call For Papers

The Joint Army-Navy-NASA-Air Force (JANNAF) 13th Nondestructive Evaluation (NDES)/22nd Rocket Nozzle Technology (RNTS)/35th Structures & Mechanical Behavior (S&MBS) Joint Subcommittee Meeting will be held Tuesday through Thursday, August 27-29, 2002 at the Holiday Inn Riverwalk in San Antonio, Texas. The best technical papers will be selected and recognized by each of the respective subcommittees. Attendance at this joint JANNAF meeting is limited to U.S. citizens whose organizations are certified with the Defense Logistics Information Service to obtain export-controlled technical data.

The purpose of the JANNAF Interagency Propulsion Committee is to coordinate fundamental research, exploratory development, and advanced development programs; standardize procedures and nomenclature; promote and facilitate the exchange of technical information; and accomplish problem solving in areas of joint

*JANNAF Cont'd on Page 5*

agency interest on propulsion systems used in missiles, rockets, boosters, spacecraft, satellites, and guns. JANNAF subcommittees focus their resources on technical issues of interest to the JANNAF agencies. The scope of these subcommittees follow: the Nondestructive Evaluation Subcommittee (NDE) addresses technical problems and issues associated with applying nondestructive evaluation and inspection techniques to solid rocket motors, liquid engines, and their components; the Rocket Nozzle Technology Subcommittee (RNTS) focuses on advanced composite materials, including carbon-carbon, ceramic matrix, and carbon phenolic composites for solid rocket nozzles and their components, materials processing, testing, evaluation, design, analysis, and other topics of interest in the rocket nozzle technology area; Structures and Mechanical Behavior Subcommittee (S&MBS) addresses the experimental, analytical, and statistical techniques used for the preliminary or detailed structural design of solid rocket motors, gun ammunition and their components, and for the prediction and assessment of their structural integrity and structural service life.

The technical areas to be addressed for this joint meeting are defined on the following pages of this announcement. Topics are not intended to be exclusive; papers on unusual or specific solutions, or novel approaches are especially desired. Individuals who wish to submit an abstract should carefully review the mission areas being solicited and use the appropriate abstract form provided herein. Abstracts are due on 11 March 2002; submittal instructions are located on the next page. Recommendations for workshops and specialist sessions are also sought. Individuals interested in organizing and chairing a workshop or specialist session are urged to contact CPIA.

Information about the August 2002 JANNAF Joint Subcommittee Meeting can also be found on CPIA's web site at: [cpia.jhu.edu](http://cpia.jhu.edu). Questions concerning the meeting may be directed to Debra S. Eggleston, CPIA, at (410) 992-7300, ext 202 or e-mail: [dse@jhu.edu](mailto:dse@jhu.edu). Abstracts forms can be electronically completed and submitted via e-mail to: [dse@jhu.edu](mailto:dse@jhu.edu).

## Mission Areas—Nondestructive Evaluation Subcommittee (NDES)

The Nondestructive Evaluation Subcommittee meeting will address technical problems and issues associated with the application of nondestructive evaluation and inspection techniques to solid propellant rocket motors, liquid or gel engines, and gun propulsion systems. These include the application of NDE techniques during any portion of the life cycle of the propulsion components. Papers on emerging NDE technologies and their potential application to the propulsion community are also sought. Specific areas of interest are listed below:

1. **NDE in Process Control and Testing** will focus on the application of NDE technology and methods for enhancing propulsion system and/or subcomponent quality and reliability, as well as the utilization of NDE methods during the testing of an end unit or any of its subcomponents. Specific areas of interest are:
  - The monitoring and control of manufacturing processes.

- Automated NDE sensing systems for quality control and conformance testing.
- Use of embedded sensing system (including Micro-Electromechanical Systems—MEMS) for performance testing.
- NDE methods used during static test.
- NDE standards for system or component acceptance.

