Advanced Reciprocating Engine Systems (ARES) Workshop

In

INTERNATIONAL MECHANICAL ENGINEERING CONGRESS & R&D EXPOSITION
November 15-21, 2003, Marriott Wardman Park Hotel, Washington, DC

Technical Program:

This Workshop aims to disseminate technical information related to research in DOE's gas-fired reciprocating engines program, with particular emphasis on DOE's University Program and its interface with industry, and to provide a public forum to discuss technical challenges in engine efficiency and emissions, and to stimulate discussion on future directions.

Topic Organizers:
Victor W. Wong - Massachusetts Institute of Technology
Ronald J. Fiskum - Department of Energy
Thomas J. George - Department of Energy

ENERT-3 Advanced Reciprocating Engine Systems Workshop I - Overview

Session Schedule: Wednesday, November 19, 2003, 11:15 am – 12:45 pm
Session Sponsors: Sponsored by Internal Combustion Engines Division and U. S. Department of Energy
Session Description: *Fundamentals, technology outlooks, and DOE's support of R&D in advanced natural gas reciprocating engines, especially the University Program, are reviewed. Three 20 minutes presentations each followed by 10 minutes Q&A.*
Session Organizer: Thomas J. George - Department of Energy
Session Co-Chairs: Bryan Willson - Colorado State University
Ronald J. Fiskum - Department of Energy

IMECE2003-55686 DOE Advanced Reciprocating Engine Systems Program Overview
by Ronald J. Fiskum - Department of Energy
IMECE2003-55687 Advanced Natural-Gas Engine Design and Performance Characteristics and Applications
by Bryan Willson - Colorado State University
IMECE2003-55688 Pathway to Improvements in Engine Efficiency and Emissions
by Bryan Willson - Colorado State University

ENERT-4 Advanced Reciprocating Engine Systems Workshop II – Combustion and Ignition

Session Schedule: Wednesday, November 19, 2003 02:00 PM-03:30 PM
Session Sponsors: Sponsored by Internal Combustion Engines Division and U.S. Department of Energy
Session Description: *A general tutorial on fundamentals of natural-gas engine combustion and ignition followed by specific examples of recent research in three separate titles; presentations of 30 minutes each.*
Session Organizers: Ron Matthews - University of Texas at Austin

Bryan Willson - Colorado State University

IMECE2003-55690 Fundamentals of Combustion and Ignition in Natural Gas Engines
by Ron Matthews - University of Texas, Bryan Willson - Colorado State University

IMECE2003-55689 Laser Ignition Processes in Large Natural Gas Engines Using Laser Spark Ignition
by Bryan Willson, Colorado State University

IMECE2003-55691 Rail Plug Ignition for Enhancing Engine Performance and Reducing Maintenance
by Ron Matthews, University of Texas

ENERT-5 Advanced Reciprocating Engine Systems Workshop III – Emissions and After-Treatment

Session Schedule: Wednesday, November 19, 2003 03:45 PM-05:15 PM
Session Sponsors: Sponsored by Internal Combustion Engines Division and U. S. Department of Energy
Session Description: *This session begins with a one-hour tutorial (up to and including the title on Lean Burn Engines..) that provides an overview of emissions from natural gas engines, and how they differ from gasoline and diesel engines. Challenges to emissions control in these engines will be identified, and various methods of control and aftertreatment will be presented. The tutorial will be illustrated by a modern after-treatment technique in the last presentation.*
Session Organizer: David Irick - The University of Tennessee

IMECE2003-55693 Lean-burn Natural Gas Engine Emissions and After-treatment
by David Irick - University of Tennessee
NOx Emission Control for Stationary Lean-Burn Natural Gas Engines *by Nigel Clark – West Virginia University*

IMECE2003-55694 Energy Efficient Thermal Management for Natural Gas Engine Aftertreatment via Active Flow Control
by David Irick - University of Tennessee

ENERT-7 Advanced Reciprocating Engine Systems Workshop IV – Friction and Parasitic Losses

Session Schedule: Thursday, November 20, 2003 11:15 AM-12:45 PM
Session Sponsors: Sponsored by Internal Combustion Engines Division and U. S. Department of Energy
Session Description: *Fundamentals of friction and wear, as well as specific application to engines, such as engine piston and ring dynamics, oil film and lubrication, are covered in a one-hour tutorial (first two titles), exemplified by recent research (last presentation). Phenomena covered are essential to minimize engine losses and improve efficiency.*
Session Organizers: Victor W. Wong - Massachusetts Institute of Technology
Session Co-chairs: Farshid Sadeghi - Purdue University

IMECE2003-55696 Friction, Lubrication, and Parasitic Loss Fundamentals
by Farshid Sadeghi – Purdue University

IMECE2003-55697 Friction, Wear, and Lubrication of Reciprocating Engine Power Cylinder Components *by Tian Tian, Victor Wong - MIT*

IMECE2003-55698 Low Engine Friction Technology for Natural Gas Reciprocating Engines by *Grant Smedley, Tian Tian, and Victor Wong – MIT*

ENERT-9 Advanced Reciprocating Engine Systems Workshop V – Technical Challenges and Future Research Directions

Session Type: Panel Session

Session Schedule: Thursday, November 20, 2003 03:45 PM-05:15 PM

Session Sponsors: Sponsored by Internal Combustion Engines Division and U. S. Department of Energy

Session Description: *In this Panel Session, experts in the gas-fired engines community will present and discuss with the audience current challenges and performance goals of the advanced reciprocating engine systems, development efforts, industry perspectives, and how industry interfaces with university research, merits and limitations of reciprocating engine university or industry research alone, future directions and improvements of DOE-industry-university partnership.*

Session Organizer and Moderator: Timothy J. Callahan - Southwest Research Institute

Session Panelists: Caterpillar Inc. – Gordon R. Gerber
Cummins Inc. – Axel O. Zurloye
Waukesha Engine Dresser Inc. – Jim Drees
Southwest Research Institute – Timothy J. Callahan