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AEROSPACE

Aerospace Division Newsletter

John W. Robinson, Editor *Summer 2002*

Chair's Message

Prabhat Hajela

As we look towards 2003 to commemorate the magnificent accomplishment of the Wright brothers, we cannot help marvel at what their flight has meant to mankind. A century of research and innovation in aerospace science and technology has not only contributed to remarkable progress in air transportation systems, space exploration, and indeed space habitation, but has resulted in a technology base that undergirds many technological developments that dominate the present day research agenda. As professionals at the forefront of these advances, members of ASME's Aerospace Division can take pride in these accomplishments, even as we prepare for challenges in the new millennium. It is my pleasure to report that the ASME Aerospace Division continues to be a vital technical group, with 6000 members indicating primary affiliation and another 7000 claiming secondary or another affiliation. Division members actively contribute to the knowledge base in areas of mechanics of structures and as pertaining to aerospace engineering. These activities are coordinated through four technical committees - Adaptive Structures and Materials, Crew Systems, Propulsion, and Structures and Materials. The technical committees solicit and program high-quality technical publications at national and international symposia in areas of topical interest, Members liaise with colleagues in other professional agencies and societies on both technical and public policy matters, increasing opportunities for networking and continued professional growth. The committees also support our honors and awards programs that recognize significant technical contributions by our peers. I would like to encourage you to visit our newly redesigned web page (www.asme.org/divisions/aerospace) to learn more about the Division and its Technical Committees, and to consider a more active role in our operations.

I earlier mentioned of challenges in the new millennium. These are many and span the spectrum from new technological innovations to the more mundane yet highly pertinent issue of healthy funding for technical programs, and the political resolve to preserve our position of international leadership in the aerospace endeavor. As a technical researcher, I am intrigued by the possibilities for new directions in aerospace technology development. Looking beyond the experiments planned aboard the International Space Station, development of the next generation of the reusable launch vehicles, expanded deep space exploration through deployment of Infrared Telescope Facility (SIRTF), and missions to explore and chart the planets Mars and Mercury are slated in the near future. Evaluating the concept of operating a constellation of spacecraft as a single system (Nanosat) is under consideration. The aeronautical domain has its own set of exciting concepts on the drawing board. The first phase of the

(continued on page 2)

Past Chair's Message

John Tracy

Over a year ago I had the privilege of chairing the Executive Committee of the ASME Aerospace Division. Throughout the first three quarters of the year I witnessed our technical committees and the members that they represent continue their outstanding efforts to advance the state of the art, communicate their findings, and work collaboratively to develop their technical areas of interest. During the last quarter of the year, the landscape was radically changed when terrorists used a commercial aerospace product that many of our membership had worked on as a weapon of great destruction. Secondary fallout from the attack was that key segments of the aerospace community suffered major downturns as air travel declined significantly and airlines are enduring major financial losses. In response to this crisis, ASME saw that our membership had the background and expertise to help improve air transportation safety and quickly moved to assemble a special colloquium to bring together key individuals from government, academia, and industry to define the issues and present them to searching for innovative ways to improve safety. Clearly our Division

(continued on page 2)

Chair's Message

(continued from page 1)

JSF competition was concluded this past year and the project will undoubtedly present unique challenges to the design engineers as it moves through the various stages of development. The Boeing Sonic Cruiser and the Airbus A380 are near-term projects that offer exciting prospects to the aerospace professional. In an era of increased security concerns, development of unmanned aeronautical vehicles of varying scale and complexity, will offer a unique set of challenges. Nanotechnology has opened new ways to engineer materials at the near-atomic level and to radically transform strength, stiffness, and durability characteristics. Even more intriguing are the aerospace applications of adaptive, functional, 'live' materials that are expected to emerge from the coalescence of nanotechnology, biotechnology, and information processing.