Area Chair: Mr. Jeffrey M. Warren, Naval Surface Warfare Center/West Bethesda, telephone (301) 227-4984, e-mail: [warrenjm@nswccd.navy.mil](mailto:warrenjm@nswccd.navy.mil)

2. **NDE in Service Life and Aging** involves the increasingly important role of NDE in service life assessment and extension, and the evaluation of propulsion system aging characteristics. Specific areas of interest include:

- The evaluation of grain integrity, inert materials aging, chemical attack and migration, corrosion, and environmental storage effects.
- Advanced NDE systems and technologies including but not limited to, real-time radiography, digital ultrasonics, holography, shearography, magnetic resonance imaging, acoustic emission, electro-optic fiber embedments, thermography, and lasers.

Area Chair: Dr. James P. Nokes, Aerospace/Los Angeles, telephone (310) 336-2326, e-mail: [james.p.nokes@aero.org](mailto:james.p.nokes@aero.org)

## 29<sup>th</sup> Annual Review of Progress in Quantitative Nondestructive Evaluation (QNDE): Call for Papers

*The Annual QNDE Review is one of the most popular and informative of the yearly NDE symposia and conferences. Iowa State's CNDE has put out the Call For Papers for this year's Review, July 14<sup>th</sup>-19<sup>th</sup>.*

Papers are sought for the 29th Annual Review of Progress in QNDE to be held July 14-19, 2002, at Western Washington University, Bellingham, Washington. The Review is organized by QNDE Programs and hosted by the Center for NDE, a member of the Institute for Physical Research and Technology at Iowa State University. Conference information and forms will be available at: <http://www.cnde.iastate.edu/qnde/qnde.html>.

Verbal and poster sessions will be held that emphasize both the basic science and early engineering developments in quantitative NDE and closely related technologies such as materials characterization and process control that utilize quantitative NDE techniques.

### Categories of the Review will include advances in:

- Fundamentals of all QNDE methods (field-flaw interactions and field property relations, scattering, probability of detection, inverse methods and their application to flaw sizing and property measurement, process models, reliability of measurement and component inspectability)
- Flaw imaging and reconstruction, image analysis—all techniques
- Signal processing methods including application of advanced techniques to QNDE

- Sensors, transducers, and probes for flaw detection, material property measurement, process control and in-situ measurements; NDE sensors for security applications
- New and emerging QNDE techniques (e.g., NMR)
- New QNDE instruments and systems
- QNDE reliability and inspectability
- Materials characterization (properties, stress, processes, weldments, corrosion, other degradation mechanics)
- QNDE for advanced materials (composites, electronic materials and devices, ceramics)
- QNDE of civil structures and materials
- QNDE in manufacturing, design and process control
- QNDE applied to security and biological systems (humans, animals, plants, foods)

Prospective authors are requested to prepare a 200-word (or less) abstract. The abstract should be typed and include the title, author(s) and affiliation before the body of the abstract. Each abstract must have a separate submittal form attached. Abstracts may be submitted electronically, by fax, or by mail. Abstract deadline is April 30, 2002.

Abstracts will be reviewed by a program committee, and author(s) will be informed by May 13, 2002, of acceptance and whether the presentation will be in a verbal or a poster session for the Review.

Questions concerning abstracts should be directed to Connie Nessa or Sarah Kallsen (515) 294-9749 or [qnde1@cnde.iastate.edu](mailto:qnde1@cnde.iastate.edu).

Proceedings will be published as a hardbound volume with all papers on an accompanying CD. Details of manuscript preparation and forms are available on the QNDE web site. Post-conference manuscripts are due on September 2, 2002.

### Acoustic Emission Working Group Meeting

The 45th Meeting of the Acoustic Emission Working Group will be held at Northwestern University in Evanston, Illinois, August 19 to August 21st, 2002. The Working Group will maintain the 34 year tradition of sharing the most recent work and concepts of the leading acoustic emission practitioners throughout the world. From the Primer that precedes the Working Group meetings where the principles of acoustic emission are laid out by leading experts to the Workshop itself, the AEWG meeting is the premier Acoustic Emission gathering of the year.

Combining advanced technical discussion through formal presentations, informal discussion and presentations of commercial equipment with the special charm of Evanston, IL in the summer, this meeting offers a unique experience for the summer of 2002.

