

SAE [®] UPdate

NEWS FOR THE MEMBERS OF SAE

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SAE elects vice president, commercial vehicle

Mark R. Pflederer was elected on October 20, 2004 to the newly created post of Vice President, Commercial Vehicle. Pflederer, who is also Vice President of the Technology and Solutions Division at Caterpillar, will be responsible for integrating the needs of the on-highway and off-highway commercial vehicles across SAE programs for standards, events, and education.



Mark R. Pflederer

Commenting on his election, Pflederer said, "I am honored that SAE has chosen me to hold this position during a period that is especially significant in the society's history—the celebration of SAE's 100th anniversary in 2005. Even more important to me is the fact that SAE, with its long tradition of serving the automobile and aerospace industries, now will provide the same depth of support to the commercial vehicle industry. This is proof that the on- and off-highway industry issues are now taking center stage. SAE's strong leadership in promoting high industry standards and providing a forum for major issues is exactly what we need to boost the potential of this category."

Pflederer has been a member of SAE for over 20 years. During his membership he has served SAE as a section member for the Central Illinois Section (1984 to 1996

and 1999 to the present) and for the Eastern Carolina Section (1996 to 1999).

As Chief Technology Officer at Caterpillar, Pflederer holds responsibility for the company's research and development activities, as well as operations at the Technical Center in Mossville, IL and the three company proving grounds.

Pflederer joined Caterpillar in 1976 as an engineer trainee and spent the following 14 years in a variety of engineering positions in materials and electronics. Most recently, Pflederer was general manager of electronic and electrical systems within the component products and control systems division. The group provides leading-edge technologies for various medium- and heavy-duty industries.

Pflederer holds a B.S. in electrical engineering from the University of Illinois. In 1996, he completed the Managing Engineering Design and Development program with Carnegie Bosch.

Pflederer also serves on the Board of Managers of Caterpillar Trimble Control Technology, a Caterpillar and Trimble joint venture that develops and manufactures advanced electronic guidance and control products. In addition to SAE, Pflederer is also a member of the Institute of Electrical and Electronic Engineers. He serves on the Carnegie Mellon Electricity Industry Center Advisory Committee, and the Bradley University College of Engineering and Technology Advisory Council.

Industry executives provide 'Future Look'

Automotive Engineering International (AEI), Aerospace Engineering, and SAE Off-Highway Engineering are celebrating the society's 100th anniversary with a series of articles not looking at the past, but into the future.

The "SAE 100 Future Look" series features the industry's top global executives sharing their views on the automotive technologies of the future. The magazines' centennial celebration will culminate in October 2005 with a special "SAE International Centennial Issue" which will highlight the rich history of the mobility industry and look ahead to the future.

"We are again in a time of transformation," wrote SAE 2005 Presidential nominee J.E. "Ted" Robertson, Vice Chairman of Product Development for ASC, in an article published in the November issues of *AEI* and *Aerospace Engineering*. "With industrial growth and expansion across the globe, SAE can provide the leadership and institutional memory to new members and their companies."

Beginning with the October 2004 issue, *AEI* has featured articles from industry executives such as Dieter Zetsche, President and CEO, Chrysler Group; Jim Queen, Vice President, GM North America Engineering; and Gerhard Schmidt, Vice President, Research and Advanced Engineering, Ford.

A commercial vehicle focus in the November issue of *AEI* included contributions from Paul Vikner, President and CEO of Mack

Trucks; Daniel Ustian, Chairman, President, and Chief Executive Officer, Navistar International; and Tom Plimpton, President of PACCAR.

"Future Look" subjects to be covered by other industry executives in *AEI* include (subjects and dates are tentative) powertrain (January issue), interiors (February), electronics (March), chassis (April), testing (May), materials (June), body engineering (July), performance and aftermarket engineering (August) and manufacturing (September).

Greg Watkin, Vice President, Marketing, Epic Data contributed an article for the November 2004 issue of *Aerospace Engineering* on the future of information flow. The magazine will feature articles looking at the future of propulsion engineering in the January/February issue. Subsequent topics will include avionics (March), space travel (May), commercial aircraft (July), and aerospace materials (September)

"Future Look" articles will also continue to be featured in *SAE Off-Highway Engineering*. To date, articles have been contributed by executives such as Manfred Grundke, President of Bosch Rexroth; Kells Hall, Vice President, Sales and Marketing, Sauer-Danfoss; Craig Arnold, Senior Vice President and Group Executive, Eaton Fluid Power Group; and Drew Smedley, Director of Global Marketing, MTS Systems, Sensors Division.

Expanded seminars at World Congress

A total of 40 SAE seminars will be offered on-site at Cobo Center in conjunction with the SAE 2005 World Congress, April 11-14, 2005. Seminar registrants receive free registration to Congress, enabling attendees to participate in the entire Congress experience, including the technical sessions and exhibition.

A record number of automotive engineering professionals attended seminars at the 2004 World Congress. The 40 seminars scheduled this year mark an increase from last year's total of 33.

Seminar topics parallel the entire event's focus on core automotive technologies (electronics, emissions/environment, materials, propulsion/powertrain, safety/testing), enabling attendees to customize activities to their own specific areas of interest.

The four new seminars added this year are "Hands-on Racecar Suspension Set-up" (April 11-12), a course offered by SAE's

Professional Development department in partnership with the Panoz Racing School. Five racecars will be stationed on the exhibit floor for attendees to work on as a part of the hands-on portion of this seminar. This also provides an opportunity for those who are considering enrolling for a future offering of this seminar to become more familiar with nature of the course.

"Advanced Vehicle Dynamics for Passenger Cars and Light Trucks" (April 13-15), highlights advanced theory and practical applications associated with the dynamic performance balance between the powertrain, brakes, steering, suspensions, and wheel and tire vehicle subsystems will be discussed with an emphasis on ride, braking and handling.

"Vehicle Accident Reconstruction Methods" (April 14-15), is devoted to the exposition, use, and limitations of the engineering, scientific, and mathematical principles and

methods used to reconstruct vehicular accidents.

"Fundamentals of Automotive Fuel Delivery Systems" (April 14-15), provides a basic, yet thorough examination of technical issues involved in automotive gasoline and diesel fuel delivery.

Another professional development offering at the Congress will provide attendees with the opportunity to take an online assessment to determine their readiness for the Automotive CAD Certification. Internet terminals in the cyber cafes will be equipped for this assessment.

For more information on the seminars offered at the SAE 2005 World Congress, or to register, visit www.sae.org/congress/seminars/.

SAE members receive a discount to seminars, and companies can save 10% by registering three or more people for seminars at the same time.



Leading Our World In Motion 1905-2005

EDITORIAL

New year, new career

An article on page nine of this issue under the Career Corner titled "Processing a job offer" claims that for engineers in 2005, "getting a job is the easy part, but processing a job offer and negotiating the salary are two parts some might like to skip." Statistics show there may be some truth to that statement, thus helpful advice is offered in the article to ensure a solid follow-through when negotiating a job offer. The article also cites the National Association of Colleges and Employers (NACE) as a good resource for engineers to consult when looking for, or changing jobs.

NACE's *Job Outlook 2005* survey/report found that employers expect to increase their college hiring in 2004-05 by 13.1% over 2003-04—especially in the fields of accounting, electrical engineering, mechanical engineering, business administration, economics/finance, and computer science. The survey revealed electrical and mechanical engineering ranked second and third over-

all among the top ten bachelor's degrees in demand for 2005.

Other promising findings from the survey included the fact that seven out of 10 (employer) respondents expect to increase starting salary offers to new college graduates at the bachelor's degree level with an average projected increase of 3.7%. If you are finishing up a doctoral degree, you are in luck because engineering and computer-related degrees are of most interest to hiring respondents.

While the job market looks promising for the engineer in 2005, it is important to prepare for all aspects of a new career, or career change. SAE has taken several measures to assist its members in career and professional development, including the Powertrack program, the Online Career Center, and the Career Corner in *SAE Update*.

Be sure to check these resources regularly for all of your career and development needs.



2005 Annual Business Meeting

The 2005 Annual Business meeting has been scheduled for Tuesday April 12, 2005 during the SAE International Congress and Exposition. The meeting will begin at 8:00 a.m. in the Innovation Forum (Theater) which is located on the exhibit floor of the Cobo Center.

Please contact andreamiramontes@sae.org should you require further information.

UPdate

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Duane D. Tiede, President

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MESSAGE FROM THE PRESIDENT

SAE International vice presidents—a major step forward

The SAE International President's term is one year with one year, and it usually rotates between different SAE sectors. Thus, we have not had continuous leadership for individual sectors.

Two years ago the SAE International Board of Directors (BOD) approved the concept of SAE Vice Presidents to serve three of the major sectors of SAE: Aerospace, Automotive, and Commercial Vehicle. It was decided these individuals would serve on the BOD and act as the communication link and counsel between the sector and the SAE BOD. Their role is to identify strategic issues that will ensure that SAE continues to deliver value to their respective sector. These positions are three-year terms with one to be filled each year on a rotating basis.

The primary duties and responsibilities for the Vice Presidents are:

- Oversee the development of an integrated plan for their sector that provides strategic direction to SAE
- Be the communication link from their respective sector to SAE, and specifically to the BOD
- Be the link for SAE to the key industry companies and organizations
- Be the spokesperson for SAE at key events and functions in their sector
- Report to the SAE President and participate in SAE BOD meetings

The first position filled was the SAE Vice President of Aerospace. Bob Spitzer, recently retired as Vice President of External Affiliations, The Boeing Company took on these responsibilities in March 2003 and has done excellent work analyzing, leading, and coordinating aerospace activities for SAE and the industry.