Against the backdrop of these exciting developments looms the question of our ability to deliver on these promises. In the United States, we have seen a 50% decline in the aerospace workforce from an all-time high in 1987; over the same period, funding for aerospace research and development has seen similar reductions. Statistics point to a significant upward creep in the average age of the aerospace workforce, with fewer individuals being drawn to our profession. The dominance of US civil aircraft manufacturers has been severely eroded; the market share has slipped from a once high of over 80% to less than 50% in recent years. As a Division of ASME with a mission to strengthen the aerospace enterprise, we owe it to our profession to work at multiple levels to reverse these trends. Through outreach programs we need to convey the message of exciting new technological innovations in aerospace to our younger generation. We must actively engage in helping evolve a modern curriculum in aerospace engineering, one that is germane to present day context, and one that will inspire the students to stay the course in spite of demanding requirements. At the same time, we must double our efforts to help federal agencies define a visionary agenda for research and development that captures the imagination of aspiring scientists and technologists. We must actively participate in educating government about the impending crisis in aviation research and technology, and help build the political resolve to turn the tide. I am pleased to report that the Aerospace Division is working closely with ASME's Government Relations office to generate and deliver a convincing message to this effect. These are important goals, not only for the aerospace professionals but also for the nation as a whole. We have come a long way from the first powered flight at Kitty Hawk - what lies ahead is only bounded by the extent of our collective imagination.

Prabhat Hajela

Past Chair's Message

(continued from page 1)

can play a major role in bringing innovative solutions to improve transportation safety and restore the public's confidence in air travel.

Although the safety colloquium was a very focused response to a specific situation, in general, the ASME Aerospace Division provides us with a great forum to develop ourselves professionally as well as to develop our field. The collective expertise of the Aerospace Division membership is there for each of us to tap into through participation in conferences, technical committees, short courses, publications, recognition of outstanding contributions, etc. Our Division is truly a community of members who share common interests, expertise, and talents. I would encourage each of you to look for opportunities to share your area of expertise with other members who have similar interests and in doing so raise the overall level of capability in our community. The outcome will be the generation of new ideas, products, best practices, and capabilities by you and your fellow members.

Thanks to each of you for your contributions last year in support of the Aerospace Division and also to the advancement of the aerospace field.

John Tracy

Visit the Aerospace Division Website

The Aerospace Division website can be accessed through the ASME International website at:

http://www.asme.org/divisions/aerospace/

You'll find that ASME.org offers a wealth of information for the mechanical engineering professional, whether a ASME member or not.

AEROSPACE 2001- 2002

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Committee Reports

Propulsion Technical Committee

The Propulsion Technical Committee continued to be a major contributor to the AIAA / ASME / SAE / ASEE Joint Propulsion Conference (JPC) and Exhibit. This was the 38th JPC, July 7-10, 2002 in Indianapolis, Indiana. This year, the Committee chaired sessions in airbreathing propulsion, turbomachinery, controls, sensors and measurement systems, future flight systems, seal technology, and lessons learned.

The Committee chaired 12 sessions in Salt Lake City at the 2001 Joint Propulsion Conference.

Propulsion Best Paper Award

Selection of a best paper presented at the JPC is presented annually. The ASME Best Paper award offers national recognition to the author of one of the papers presented in one of the ASME sponsored sessions. This award is presented at the JPC awards luncheon and selected from previous conference presentations. The winning paper this year was authored by Sandy Fleeter and Mark Richmond.

Technical committee officers are:

Carl Guernsey - Jet Propulsion Laboratory
Propulsion TC Chair
Scott Sawyer - University of Akron
Vice-Chair
Charles Cross - AFRL PRTC
Secretary

The committee also welcomed the following new members:

Zane Gastineau - US AIR FORCE
AFRL/PRTA
Claudia M. Meyer - Dynacs Engineering
at NASA LeRC