Deadline for abstracts is June 1, 2002. Abstracts may be submitted via mail, fax, or e-mail. Send abstracts to Nancy Seeger, Northwestern University, Infrastructure Technology Institute, 1801 Maple Avenue, Evanston, IL 60201-3140; fax to 847-467-2056; or e-mail [nseeger@northwestern.edu](mailto:nseeger@northwestern.edu).

## The Defense Working Group on Nondestructive Testing

The Defense Working Group on Nondestructive Testing provides the only forum for Army, Navy, Air Force, Marine, DLA, and DCMA representatives to freely exchange information pertaining to nondestructive testing methods, equipment and applications. As attendance is restricted, and tightly controlled, the focus remains on information exchange and problem solving without regard to contractual considerations. For the past 49 years this group has met annually, providing a conduit for engineers, scientists, and technicians to present technical problems and innovative testing systems to the assembled specialists. Collectively, attendees strive to advance solutions, utilizing their knowledge, skills and experience.

With reductions in expenditures for maintenance, repair, and acquisition of new systems, it has become imperative that the Defense Department maximize the useful life of present assets, while developing economical maintenance strategies. NDT plays a significant role in this process as it provide quantitative input on the characteristics of systems and components during all phases of life-cycle management. This ability to test and inspect without destroying or degrading equipment ensures the highest standards of personnel safety while providing the most inexpensive method available to assess useful life and readiness of current assets.

This year government contractors and vendors will be invited to the Wednesday afternoon technical session as well as the evening social on Wednesday evening.

The 50th Defense Working Group on Nondestructive Testing is hosted this year by Commander, Naval Air Forces, Atlantic Fleet (COMNAVAIRLANT) and will be held from 18-21 Nov. 2002, at the Renaissance Portsmouth Hotel, Portsmouth, VA. More information may be obtained by contacting our web site at: <http://hometown.aol.com/dodndt>, or our host representative: HT1 (SW)

Todd Stelzig, [tstelzig@marmc.spear.navy.mil](mailto:tstelzig@marmc.spear.navy.mil).

## ASNT's Materials Evaluation Launches NDT Technician

The January 2002 Edition of Materials Evaluation saw the premiere of the NDT Technician, a new four-page quarterly newsletter, written and reviewed by NDT technicians, and will include technical focus articles, a "good ideas" column, and practitioner profiles. During its first year of publication, TNT will be part of Materials Evaluation, as a removable insert. Looking forward, TNT will be expanded, and possibly spun off as a stand-alone publication.

