Gerald John Micklow

Business Address

Florida Institute of Technology
Department of Mechanical and Civil Engineering
Melbourne, FL 32901
Email: gmicklow@fit.edu
Mobile: 704-340-8575
Website: www.performeng.com

Home Address

2035 Commodore Street
Melbourne, FL 32904
Home: 704-340-8575
Email: prof002@att.net

Education

B.S.-1975 Pennsylvania State University
Major: Aerospace Engineering

M.S.-1981 Pennsylvania State University
Major: Aerospace Engineering

Ph.D.-1989 Virginia Polytechnic Institute and State University
Major: Mechanical Engineering

Professional Experience

2022-present Department of Mechanical and Civil Engineering, Florida Institute of Technology, Melbourne, FL, Professor Emeritus, Head, Automotive Engineering

Automotive Engineering, thermodynamics, computational fluid dynamics, fluid dynamics, gas turbine engines, advanced fan and compressor design, compressible gas dynamics, jet and rocket propulsion, hypersonics, acoustic emissions, combustion, hydraulic systems, turbomachinery, internal combustion engines, external aerodynamics, dynamics, mechanics of materials, non-destructive testing, alternative fuels.

2012-2022 Department of Mechanical and Civil Engineering, Florida Institute of Technology, Melbourne, FL, Professor, Head, Automotive Engineering, Director, Florida Center for Automotive Research

Automotive Engineering, thermodynamics, computational fluid dynamics, fluid

IP2023-01234
Petitioner - Exhibit 1004

dynamics, gas turbine engines, advanced fan and compressor design, compressible gas dynamics, jet and rocket propulsion, hypersonics, acoustic emissions, combustion, hydraulic systems, turbomachinery, internal combustion engines, external aerodynamics, dynamics, mechanics of materials, non-destructive testing, alternative fuels.

2005-2012 Department of Engineering, East Carolina University, Greenville, NC, Professor, Program Director, Mechanical Engineering Concentration

Automotive Engineering, thermodynamics, computational fluid dynamics, fluid dynamics, gas turbine engines, advanced fan and compressor design, compressible gas dynamics, jet and rocket propulsion, acoustic emissions, combustion, hydraulic systems, turbomachinery, internal combustion engines, external aerodynamics, dynamics, mechanics of materials, Non-destructive testing.

2001-2005 Mechanical Engineering and Engineering Science Department, University of North Carolina, Charlotte, Charlotte, NC, Associate Professor

Automotive and Motorsports Engineering, thermodynamics, computational fluid dynamics, fluid dynamics, gas turbine engines, advanced fan and compressor design, compressible gas dynamics, jet and rocket propulsion, acoustic emissions, combustion, hydraulic systems, turbomachinery, internal combustion engines, external aerodynamics.

1996-2001 Mechanical Engineering Department, University of Alabama, Tuscaloosa, AL. Associate Professor

Automotive Engineering, thermodynamics, computational fluid dynamics, fluid dynamics, compressible gas dynamics, jet and rocket propulsion, gas turbine engines, advanced fan and compressor design, acoustic emissions, combustion, hydraulic systems, turbomachinery, internal combustion engines.

1988-1996 Mechanical Engineering Department, University of Florida, Gainesville, Florida. Assistant Professor

Computational fluid dynamics, fluid dynamics, combustion, jet and rocket propulsion, gas turbine engines, advanced fan and compressor design, compressible gas dynamics, turbomachinery, hydraulic systems, internal combustion engines.

1982-1988 Mechanical Engineering Department, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

Full-time faculty, Instructor, thermal-fluid sciences area

1981-1982 Allison Gas Turbines, Indianapolis, Indiana. Engineering Consultant

Advance military engine fan and compressor design. Worked on the improvement of existing compressor design codes. One of the principal designers for an entirely new advanced compressor for the Modern Technology Demonstrator

IP2023-01234
Petitioner - Exhibit 1004

Engine. This compressor was designed to achieve an 8.5:1 pressure rise in six stages. Low aspect ratio blading was utilized and the first three stages had supersonic blade sections. Arbitrary airfoil sections were used to minimize losses due to shocks and flow separation.

1980-1981 Tracor Aerospace, Austin, Texas.
Senior Development Engineer

Developed numerical models to predict the aerodynamic performance and heating characteristics of hypersonic re-entry bodies.

1976-1980 Pratt & Whitney Aircraft, Government Products Division, West Palm Beach, Florida. Senior Analytical Design Engineer

Advance fan and compressor design. Developed numerical models to predict the unsteady aerodynamic environment of rotor and stator blades during flutter and integrate the models into an overall flutter prediction scheme. Performed advanced compressor design for advanced jet fighter applications.

Fellowships

5/89-8/89 NASA Lewis Research Center, Combustor Technology Branch.
ASEE Faculty Fellow.