Structures and Materials Technical Committee

The Structures and Materials Technical Committee of the Aerospace Division focuses on key developments in the area of structures and materials as applicable to aerospace systems. In an effort to disseminate new information, the committee actively participates in organizing technical sessions at the International Mechanical Engineering Conference and Exhibition (IMECE). In 2001, at the Congress held in New York City, the committee programmed a total of 12 technical sessions. A number of papers exploring the static and dynamic behavior of plates and shells, including stability issues, comprised a mini-symposia to honor Professor G. Simitses, a long-time member of the committee and pioneer in this subject area. Another mini-symposia on the subject of thermal-barrier coatings was organized in cooperation with the Materials Division. It should be pointed out that the committee in the past has cooperated or jointly sponsored sessions and symposia with the Applied Mechanics and the Materials Divisions. We welcome such synergism and encourage our members to develop them as dictated by technical interests. This has assumed greater significance due to the recent shift in the philosophy of organizing the IMECE, with greater emphasis being placed on 'tracks' or specific themes. The technical committee would like to add in its membership profile individuals with interests in structural and material issues as related to MEMS and modeling of material systems at the nanoscale. We are on track to putting together 14-18 technical sessions for IMECE 2002 in New Orleans, November 17–22. At this Congress, we will participate in a significant way in the 5th International Symposium on Fluid-Structure Interactions, Aeroelasticity, Flow-Induced Vibration and Noise. A total of 6 sessions devoted to aeroelasticity are planned for this symposium, with significant industrial participation. The Technical Committee also supports the annual AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference. We select the ASME/Boeing Best Paper Award from papers published and presented at this meeting. The winners for the 2001 meeting were Dr. C.E.S. Cesnik and T. Radcliffe from MIT. Members of our Technical Committee will provide the leadership for the conference in April 2003, to be held in Norfolk, Virginia.

Adaptive Structures and Material Systems Technical Committee

The Adaptive Structures and Material Systems Technical Committee supports four major conferences in the area of smart materials and structures. These four conferences are the ASME Adaptive Structures and Materials Systems Conference, the International Conference on Adaptive Structures and Technologies (ICAST), SPIE International Symposium on Smart Structures and Materials, and the AIAA Adaptive Structures Forum. In addition to these four conferences, the committee is in charge of choosing two best paper awards and the coveted Adaptive Structures and Material Systems Prize. In the following paragraphs we review our activities in these areas along with a brief write-up describing ongoing progress in the field of Adaptive Structures and Material Systems.

Adaptive Structures and Material Systems Symposium

The Adaptive Structures and Materials Systems Technical Committee sponsored the Adaptive Structures and Material Systems Symposium at the 2001 ASME Congress in New York NY, from November 12-16. The symposium was organized by Professors John A. Main of the University of Kentucky and John Shaw of the University of Michigan. The 2001 symposia accepted 56 papers out of 62 abstracts submitted for presentation. Fifteen technical sessions were held over a three-day period during the ASME International Congress. This symposium brought together the world's experts to discuss the latest breakthroughs in smart materials, the cutting edge in adaptive structure applications and the recent advances in both new device technologies and the basic engineering research exploration. The 2002 Adaptive Structures and Material Systems Symposium is to be held in New Orleans and will be organized by Professor John Shaw of the University of Michigan and Professor Mary Frecker of Penn State University. If you would like to contribute a paper to the 2002 conference, please contact Professor John Shaw at the University of Michigan.

ASME Adaptive Structures and Material Systems: Best Paper Awards

The annual best paper award has been established to recognize outstanding papers in the area of adaptive structures and material systems appearing as an authored journal publication or conference proceedings. Over 20 papers were nominated in the category of Adaptive Structures and Materials Systems and a review panel of 8 individuals were involved in reviewing the papers. The winner of 2000 ASME Adaptive Structures and Material Systems Best Paper Award is "Fundamentals of Magnetorheological Fluid Utilization in High Precision Finishing," by W. I. Kordonski and D. Golini, from Journal of Intelligent Material Systems and Structures, Vol. 10, No. 9, pp. 683-689, September 1999. This award was presented in San Diego at the 2002 SPIE Conference on Smart Structures and Materials in March. If you wish to nominate a paper for the 2001-2002 award, please contact Professor John Main at the University of Kentucky.

ASME: Adaptive Structures and Material Systems Prize

The Aerospace Division Adaptive Structures and Material Systems Technical committee established this award to honor a member of the technical community who has made significant contributions to the advancement of the sciences and technologies associated with adaptive structures and/or material systems. The award recognizes scientific contribu-

(continued on page 4)

Committee Reports (continued)

tions as measured by significant innovations, as well as service to the scientific community, and leadership that the individual has demonstrated to advance the science. The recipient of the prize this year is Dr. Inderit Chopra.