## MEETINGS AND SYMPOSIA CALENDAR

2002

- June 12-14 **8th International Workshop on Electromagnetic Nondestructive Evaluation**, Fraunhofer Institute for Nondestructive Testing (IZFP) in Saarbruecken, Germany, June 12-14, 2002. Deadline for abstracts is March 15, 2002. Further information is available through email (secretariat@ende2002), or from the IZFP's website at <http://www.izfp.fhg.de/index.html/ende2002/index.html>.
- June 24-27 **National Space and Missile Materials Symposium**, Colorado Springs Colorado. Contact: Michelle Kubal, Anteon Corporation, Attn: NSMMS, 5100 Springfield St, Suite 509, Dayton Ohio 45431-1264, Phone: (937) 254-7950 Extension 1168 Fax: (937) 253-2296 Email: [mkubal@anteon.com](mailto:mkubal@anteon.com). Alternate contact is Mr. Ron Ooten, Phone (865) 576-8146 Email: [ootent@oro.doe.gov](mailto:ootent@oro.doe.gov).
- June 24-28 **11th International Symposium on Nondestructive Characterization of Materials**, Berlin, Germany. Contact: Johns Hopkins University Center for NDE (410) 516-6115, or in Germany +49(0)30 8104-1832. Update information websites: [www.cnde.com](http://www.cnde.com) [www.dgzfp.de/tagungen/ndcm/index.htm](http://www.dgzfp.de/tagungen/ndcm/index.htm)
- July 8-11 **Data Fusion Applications in Nondestructive Inspection**, Annapolis Maryland July 8-11 2002, as part of the 5th International Conference on Information Fusion. Contact: David S. Forsyth, Institute for Aerospace Research, National Research Council Canada, Building M14, 1200 Montreal Road, Ottawa, ON Canada K1A 0R6, by phone (613) 991-0693, fax (613) 952-7136 or email [david.forsyth@nrc.ca](mailto:david.forsyth@nrc.ca). More information about the conference, and the call for papers, can be found at: [http://www.fusion2002.org/callforpapers\\_page.htm](http://www.fusion2002.org/callforpapers_page.htm).
- July 8-11 **U.S. Navy & Industry Corrosion Technology Exchange (RUST 2002)** will be held at the Hurstbourne Hotel & Conference Center in Louisville, Kentucky, July 8-11, 2002. Contact Mr. Don Hileman, U.S. Navy & Industry CTE Exhibitor Coordinator, at 502.364.5231, fax 502.364.5108 or email [hilemande@nswcl.navy.mil](mailto:hilemande@nswcl.navy.mil).
- July 10-12 **First European Workshop on Structural Health Monitoring**, Ecole Normale Superieure, Cachan (Paris), France. Contact: Prof. Daniel Balageas, ONERA, Structure & Damage Mechanics Dept., BP 72, 92322 Chatillon Cedex, France. Phone: +33-1-46-73-48-73. Fax: +33-1-46-73-48-91. Email: [Daniel.Balageas@onera.fr](mailto:Daniel.Balageas@onera.fr) Website: [www.onera.fr/congres/shm2002/](http://www.onera.fr/congres/shm2002/)
- July 14-19 **29th Annual Review of Progress in Quantitative Nondestructive Evaluation**, Bellingham Washington July 14-19, 2002 at Western Washington University. Abstracts of not more than 200 words can be submitted electronically through the website at <http://www.cnde.iastate.edu/qnde/qnde.html> or mailing abstracts @cnde.iastate.edu. The deadline for abstracts is April 30, 2002. Contact: QNDE Programs, Attn: Abstract Enclosed, Center for NDE, 1917 Scholl Road, Ames IA 50011-3051. Further information is available from Connie Nessa or Sarah Kallsen by calling (515)294-9749.
- August 19-21 **The 45th Meeting of the Acoustic Emission Working Group** will be held at Northwestern University in Evanston, Illinois, August 19 to August 21st, 2002. Deadline for abstracts is June 1, 2002. Abstracts may be submitted via mail, fax, or e-mail. Send abstracts to Nancy Seeger, Northwestern University, Infrastructure Technology Institute, 1801 Maple Avenue, Evanston, IL 60201-3140; fax to 847-467-2056; or e-mail [nseeger@northwestern.edu](mailto:nseeger@northwestern.edu).
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- September 10-13 **Structural Materials Technology (SMT): NDE/NDT for Highways and Bridges Topical**, Cincinnati Ohio, September 10-13, 2002 at the Westin. Abstracts due no later than March 15, 2002. Contact: ASNT Conference Department, 1711 Arlingate Lane PO Box 28518, Columbus OH 43228-0518. Phone (800) 222-2768 (Canada and US only) or (614) 274-6003, fax (614) 274-6899.
- September 11-13 **3rd European-American Workshop on NDE Reliability**, Berlin, Germany, September 11-13, 2002. For information on abstract submission for papers or teaching units contact Christina Mueller, BAM, Unter den Eichen 87, Berlin 12205, Germany, Phone: +49 30 8104 1833, Fax: +49 30 8104 1837, Email: [christina.mueller@bam.de](mailto:christina.mueller@bam.de) Deadline for submissions extended to March 15, 2002.
- September 16-19 **Sixth Joint FAA/DoD/NASA Aging Aircraft Conference**, September 16-19, San Francisco CA, Hyatt Regency. Questions about the conference can be addressed to the attention of Dennis Flath ([agingaircraft2002@galaxyscientific.com](mailto:agingaircraft2002@galaxyscientific.com)), Galaxy Scientific Corporation, 2500 English Creek Avenue, Building C, Egg Harbor Township NJ 08234-5562, 609-645-3772, Fax 609-645-2881
- October 8-11 **2002 IEEE International Ultrasonics Symposium**, Oct. 8-11, Forum Hotel, Munich, Germany. Symposium information can be obtained via the World Wide Web, at <http://www.ieee-uffc.org/2002/>. Further information available from Donald C. Malocha ([dcm@ece.engr.ucf.edu](mailto:dcm@ece.engr.ucf.edu)), School of Electrical Engineering & Computer Science, University of Central Florida, Orlando, FL 32816-2450, 407-823-2414, Fax:407 823-5835.

