

2008 SAE *Motorsports Engineering* Conference


December 2-4, 2008

The Embassy Suites Charlotte-Concord Golf Resort & Spa
Concord, North Carolina, USA

Keeping You Ahead – Racing Technologies YOU Need to Know

The Motorsports Industry Technical Event Focusing On:

- Aerodynamics
- Vehicle/Chassis
- Suspension/Tires
- Green Motorsports
- Materials
- Powertrain
- Safety
- Testing
- Simulation
- Sanctioning Bodies/Event Management



Pre-Register by November 14, 2008
SAE Members Save \$400 off of the
full conference fee;
Non-Members Save \$100

Inside – Information about this must-attend event.

www.sae.org/events/msec



EVENT OVERVIEW

2008 SAE Motorsports Engineering Conference

December 2 – 4, 2008

Keeping You Ahead –
Racing Technologies YOU Need to Know

The SAE Motorsports Engineering Conference is returning to its roots by offering a technical program that is invaluable to the working engineers and engineering managers in the motorsports industry - a technical program that has been defined and organized by EXPERTS WORKING IN THE MOTORSPORTS INDUSTRY and delivers high-quality, practical information.

Experience the ONLY Technology Centered Industry Event Designed for the Motorsports Engineer ... **all in the Charlotte, North Carolina area - a globally recognized center for racing, high performance and engineering excellence!**

BENEFITS OF ATTENDING

- Address advances in racing technology in the technical sessions
- Gain insight on the latest techniques and solutions in motorsports
- Participate in working groups to address industry needs and set future direction
- Network with your peers – motorsports professionals from race teams, test facilities, sanctioning bodies, suppliers, major manufacturers and OEMs.

WHO SHOULD ATTEND

- Engineers
- Researchers
- Engineering Management
- Technicians
- Corporate Executives
- Academia
- Event Organizers
- Officials
- Drivers & Crews

From OEM's, Suppliers, Race Teams, and Sanctioning Bodies

SAE INTERNATIONAL - THE ENGINEERING INTERSECTION BETWEEN RACING AND THE TRANSPORTATION INDUSTRY.

Visit www.sae.org/msec for the most up-to-date information on the 2008 SAE Motorsports Engineering Conference



EVENT - AT - A - GLANCE

Tuesday, December 2	Wednesday, December 3	Thursday, December 4
8:00 – 9:00 a.m. Opening Reception & Keynote Address	8:00 – 10:00 a.m. Safety Panel	8:00 – 10:00 a.m. Green Motorsports Panel
9:00 – 9:30 a.m. Networking Break Tabletop Displays Open	10:00 – 10:30 a.m. Networking Break Tabletop Displays Open	10:00 – 10:30 a.m. Networking Break Tabletop Displays Open
9:30 – 11:30 a.m. Sanctioning Bodies Panel	10:30 – 11:30 a.m. Aerodynamics Focus Group Meeting	10:30 a.m. – 12:30 p.m. Technical Sessions
11:30 a.m. – 12:30 p.m. Technical Sessions	10:30 a.m. – 12:30 p.m. Technical Sessions	
12:30 – 2:00 p.m. Lunch Tabletop Displays Open	12:30 – 2:00 p.m. Lunch Tabletop Displays Open	12:30 – 1:00 p.m. Lunch Tabletop Displays Open
2:00 – 5:00 p.m. SAE Motorsports Aero Challenge Workshop	2:00 – 5:00 p.m. Technical Sessions	2:00 - 3:00 p.m. Safety Focus Group Meeting
	4:00 - 5:00 p.m. Vehicle/Chassis Focus Group Meeting	
2:00 – 5:00 p.m. Technical Sessions	5:00 – 6:00 p.m. Networking Reception	3:00 - 4:00 p.m. Powertrain Focus Group Meeting
	6:30 – 8:30 p.m. Banquet	2:00 – 5:00 p.m. Technical Sessions

TECHNICAL SESSION HIGHLIGHTS

The 2008 SAE Motorsports Engineering Conference will feature progressive technical sessions focused on the issues challenging today's motorsports industry professional.

Some of the sessions in development include:

- Vehicle/Chassis
 - Software Analysis
 - Tires
 - Virtual tools, data acquisition, instrumentation
- Aerodynamics
 - Technical Needs/Research Opportunities
 - Aerodynamic: Testing Facilities and Measurement Techniques
 - Computational Methods & Modeling (CFD)
- Powertrain
 - Advanced Combustion
 - Life Cycle & Failure Analysis
 - Diesel Engines in Competition
 - Direct Injection in Competition
 - Electronic Powertrain Control Systems
- Materials
 - Advanced Materials & Manufacturing Processes
 - Life Analysis of Composite Materials
- Green Motorsports
 - Energy balance – a different approach
 - Energy recovery (KERS)
 - Implementation of 'Green Racing'
- Testing & Simulation
 - Optimization using math-based models
 - Simulators for driver training
 - Integration of test and data acquisition with simulation
- Safety
 - Prepare to Race - The Driver/Crew Environment and Accessories
 - Designing Safer Race Cars
 - The Science of Safety
 - Facility Safety & Event Management



PANEL DISCUSSIONS AND SPECIAL PROGRAMS

TUESDAY, DECEMBER 2, 2008

9:30 – 11:30 A.M.

Sanctioning Body Panel – Is Innovation Being Outlawed?

The state of rules-making in the age of spec components, and demands for competitive parity on the track for “entertainment” sake will be discussed by top technical personnel from a variety of sanctioning bodies.

Are these sanctioning bodies *killing* innovation in their pursuit of lower costs and close competition? Or, are they consciously *re-directing* it to give motorsports engineers new challenges?

Here’s your opportunity to hear directly from the rules makers where the future of innovation in their specific series is going...and a chance for you to ask what’s on your mind.

Moderator:

Don Taylor, NHRA

Sanctioning Body Panel Participants:

Scot Elkins, ALMS

Mike Fisher, NASCAR

Jeff Horton, IRL

Peter Riches, BTCC and A1GP

Dave Spitzer, Grand American

Jeremy Thoennes, SCCA Pro Racing

WEDNESDAY, DECEMBER 3, 2008

8:00 – 10:00 A.M.