Dr. Inderjit Chopra is an Alfred Gessow Professor in Aerospace Engineering and Director of the Alfred Gessow Rotorcraft Center at the University of Maryland. Also, he was the Minta-Martin Research Professor from 1996 to 2000. After receiving his Sc. D. degree from the Massachusetts Institute of Technology in 1977, he joined the NASA Ames/Stanford University Joint Institute of Aeronautics & Acoustics, where he worked for four and half years on the development of aeroelastic analyses and testing of advanced helicopter rotor systems. In 1981, he joined the University Maryland as an associate professor, and got promoted to full professor in 1986. He has been working on various fundamental problems related to dynamics of helicopters including aeromechanics stability, smart structures applications, active vibration control, modeling of composite rotors, rotor head health monitoring, aeroelastic optimization, and comprehensive aeromechanics analyses of bearingless, tilt-rotor, servoflap, teetering and circulation control rotors. His direct graduate advising resulted in 30 Ph.D. and 58 M.S. degrees. He has been the principal investigator of three major research programs: Army's University Research Initiative (URI) (1992-97) on "Smart-Structures Technology: Innovations and Applications to Rotorcraft Systems," Army's Multidisciplinary University Research Initiative (MURI) (1996-2001) on "Innovative Smart Technologies for Actively Controlled Jet-Smooth Rotorcraft" and Army/NASA's "Rotary-Wing Center of Excellence" (1982-2001). He acted as the Department Chairman from 1988-1990. An author of over 125 archival papers, Dr. Chopra has been an associate editor of the *Journal of the American Helicopter Society* (1987-91), *AIAA Journal of Aircraft* (1987-cont.) and *Journal of Intelligent Materials and Systems.* (1997-cont.). Also, he has been a member of the editorial advisory board of three journals, *VERTICA* (1987-91), *Smart Materials and Structures* (1994-cont.) and *SADHANA* (1991-95). He was awarded the Research Professorship, 1995 UM's Presidential Award for Outstanding Service to the Schools, 2001 ASME Adaptive Structures and Material Systems Prize and 1996 AIAA/ASME Best Paper Award. He is a member of the *Army Science Board* (1997-cont.). He is a Fellow of the *American Institute of Aeronautics and Astronautics*, a Fellow of the *American Helicopter Society* and a Fellow of the *Aeronautical Society of India.*

ICAST 01: International Conf on Adaptive Structures & Technologies

ICAST is in its twelfth year of providing an international forum for discussing the most recent advances in Adaptive Structures and Material Systems. The conference was held on the University of Maryland Campus outside of our Nations Capitol during October 15-17 2001. The 50 paper conference was hosted by Professor Inderjit Chopra and Professor Norman Wereley of the University of Maryland. The objective of the 12th ICAST was to extend and further promote scientific research, innovative exchanges and beneficial interactions among the global community engaged in the field of adaptive materials, structures and technologies. Traditionally, ICAST is a non-parallel sessions, three-day meeting focused on a variety of multi-disciplinary subjects that are essential components of adaptive structures and material systems. In addition to regular presentations, there were eight invited lectures to review the state-of-art on various research topics in this field. Two popular topics were given by pioneers and these were: "Reflections on 50 Years of Ferroelectricity: People, Places and Phenomena" by Professor L. Eric Cross (Penn State) and "Magnetostriction: Long, Strong and Inductive" by Dr. Kristl Hathaway (ONR). Two presentations were also made by program managers to show the past, present and future R&D activities in adaptive structures and smart materials. The next Conference will be in Berlin, Germany, Oct. 7–9, 2002 and the conference chair is Dr. Elmar J. Breitbach of German Aerospace Center.

SPIE: International Symposium on Smart Structures and Materials

The International Society for Optical Engineering (SPIE) held its 8th Annual International Symposium on Smart Structures and Materials, consisting of nine different conferences at the Newport Beach Marriott Hotel and Tennis Club in Newport Beach on March 5-9, 2001. This Symposium is jointly sponsored by both ASME Adaptive Structures and Material Systems Committee and SPIE. Over 500 papers were presented. Chair and Co-Chair of the Symposium were Dr. Janet M. Sater of the Institute for Defense Analyses and Marc E. Regelbrugge of Rhombus Consultants. The Symposium was co-located with SPIE's 6th International Symposium on Nondestructive Evaluation and Health Monitoring of Aging Infrastructure. Both Symposia were attended by over 900 attendees.