# CALL FOR PAPERS

**29<sup>th</sup> Annual Review of Progress in Quantitative Nondestructive Evaluation**, Bellingham Washington July 14-19 2002 at Western Washington University. Abstracts of not more than 200 words can be submitted electronically through the web site at <http://www.cnde.iastate.edu/qnde/qnde.html> or mailing [abstracts@cnde.iastate.edu](mailto:abstracts@cnde.iastate.edu). The deadline for abstracts is April 30, 2002. Contact: QNDE Programs, ATTN: Abstract Enclosed, Center for NDE, 1917 Scholl Road, Ames IA 50011-3051. Further information is available from Connie Nessa or Sarah Kallsen by calling (515) 294-9749.

**Joint Army-Navy-NASA-Air Force (JANNAF) 13th Nondestructive Evaluation (NDES)/22nd Rocket Nozzle Technology (RNTS)/35th Structures & Mechanical Behavior (S&MBS) Joint Subcommittee Meeting**, Holiday Inn Riverwalk, San Antonio, August 27-29 2002. Information about the August 2002 JANNAF Joint Subcommittee Meeting can also be found on CPIA's web site at: <http://cpia.jhu.edu>. Questions concerning the meeting may be directed to Debra S. Eggleston, CPIA, at (410) 992-7300, ext 202 or e-mail: [dse@jhu.edu](mailto:dse@jhu.edu). Abstracts are due on 11 March 2002. Recommendations for workshops and specialist sessions are also sought. Individuals interested in organizing and chairing a workshop or specialist session are urged to contact CPIA. Attendance at this joint JANNAF meeting is limited to U.S. citizens whose organizations are certified with the Defense Logistics Information Service to obtain export-controlled technical data.

**The 45th Meeting of the Acoustic Emission Working Group** will be held at Northwestern University in Evanston, Illinois, August 19 to August 21st, 2002. Deadline for abstracts is June 1, 2002. Abstracts may be submitted via mail, fax, or e-mail. Send abstracts to Nancy Seeger, Northwestern University, Infrastructure Technology Institute, 1801 Maple Avenue, Evanston, IL 60201-3140; fax to 847-467-2056; or e-mail [nseeger@northwestern.edu](mailto:nseeger@northwestern.edu).

**Structural Materials Technology (SMT): NDE/NDT for Highways and Bridges Topical**, Cincinnati Ohio September 10-13, 2002 at the Westin. Abstracts due no later than March 15, 2002. Contact: ASNT Conference Department, 1711 Arlingate Lane PO Box 28518, Columbus OH 43228-0518. Phone (800) 222-2768 (Canada and US only) or (614) 274-6003, fax (614) 274-6899.

**ACCESS NDT, ASNT Fall Conference and Quality Testing Show - 2002**, The Town and Country Resort, San Diego, CA, November 4-8 2002. Deadline: April 5, 2002. For more information, contact Jennie Heine in the ASNT Conference Department: [jheine@asnt.org](mailto:jheine@asnt.org), phone no. - 800-22202768 in U.S. and Canada, 614-274-6003, [www.asnt.org](http://www.asnt.org).

**2002 IEEE International Ultrasonics Symposium**, Oct. 8-11, Forum Hotel, Munich, Germany  
Symposium information can be obtained via the World Wide Web, at <http://www.ieee-uffc.org/2002/>. Abstracts are due May 16, 2002; all abstracts must be submitted electronically via the World Wide Web, at <http://www.ieee-uffc.org/2002/>.

**Non-Destructive Testing in Civil Engineering (NDT-CE)**, September 16-19, 2003, Berlin Germany. Deadline for submission of abstracts is November 1, 2002. Abstracts are to be one page in length, approximately 300 words in length. Contact Mrs. Ute Salac at [tagungen@dgzfp.de](mailto:tagungen@dgzfp.de) or visit the website at [www.ndt-ce2003.de](http://www.ndt-ce2003.de) for more information.

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