The second Vice President appointed was Richard Schaum, recently retired as Executive Vice President of Product Development, DaimlerChrysler, and now Vice President and General Manager, Vehicle Systems, Wavecrest Technology. Schaum was appointed in March 2004 and is providing

strong leadership to our automotive sector activities.

Given the excellent results from the first two Vice Presidents and an opening available on the SAE BOD, the board agreed to fill that opening early with the Commercial Vehicle Vice President. We are very pleased that Mark Pfloderer, Vice President of the Technology and Solutions Division at Caterpillar, will serve the Commercial Vehicle sector for the next three and a half years. Pfloderer was introduced in this role at the new Commercial Vehicle Engineering Congress and Exposition in October 2004.

To support these individuals and better focus SAE staff activities for each sector, key SAE staff have been appointed Business Directors and are aligned with each SAE Vice President. The Aerospace Business Director is Scott Klavon, the Automotive Business Director is Dave Amati, and the Commercial Vehicle Business Director is Herb Kaufman. These individuals will work with their respective Vice President's to interface with SAE Staff and coordinate SAE activities for each sector.

I am very supportive of these new positions and the excellent people serving SAE in these roles. We already have seen the impact of these changes in the aerospace and automotive sectors with better continuity, planning, and visibility regarding each sector's activities. We must continue to improve for SAE's next 100 years, and I think this change will increase the value of SAE to all our constituents.

Please e-mail me at dtiede@sae.org with your thoughts on these new positions or any other topic you would like to discuss. I look forward to your response and the opportunity to share thoughts with you monthly in this forum.




2004 SAE Annual Nominating Committee Meeting

The Annual Nominating Committee (ANC) meeting has been scheduled for Monday, March 8, 2004 during the SAE International Congress and Exposition. The meeting will begin at 8:00 a.m. in the Ambassador Ballroom, Marriott Renaissance Center.

Information regarding the meeting will be forwarded to all ANC delegates and alternates.

Andrew L. Riker, SAE's first President

SAE's first President was Andrew L. Riker, an early pioneer of electric vehicles who later produced the Locomobile Co.'s first gasoline-powered car.



Andrew L. Riker

Riker served as SAE President for three years from 1905 through 1907. Born in 1868, he produced his first electric car in 1894, using a pair of Remington bicycles as a base. The Riker Electric Vehicle Co., based in Elizabethport, NJ, became one of the country's leading manufacturers of electric vehicles, including cars, trucks, vans, and trolleys.

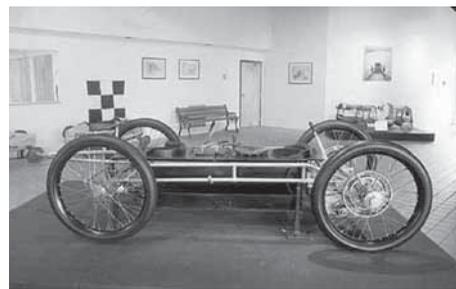
Riker gained acclaim for his development of high-speed electric cars. In 1901, his electric-powered racer known as "The Riker Torpedo" set a world speed record for electric cars that stood for 10 years. Five-ton electric trucks produced by the Riker Co. were also in use in New York City in the early 1900s.

Riker became vice president of the Locomobile Co. in 1902, overseeing the production of automobiles powered by two- and four-cylinder internal-combustion engines. His design of the company's first gasoline-propelled car had many features that were largely unfamiliar to the American market, including a sliding gear transmission, steel frame, and gear-driven electric generator.

In 1904, he designed a special 90-hp race car, and in 1908, he developed Locomobile's "Old 16," the first American car to win an international race (the Vanderbilt Cup). The victory boosted the reputation of American automotive engineering throughout the world.

In the World War I era, Riker/Locomobile trucks were very popular, and heavily advertised in publications such as *Scientific American* and *The Saturday Evening Post*. Riker was appointed to the U.S. Naval Consulting Board in 1915, chairing the board's committee on internal-combustion motors.

Riker died in 1930. Three Riker electric vehicles, including a truck and a racer, are housed at the Henry Ford Museum in Dearborn, MI. The book *Andrew L. Riker and The Electric Car-A Biography of the Young Riker* by Neal Donovan, published by McPherson College Press in 2003, chronicles Riker's early experiments, his contributions to the fields of electricity and transportation, and his business dealings.



The Riker Torpedo built in 1901.

100th Anniversary commemorative products available

As part of the celebration of SAE's 100th anniversary, a line of more than 40 commemorative products featuring the "SAE 100" logo is now available.

Shirts featuring the logo are available in a wide variety of styles, including long-sleeve denim shirts, crew and V-neck casual shirts, golf/polo shirts, fleece sweatshirts, and V-neck wind shirts.

Three styles of jackets (leather, poplin, and nylon fleece-lined hooded) and four styles of caps are available. Other commemorative products include mugs, umbrellas, duffle bags, and pen/pencil sets. Additionally, four unique crystal pieces, featuring 3-D images created inside a solid piece of optical crystal, have been developed. (Images are: Formula One car, front-end loader, road racer, and World War I bi-plane.)

For more information, or to order any of the SAE 100th Anniversary commemorative products, visit www.sae.org/sae100 and click on the "memorabilia" tab at the top of the page.

From a black tie gala and special Section functions to "mini celebrations" at various SAE conferences and the Centennial Series editions of SAE magazines, there will be many opportunities to join SAE in toasting the society's first century.

The following is a listing of dates and events for members to join in the centennial celebration.

SAE 2005 World Congress

Banquet and many other events that will spotlight the 100th Anniversary.
April 11-15, 2005
Detroit, MI

2005 Foundation Banquet

May 2005

2005 Government & Industry Meeting

Reception at the Air & Space Museum
May 10, 2005
Washington, DC

SAE AeroTech Congress and Exhibition

October 3-6, 2005
Dallas/Fort Worth, TX

2005 SAE Commercial Vehicle Engineering Congress & Exhibition

Banquet and other events that will spotlight the 100th Anniversary.
November 1-3, 2005
Chicago, IL

2005 DoD Maintenance Symposium and Exhibition

October 24-27, 2005
Birmingham, AL

2005 Student Competition

100-Mile Mini Baja
Southern Arizona

Student poster competition celebrates centennial

A *World in Motion* (AWIM) students will be eligible to join in the celebration of SAE's 100th anniversary by creating posters which interpret the theme "SAE 100: Leading Our World In Motion."

The posters will be judged on theme interpretation, originality, and visual effectiveness. They must be created on flat paper sized between 15" x 20" and 22" x 28". Markers, crayons, pen and ink, colored pencils, watercolors, or poster paint may be used.

Grand prize winners in each of three categories (Grades 4-5; Grades 6-7; and Grades 8-10) will receive \$500 U.S.

Savings Bond. Each school may submit one entry per category to their regional SAE section. The entries must be postmarked by February 1, 2005. Section judging will then take place and each section will submit the winning entries from their section to SAE headquarters. A special committee of SAE members will then judge the displayed posters at the SAE 2005 World Congress, where the grand prize winners will be announced.

For further rules and details, and for entry forms, call (800) 457-2946, or visit www.sae.org/sae100.

2005 CONGRESS

(Grand) prizes for Congress pre-registrants

Special "SAE 100" anniversary gifts will be provided to all attendees who pre-register for the SAE 2005 World Congress by March 18, 2005. Special grand prizes, including 100th anniversary leather jackets and a trip to New York City will also be awarded during the week.

Attendees who pre-register before March 18 will receive a registration confirmation that includes a voucher for a gift to be picked up at the SAE Store, which will now be located inside Wayne Hall. Everyone who picks up their gift will be entered into a drawing for the grand prizes.

One hundred winners will receive the SAE 100 classic leather jacket. One grand

prize recipient will win a trip to New York City—the birthplace of SAE.

The prize winners will be announced at the new Industry Networking Reception. The reception will be held Tuesday, April 12 from 5:00-7:30 p.m. in the Exhibition Hall. All SAE 2005 attendees are invited to come and interact with industry leaders and their peers from OEMs and supplier companies.

To pre-register for the SAE 2005 World Congress, visit www.sae.org/congress; call (877) SAE-CONG in the U.S. and Canada or (724) 772-4027; or e-mail CustomerService@sae.org.

OFFICER PROFILE

Landon J. Sproull (Mbr '89), Assistant Chief Engineer, Peterbilt Motors Co., is serving a three-year term on the SAE Board of Directors (2003-2005).

Sproull received his BSME degree from the University of Evansville, Indiana, in 1987, and his MBA from Middle Tennessee State University in 1992. From 1988-1989 he worked as an SQA manufacturing Engineer for GM Truck and Bus. He then joined Peterbilt Motors Co. and



Landon J. Sproull

advanced through various engineering and production positions to his current position as assistant chief engineer.

He became a member of the Mid-South Section in 1988 and transferred to the Texas Section in 1993 where he has served as Secretary (1994-95), Treasurer (1995-96), Vice Chair (1996-97), and Chair (1997-98). At the national level, Landon has served on the Sections Board as Vice Chair (2000-01), Chair (2001-02) and Finance Committee (1999-2001).

Landon received SAE's Distinguished Younger Member Award in 1996, and the Ambassador Club-First Level Award in 1997. In his spare time, Landon enjoys flying single-/multi-engine airplanes, automotive restoration, golf, and go-kart racing.

Technical sessions detail on Congress Web site

Details on the technical sessions to be offered at the SAE 2005 World Congress, April 11-14, 2005 are now available on SAE's newly developed Congress Web site at www.sae.org/congress. The site's information has been organized to parallel the core automotive technologies around which the event is built, enabling visitors to focus on their own areas of interest.