Safety Panel – Putting Research to Work

Panelists representing a spectrum of motorsports safety activities will briefly discuss their role in this area of the sport and focus on how to better facilitate the implementation of new safety developments to the benefit of the end users.

The panel will include representatives from research, event administration, medical, first response, safety equipment standards and competition. The panel will be supported by other safety experts in motorsports attending the conference. The session will be open to questions from the audience.

Moderator:

Dr. John Melvin, Tandelta

Safety Panel Participants:

Daniel L. Jones, Chapel Hill Fire Department

Arnold S. Kuhns, SFI Foundation

Andrew Mellor, Federation Internationale de L’Automobile

Dr. Stephen E. Olvey, University of Miami



THURSDAY, DECEMBER 4, 2008

8:00 – 10:00 A.M.

Green Motorsports Panel – Alternative Fuels to Energy Recovery

A discussion on advancing environmental technologies in motorsports while maintaining both the spectacle and the safety requirements?

Is professional motorsports being conducted for its own sake or is there a real benefit to be gained by the transfer of environmental racing technology into the passenger vehicle and transportation sector? With the ever growing concerns regarding the environmental impact of transportation, motorsports is coming under increasing scrutiny from both the public and those that see little correlation to road transportation. The panelists bring a breadth of knowledge to this debate from both the technical delivery viewpoint as well as the consumer. How the technologies can be developed and then fast tracked from the racing world to passenger vehicle development is a question that will be raised and explored.

Safety concerns are another topic that will be discussed as these new technologies have their own, often unique, requirements which are completely new to the traditional liquid fuel racing environment.

Moderator:

Tim Holland, Lotus Engineering Inc.

Green Racing Panel Participants:

Ian Bamsey, Race Engine Technology Magazine

Ted Bohn (invited), Argonne National Labs.

Doug Cross, Flybrid Systems LLP

Doug Robinson, IMSA

Jamie Turner, Lotus Engineering Inc.

Peter Wright, FIA

THE SAE MOTORSPORTS AERO CHALLENGE

Comparison and Evaluation of Aerodynamic Tools for the Race Car Industry

There are a number of areas of race car aerodynamics that would benefit from a better understanding of the fundamentals. A series of evaluations is planned combining both experimental and numerical methodologies on several, common race car chassis. Special emphasis will be placed on understanding the physics and applications. Resulting benefits impact the wind tunnel facilities, the CFD coders and the race teams to ultimately improve performance. We have laid out a seven step process and welcome participation and contributions. Join us and be on the leading edge of the technical developments. For additional details and to request additional information, visit www.sae.org/events/mec/aerochallenge.htm or contact Bob Welge, bobw@robertsengineeringdevelopment.com or by phone, 714-593-2312.

AERO CHALLENGE WORKSHOP AT THE 2008 SAE MOTORSPORTS ENGINEERING CONFERENCE

TUESDAY, DECEMBER 2, 2008

2:00 – 5:00 P.M.

The SAE Motorsports Aero Challenge topic for 2008 is **“Race Cars in Proximity”** and is a comparison and evaluation of aerodynamic tools for the racecar industry. Interest in participating has been expressed from a full spectrum of industry including racing teams, engineering companies, universities, wind tunnel facilities and the CFD developers. We will meet in person as a working group to solidify the details and begin to produce results. Please join us and participate.

For additional information visit the 2008 SAE Motorsports Engineering Conference website at www.sae.org/events/msec

TECHNICAL SESSION WEEK-AT-A-GLANCE

Session Title	Tues am	Tues pm	Wed am	Wed pm	Thurs am	Thurs pm	Room
Advanced Combustion (MSEC9)	-	-	-	✓	-	-	Concord C
Advanced Materials and Manufacturing Processes (MSEC19)	-	✓	-	-	-	-	Concord C
Aero Challenge Workshop (MSEC33)	-	✓	-	-	-	-	Concord D
Aerodynamics - Computational Methods and Modeling - Part 1 (MSEC8)	-	-	-	-	✓	-	Concord D
Aerodynamics - Computational Methods and Modeling - Part 2 (MSEC8)	-	-	-	-	-	✓	Concord D
Aerodynamics Focus Group Meeting (MSEC34)	-	-	✓	-	-	-	Concord D
Aerodynamics Technical Opportunities, Needs and Testing (MSEC6)	-	-	-	✓	-	-	Concord D
Designing Safer Racecars (MSEC27)	-	✓	-	-	-	-	Concord B
Diesel Engines in Competition (MSEC10)	✓	-	-	-	-	-	Concord C
Direct Injection in Competition (MSEC11)	-	-	-	✓	-	-	Concord C
Facility Safety and Event Management (MSEC26)	-	-	-	-	✓	-	Concord B
Green Motor Sports - Part 1 (MSEC22)	-	-	-	-	✓	-	Concord C
Green Motor Sports - Part 2 (MSEC22)	-	-	-	-	-	✓	Concord C
Green Motorsports Panel (MSEC32)	-	-	-	-	✓	-	Concord B
Keynote Address - Motorsport and the Environment - Challenge or Compromise (MSECK1)	✓	-	-	-	-	-	Room TBD
Powertrain Testing and Measurement (MSEC18)	-	-	-	✓	-	-	Concord C
Powertrain/Green Racing Focus Group Meeting (MSEC36)	-	-	-	-	-	✓	Concord C
Prepare to Race - The Driver/Crew Environment and Accessories (MSEC25)	-	-	✓	-	-	-	Concord B
SAE Motorsports Engineering Conference Vehicle/Chassis Group Meeting (MSEC37)	-	-	-	✓	-	-	Carolina B
Safety Focus Group Meeting (MSEC35)	-	-	-	-	-	✓	Concord B
Safety Panel - Safety is no Accident. (MSEC30)	-	-	✓	-	-	-	Concord B
Sanctioning Bodies Panel (MSEC31)	✓	-	-	-	-	-	Concord B
Sanctioning Bodies and Event Management (MSEC23)	✓	-	-	-	-	-	Room TBD
Suspension and Handling (MSEC2)	-	✓	-	-	-	-	Carolina B
Testing and Simulation - Chassis Part 2 (MSEC24)	-	-	-	-	✓	-	Carolina B
Testing and Simulation - General Part 3 (MSEC24)	-	-	-	-	-	✓	Carolina B
Testing and Simulation - Powertrain Part 1 (MSEC24)	-	-	✓	-	-	-	Concord C
The Quest for Speed (MSEC29)	-	✓	-	-	-	-	Concord C
The Science of Safety - Part 1 (MSEC28)	-	-	-	✓	-	-	Concord B
The Science of Safety - Part 2 (MSEC28)	-	-	-	-	✓	-	Concord B
Vehicle Design (MSEC1)	-	-	✓	-	-	-	Carolina B
Virtual Tools, Data Acquisition, Instrumentation (MSEC4)	-	-	-	✓	-	-	Carolina B