Smart Structures & Materials Achievement Award

This award is presented yearly to an individual whose vision and leadership in the research, development and application of smart structures and materials concepts has led to significant advances in the state-of-the-art of these interdisciplinary technologies. Selection of this award is made by the SPIE Smart Structures and Materials Symposium Planning committee members.

At the 2001 SPIE Symposium, this award was given to Dr. Michael A. Obal (retired AF Lt. Col.), currently of Obal Technologies Group. As a young Air Force officer, he worked on vibration suppression approaches using piezoceramics for laser systems (he received his Ph.D. from Georgia Tech). He was later among the first in DoD to fund smart materials and structures technology at a substantial level. As Program Manager for the SDIO (and later, BMDO) Materials and Structures Office, he was responsible for developing and managing a number of significant technical efforts exploring this technology for use in space systems; these projects culminated in extensive ground tests and, in some cases, space flight tests. The success of these projects really sparked the interest of the larger DoD community and contributed directly to the significant, rapid growth in funding that followed at DARPA and elsewhere.

Smart Structures Product Implementation Award

This award is intended to recognize those individuals or companies who have taken the critical step of transforming smart structures technologies into viable industrial and commercial products. The best product is selected on the basis of its importance, uniqueness and usefulness to the defense and commercial industry by a panel of independent technical experts. The objective is to identify the most innovative but realistic products using smart structures and materials technologies. System integration aspects are important criteria as well. The 2001 SPIE Smart Structures Product Implementation Award was presented to Lord Corporation and Biedermann Motech GmbH for their Smart Magnetix Knee Prosthesis with MotionMaster MR Fluid Damper. Most prosthetic knees in use today are essentially passive mechanical hinges that use quite complex locking devices and friction or hydraulic dampers to control swing. Some more sophisticated models may have manual adjustment capabilities as well to accommodate different modes of use. Extensive training is required of the humans using these passive devices. And there is one quite expensive knee prosthesis available with microprocessor control capabilities; this model requires extensive fine tuning and maintenance. The Smart Magnetix Knee Prosthesis, a

(continued on page 5)

Committee Reports (continued)

completely artificial knee system, uses a real-time controlled MR fluid damper to automatically enable a natural gait over a very broad range of conditions-for walking speed and inclination, walking up and down stairs, even riding a bicycle. The battery-powered system includes the MR fluid damper, sensors, a microprocessor-based controller, and a mechanical structure. The microprocessor control system analyses input from various gait sensors and then commands the semi-active MR fluid damper to respond optimally, much in the way the nerve receptors, ganglion, lower spinal cord, and nerves work to control a living knee. As an interesting side note, the MotionMaster MR fluid dampers used in these prostheses are functionally the same as those used in the heavy-duty class 8 truck market: there are over 10,000 of these truck fluid dampers in use in the United States with no field failures.

Recent Advances in Adaptive Structures/Material Systems

Research in the area of Adaptive Structures continues to play a dominant role in both industrial and academic circles. Ongoing DARPA-sponsored efforts include Boeing's Smart Rotor project and the new Compact Hybrid Actuator Program (CHAP) as well as several related SBIR topics. CHAP encompasses a number of individual projects, including the following: Active Signal Technologies/Moog/VPT magnetostrictive hydraulic motor; Burleigh Instruments/UCLA piezoelectric motor; CSA Engineering/Rhombus Consulting Group/Hamilton Sunstrand (UTRC) piezoelectric-hydraulic device; HRL Laboratories/Raytheon/UCLA shape memory motor; PSU/VPI/Boeing/MPC Products piezoelectric motor; the University of Michigan/VPI/PSU/Techno-Sciences compliant transmission actuator; and the University of Washington/Instron ferromagnetic SMA motor. Related DARPA SBIR projects are addressing piezoelectric motors and high temperature shape memory alloys. In addition to these DARPA efforts, funding from NASA, NSF, AFOSR, ARO, and ONR continues at fairly significant levels, an example being the new ONR Ferromagnetic Shape Memory Alloy Multi-University-Research-Initiatives (MURI) at U. Md., U. Mn., UCLA, and UCSD. The evolution of new materials-single crystal piezoelectric and ferromagnetic shape memory alloys-with new concepts-motors, energy harvesting, space applications-promises significant research and engineering opportunities in the fields of Aerospace Engineering in the near future.