The technical session information is categorized in seven technology topics: electronics, emissions/environment, high-performance vehicles, management and

marketplace, materials, propulsion/powertrain, and safety/testing. Each topic includes a list of session titles in that core technology, along with information on the date, time, and location of the sessions. Further information is also available for each specific session, including a preliminary list of paper titles and presenters.

The Web site also includes details on SAE 2005 World Congress business sessions, seminars, exhibitors, and registration information.

CALL FOR PAPERS

2005 AeroTech Congress and Exhibition

The AeroTech Congress and Exhibition, to be held in the Dallas/Fort Worth airport area, at the Gaylord Opryland Texas Hotel, October 3-6, 2005, will bring together a diverse group of attendees who share the common goal of advancing the aerospace industry on all levels including air-vehicle design, manufacturing, and safety. Individual technologies and broader industry issues will be addressed at this premier aerospace event.

The AeroTech Congress and Exhibition comprises four conferences addressing issues relevant to industry.

1. Advances in Aviation Safety Conference

This conference provides a forum where the latest technical developments across the full spectrum of design, maintenance, and operations in the critical area of aviation safety can be discussed. A number of conferences cover various aspects of aviation safety, but Advances in Aviation Safety is the primary venue for technology information exchange. Covered topics include:

- Design
- Testing
- Modeling and simulation
- Human factors
- Weather
- In-flight smoke and fire
- Equipment Analysis techniques
- Regulatory issues

2005 In-flight Icing and Aircraft Ground Deicing Conference

The 2005 SAE Aviation Environmental In-flight Icing and Aircraft Ground Deicing Conference and Exhibition is to be held August 29- September 1, 2005 at the Hilton Stockholm Slussen, Stockholm, Sweden. It is the only event that is dedicated to provide the latest technology advances and emerging issues surrounding safe aircraft operation in environmental icing and deicing conditions.

This conference will include presentations and workshops in topics listed below, along with discussions in technical and plenary sessions. Participants will have the opportunity to comment and make recommendations relative to the direction and content of what is being accomplished towards improvement in the safe aircraft in-flight icing and ground deicing operations.

The topics in the forefront of the aircraft ground de/anti-icing and in-flight icing communities that will be addressed in the technical program include but are not limited to:

Aircraft de/anti-icing during ground operation

- Airplane de/anti-icing operations
- Aircraft de/anti-icing methods and training
- Airplane de/anti-icing Equipment
- Ground ice detectors
- Environmental regulations for capturing and recycling fluids
- Aircraft de/Anti-icing fluids
- Runway and taxi way deicing and snow removal operations

2. Aerospace Manufacturing and Automated Fastening Conference

SAE has merged the Aerospace Manufacturing Technology Conference (AMTC) with the Aerospace Automated Fastening Conference (Aerofast) to create this new, exciting event. Technical sessions will enable attendees to explore the latest in both sub-assembly and final assembly technologies and processes that focus on building stronger, lighter aircraft more quickly and economically. Covered topics will include:

- Composite manufacturing and processing
- Lean manufacturing and supply chain management
- Virtual and information technologies for manufacturing
- Advancement in manufacturing and process development
- Advanced metal manufacturing processes and techniques
- Machine technology and assembly automation
- Quality integration in advanced assembly

3. International Powered Lift Conference (IPLC)

The IPLC is the premier event for engineers, technologists, and managers to discuss the latest developments in vertical and/or short take-off and landing (V/STOL) aircraft research, concepts, and programs. It

Aircraft in-flight icing

- In-flight icing simulation-experimental and facilities
- In-flight icing simulation-CFD
- Icing effects on aircraft performance
- SLD engineering tools development
- In-flight ice protection systems
- In-flight icing effects on rotorcraft
- In-flight ice detectors

Environment icing meteorology

- Forecasting icing conditions
- Meteorological studies of atmospheric icing conditions
- Remote detection of atmospheric icing conditions
- Tools, systems and instrumentation to measure icing conditions

Abstracts for either papers or oral-only presentations should be 300-500 words in length, presenting facts that are new and significant, and including results achieved, if applicable. Abstracts are to include the title and author's contact information. Please submit all abstracts online.

For general information on the conference, contact Chris Durante at cdurante@sae.org or by phone at (724) 772-7191.

Abstract deadline: January 31, 2005

Final deadline: June 20, 2005

is the only event focused on the technologies, promise, and progress of powered lift systems, with applications ranging from helicopters to advanced rotorcraft to runway-independent aircraft to jet-borne lift aircraft. Covered topics will include:

- UAVs
- Helicopters
- New army initiatives
- Advanced concepts
- ESTOL programs
- JSF program
- Lean aircraft development
- Integrated flight and powerplant control
- Modeling and simulation
- Lift-system technologies
- Testing
- Future concepts
- Jet-induced effects

4. World Aviation Aerospace Conference

The World Aviation Aerospace Congress provides a unique forum for the international aircraft design, development,

operations, and research communities to meet and to communicate across traditional organizational boundaries. Covered topics will include:

- Commercial aircraft programs
- Military aircraft programs
- Applied technology and methods
- Access to space

Abstracts for written papers or oral-only presentations should be 300-500 words in length, present facts that are new and significant, and include results achieved, if applicable. Abstracts--including paper title, author name(s), mailing address, telephone number, facsimile number, and e-mail address--should be submitted no later than February 11, 2005. Abstracts should be submitted to each specific conference at <http://www.sae.org/aerotech>.

Details about the conferences will be announced and updated on SAE's Web site at <http://www.sae.org/aerotech> as information becomes available.

Abstract deadline: February 11, 2005

Draft deadline: May 27, 2005

Final deadline: August 5, 2005

Great Ideas Competition 2005

The Great Ideas Competition will be held at the DoD Maintenance Symposium and Exhibition, October 24-27, 2005 in Birmingham, AL.

Selected presenters will be given the opportunity to highlight promising new technologies, processes, or business practices to the symposium audience. Presentations must be technical in nature—focused on current, or potential maintenance operations, or management—and avoid commercialism.

Abstracts are to be 300-500 words, and will be judged on the basis of:

- Original contribution to the state of the art
- Technical accuracy
- Test data or valid simulation support for all performance claims and conclusions
- Feasibility or practicality of the idea

An evaluation board with maintenance expertise will select the finalists. The presenters will be notified of acceptance by August 19, 2005.

Abstract guidelines:

- Submit in Microsoft Word format
- Include complete contact information at the bottom left corner of the abstract
- Filename should be the presenter's last name
- Limit one presenter per presentation
- Submit via e-mail to Nancy Eiben, staff team leader, at naneiben@sae.org. The e-mail subject line should read, "Great Ideas-(insert presenter's last name)."

Call Nancy Eiben at (724) 772-8525 if you have any questions about the competition.

Submission deadline: July 15, 2005

Renew your membership before December 30!

Check your SAE membership card. If you have an expiration date of December 30, now is the time to take action and renew for 2005. If you have not already done so, here are your options:

Automatic renewal: This feature is perfect for you if you do not want to receive membership renewal reminders every year. You give authorization for SAE to charge your credit card each year at renewal time and we renew your membership automatically. Plus, you'll save \$10 on your membership dues every year you are in the Automatic Membership Renewal Program.

Renew online: This is a fast, easy way to renew, and you can save money, too. Reduce your dues from \$90 to \$85 by renewing on the SAE Web site at www.sae.org/renew. Payments online are by credit card only, and VISA, MasterCard, American Express, and Discover are

accepted. To ensure your privacy, your membership renewal will be processed on our secure server. You will need your login ID and password. Call (724) 776-4970 or e-mail CustomerService@sae.org for ID and password help.

Renew by mail: If you have not yet received a renewal notice in the mail, call (877) 606-7323 to request one. Complete your membership renewal form and mail it along with payment—either credit card or check—in the envelope we provide.

Renew by phone: Call (877) 606-7323 or (724) 776-4970 outside the U.S. and Canada, and an SAE Customer Service Representative will assist you.

Renew by fax: Fax your completed form and credit card payment information to (724) 776-0790. To prevent duplicate charges, please refrain from mailing the completed form to Headquarters.

CALL FOR PAPERS

2005 International Powered Lift Conference (IPLC)

The International Powered Lift Conference (IPLC) is the premier event for engineers, technologists, and managers to discuss the latest developments in vertical and/or short take-off and landing (V/STOL) aircraft research, concepts, and programs. It is the only event focused on the technologies, promise, and progress of powered lift systems, with applications ranging from helicopters and advanced rotorcraft, to runway-independent and jet-borne lift aircraft.

IPLC 2005 is cosponsored by SAE Aerospace, the American Institute of Aeronautics and Astronautics (AIAA), the American Helicopter Society (AHS), and the Royal Aeronautical Society (RAeS). IPLC 2005 will be administered by SAE as part of the integrated set of conferences conducted under the umbrella event of the SAE AeroTech Congress & Exhibition, scheduled for October 3-6, 2005 at the Gaylord Opryland Texan Hotel at the Dallas/Fort Worth Airport.

IPLC will focus on three primary thrusts: advanced rotorcraft, jet-lift, and recent progress in the underlying science and technology. The planning committee is seeking abstracts of written papers and oral-only presentations for the following topics. The committee will also consider abstracts

on other topics related to the scope of this conference.

Abstracts should be 300-500 words in length, present facts that are new and significant, and should include results achieved, if applicable. Abstracts, including paper title, author name(s), mailing address, telephone number, facsimile number, and e-mail address, should be submitted no later than February 11, 2005.

Abstracts may be submitted online or e-mailed to iplc@sae.org. Please do not submit your abstract by both methods. For online submission, you will be directed to submit your abstract to a specific session; when e-mailing, please indicate by session code which session is most appropriate for your paper. If you are not sure of the best placement for your abstract, please submit it to Session Code IPLC24-other.