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

Keynote Address - Motorsport and the Environment - Challenge or Compromise

8:00 a.m.

Sanctioning Bodies Panel

9:30 a.m.

Is innovation being outlawed? The state of rules-making in the age of spec components and demands for competitive parity on the track will be discussed by technical personnel from a diverse group of sanctioning bodies

Moderators:

Don Taylor, NHRA

Panelists:

Scot Elkins, IMSA

Michael Edward Fisher, NASCAR

Jeff H. Horton, Indy Racing League

Peter P C Riches

Jeremy J. Thoennes, SCCA Pro Racing

Diesel Engines in Competition

11:30 a.m.

This session covers all aspects of diesel engines in competition.

Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

Fast Prototyping of a Racing Diesel Engine Control System

Enrico Corti, Giulio Cazzoli, Matteo Rinaldi, Luca Solieri, Univ. of Bologna

The Quest for Speed

12:00 p.m.

This is a session that describes the engineering involved in many of the systems of the vehicle and how they are brought together to produce the final racing machine. It covers competitions in general and speed record attempts in particular.

Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

Design and Development of the BUB 7 Land Speed Record Motorcycle

Joseph H. Harralson, California State Univ-Sacramento

Advanced Materials and Manufacturing Processes

2:00 p.m.

This session covers advanced materials and processes that are, or could be used in high performance and race powertrains.

Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC; Christopher E. Shaw, Visteon Corp.

Extremeions Type V Carbon Raptor Nano-Crystalline Diamond Thin Film Coating for Exhaust Valve Applications (Oral Only)

Darren R. Burgess, George Barr, Anatech, Ltd.

Determining the Effect of Material Properties on Operating Temperatures of Fiber Reinforced Internal Combustion Engine Poppet Valves

Donald W. Radford, Colorado State Univ.

Aluminum Casting Materials Processes (Oral Only)

Paul James Fricker, Grainger & Worrall, Ltd.

Hone and Surface (Oral Only)

Chris P. Sauer, Nagel Precision Inc.

Fastener Technology - How Fastener Science Effects Cyl Head Lifting (Oral Only)

Don Trapp, A1 Technologies

Aero Challenge Workshop

2:00 p.m.

The SAE Motorsports Aero Challenge topic for 2008 is Race Cars in Proximity and is a comparison and evaluation of aerodynamic tools for the racecar industry. Interest in participating has been expressed from a full spectrum of industry including racing teams, engineering companies, universities, wind tunnel facilities and the CFD developers. We will meet in person as a working group to solidify the details and begin to produce results. Please join us and participate.

Organizers:

H. Robert (Bob) Welge, Robert's Engineering Development; Thomas N. Ramsay, Honda R&D Americas Inc.

Designing Safer Racecars

2:00 p.m.

Presentations look at systems and materials that help improve racecar safety performance.

Organizers:

John W. Melvin, Tandelta; J. Kirk Russell

Stock Car Racing Driver Restraint Development and Implementation of Seat Performance Specification

John Patalak, NASCAR; John Melvin, Tandelta

Strength Testing of Inside Nets (Oral Only)

Gregg S. Baker, GTP

RallyCar Occupant Protection (Oral Only)

Andrew Mellor, Federation Internationale de L'Automobil

Shape Memory Composites Applied to the Construction of a Conformable Racing Car Seat

Patrick Devin Leahy, Allyson Antonio, Donald W. Radford, Colorado State University

IMPAXX* Energy Absorbing Foam for Enhanced Driver Safety in Motorsports Door Applications

Myron John Maurer, Dow Chemical Co.

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

Self-Reinforced Polypropylene Composites - A new class of material for the motorsports industry

Heather Hayes, Milliken & Co.

Suspension and Handling

2:00 p.m.

Analysis, design, development, and manufacturing of suspension systems and components

Organizers:

Paul Haney, InfoTire; David A. Finch, Raetech Corp.

An Application of Traction Vectoring to a Formula SAE Car

Rob Tarlton, Steven Ward, Michael Bentz, Univ of Illinois at Urbana-Champaign; Norman R. Miller, Univ. of Illinois at Urbana-Champaign; David Cox, Thomas Becker, Univ of Illinois at Urbana-Champaign

Suspension Geometry: Theory vs K & C Measurement

William C. Mitchell, William C Mitchell Software

A New Method to Evaluate Bump Steer and Steering Influence on Kinematic Roll and Pitch Axes for All Independent Suspension Types

Ganesh Mohan, Claude Rouelle, OptimumG

Design and Development of an Optimized, Passive Camber System for Vehicles

James F. Cuttino, Maruti Nandan Sinha, Univ. of North Carolina Charlotte

State Transition Diagrams of Transient Roll and Pitch

Austin Dvorak, Patrick Fitzhorn, Colorado State Univ

Exploring the Effect of Manufacturing Tolerances on the Front Suspension Performance of a Formula SAE Vehicle Relative to Design Targets

Andrew John Prusinowski, University of Michigan

Sanctioning Bodies and Event Management

This session includes presentations and papers featuring technical issues facing sanctioning bodies in their rules and conduct of race events.