Honors and Awards

Flag Award–Awarded for Significant and Outstanding Service over a period of years to Aerospace Division and Mechanical Engineering Profession. Last year, the ASME Flag awards were presented to Miland Bahkle and Sandy Fleeter

Wooden Plaques–Division Awards for Outstanding Service Award procedures outlined:

1. Criteria for selection should be spelled out
2. Prepared request submitted to H&A committee
3. Corresponding service/achievements defined, discussed and selection made by H&A
4. Submitted to Executive Committee for final approval

Criteria for Selection:

1. Sustained service by an individual over a period of years to ASME and the mechanical engineering profession.
2. Service that is beyond the call of duty - only satisfying the normally expected and required duties of a committee chair or other official position does not qualify one for this award.

Upcoming Conferences

2002 International Mechanical Engineering Congress and Exposition (IMECE)
November 17-22 2002
New Orleans Hilton & Ernest Morial Convention Center
New Orleans, LA
www.asme.org/congress

13th International Conference on Adaptive Structures and Technologies (ICAST '02)
October 7-9, 2002
Hotel Dorint - Sanssouci
Potsdam/Berlin, Germany
www.icast2002.de

Smart Structures and Materials
San Diego, CA
March 1-6, 2003
www.spie.org/info/

44th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference (SDM)
April 7-10, 2003, Norfolk, VA
www.aiaa.com

John Robinson, Andrew Bicos, Ozden Ochoa, and Prabhat Hajela.

Aerospace Division Executive Committee Members attended the Council on Engineering Technical Executive Committee (TEC) meeting held in Atlanta, Georgia to participate in the annual training events for leaders of ASME's Technical Groups and Divisions.

ASME Workshop Charter

The State of the Nation's Aeronautics Research & Technology Programs

Background

In 1999, NASA commissioned the Aeronautics and Space Engineering Board (ASEB) of the NRC to conduct a four-month evaluation of the U.S aeronautics program. The assessment included work supported by government agencies and industry. The National Research Council (NRC) released their report on "Recent Trends in U.S. Aeronautics Research and Technology" in September 1999. The report was prepared by the NRC in conjunction with the Committee on Strategic Assessment of U.S. Aeronautics, the Aeronautics and Space Engineering Board (ASEB), the Commission on Engineering and Technical Systems.

The intent of the study was to provide a timely review of national support of Research and Technology (R&T) in traditional aeronautics. Traditional aeronautics was defined as including both fixed- and rotary-wing aviation but excluding space operations, space launch and reentry, and some of the new air-breathing hybrid technologies proposed for hypersonic entry into space flight.

Report conclusions:

- The Committee found evidence that the aeronautics segment of the economy is becoming less competitive. The U.S. share of world aerospace markets fell from over 70 percent in the mid-1980s to 55 percent in 1997. The U.S. is losing market share in terms of unit orders in the important category of large commercial transport aircraft to Europe, down from 73 percent in 1990 to 54 percent in 1998.
- Although a strong national program of aeronautics R&T may not, by itself, ensure the competitiveness of the U.S. aviation industry, the committee agrees with earlier studies that without it, the U.S. is likely to become less competitive in aeronautics relative to countries with stronger programs. Maintaining a successful, state-of-the-art aeronautics industry has required that a higher percentage of net sales be invested in R&T than the corresponding investments made by other industries associated with rapid innovation and application of scientific advances.
- Aeronautics in the U.S. can ill afford to lose highly educated, motivated engineers and scientists, and developing experimental aircraft is one approach for maintaining the skills of aircraft designers. Continued reductions in aeronautics R&T would damage the personnel base required to maintain a robust, competitive aeronautics industry capable of supporting U.S. national security and economic interests.
- Government aeronautical test facilities are another area of concern. Many facilities have been or are being closed down, the U.S. government has backed away from proposals to construct major new facilities, and U.S. aircraft companies are increasingly going overseas to perform wind-tunnel testing of new U.S. designs.
- The Committee pointed out that continued reductions in funding for aeronautics R&T may have irreversible consequences. Once the position of the U.S. in aeronautics is lost, it will be exceedingly difficult to regain because of the difficulty in reassembling the infrastructure, people, and investment capital.