Details about the conference will be announced and updated on the International Powered Lift Conference website as information becomes available.

Abstract deadline: February 11, 2005

Draft deadline: May 27, 2005

Final deadline: August 5, 2005

Become a Company Representative

Help spread information about the benefits of SAE by becoming a Company Representative at your workplace. Company Reps are SAE ambassadors who serve as information resources for SAE members and nonmembers. Receive important SAE information first and be responsible for signing up new members, routing timely SAE notices, supplying necessary forms, and answering questions that your co-workers may have about SAE programs and activities. Company Reps receive early SAE news appropriate to their industry, as well as up-to-date membership materials to help them spread the word.

If you'd like to serve as a Company Rep at your worksite, call (724) 772-7138, fax (724) 776-3393, or e-mail companyrep@sae.org.

23rd Annual Brake Colloquium and Exhibition

The 23rd Annual Brake Colloquium & Exhibition held at the Omni Championship Orlando, FL on October 9-12, 2005, brings together brake industry experts and specialists from all points of the globe to learn about, present, and display the latest technological innovations of brake friction materials and systems.

Abstracts for potential SAE papers and presentations are now being invited on (but are not limited to) the following subjects:

- Materials
- NVH
- New Technology
- Variability reduction and fingerprinting
- Testing
- Models and simulation
- Systems

A digest of 200-300 words that states the objective of the paper/presentation; outlines the problem requiring solution, or the method of approach to research; is explicit with respect to the types of data to be included; and summarizes the conclusions that will be made.

The following information will be required during the on-line submission process:

- Tentative title
- Name of the author and co-authors.
- Author and co-author business affiliation, mailing address and telephone and fax numbers, e-mail addresses
- Selection of one of the session topics listed above

Each submission should include the following:

- Objective
- Problem definition
- Approach methodology (theoretical and/or experimental)
- Supporting data
- Conclusion

Each year the Colloquium receives far more submissions than can be accommodated in the 3 days of the event. Each submission is evaluated to the following criteria:

- Submission fits identified session topics
- New contribution, concept or conclusion
- Technical Orientation (non-commercial)
- Quality of content, grammar and structure
- Conclusions with supporting data

Offered papers shall not have been published elsewhere; and if accepted, contributors are not to release their paper for publication through other media.

Paper acceptance will be based on organizer moderated peer review of draft manuscripts. Authors will be charged a nominal registration fee.

Abstracts are to be submitted online via the SAE Web site. Upon submission, you will receive an automatic reply with your tracking number.

For questions, contact Nori Fought at (248) 273-2465 or e-mail brakemtgs@sae.org

Abstract deadline: February 3, 2005

Draft deadline: April 26, 2005

Final deadline: August 18, 2005

MEETINGS UPDATE

Meetings and symposia schedule

For more information about meetings and symposia, call SAE Customer Service toll-free at (877) 606-7323 ((724) 776-4970 outside the U.S. and Canada). Additional meeting details can be found on SAE's Web site at www.sae.org/calendar/meetings.htm; symposia details at www.sae.org/calendar/toptecs.htm.

SAE Ground Vehicle Design and Manufacturing Events		
Hybrid Vehicle Technologies- Today and Tomorrow	February 9-10, 2005	Costa Mesa, CA
*SAE 2005 World Congress	April 11-14, 2005	Detroit, MI
Plug in and Drive: Automotive Electronics-Convergence Transportation Electronics Series	January 7, 2005	Las Vegas, NV
Intelligent Asset Management Symposia	March 1-2, 2005	Fort Lauderdale, FL
Heavy Truck Handling, Dynamics and Control	May 3-4, 2005	Greenville, SC
Government/Industry Meeting	May 9-11, 2005	Washington, DC
Vehicle Thermal Management Systems	May 10-12, 2005	Toronto, Canada
Fuels and Lubricants Meeting and Exhibition	May 11-13, 2005	Rio de Janeiro, Brazil
Noise and Vibration Conference and Exhibition	May 16-19, 2005	Traverse City, MI
Aerospace Design and Manufacturing Events		
Aviation Maintenance and Human Factors Symposium	May 17-18, 2005	Arlington, TX

*Events at which SAE seminars will be conducted.

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INSTRUCTORS WANTED

SAE Professional Development is seeking experienced engineering professionals with industry/academic backgrounds to propose, develop, and instruct seminars covering all technical areas, including:

- ✓ OBD II
- ✓ Advanced Engine Technologies
- ✓ Hybrid Electric Vehicles
- ✓ Hydraulic Brake Systems
- ✓ Steering Systems
- ✓ By-wire Technologies
- ✓ Homogeneous Charge Compression Ignition
- ✓ Vehicle Stability/Rollover Prevention Technologies
- ✓ Other technical areas will also be considered.

The potential seminar instructor must have experience in either the engineering field, academia, or both. All submitted seminar proposals will be evaluated by a Technical Review Committee to ensure high quality and value to the engineering community.

Interested individuals should contact:

Bev Hoerner
 Manager, New Seminar Development
 SAE Professional Development
 400 Commonwealth Drive
 Warrendale, PA 15096-0001
 Phone: 724-772-8553
 E-mail: bhoerner@sae.org
 Or visit on-line at www.sae.org/calendar/semguide.htm

AWARDS

Team of authors receive 2003 Wright Brothers Medal

The technical paper "An Experimental Investigation of SLD Impingement on Airfoils and Simulated Ice Shapes" has been recognized by SAE with the 2003 Wright Brothers Medal. The award was presented to the authors at a luncheon on Wednesday, November 3, 2004, during the World Aviation Congress in Reno, NV.

Established in 1927, the award annually recognizes the author(s) of the best paper(s) relating to the invention, development, design, construction, or operation of an aircraft and/or spacecraft presented at a meeting of the society, or at any of its sections. Consideration is given to the value of the author's contribution to the state of the art in furthering flight technology, whether it pertains to aircraft or spacecraft systems or their parts, components, subsystems, or accessories. The award honors Orville (an early SAE member) and Wilbur Wright, the first successful builders and operators of heavier-than-air flying equipment.

This year's award-winning authors include:

Michael Papadakis, the lead author, is a professor in the Aerospace Engineering Department at WSU in Wichita, KS. He is also director of the aircraft icing laboratory at the school's National Institute for Aviation Research (NIAR). His main research interests are in aircraft icing, theoretical and experimental aerodynamics, and computational fluid dynamics. In addition, he has conducted research in computational aeroacoustics and computational electromagnetics. Since 1986 he has directed or co-directed over 80 research projects. He received bachelor's and master's degrees in aeronautical engineering from Loughborough University in the United Kingdom, and his doctorate in aeronautical engineering from Wichita State University.



*Michael Papadakis,
Wichita State University (WSU)*

Arief Rachman is currently a software tester with CCH Inc., a WoltersKluwer company. Previously, he served on the research team at Wichita State University (WSU) and was heavily involved in several water drop-



*Arief Rachman,
CCH Inc.*

let impingement projects, including two tests in the icing research tunnel at NASA Glenn Research Center. His experience includes several icing research projects funded by NASA and the FAA. Rachman holds bachelor's and master's degrees in aerospace engineering from WSU.

See-Cheuk Wong is a research scientist at WSU. He works in aircraft icing research and has been involved in projects related to water impingement on airfoils and simulated ice shapes. Wong received his doctoral degree in aerospace engineering from Wichita State University in 2004. He also holds a bachelor of science and a masters of science from WSU.



*See-Cheuk Wong,
Wichita State University (WSU)*

Collin S. Bidwell is a research engineer with over 22 years of experience in the Icing Branch at NASA Glenn Research Center. He has been involved with the development of wind-tunnel and flight-based experimental icing databases, and with the development of analytical tools for the design and certification of aircraft ice-protection systems. Bidwell received his bachelor's degree in aerospace engineering from the University of Michigan in 1985.



*Colin S. Bidwell,
NASA Glenn Research Center*

Timothy J. Bencic is a research engineer in the Optical Instrumentation and NDE Branch at the NASA Glenn Research Center with 21 years of experience in aerospace testing. He has worked in the area of imaging measurement techniques for use in wind-tunnel-based aircraft icing and luminescent coatings for global pressure and temperature applications for the last 12 years. Bencic received a master's degree in electrical engineering from Cleveland State University in 1989.



*Timothy J. Bencic,
NASA Glenn Research Center*

For more information, contact SAE Awards and Scholarships Program Manager Lori Pail at (724) 772-8534 or at lorile@sae.org.

Aerospace Engineering Leadership Award winner announced

Alain Garcia was presented with the SAE Aerospace Engineering Leadership Award on November 3, 2004 at the SAE World Aviation Congress, in recognition of his lifetime career achievements in the design and construction of commercial air transports.



*Alain Garcia,
Executive VP,
Airbus*

Garcia has shown the highest of engineering capability and leadership from his contributions to the design of the Concorde (the first supersonic commercial air transport) to prominent participation in the Airbus A320, which has become the most successful aircraft put into service by Airbus. He was responsible for the direction of the A330/A340 large wide body, and leadership of the engineering design team for the Airbus A380, which has significantly advanced the state of the art for commercial air transports.

Established in 1992, this award honors individuals for outstanding contributions to the field of aerospace engineering and enhances the image of SAE in the aerospace community. The award recognizes individuals who have applied their leadership skills to make significant contributions leading to great positive impact on the aerospace community.