Organizers:

Don Taylor, NHRA; Jeremy J. Thoennes, SCCA Pro Racing

Assistant Chairpersons:

Jeremy J. Thoennes, SCCA

Changes to FIM-MOTOGP Rules to Reduce Costs and Make Racing More Directly Relevant to Road Motorcycle Development (Written Only -- No Oral Presentation)

Alberto Boretti, Univ. of Melbourne

SAE International, the society dedicated to advancing mobility engineering worldwide, would like to invite you to participate in a focus group meeting designed to set the direction of SAE's motorsports technology offerings. SAE is focused on providing leading edge technical information in the form of technical papers, conferences, symposiums, seminars, standards, books and publications. This focus group will follow a process of open discussion, brainstorming, prioritization, definition and selection of leadership. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Please check Event-at-a-Glance or Session Listings for additional information topics, dates, and times.

NOTE: This is a preliminary schedule. Session and session times subject to change without notice. For the most-up-to-date information visit www.sae.org/msec

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE**Safety Panel - Safety is no Accident.**

8:00 a.m.

Safety is no accident - The world's leading motor sports safety engineers want to share the results of their research with you.

Moderators:

John W. Melvin, Tandelta

Panelists:

Jim Downing, Downing Atlanta Inc.
Daniel L. Jones, Chapel Hill Fire Department
Arnold S. Kuhns, SFI Foundation
Andrew Mellor, Federation Internationale de L'Automobil
Stephen E. Olvey, Univ. of Miami

Aerodynamics Focus Group Meeting

10:30 a.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Moderators:

John Miller, SAE International

Prepare to Race - The Driver/Crew Environment and Accessories

10:30 a.m.

Presentations covering a variety of subjects that affect motor sport safety.

Organizers:

John W. Melvin, Tandelta; J. Kirk Russell

Jack Stands in North American Rally A Design Proposal

Mike Johnston, Kevin Martin, Jennifer Johrendt, University of Windsor

Crash Recorders in Racing - An Overview

Thomas W. Gideon, General Motors Corp.

Engineering The Driver

Ross Bentley

Occupant Compartment Updates for Side to Side Vibration in a Fuel Funny Car

Trevor Ashline, Safety Solutions; John Melvin, Tandelta; Kris Vangilder, ISP Innovative Safety Products

Testing and Simulation - Powertrain Part 1

10:30 a.m.

This session covers some of the simulations that are powertrain related. Specifically, it has two papers on predicting the performance of a top fuel dragster and an oral presentation on a simulation package on rotating powertrain assemblies. Simulation enables engineers to predict how a new design will perform by combining math-based methods with insight into to existing designs. Testing serves to confirm the behavior of the new design using physical hardware. Testing and simulation as two essential engineering methods for motorsports go hand in hand. This session discusses leading edge applications of testing and simulation as well as best practices for leveraging a combination of the two to achieve ever greater performance.

Organizers:

Wensi Jin, The MathWorks Inc.; Edward M. Kasprzak, SUNY-Buffalo

Top Fuel Dragster Powertrain Modeling

Thomas Charles Stone, Lex Joon Racing; Matthew Best, Loughborough Univ; Sebastian Visser, Lex Joon Racing

A Nonlinear Model for Top Fuel Dragster Dynamic Performance Assessment

Pol Spanos PhD, Rice University; David Hernández, Tecnológico de Monterrey; Richard Tapia PhD, Rice University

Presentation of EXCITE simulation software-rotating systems. Rotating assembly analysis & simulation (Oral Only)

Andrew C. Martin, AVL Powertrain Engineering Inc.

Vehicle Design

10:30 a.m.

Analysis, design, manufacture, and development of racecar structures.

Organizers:

Paul Haney, InfoTire; David A. Finch, Raetech Corp.

Welding in Racecar Design (Oral Only)

Jeffrey R. Mallat, Siemens Power Generation Inc.

3D Laser Scanning in Racing Vehicle Design (Oral Only)

Kevin N. Outz, Matrix CAD Design Inc.

Mechanical Coupling Due to Composite Structural Damage and Repair

Donald W. Radford, Colorado State Univ.

Terminology and Manufacturing Methods of MIL/AMS-T-6736B Frame Tubing

Eric Rayner, Plymouth Tube Co

Advanced Combustion

2:00 p.m.

This session covers some of the many aspects of airflow and combustion as they apply to high performance and race engines.

Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

Tumble Meter Development

Patrick H. Baer, Chrysler LLC

Top Land Crevice and Piston Deflection Effects on Combustion in a High Speed Rotary Valve Engine (Written Only -- No Oral Presentation)

Harry Watson, Univ of Melbourne; Alberto Boretti, Univ. of Melbourne

A Technique for Processing Cylinder Pressure and Test Bed Data Sets for Engine Speed-Sweep Tests to Allow Reduced Testing Time with Enhanced Interpretation of Results

Gary J. Patterson, AVL North America Inc.

The Effects of Intake Plenum Volume on the Performance of a Small Normally Aspirated Restricted Engine

Leonard Joseph Hamilton, Jasen Lee, US Naval Academy

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE**Aerodynamics Technical Opportunities, Needs and Testing**

2:00 p.m.

The Session will contain technical discussions on progress toward understanding aerodynamic technical issues that are contributors to improved racing vehicle performance. Current research unknowns and research opportunities will be discussed. Improved testing techniques and facilities will be presented.

Organizers:

H. Robert (Bob) Welge, Robert's Engineering Development; Peter Thomas Tkacik, Univ. of North Carolina Charlotte; Thomas N. Ramsay, Honda R&D Americas Inc.

The Influence of Model Motion on the Simulation of Vehicle Dynamics - presentation from SAE 2008 World Congress (SAE paper # 2008-01-0657) (Oral Only)

Peter Aschwanden, RUAG Aerospace

Racecar Front Wing Aerodynamics

Wael Mokhtar, Jonathan Lane, Lake Superior State Univ.