In addition to and independent of this NRC review, ASME spearheaded a 10-member Aviation Coalition to examine the decline in U.S. aviation research and development funding. The coalition's findings corroborated the NRC's findings, concluding that a national aeronautics R&T strategy was needed to remedy the situation. The Aviation Coalition released a position statement on the "Crisis in Aviation" to policy makers in Congress and the Administration to educate and inform policymakers about their concerns.

Workshop Objectives

Bring together members of the scientific and engineering community to discuss the current state of the nation's aeronautics research and technology program, as well as the near-term needs.

Issues examined include:

- Technology- What technology advancements are required for civil and military aircraft over the next couple of decades?
- Competitiveness - Will U.S. industry remain competitive internationally in light of the EU proposal to increase their investment in aeronautics R&T over the next two decades?
- Federal Investment in R&T- Are the federal/ industry/ university partnerships that have characterized U.S. leadership in aviation technology development healthy?
- Facilities- Are research facility upgrades keeping pace with projected R&T needs?
- Education- What are the requirements for maintaining the workforce needs of the U.S. aviation industry? Is the environment for creative R&T in aeronautics being sustained at U.S. universities, at federal laboratories and within the private sector?

The primary findings and recommendations on "next-steps" for ASME International, included:

a. Recommendations for working with aviation coalition;
b. Scheduling of Congressional Noontime Briefings;
c. Workshops or conferences; and/or
d. Create a Task Force to prepare a position statement on this issue. The statement could be provided to the "Commission on the Future of the U.S. Aerospace Industry", to the U.S. Congress and to the appropriate federal agencies. The report could: 1) define current problems and offer solutions; 2) discuss the role of the federal government and industry; and 3) provide recommendations on future investments.

General Information

The workshop was held in Washington, D.C. on December 5-6, 2001.

On the first day, panels of speakers discussed issues relevant to the aeronautics R&T programs (such as education, competitiveness, etc.) The meeting was open and interactive, and primarily designed to educate members and participants.

The members of the Steering Committee, as well as key representatives from the engineering community and the aviation community, met on the second day of the workshop to provide the resource for making recommendations on the next steps to move ASME forward.

For additional information on government relation activities contact: John W. Robinson, Government Relations Contact, Aerospace Division, 714-762-7990, john.w.robinson2@boeing.com or Kathryn Holmes, Goverment Relations Representative, ASME International, 1828 L Street NW, Suite 906, Washington, DC 20036-5104, 202-785-3756, holmesk@asme.org

ASME Government Relations

On September 17, 2001, the Aerospace Division sent a letter to the U.S. Senate Committee on Appropriations expressing our support for provisions in the Senate bill (S.1216) increasing funding for NASA's research and development programs within the Science, Aeronautics and Technology Programs to $7.7 billion, with $2.5 billion directed to NASA's Aero-Space Technology programs.

We also supported the language in the House Conference Report #107-159 directing NASA to "reestablish a consolidated aeronautics line in the fiscal year 2002 operating plan that covers all research base, focused and advanced technology programs, and related test facilities and civil service costs."

NASA's investment in aeronautics has declined from approximately $1 billion annually in 1994 to just under $400 million today. This decline has occurred as foreign competition has reached virtual parity with the U.S. Aeronautics industry in annual commercial sales and the Europeans have established a formal "2020 Vision" with a goal to dominate global aeronautics and aviation services.

We need to maintain continued interaction with the Senate. Those members who have an interest participating with Government Relations should contact John W. Robinson, Chairman, NASA Task Force (email: john.w.robinson2@boeing.com) or Kathrine Holmes in the ASME Washington Office (email: holmes@asme.org).