Garcia joined Aerospatiale (then Sud Aviation) in 1966 as a flight controls engineer in the Concorde program. He became head of powerplant systems in 1972, working specifically with applications for the Airbus

programs, where he developed new standards related to powerplant integration. In 1987, he became Chief Engineer for Aerospatiale, in charge of the A330/A340 program from its inception to initial in-service years.

Garcia, who has been involved in Airbus programs since 1969, was appointed Vice President, General Engineering, at Airbus in 1994. He was in charge of the consortium's engineering policies and aircraft performance. In January 1997, he succeeded Bernard Ziegler as Senior Vice President of Engineering. In 2001, he was appointed Executive Vice President of Airbus SAS, as head of engineering.

He has taught thermodynamics and propulsion in Toulouse engineering colleges and participated in a number of international seminars and symposia. He is also a member of the Haut Conseil Scientifique de l'ONERA.

Garcia has received the following honors: Membre de l'Académie Nationale de l'Air et de l'Espace; Fellow of the Royal Aeronautical Society; Membre Emérite of the French Aeronautical and Astronautical Association; Prix Aéronautique AAAF (2001); Médaille de l'Aéronautique (2002); and Honorary President of Eurocaé (active from 1999 to 2002).

He graduated in 1966 from the Ecole Nationale Supérieure d'Arts et Industrie de Strasbourg, France, with additional training in aero engines in Bristol, England, and aerodynamics at ENSICA in France.

For additional information, go to: www.sae.org/news/awards/list/aero_leadership.

Rumbaugh outstanding student leader chosen

Alta Karpenko, a 2004 engineering graduate of The University of Western Ontario, has been named the 2004 recipient of the SAE Rumbaugh Outstanding Student Leader Award. Karpenko will be presented with the award during the Honors Convocation at the SAE World Congress in Detroit, MI, April 11-14, 2005. As part of the award, she will also receive free SAE lifetime adult membership and a monetary stipend.



Alta Karpenko

This award, established by Max E. Rumbaugh Jr., former SAE Executive Vice President, annually recognizes an outstanding SAE student leader, encouraging continued participation in SAE throughout his or her professional career. The award is based on leadership skills demonstrated during the student's senior year of undergraduate

studies, and the recipient must be employed in a mobility-related industry at the time of selection.

Karpenko was nominated by the acting chair of the mechanical engineering department at The University of Western Ontario based on her exceptional participation in, and support of, SAE activities. As an SAE student member, Karpenko served as both chair for the school's collegiate chapter and captain of the Aero Design team. She also acted as a liaison between the local professional SAE Chapter and the student group. Karpenko is described by her professor as "a dynamic and resourceful person, dedicated to the advancement of others as well as herself."

Karpenko graduated from The University of Western Ontario in June 2004 and is currently a mechanical engineer at Armatec Survivability Corp., where she works on projects related to the protection of military ground vehicle crews from accidents and hostile threats.

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AWARDS

Lubricant research award presented

The 2003 Award for Research on Automotive Lubricants was awarded to two outstanding authors during the SAE Powertrain and Fluid Systems Conference and Exhibition on Tuesday, October 26, 2004. The authors recognized were Sanjay Gulwadi and Gary Shrimpling for their paper "Journal Bearing Analysis in Engines Using Simulation Techniques."

This award recognizes accomplishments and acknowledges contributions through original research and/or developments to the better mutual adaptation of lubricants and lubricated automotive systems or components.

The 2003 Award was presented by Irwin Goldblatt, Executive Director, Technology, Castrol North America, and Outgoing Chair, 2003 Research on Automotive Lubricant Award Board.

Gulwadi has been working for the past 11 years in the areas of design-analysis, simulation and modeling related to engine tribology, lubrication systems, combustion and in-cylinder flow. His winning paper



Sanjay Gulwadi

research was completed during his career with Ricardo, where he developed tools and techniques for a better understanding of the dynamic behavior of various mechanical components with application to the power cylinder system and automotive journal bearings. Gulwadi is currently a senior engineer working on John Deere power system projects at Volt Services. He has been an SAE associate member for more than 10 years. Gulwadi holds his bachelor's degree in engineering from Mangalore University in India and his



From left to right are James Linden, Incoming Chair of Award Board, Sanjay Gulwadi, 2003 Recipient, and Irwin Goldblatt, Outgoing Chair of Award Board.

master's and doctorate degrees in mechanical engineering from Marquette University in Milwaukee.

Shrimpling, a senior software engineer, has dedicated his engineering career to the area of finite element analysis (FEA) and works at Ricardo to integrate FEA techniques into the mechanical simulation of pistons and bearings in reciprocating engines. His award winning research was a culmination of efforts to leverage FEA techniques to provide the structural flexibility data that is key to accurate prediction of elasto-hydrodynamic effects. Shrimpling has been an associate member of SAE for more than seven years and is a 15-year associate member of the Institute of Mechanical Engineers of the UK. Currently a resident of Lockport, IL, Shrimpling holds a bachelor's degree in mechanical engineering from the University of South Hertfordshire, England.



Gary Shrimpling

2003 Horning Memorial Award presented

The 2003 Harry L. Horning Memorial Award was presented on Tuesday, October 26, 2004, at the SAE Powertrain and Fluid Systems Conference and Exhibition. The award recognized seven authors for their outstanding technical paper entitled, "Effect of Hydrocarbon Molecular Structure in Diesel Fuel on In-Cylinder Soot Formation and Exhaust Emissions."

Presented in honor of former SAE President Harry Horning, this award recognizes accomplishments and acknowledges contributions through research and development to the better mutual adaptation of fuels and engines.

The award is looked upon in the society as one of the highest recognitions that can be accorded to researchers in this field. The award was presented by Thomas W. Ryan III, Southwest Research Institute and Outgoing Chair of Horning Memorial Award Board.



Pictured from left to right are Thomas W. Ryan III, Kiyomi Nakakita, Walter Weissman, and John Farrell.

Recipients of the 2003 Harry L. Horning Memorial Award include: Kiyomi Nakakita, Hitoshi Ban, Semon Takasu, Yoshihiro Hotta, Kazuhisa Inagaki of Toyota Central R&D Labs, and Walter Weissman and John T. Farrell of ExxonMobil Corp.

CALL FOR NOMINATIONS

Automotive policy analysis award

The **Barry D. McNutt Award for Excellence** recognizes individuals who have made outstanding contributions to the development of improved federal automotive policy. SAE recognizes the importance of sound policy analysis and inspires members of the mobility community in government, industry, and elsewhere to strive for excellence.

Nomination deadline: January 15, 2005

Submission: For more information and a nomination form, go to <http://www.sae.org/news/awards/list/mcnutt/>

Aerospace product/customer support management award

The **SAE Aerospace Customer Support Person of the Year Award** recognizes individuals who in the assessment of his/her peers has contributed to the advancement in safety, reliability, and product worthiness in air transport and/or military aircraft through his/her initiative, dedication, and excellence in personal interfaces when working with customers and users to achieve operational efficiency.

Nomination deadline: February 1, 2005

Submission: For more information and a nomination form, go to <http://www.sae.org/news/awards/list/customersupport/>

Aerospace engineering leadership award

The **SAE Aerospace Engineering Leadership Award** recognizes an individual for outstanding contributions to the field of aerospace engineering through his/her leadership skills and significant contributions leading to great positive impact on the aerospace community.

Nomination deadline: February 1, 2005

Submission: For more information and a nomination form, go to http://www.sae.org/news/awards/list/aero_leadership/

Civil air transportation professionals lecture

The **SAE/AIAA William Littlewood Memorial Lecture** provides for an annual presentation and recognizes a distinguished leader in the field of civil air transportation. The objective of the lecture is to advance air transport engineering, and to recognize those who make personal contributions to the field.

Nomination deadline: February 1, 2005

Submission: For more information and a nomination form, go to <http://www.sae.org/news/awards/list/littlewood/>

Air transportation and aerospace award

The **Franklin W. Kolk Air Transportation Progress Award** recognizes individuals for unique and outstanding contributions to air transportation and/or contributions to the work of the aerospace technical committees in developing aerospace standards, specifications, technical reports and data through cooperative research. Selection is based on originality and value of the contribution, the impact and influence on the progress and development of air transportation, and peer recognition.

Nomination deadline: February 1, 2005

Submission: For more information and a nomination form, go to <http://www.sae.org/news/awards/list/kolk/>

Aerospace design and development award

The **Clarence L. (Kelly) Johnson Aerospace Vehicle Design and Development Award** recognizes individuals who have had a distinguished career involving significant contributions in the innovative design and development of advanced aircraft and/or spacecraft. Nominations will be judged primarily for the technical value and originality of the contributions which have expanded the knowledge of aerospace engineering.

Nomination deadline: February 1, 2005

Submission: For more information and a nomination form, go to <http://www.sae.org/news/awards/list/johnson/>

Aerospace operations award

The **Marvin Whitlock Award** recognizes an individual for significant technical contributions and/or innovation related to operational availability of aircraft. Operational availability includes areas such as repair design, tooling, maintenance practices, logistics, inspection, modification, and safety. Established in 1988 by the Aerospace Council, this award acknowledges and commemorates the distinctive management contributions of the late Marvin Whitlock, Senior Vice President of Maintenance and Operations and a member of the United Air Lines Board of Directors.

Nomination deadline: February 1, 2005

Submission: Visit the SAE Web site at <http://www.sae.org/news/awards/list/whitlock/>

Off-highway managerial award

The **Sid Olsen Engineering Manager Award** recognizes an outstanding engineering manager in the off-highway industry who demonstrates capabilities in field-proven products and/or services, successful protégés, development of outstanding teams, unquestioned integrity, charismatic leadership, and creation of a supportive environment allowing a customer/product focus.