The use of a Bluff Body Wake Generator for Wind Tunnel Studies of NASCAR Drafting Aerodynamics

Robert G. Dominy, Durham Univ.; Geoffrey Le Good, G L Aerodynamics Ltd

Design of a Continuous Flow Water Channel for Fluid Dynamics Research

Peter Thomas Tkacik, Univ. of North Carolina Charlotte

Direct Injection in Competition

2:00 p.m.

This session covers all aspects of the use of direct injection on gasoline engines in motor sports.

Organizers:

Lee Carducci, Power-Tec Engineering; Wiley R. McCoy, McLaren Performance Technologies; Michael J. Royce, Albion Associates LLC

Comparison of PFI and DI Superbike Engines (Written Only -- No Oral Presentation)

Alberto Boretti, Univ. of Melbourne; Harry Watson, Univ of Melbourne

Powertrain Testing and Measurement

2:00 p.m.

This session covers some of the advanced techniques being used in engine dynamometer test and development.

Organizers:

Lee Carducci, Power-Tec Engineering

Crank Angle Resolved Friction Measurements on a Motored Floating Liner Engine (Oral Only)

Bryan O'Rourke, Colorado State Univ; Donald W. Radford, Colorado State Univ.

Advantages and benefits of transient dyno testing to accelerate engine development (Oral Only)

Don Swetzig, AVL North America Inc.

Techniques and hardware for hi-speed combustion measurement and analysis (Oral Only)

Gary J. Patterson, AVL North America Inc.

The Science of Safety - Part 1

2:00 p.m.

This sessions presentations cover research and development activities on a variety of safety related issues.

Organizers:

John W. Melvin, Tandelta; J. Kirk Russell

Recognition, Treatment, and Prevention of Mild Traumatic Brain Injury in Motor Sports (Oral Only)

Stephen E. Olvey, Univ. of Miami

New Sensors to Track Head Acceleration During Possible Injurious Events

Ted Knox, US Air Force

Improving Earpiece Accelerometer Coupling to the Head

Robert Salzar, Univ of Virginia; Joseph A. Pelletiere, US Air Force; Cameron Bass, Univ of Virginia

Wireless Acceleration and Impact Recording Chips

Ted Knox, AFRL; Navid Yazdi, Evigia Systems; John A. Plaga, Wright-Patterson Air Force Base

Recent Developments in Karting Safety (Oral Only)

Hubert Gramling, FIA Institute

Failure Analysis of NASCAR Racecar Components (Oral Only)

Samuel C. Pendergrass, Metallurgical Technologies Inc.

Virtual Tools, Data Acquisition, Instrumentation

2:00 p.m.

The software, hardware, sensors, and methodology needed to gather and analyze vehicle data.

Organizers:

Paul Haney, InfoTire; David A. Finch, Raetech Corp.

Tire-Ground Interaction Model for Suspension Analysis and Optimization

Arnaud Dufournier, DUFOURNIER Technologies

Advanced Triaxial Accelerometer for Race Car Performance Enhancement

Thomas Connolly, Measurement Specialties

Trail-Braking Driver Input Parameterization for General Corner Geometry

Efsthios Velenis, Brunel University; Panagiotis Tsiotras, Georgia Institute of Technology; Jianbo Lu, Ford Motor Co

Avoiding the Pitfalls in Motorsports Data Acquisition

Steve Southward, Virginia Tech.; Holley Conner, Virginia Tech

SAE Motorsports Engineering Conference Vehicle/Chassis Group Meeting

4:00 p.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Organizers:

John Miller, SAE International

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

Green Motorsports Panel

8:00 a.m.

This panel will feature a discussion on advancing environmental technologies in motorsports while maintaining the spectacle, the sport and the safety requirements.

Moderators:

Tim Holland, Lotus Engineering, Ltd.

Panelists:

Michael Austin, Car and Driver Magazine
 Ian Bamsey, Race Engine Technology
 Douglas Cross, Flybrid Systems LLP
 Robert Paul Larsen, Argonne National Laboratory
 Doug Robinson, International Motor Sports Association
 James W G Turner, Lotus Engineering, Ltd.
 Peter G. Wright, FIA Institute for Motor Sport Safety

Aerodynamics - Computational Methods and Modeling - Part 1

10:30 a.m.

This motorsports session includes papers with analyses and investigations that cover the full range of aerodynamic topics from a computational point of view. Papers on numerical techniques, comparative studies, improved performance, race car design, and even a historical paper regarding the 1955 LeMans disaster are presented.

Organizers:

Thomas N. Ramsay, Honda R&D Americas Inc.; Sandeep Dinkar Sovani, ANSYS Inc.; H. Robert (Bob) Welge, Robert's Engineering Development

Improving the Cooling Airflow of an Open Wheeled Race Car

Lasse Christoffersen, Chalmers Univ. of Technology; David Söderblom, Chalmers Univ of Technology; Lennart Löfdahl, Chalmers

Numerical Optimization of the Location of F1 CDG Wings

Jorge Barata, João Correia, André Silva, Univ. of Beira Interior

The Role of Aerodynamics in the 1955 Le Mans Crash

Peter Gullberg, Lennart Löfdahl, Chalmers

Experimental and CFD Comparative Case Studies of Aerodynamics of Race Car Wings, Underbodies with Wheels, and Motorcycle Flows.

Sachin Desai, Betty Chi Man Lo, Cornell Univ; Emily Leylek, Oren Breslouer, Cornell Univ.; Aleksandr Bychkovsky; Punith Doddegowda; Albert R. George, Cornell Univ.

Facility Safety and Event Management

10:30 a.m.

Presentations cover the development of a trackside energy-attenuating barrier and Australian motor sport accident monitoring.

Organizers:

John W. Melvin, Tandelata; J. Kirk Russell

Development of a Barrier for Perpendicular High Speed Impact (Oral Only)

Hubert Gramling, FIA Institute

Australian Motor Sport Crash Data Collection and Analysis.

Thomas Gibson, Human Impact Engineering; Michael Henderson, Self Employed; Christine Bethwaite, CQB Services Pty Ltd

Green Motor Sports - Part 1

10:30 a.m.

The Green Motorsports session includes papers and oral presentations on the environmental issues the sport faces today with comments on the possible solutions. Topics include the use of alternative fuels, energy recovery, and energy governance as ways to improve both the dedicated racing fan's, as well as the general public's, perception of racing. How and why these technologies are transferred into mainstream transportation will also be explored.

Organizers:

Tim Holland, Lotus Engineering Inc.

The Road to the Green Challenge One Way to Make Racing Relevant By John Glenn, Environmental Specialist USEPA, and other members of the Green Racing Work Group (tbd) (Oral Only)

The Application of Energy-Based Fuel Formulae to Increase the Efficiency Relevance and Reduce the CO2 Emissions of Motor Sport

James Turner, Richard Pearson, Lotus Engineering Ltd

'ADVANCED & FUTURE FUELS IN MOTORSPORT' (Oral Only)

Richard Karlstetter, Shell Global Solutions UK

Optimisation of Hybrid Kinetic Energy Recovery Systems (KERS) for Different Racing Circuits

Douglas Cross, Flybrid Systems LLP

Testing and Simulation - Chassis Part 2

10:30 a.m.

Simulation enables engineers to predict how a new design will perform by combining math-based methods with insight into to existing designs. Testing serves to confirm the behavior of the new design using physical hardware. Testing and simulation as two essential engineering methods for motorsports go hand in hand. This session discusses leading edge applications of testing and simulation as well as best practices for leveraging a combination of the two to achieve ever greater performance.

Organizers:

Wensi Jin, The MathWorks Inc.; Edward M. Kasprzak, SUNY-Buffalo

Application of System Identification for Efficient Suspension Tuning in High-Performance Vehicles: Quarter-Car Study

Chris Boggs, Steve Southward, Mehdi Ahmadian, Virginia Tech

Comparison of the Performance of 7-Post and 8-Post Dynamic Shaker Rigs for Vehicle Dynamic Studies

Steve Southward, Chris Boggs, Virginia Tech

Simulation with a Vertical Oscillating Race Car Model

Michael Graf, D.A.T.A.S., Ltd.; Steffen Kosuch, DATAS Ltd

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE**The Science of Safety - Part 2**

10:30 a.m.

This sessions presentations cover research and development activities on a variety of safety related issues.

Organizers:

John W. Melvin, Tandelta; J. Kirk Russell

Numerical Simulation of Hybrid III Response in an SAE Baja Vehicle in Frontal Impact Scenarios

Kin Yuen, Univ of Waterloo; Christopher George Thom, Univ. of Waterloo; Duane Cronin, Univ of Waterloo

Determination of the Pressure Distribution Beneath Two and Three Inch Wide Racing Safety Belts

John W. Melvin, Tandelta

Development of the MADYMO Race Car Driver Model for Frontal Impact Simulation and Thoracolumbar Spine Injury Prediction in Indianapolis-type Racing Car Drivers

Tara Amenson, Motorsports Impact Biomechanics Consulting, LLC; Paul Begeman, Wayne State University; John Melvin, Tandelta, Inc.; Michele Grimm, Wayne State University

Vertical Impact to an Open Wheel Racecar and Development of a Crash Test to Simulate the Driver Response

James Chinni, Indiana Mills & Mfg. Inc.; Jeff Horton, Indy Racing League; Terry Trammell, Orthopaedics Indianapolis

Aerodynamics - Computational Methods and Modeling - Part 2

2:00 p.m.

This motorsports session includes papers with analyses and investigations that cover the full range of aerodynamic topics from a computational point of view. Papers on numerical techniques, comparative studies, improved performance, race car design, and even a historical paper regarding the 1955 LeMans disaster are presented.

Organizers:

Thomas N. Ramsay, Honda R&D Americas Inc.; Sandeep Dinkar Sovani, ANSYS Inc.; H. Robert (Bob) Welge, Robert's Engineering Development

Development of New Turbulence Models and Computational Methods for Automotive Aerodynamics and Heat Transfer

Scott Holloway, Clemson Univ.; Mary Holloway, James Leylek, Clemson Univ

A Fast and Fully Automated Cartesian Meshing Solution for Dirty CAD Geometries

Santosh Kini, Richard Thoms, Fanglin Zhu, ESI Group

Design and CFD Analysis of an NHRA Funny Car Body

Dan Engel, Kevin Golsch, General Motors Corp.; Mike Green, Don Prudhomme Racing; Ed Smith, Applied Technologies, Inc.; Cem Albukrek, Exa Corporation

HPC-LES for the Prediction of Unsteady Aerodynamic Forces on a Vehicle in a Gusty Cross-flow Condition

Makoto Tsubokura, Hokkaido Univ.; Takuji Nakashima, Takeshi Ikenaga, Hiroshima Univ.; Keiji Onishi, AdvanceSoft Corporation; Kozo Kitoh, Kozo Kitoh Technology; Nobuyuki Oshima, Hokkaido Univ.; Toshio Kobayashi, Univ. of Tokyo

Green Motor Sports - Part 2

2:00 p.m.

The Green Motorsports session includes papers and oral presentations on the environmental issues the sport faces today with comments on the possible solutions. Topics include the use of alternative fuels, energy recovery, and energy governance as ways to improve both the dedicated racing fan's, as well as the general public's, perception of racing. How and why these technologies are transferred into mainstream transportation will also be explored.

Organizers:

Tim Holland, Lotus Engineering Inc.

A Selective Retrospective of Alternative Engines and Fuels in Motor Sports: You're Burning What? And How? (Oral Only)

Dennis Simanaitis, Road & Track Magazine

The future of speed (Oral Only)

Eric S. Wilson, Innovation MotorSports Development Group

Cost Effective Sustainable Fuels for Performance Vehicles (Written Only -- No Oral Presentation)

Kevin Dwyer

Safety Focus Group Meeting

2:00 p.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Moderators:

John Miller, SAE International

Testing and Simulation - General Part 3

2:00 p.m.