Nomination deadline: May 1, 2005

Submission: For further information and a nomination form, go to www.sae.org/news/awards/list/olsen/

Off-highway/powerplant industry engineer award

The **AEM Outstanding Young Engineer Award for the Off-Highway Industry** recognizes a young engineer in the off-highway or powerplant industry who demonstrates outstanding leadership skills, teamwork, integrity, innovation, community involvement, and participation in SAE activities. Candidates should be nominated by their managers or supervisors.

Nomination deadline: May 15, 2005

Submission: Visit www.sae.org/news/awards/list/outstanding/youngoh.htm

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COLLEGIATE DESIGN SERIES

South African Mini Baja winners announced



Sasol Mini Baja – South Africa's overall winners Tshwane University of Technology-Pretoria's team poses with their #1 car.

The 9th annual Sasol Mini Baja-South Africa, held at Gerotek Test Facilities and Zwartkops Off Road Academy (ZORA) in mid October, saw the team from Tshwane University of Technology - Pretoria (# 1) emerge as the winners.

The 2004 event, sponsored by Sasol and organized by the University of Pretoria's Mechanical and Aeronautical Engineering Department (TUKS), was "the best ever in all respects," said organizer Schalk Els of TUKS.

Thirty-four teams did their best to reach new engineering frontiers with their purpose built, spaceframe vehicles, powered by 7.5-kW Briggs & Stratton engines. In addition to teams from around Southern Africa, entries were also received from the Delhi College of Engineering (India) and Isfahan University of Technology (Iran), the latter winning the ZORA Best Team Spirit trophy.

University of Pretoria's #4 car finished second overall in the total points' standings, only 27 points behind the victors, while Cape Technikon's #34 entry placed 3rd, collecting R2000 of the total of R10,000

prize money provided by Sasol and TUKS, in association with the other event sponsors Briggs & Stratton, Gerotek, and the Automotive Industries Development Centre (AIDC). The TUKS team was also the winner in static judging at Gerotek.

The AIDC presented the Port Elizabeth University of Technology team (#30) with the award for the vehicle with the best feasibility of mass production. Rand Afrikaans University (#26) and the University of Cape Town (#12) placed 2nd and 3rd in this category, respectively.

In addition to being the overall winners, the team from Tshwane University of Technology-Pretoria also took top honors in the four-hour Sasol endurance race at ZORA. In the survival of "the strongest and fastest" endurance event at Zwartkops, the two University of Witwatersrand teams (cars #11 and #31) were so close together for second that only a small time gap gave the honor and trophy to the #11 team, who were five laps down on the winners at the finish.

Full results of the event are available at www.me.up.ac.za/mini_baja.

Corporate sponsorship for 2005 CDS

Opportunities to promote your company and sponsor the SAE Collegiate Design Series (CDS) events are now available.

The corporate sponsorship opportunity allows for your company to build long-term relationships with the engineers of tomorrow. The SAE CDS consists of six programs, with over 4500 participants. Formula SAE alone registers over 1900 students a year.

Scott McNeil, Engineering Manager of Engine Management Systems, Robert Bosch, said Bosch has benefited greatly from their involvement in Formula SAE (FSAE). "In my area alone we have six FSAE alumni out of 40 associates. We also assist a couple

of local universities, and this has lead directly to the recruitment of two associates in our department. All these FSAE alums have hands-on talent, are team players, and know how to take a project to completion and how to document it. I'm quite sure we could build the entire department from FSAE alums."

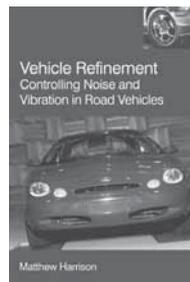
Corporate sponsorship is available in gold, silver, and bronze levels. To find sponsorship at the level that best suits your company, or for more information, contact Doug Shymoniak at shymoniak@sae.org, or (724) 772-4081.

PUBLICATIONS

Controlling NVH

Vehicle Refinement: Controlling Noise and Vibration in Road Vehicles, by Matthew Harrison, reaches out to engineering practitioners and students to provide the very latest information about noise, vibration, and harshness (NVH) for future development.

With refinement being a major engineering and design attribute in the development of



new vehicles and components, this book helps readers create quieter, more comfortable cars.

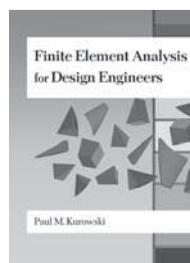
The 360-page softbound book includes chapters on the measurement and behavior of sound and vibration, exterior and interior noise, and sources and solutions of vibration control.

Vehicle Refinement: Controlling Noise and Vibration in Road Vehicles is available for \$79.95 (SAE members receive a 20% discount). To order, visit store.sae.org, e-mail CustomerService@sae.org, or phone (724) 772-7108.

New book on FEA

Finite Element Analysis for Design Engineers, by Paul M. Kurowski, provides a thorough examination of the FEA process in a book that is specifically targeted at the design engineer.

Kurowski wrote the 212-page, case-bound book to address and approach specific needs for those design engineers who use FEA every day, as well as to avoid costly mistakes in the design process. Some of the book's



12 chapters include controlling discretization errors, finite-element mesh, modeling processes, design optimization, misconceptions, and frequently asked questions.

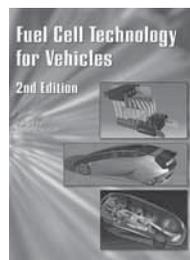
Readers are able to try all concepts and ideas covered by working and solving downloadable exercises using their own FEA software or the commercial FEA software StressCheck from ESRD.

Finite Element Analysis for Design Engineers is available for \$79.95 (SAE members receive a 20% discount). To order, visit store.sae.org, e-mail CustomerService@sae.org, or phone (724) 772-7144.

Fuel cell 2nd edition solves application questions

A second edition of *Fuel Cell Technology for Vehicles*, edited by Richard Stobart, is now available. This 584-page book features more than 50 SAE technical papers, articles from the *Journal of Power Sources*, and biographical data for nearly 200 documents published by SAE and other top sources.

Chapters include: policy, fleet, trials, public reactions; fuel issues; systems design



and evaluation; component development; development, testing and life cycle issues; and modeling, control, and diagnosis.

The most up-to-date research and technological advances in fuel-cell technology are covered in this edition as opposed to the first, which focused on history. In addition, there are many activities that deal with solving application questions based on the latest growth in research activity.

Fuel Cell Technology for Vehicles is available for \$129.95 (SAE members receive a 20% discount). To order, visit store.sae.org, e-mail CustomerService@sae.org, or phone (724) 772-7108.

Technical papers on automotive safety

The latest complete collection of technical papers concerning recent developments in automotive safety technology has arrived. Edited by Daniel J. Holt, *Recent Development in Automotive Safety Technology* features the 70 best safety-related SAE technical papers of 2003.

The many new technologies being developed and the most current compre-



hensive and emerging developments in automotive safety are offered in the 700-page soft-bound manual. All included papers met the criteria for inclusion in SAE transactions, the collection of the year's best technical research in automotive engineering. The book provides engineers with an idea of the direction engineers are taking to reduce the deaths and injuries of vehicle occupants and pedestrians.

Recent Developments in Automotive Safety Technology is available for \$199.95 (SAE members receive a 20% discount). To order, visit store.sae.org; e-mail CustomerService@sae.org; or phone (724) 772-7144.

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SAE administers more than 50 awards and recognition programs that recognize individuals for outstanding achievements in engineering. Information and nomination forms for SAE awards can be found at www.sae.org/awards

CAREER CORNER

Powerful presentations: prepare, rehearse, deliver

For many of us, public speaking can be very intimidating regardless of our level of confidence. While most of us think that those who have mastered the art of effective public speaking have a special gene, the reality is public speaking can be learned. With a little practice and preparation, learning the craft can take your credibility and career to new heights.

Start with a strategy

Just like any project, make sure to develop a strategy, and gear your presentation accordingly. Ask yourself "What do I want to accomplish?" Whether your mission is to inform, persuade, motivate, or entertain, you also need to consider the audience and their goals for attending. Two of the top mistakes made by presenters include lack of adequate preparation, and not tailoring the information to the needs and demographics of the audience.

Maintain your theme

Establish a central theme for your presentation and develop your speech around supporting that focus. Start with the big picture then follow with details. Nearly 70% of people first process information globally, so you will grab the attention of most of your audience if you start this way. Tell your audience what you are going to talk about, be direct and interesting, and always come back to your central theme.

Be a teacher, not a preacher

While your style and delivery are key, it is more important that your audience gains something and understands the material you are presenting. If you start off enthusiastically, your audience will pick up your lead. Studies show adults learn through involvement, so make sure you follow these rules of thumb when presenting your material:

- Link your content to experiences or anecdotes
- Show how your information can help solve a problem
- Get them involved after no more than 20 minutes of talking

Ask the audience for input to help you make a point, or to discuss a concept with their peers for five minutes if you do not have a planned activity as part of your presentation.

Keep it simple

Try to stick to three main points that relate to your theme and keep them concise. You would not want to read a fifteen-page newspaper article when the subject could have been summed up in a few paragraphs.

Categorize information into "need to know", and "nice to know" and eliminate any information that is not relevant. You may want to include more detailed information in handouts with web addresses and references. Information overload is one of the main reasons why audiences tune out a speaker.

Driving the point home with visuals

The information will not speak for itself no matter how compelling it is—you will need to deliver it to your audience in a way they can understand it. The content of the verbal information you provide only contributes 10% to message believability, whereas how you say it counts for 40%. How you look and act when communicating your point contributes a huge 55% to message believability. Visuals support your message and are important to help keep the audience interested and retain the information you present. Some rules of thumb for preparing visuals include:

- Use a slide design master and keep that throughout your presentation
- Keep to one main message per slide
- Strive for only 3-6 bullets per slide
- Do not use more than two fonts and 3-4 colors
- Use 24 point type (minimum) for headline or main message, and no less than 18 point for text

Incorporate charts, graphs, or photos if it helps to get the point across. When presenting information, try to illustrate what it means.