Simulation enables engineers to predict how a new design will perform by combining math-based methods with insight into to existing designs. Testing serves to confirm the behavior of the new design using physical hardware. Testing and simulation as two essential engineering methods for motorsports go hand in hand. This session discusses leading edge applications of testing and simulation as well as best practices for leveraging a combination of the two to achieve ever greater performance.

Organizers:

Wensi Jin, The MathWorks Inc.; Edward M. Kasprzak, SUNY-Buffalo

Speed in Design Equals Speed at the Track (Oral Only)**Keeping Your Simulation Models from Changing Teams (Oral Only)**

Ethan Woodruff, The MathWorks Inc.; Brett Shoelson, Vinod Reddy, The MathWorks Inc

Virtual Motorsports as a Vehicle Dynamics Teaching Tool

Rob Rieveley, Bruce Minaker, University of Windsor

SESSIONS TECHNICAL, BUSINESS & EXECUTIVE

Development of an Effective, Low-Cost Internet-Based Motorsport Driver Simulation

David Kaemmer, Ian Berwick, iRacing.com Motorsport Simulations;
Steve Potter, iRacing.com

Racing Simulation of a Formula 1 Vehicle with Kinetic Energy Recovery System

Aldo Sorniotti, Univ. of Surrey

Application of the Optimal Maneuver Method for Enhancing Racing Motorcycle Performance

Vittore Cossalter, Matteo Massaro, Simon Bobbo, Martino Peretto,
University of Padova

Powertrain/Green Racing Focus Group Meeting

3:00 p.m.

SAE is focused on providing leading edge technical information. This focus group will follow a process of open discussion, brainstorming and prioritization. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Moderators:

John Miller, SAE International

NOTE: This is a preliminary schedule. Session and session times subject to change without notice. For the most-up-to-date information visit www.sae.org/msec

Focus Group Meetings

SAE International, the society dedicated to advancing mobility engineering worldwide, would like to invite you to participate in a focus group meeting designed to set the direction of SAE's motorsports technology offerings. SAE is focused on providing leading edge technical information in the form of technical papers, conferences, symposiums, seminars, standards, books and publications. This focus group will follow a process of open discussion, brainstorming, prioritization, definition and selection of leadership. At the end of the day we hope to have a calendar of events and a list of products that will help you become a leader in the motorsport industry. This focus group is open to all attendees and will be facilitated by SAE staff or a conference leader.

Please check Event-at-a-Glance or Session Listings for additional information topics, dates, and times.

2008 MOTORSPORTS CONFERENCE SPECIAL GUEST SPEAKERS

TUESDAY, DECEMBER 2, 2008

8:00 – 9:00 A.M.

OPENING RECEPTION AND INDUSTRY KEYNOTE



Keynote Speaker

Peter Wright
*Technical Consultant,
FIA Institute*

*Motorsports and the
Environment:
Challenge or Compromise*

Peter Wright has a long and distinguished career in the field of motor sport. In 1967, he became the aerodynamicist and vehicle development engineer for the F1 team British Racing Motors (BRM). Later, he went to work for Specialised Mouldings Ltd., which designed and manufactured racing car bodies. As the General Manager of Technocraft, Mr. Wright was responsible for the F1

Team Lotus wind tunnel program and was instrumental in the development of the Lotus 79, the winner of 1978 Formula One World Championship.

As the director of Research and Development at Team Lotus, Mr. Wright was responsible for the development of many Lotus Formula One cars. Mr. Wright has served as Managing Director for Lotus Engineering, Director for Group Lotus and Technical Director of Team Lotus from 1991 to 1994.

Because of his extensive experience in motor sport, Mr. Wright was asked to be a technical adviser for the FIA in 1995 - a position he holds to this day. He currently works across a number of FIA affiliated organizations including Director of Euro NCAP and as an advisor on EU safety, emissions and traffic legislation. Mr. Wright was named an SAE Fellow in 2008.

WEDNESDAY, DECEMBER 3, 2008

5:00 – 8:30 P.M.

RECEPTION AND BANQUET



Banquet Speaker

Bob Varsha
*Motorsports Industry
Broadcast Journalist*

*Explaining Engineering To The
Layman In Twenty Seconds
Or Less - the Task of a Motor
Sports TV Commentator*

A former world-class runner and corporate attorney, Mr. Varsha began his career with Turner Broadcasting covering a popular foot race in his home town.

Over four years at Turner Broadcasting Mr. Varsha hosted a WTBS public affairs program and served as a weekday sports anchor on CNN. In 1982 he joined the cast of the first weekly motorsports program on television, "MotorWeek Illustrated," airing on WTBS. Later he accepted a job with World Sports Enterprises

and began to cover motorsports full-time. Auto racing led him to ESPN. Mr. Varsha's assignments for ESPN and ABC Sports included a healthy portion of motorsports but not just motorsports.

Mr. Varsha's assignments for ESPN and ABC sports included major events like the World Alpine Championships, the Indianapolis 500 Time Trials, the U.S. Olympic Trials, and the New York City and Boston Marathons. For Outdoor Life he hosted the network's acclaimed first-ever live coverage of the greatest events in cycling, the Tour de France and the Giro d'Italia.

In late 2001 Mr. Varsha joined Speedvision when it relaunched as SPEED Channel. There he has continued his long association with Formula One and Le Mans and added new programs including the ground-breaking automotive history series "Behind the Headlights"; he also serves as the co-host of "Focus on Racing Radio", and serves as the Formula One correspondent for the program "Powershift" on XM Satellite Radio.

CONFERENCE ORGANIZING COMMITTEE

Conference General Chairperson

Michael Royce

Albion Associates LLC



Mr. Royce is a consultant with Albion Associates LLC. He retired from the DaimlerChrysler Corporation in June 2004 after almost 41 years within the Chrysler family. During his time with Chrysler, Mr. Royce held management positions including assignments in Truck Engineering, Product Planning, Engine Development and Powertrain Program Management.

Between 1992 and 1994 he was the Technical Director at Lamborghini Engineering in Italy, managing the Chrysler Lamborghini Formula 1 engine program. His last assignment was that of Senior Manager of Advanced Engine Technologies.