The home stretch

Each presentation should have an effective closing. Bookend your presentation with a good first impression and quick overview, a smooth transition to the meat of your topic, and a strong closing where you leave the audience excited. A question and answer period, if permitted, always adds for good dialogue, a chance to reaffirm your point or opinion, and also to receive feedback from your audience.

Creating a great presentation comes down to three major steps:

Prepare-know your subject, know your objective, consider the audience, and present the big picture first

Design-organize the material, keep it simple, use visuals to help deliver, and bookend your talk

Deliver-rehearse, check the room and equipment, be enthusiastic, adjust to audience body language and feedback, make a strong closing, and listen for the applause!

Processing a job offer

For engineers, young and old, getting a job in 2005 is the easy part. But, processing a job offer and negotiating the salary are two practices some might like to skip.

Right now, in a competitive job market, companies may or may not be willing to negotiate salaries. The number one technique to process a job offer is to assess the situation carefully, and think about who you are working with.

Job offers can come by phone, in person, or through the mail. The mail gives you the best time frame when deciding on the offer. Offers in person or on the phone force you to think on your feet and respond quickly. Unless you are absolutely certain that this is the job you want, prepare the answer of: "Thank you for your offer, however I am just going to need a little time to process everything and think it through." While this may not please the employer, you do need time to look over the offer, salary, and benefits.

Although you may not want to negotiate, remember that necessarily negotiating is more of a personal evaluation of how much the employer values its employees, and how much they are willing to bend for you. It is very important to weigh all of your options to decide what is most important to you: a salary increase, being happier in your new position, and/or the opportunity for advancement within the company.

While thinking about your offer, remember your job content first. What will your

new position entail every day? Think of who you are working for, and who you are working with every day. Then let things such as salary, location, and general work issues fall last when weighing the pros and cons.

Checking for equal salary offers in your area is beneficial when studying the job you are interested in. The listed ranges for the job or for other similar jobs in your area can provide you with questions to ask human resources. For recent college graduates, the National Association of Colleges and Employers is very helpful; and you may consider contacting your alma mater or university in the area for salary ranges.

Be sure to closely review your benefits package, and ensure you are comfortable with what is offered. Often, when asking for a higher salary, human resources will point out that a higher salary is not available due to the lucrative benefits package.

Remain firm, yet flexible when negotiating. If you are interviewing with other companies, be sure to compare salary offers and benefits, and do not be afraid to speak up when offers are below the national or local level. Remember not to sell yourself short—you are worthy of a fair salary.

Constantly be aware of any hiring workshops or associations meeting in your area. Usually around summer and winter there are meetings and informational sessions helping young graduates with the job process.

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PROFESSIONAL DEVELOPMENT

Courses from SAE

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January 2005

Jan 10	Introduction to Failure Modes and Effects Analysis for Product Design (Design FMEA)
Jan 10-11	Diesel Engine Technology
Jan 10-12	Cost, Finance, and Economics for Engineers
Jan 13-14	Engineering Project Management
Jan 13-14	Design for Manufacturing and Assembly (DFM/DFA)
Jan 20-21	Managing Integrated Product Development
Jan 26-27	Turbocharging Internal Combustion Engines
Jan 26-28	Concurrent Engineering Practices Applied to the Design of Chassis Systems **

February 2005

Feb 3-4	Role of the Seat in Rear Crash Safety **
Feb 9-11	Fundamentals of Metal Fatigue Analysis
Feb 14-15	Designing for Safety and Developing Accurate Safety Specifications
Feb 16-18	New! Engineering Effective Team Management and Practice Organizations, in general, and engineering and product development teams in particular, confront a number of serious and ongoing challenges to creating and sustaining positive performance: voluntary employee turnover; product plans breaking down at the point of implementation; team members consistently failing to meet expectations; etc. Many of these challenges relate directly to factors controlled or influenced each day by an organization's managers. Today's successful organization recognizes this critical relationship between superior performance and effective management. This course focuses on ten core management processes designed to increase business results. This is a three-day class that involves significant interaction between students and between students and the instructor. Each day will include presentations by the instructor, group discussions and exercises or casework.
Feb 17-18	New! Collaborative Supply Chain Integration This course is one in a five-course series that leads to a Professional Certificate in Automotive Product Development Management, jointly

March 2005

Mar 7-9	Automotive Fuel Cell Systems
Mar 10-11	New! Electrical System Issues in Automotive Fuel Cell and HEV Applications Hybrid electric and fuel cell vehicles feature an increase in electric power levels from those of a typical IC engine vehicle of a few kilowatts, up to propulsion requirement levels of 100 kilowatts. Over this range, vehicle maximum voltages increase from 12 volts to several hundred volts. While much of the attention on fuel cells has focused on thermal and electrochemical matters, electromagnetic effects can occur as electrical power is generated to propel the traction drives. This course covers three electrical issues that arise in fuel cell and hybrid electric systems: (1) causes of electrical noise in the system, (2) ways in which that noise can create problems and (3) grounding and shielding methods to address these concerns. In addition, various modeling techniques to simulate and predict electrical behavior are presented.
Mar 14	Patents - A Global Perspective
Mar 14-15	Controller Area Network (CAN) for Vehicle Applications **
Mar 14-16	Vehicle Dynamics for Passenger Cars and Light Trucks **
Mar 17-18	New! Program and Risk Management This course is one in a five-course series that leads to a professional certificate in automotive product development management, jointly conferred by SAE and Oakland University's renowned School of Business. This course presents an eight-step method for program planning and control, including: definition of customer's requirements, roles of the program team, determination and flowcharting of program tasks, scheduling and costing, quality aspects of critical tasks, and risk management. Each of the eight steps evolve from common-sense questions that should be answered for any program, regardless of size or complexity.

See SEMINARS, p. 11

MEMBERS ON THE MOVE

Wil Conner (Mbr '97), has joined the Kurz-Kasch company as Automotive Industry Manager.



Wil Conner

Brian Walters (Mbr '03), has been named Director of Heavy-Duty Sales by the Timken Company.

Timothy Glock (Mbr '91), has joined Dura Automotive Systems as Vice President of Sales for North American customers.

Sivanandi Rajadurai (Mbr '96), has joined ACS Industries as Vice President of Exhaust Products.



Sivanandi Rajadurai

Mohammad Samii (Mbr '95), President and Operator of Sammy's Auto Electric Service, has been honored with the Automotive Parts Remanufacturers Association's Distinguished Service Award.

Special Acknowledgements

Marvin Weintraub (Mbr '83), Co-founder and General Chair of the SAE Brake Colloquium, has been appointed by the Automotive Manufacturers Equipment Compliance Agency as representative to the Friction Material Industry.

Richard Adams (Mbr '76), Vice President, Automotive Business Development, Timken Company, has joined the Motor and Equipment Manufacturers Association's board of directors.

Robert Strazzella (Mbr '91), Valeo Inc.'s Chairman and Group Vice President of North America, has joined the Motor and Equipment Manufacturers Association's board of directors.

Walter A. Poggi (Mbr '93), President and CEO of Retlif Testing Laboratories, has been recognized by The American Council of Independent Laboratories with its Lewis E. Harris Fellow Award. The award is the highest commendation for outstanding service and dedication to the U.S. independent testing community.



Walter A. Poggi

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PROFESSIONAL DEVELOPMENT

SEMINARS continued from p. 10

- Mar 17-18 Electronics Packaging: Thermal and Mechanical Design and Analysis
- Mar 17-18 Automotive Advanced Driveline Systems: Theory and Design
- Mar 17-18 Finite Element Analysis for Design Engineers-Hands-on FEA Workshop
- Mar 21 Engine Cooling Design: A System Engineering Approach
- Mar 21-22 Hydraulic and Pneumatic Fluid Power Seals
- April 2005**
In Conjunction with the SAE 2005 World Congress and Exhibition, Detroit, MI
- Apr 11 Fundamentals of Sensor Design for Automotive Air Bag Systems
- Apr 11-12 Automotive Electronics-An Applications Primer
- Apr 11-12 Diesel Engine Technology **
- Apr 11-12 **New!** Hands-on Racecar Suspension Set-up in Partnership with Panoz Racing School
This course is designed to provide participants with a sound understanding of suspension adjustment theory along with supervised hands-on experience performing proven suspension set-up procedures. All necessary tools and equipment will be provided including demonstration cars for setup. With further practice, participants should be equipped to master the physical attributes required to perform correct setup procedures in a repeatable and consistent fashion.
- Apr 11-12 Sensor and Actuator Technology: Module 1-Powertrain (Engine, Transmission, and Onboard Diagnostics) **
- Apr 11-12 Metal Forming
- Apr 11-12 Compact Heat Exchangers for Automotive Applications
- Apr 11-12 Catalytic Converters: Design and Durability **
- Apr 11-12 Introduction to Brake Control Systems
- Apr 11-12 Engineering Project Management
- Apr 11-13 Geometric Dimensioning and Tolerancing-Level I
- Apr 11-13 Injuries, Anatomy, Biomechanics and Federal Regulation **
- Apr 11-13 Chassis and Suspension Component Design for Passenger Cars and Light Trucks
- Apr 11-13 Combustion and Emissions for Engineers
- Apr 11-13 Commercial Vehicle Braking Systems **
- Apr 11-13 Fundamentals of Modern Vehicle Transmissions **
- Apr 12-13 Diesel Emissions and Aftertreatment Devices: Design and Durability
- Apr 12-13 Sensor and Actuator Technology: Module 2-Chassis (Steering, Suspension, Braking, Stability, Vehicle Dynamics) **
- Apr 13 The Tire as a Vehicle Component **
- Apr 13 Design Reviews for Effective Product Development
- Apr 13-15 Weibull-Log Normal Analysis Workshop
- Apr 13-15 **New!** Advanced Vehicle Dynamics for Passenger Cars and Light Trucks
This interactive seminar will take you beyond the basics of passenger car and light truck vehicle dynamics. Advanced theory and practical applications associated with the dynamic performance balance between the powertrain, brakes, steering, suspensions, and wheel and tire vehicle subsystems will be discussed with an emphasis on ride, braking and handling. Governing state space-equations with transfer functions, CAE solutions, and analysis for both steady and transient conditions will also be covered. Substantial time will be dedicated to the DOE approach to vehicle dynamics including Pareto of main effects (screening DOE) and multi-response optimization (response surface method). Practical workshops using CAE will reinforce the material and provide you with hands-on experience.
- Apr 13-15 Advanced Electric Motor/Generator/Actuator Design and Analysis for Automotive Applications
- Apr 14 Tire and Wheel Safety Issues **
- Apr 14 A Familiarization of Drivetrain Components **
- Apr 14 Sensor and Actuator Technology: Module 3-Body (Occupant Safety, Intelligent Vehicles, Navigation, Comfort, Convenience, Security)
- Apr 14-15 Static and Dynamic Sealing
- Apr 14-15 Introduction to Failure Modes and Effects Analysis for Product Design and Manufacturing Process Design (Product and Process FMEA) **
- Apr 14-15 Distributed Automotive Embedded Systems
- Apr 14-15 Threaded Fasteners and the Bolted Joint
- Apr 14-15 **New!** Occupant and Vehicle Kinematics in Rollovers
This course on occupant and vehicle responses examines relevancy of rollover field conditions and vehicle responses in currently available studies, and under new test conditions. Additionally, the course provides a review of occupant kinematics and offers a discussion on sensing technologies prior to and during a rollover event. The text *Occupant and Vehicle Responses in Rollovers*, editors David C. Viano and Chantal Parenteau, is included in the course materials.
- Apr 14-15 **New!** Vehicle Accident Reconstruction Methods
This seminar is devoted to the exposition, use, and limitations of the engineering, scientific, and mathematical principles and methods used to reconstruct vehicular accidents. The primary objectives are to help the attendees achieve a high level of understanding of these methods and to immediately begin reconstruction of accidents. The course covers a wide range of topics including uncertainty, impact mechanics, tire mechanics, vehicle-pedestrian impacts, and vehicle dynamics. Most of the calculations can be carried out using commonly available spreadsheet technology suitable for personal computer use.
- Apr 14-15 **New!** Fundamentals of Automotive Fuel Delivery Systems **
This course provides a basic yet thorough examination of technical issues involved in automotive gasoline and diesel fuel delivery. Participants will acquire a fundamental understanding of the current technology and requirement guidelines and apply some of the principles through an in-class project and exercises. Examples of frequently encountered technical issues of fuel delivery systems shall also be discussed. The course is designed to encourage discussion, insights, and possible solutions into the engineering problems encountered in the gasoline and diesel fuel delivery systems and components.
- Apr 14-15 Design of Experiments (DOE) for Engineers
- Apr 14-15 Selection, Evaluation and Measurements of Acoustical Materials for Vehicle Interior Noise Study
- Apr 14-15 Accelerated Test Methods for Ground and Aerospace Vehicle Development
- Apr 14-15 The Basics of Internal Combustion Engines
- Apr 14-15 Introduction to Failure Modes and Effects Analysis for Product Design and Manufacturing Process Design (Product and Process FMEA) **
- Apr 15 Fundamentals of Automotive All-Wheel Drive Systems
- Apr 15 Exhaust Flow Performance and Pressure Drop of Exhaust Components and Systems
- Apr 15 Patent, Trademark and Copyright Law for Engineers
- May 2005**
May 2-3 **New!** Leading High Performance Teams
This course is one in a five-course series that leads to a professional certificate in Automotive Product Development Management, jointly conferred by SAE and Oakland University's renowned school of business. Product development is organizationally a complex undertaking that requires effective coordination within a company and between companies. During product development, teams are confronted with a number of ongoing organizational challenges and there is a high potential for conflict between participants in the process. This course addresses teamwork and other "soft-side" factors that largely determine whether product development programs are successfully completed on schedule. The content is relevant for both OEMs and suppliers.
- May 2-3 Automotive Glazing Materials
- May 5-6 Adhesive Bonding Technology
- May 9-10 **New!** Forensic Analysis of Medical Records in Injury Biomechanics and Accident Reconstruction studies
This course focuses on medical records, how to read them, the types of information they contain, and the insights they can provide regarding restraint usage and deployment, injury mechanism, severity and outcome, and the effects of pre-existing conditions. Annotated case studies reveal "real world" usage of terminology and abbreviations and illustrate how medical records may be used to understand: impact severity and direction; the effect of intoxication and other pre-existing conditions on crash avoidance; injury severity and injury outcome; restraint usage; injury mechanisms that involve occupant impacts with the vehicle interior (the so-called second collision) and those that do not; and airbag deployment versus non-deployment.
- May 9-10 Ignition Issues and Their Impact on Engine Performance, Efficiency and Emission
- May 9-11 Geometric Dimensioning and Tolerancing - Level II
- May 9-11 **New!** Applied Vehicle Dynamics Seminar in Partnership with BeaveRun MotorSports Complex, Big Beaver Borough, PA
This course devotes intense classroom time (nearly 8-hours) to the understanding of the fundamental principles associated with longitudinal and lateral vehicle dynamics. Classroom exercises are augmented with focused behind-the-wheel driving sessions (approximately 15-hours) to illustrate and reinforce these principles in the real world. The course builds the bridge between vehicle dynamics theory and practical application by providing a rich academic underpinning and then reinforcing it with highly focused, relevant driving experiences. Additional technical skill-building is provided on day three, nearly all of which involves instructor-supervised wheel-time to further practice the driving skills covered in the first two days.

See SEMINARS, p. 12

PROFESSIONAL DEVELOPMENT

SEMINARS continued from p. 11

May 12-13	Tolerance Stack-Up Analysis	June 2005
May 16-17	Fundamentals of Gear Design and Application **	Jun 1-3
May 17-18	Simplified Taguchi/DOE Methods	Jun 2-3
May 17-18	Turbocharging Internal Combustion Engines	
May 18-19	Fundamentals of Truck and Off-Highway Transmission Systems	
May 20	Current Issues in Using Crash Injury Data	
May 23	Basic Noise Control	
May 23-24	Powertrain Selection for Fuel Economy and Acceleration Performance	
May 23-24	In-Vehicle Multiplex Networking Applications	
May 24	Noise and Vibration Measurement: Instruments and Facilities	

Automotive Coatings: Materials and Applications

New! Cost Planning and Improvement

This course addresses planning and improving costs during product development, and emphasizes that cross-functional management and information-sharing are required for effective cost planning and improvement. The focus is on improving costs, not just cost reduction, because the objective of effective cost management is to increase value for customers. Increasing value for customers includes spending money where it provides the most benefit to customers, as well as eliminating waste and reducing costs in areas where they do not add value for customers.

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Applicants must hold a doctorate in mechanical engineering or related area and demonstrate potential for excellent teaching and research. Candidates with an outstanding record of teaching, research achievements, and scholarship will be given consideration for a tenured position. Verbal and written communication skills are a prerequisite. Postdoctoral or industrial experience is considered an advantage. Duties include research, advising, teaching basic and advanced undergraduate design courses, and introducing new graduate courses. Salary and start-up packages commensurate with experience.

Applicants should submit a resume, a research and teaching statement, a list of at least four references, and a copy of three publications to: Robotics Search Committee Chair, Department of Mechanical Engineering, University of Maryland, College Park, MD 20742-3035.

Applicant should be available to start in August 2005. For best consideration apply by January 31, 2005, but the position will remain open until filled. Please check our website (<http://www.enme.umd.edu/department/employment.html>) for current information. The University of Maryland is an equal opportunity, affirmative action employer.

Industrial Engineer for automotive manufacturer in Mansfield, OH. Analyze and evaluate work practices using various work measurement techniques; analyze existing operations by conducting labor and equipment utilization studies to determine actual manpower requirement; propose cost justified capital investment to maximize operating efficiencies; design lean manufacturing cells using predictive system simulation tools to optimize use of space, equipment, material and personnel; develop plan layouts for cells using computer aided design software and assist in integrating them into plant floor; establish efficient operational methods, work standards and cost; assist in developing plant layout in planning and rearrangement of facilities, equipment and operations; develop management information systems to support decision making process; monitor adherence to recommended procedures. M.S. in Industrial Engineering; 3 yrs experience in job offered. Experience must have included time and delays studies, line balancing, lean manufacturing, linked cell manufacturing; process planning, advanced statistical techniques, queuing systems; system simulation software Pro Model, optimization and advanced statistical techniques; motion studies, development of work standards and cost structure; facility planning; AutoCAD for plant layout development. Education must have included courses on Concepts in Advanced Manufacturing, Linear Statistical Methods, Manufacturing Engineering, Queuing Theory, System Simulation, Optimization Theory, Information Storage and Retrieval Systems, Management Information Systems. 40 hours/wk, 6:30 a.m. to 3:30 p.m., \$61,276/yr. Send two resumes and cover letters to: REF #12077, PO Box 16808, Columbus, OH 43216.

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