In 1999 Mr. Royce became a founding member of the DaimlerChrysler Automotive Engineers Program and

was on its organizing committee until his retirement. He has been a licensed SCCA scrutineer for many years working everything from local autocrosses to Formula 1.

Royce received Bachelors and Masters Degrees in Mechanical Sciences from Cambridge University, England, and Masters Degrees in Automotive Engineering from the Chrysler Institute of Engineering and in management from the University of Michigan-Dearborn.

Royce has been an active member of the SAE since 1965, and has served on the organizing committee of all eight SAE Motorsport Engineering Conferences. He has been actively involved in Formula SAE since 1986, has been a member of the Formula SAE Rules Committee since 1996, and its Chairman since 2000. He now also chairs the SAE's University Programs Committee. He was the recipient of the 2005 SAE Excellence in Engineering Education Award.

CONFERENCE ORGANIZING COMMITTEE

Lee Carducci, President, Power-Tec Engineering

Dr. Edward M. Kasprzak, Associate, Vehicle Dynamicist, Milliken Research Associates, Inc.

David Finch, President, RAETECH Corp.

Paul Haney, Owner, InfoTire

Tim Holland, Director of Motorsports Initiatives, Lotus Engineering Inc.

Wensi Jin, Automotive Industry Manager, The MathWorks Inc.

Wiley R. McCoy, Director, Technical Advisory Board, McLaren Performance

John Melvin, President, Tandelta

Thomas N. Ramsay, Senior Engineer, Honda R&D Americas, Inc.

J. Kirk Russell

Don Taylor, Senior Technical Director, NHRA

Jeremy Thoennes, Technical Manager, SCCA

H. Robert Welge, Chief Engineer, Robert's Engineering Development

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Conditions of Sale

All cancellations must be in writing and received by SAE prior to November 14, 2008. A \$50 processing fee will be assessed for each cancelled registration that results in a refund. Refunds will not be issued if cancellation occurs on or after November 14. This policy includes special event and meal fees. For the SAE membership registration rates, member dues must be current at the start of the event. Children under 16 years of age are not permitted.



SAE will do what is feasible to make its events reasonably accessible to attendees. If you have special accommodation needs, please let us know in advance by calling 1-877-606-7323 (1-724-776-4970 outside U.S. and Canada). Accommodations requested on site will be provided only if possible for us to do so with short notice.

Note: Registration fee includes technical sessions, breaks, exhibition and a copy of the event proceedings on CD-ROM.

HOTEL AND TRAVEL INFORMATION

Embassy Suites Charlotte-Concord Golf Resort & Spa

5400 John Q. Hammons Drive NW
 Concord, NC 28027

Hotel Reservation

SAE's group rate is \$170 per single/double, per night, plus local, state and federal applicable taxes. A block of sleeping rooms has been reserved at the Embassy Suites Charlotte – Concord Golf Resort & Spa.

All attendees are responsible for their own lodging and travel arrangements.

Reservations must be made through The Housing Connection by November 14, 2008 by calling 888-221-9425.

SAE Related Resources

2008 Motorsports Engineering Conference

For complete listing of products visit store.sae.org
Books • Standards • Web/CD • Papers • Training



\$69.95

Hands-On Race Car Engineer

Author: John H. Glimmerveen

This book will help racing professionals and enthusiasts learn to recognize why they won or lost a race - key information to continually improving and reaching the winner's circle. It looks at every part of the process required to make a car better than its competitors.

Chapters include:

- Assembling the Car
- Testing, Practice and Qualifying
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- Racing
- and more

ISBN: 978-0-7680-0898-2
Paperbound; 2004

SAE Member Price: \$55.96

Non-member Price: \$69.95

Product I.D. R-323



\$79.95

Analysis Techniques for Racecar Data Acquisition

Author: Jorge Segers

Data acquisition has become an invaluable tool for establishing racecar and car/driver performance. Now that the ability exists to analyze each and every performance parameter for car and driver, accurate use of this data can provide a key advantage on the racetrack. This book provides a thorough overview of the varied methods for analyzing racecar data acquisition system outputs, with a focus on vehicle dynamics.

Topics covered include:

- Data analysis software requirements
- Straight-line acceleration
- Braking, gearing, and cornering
- Quantifying roll stiffness distribution
- and much more!

ISBN: 978-0-7680-1655-0
Hardbound; 2008

SAE Member Price: \$63.96

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Product I.D. R-367



\$149.95

Race Car Vehicle Dynamics Book and Problems, Answers and Solutions Set

Authors: William F. Milliken; Douglas L. Milliken; Edward M. Kasprzak; L. Daniel Metz

Written for the engineer as well as the race car enthusiast, Race Car Vehicle Dynamics gives a comprehensive treatment of vehicle dynamics and its application in a racing environment. It is also widely used as a college textbook and has been an SAE best-seller since its introduction.

Race Car Vehicle Dynamics: Problems, Answers and Experiments is a supplement to Race Car Vehicle Dynamic and includes problems and solutions for every chapter of Race Car Vehicle Dynamics and has been specially developed for inclusion with this book. Purchase both the book and the workbook as a set and save!

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FRIENDS OF THE INDUSTRY **\$1,000 (USD)**

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- Recognition in the Event Guide
- Recognition on the event sponsors page of the SAE website

White Flag Partner



MARKETING SOLUTIONS – cont.

Other Sponsorship Opportunities

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Display your company name and logo to all attendees. The week-at-a-glance shows a helpful summary of all scheduled events during the conference and fits in every attendee's badge holder with your company's name and logo showing for all to see.

Conference Pens and Notepads \$6,000

Provide each attendee with a pen and notepad to take valuable notes and contact information that is obtained throughout the conference. Have your corporate logo splashed on the notepads and pens that each attendee will use and keep.

Advertising Opportunities

Available in both the *Event Guide* and *Automotive Engineering International* magazine with a global circulation of 87,718* and distributed at this event. Advertising rates start at just \$3,490.

*BPA audited circulation statement, June 2007

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* BPA statement for the six month period ending June 2007 (small text)

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