5/90-8/90 NASA Lewis Research Center, Combustor Technology Branch.
ASEE Faculty Fellow.

6/95-8/95 NASA Langley Research Center, Hampton Virginia. ASEE Faculty Fellowship.

6/96-8/96 NASA Marshall Space Flight Center, Huntsville, AL. ASEE Faculty Fellow.

6/97-8/97 Air Force Office of Scientific Research, Arnold Engineering Development Center, TN.

Consulting

2018-present Performance Engineering Solutions, LLC, Melbourne, FL
Expert Witness testimony for patent litigation and mechanical engineering systems. Chief engineer for computational and experimental work related to the design, analysis and testing of fluid mechanic devices and power-producing systems.

6/22-present Bradley Robinson, Attorney at Law Licensed in Georgia and Florida, 12016 Abercorn Street, Savannah GA 31419, ATV fuel and intake systems expert.

IP2023-01234
Petitioner - Exhibit 1004

6/22-present Luks, Santaniello, Petrillo, Cohen, and Peterfriend, 100 North Tampa Street Suite 2120, Tampa, FL 33602, Phone: 813-226-0081, Off Road Vehicle (ATV)suspension and performance.

4/22-present The Webb Law Firm, One Gateway Center, 420 Ft. Duquesne Blvd., Suite 1200, Pittsburgh, PA 15222 Turbine Power systems expert, Patent Litigation, WABTEC.

6/22-present Osborne & Francis, PLLC, 805 S. Kirkman Road, Suite 205, Orlando, FL 32811, (407) 655-3333
Combustion expert for gas grill explosions

7/20-present W. Alan Winter, Esquire, c/o The Winter Law Firm, 310 Third Street, Neptune Beach, Florida, 32266, (904) 242-0222
Combustion expert for gas grill explosions

6/20-present Brett Hastings, Esq., www.JusticeforJacksonville.com, Hastings Injury Law Firm, 1661 Beach Blvd., Jacksonville Beach, FL 32250, 904.247.4400, Brett@JusticeforJax.com
Combustion expert for gas grill explosions

12/19-present Stern, Kessler, Goldstein and Fox, P.L.L.C., 1100 New York Avenue, NW, Washington, DC 20005, Vehicle Throttle Body control expert, Patent Litigation, Volkswagen.

09/18-present Quinn Emanuel Urquhart & Sullivan, LLP, 1300 I St. NW,
Washington, D.C. 20008, Vehicle design expert, anti-trust litigation, Damler AG, BMW, Porsche, Audi, Volkswagen

07/18-present Steptoe & Johnson LLP, Steptoe & Johnson LLP | 1114 Avenue of the Americas | New York, NY 10036, Large Truck Aerodynamics, patent litigation.

01/18-present Steptoe & Johnson LLP, 1330 Connecticut Avenue, NW, Washington, DC 20036 Hybrid Electric Vehicles, patent litigation, Honda

12/17-present Venable LLP, 600 Massachusetts Avenue, NW, Washington, DC 20001, Engine Control Systems, patent ligation, Chrysler Fiat

10/17-present Baker & McKenzie LLP, 2001 Ross Ave., Suite 2300
Dallas, TX 75201, Engine Monitoring Systems, patent ligation, Hyundai.

05/17-present Finnegan, Henderson, Farabow, Garrett & Dunner, LLP
901 New York Avenue, NW, Washington, DC 20001-4413
Hybrid Electric Vehicles, patent ligation, Toyota.

12/16-present Mayer Brown LLP, 1999 K Street, N.W., Washington, D.C. 20006-1101
Gas Turbine Engine systems, patent litigation Eco Power Systems.

2/13-present Space Coast Intelligent Solutions, Melbourne, FL
Analysis of Mechanical Engineering Systems

11/12-present Lauren M. Dodrill, Smith, Gildea & Schmidt, LLC, 600 Washington Avenue, Suite 200, Towson, MD 21204
Expert witness concerning the operation of large road transport vehicles and mechanical systems

8/12-present Jonathan M. Feinstein, Tressler LLP, 233 South Wacker Drive, 22nd Floor Chicago, IL 60606
Expert witness concerning the operation of large road transport vehicles and mechanical systems

6/12-present Phillip J. Bartolementi, LTD., 53 W. Jackson Blvd., Suite 1401, Chicago, IL. 60604
Expert witness concerning the operation of large road transport vehicles and mechanical systems

6/08-present H2 Fuel Sciences Inc, Austin, TX
Consultant for advanced combustion system, aerodynamics, and energy related inventions related to automotive, tucking and railway applications.

11/07-present Bricker Law Firm PC, Richmond, VA
Expert witness concerning the pneumatic braking system on large buses.

9/07-present Viscon Technology Applications, Manassas, VA
Consultant for advanced combustion and fuel injection additives for improved efficiency in automotive, tucking and railway applications

8/07-present Nelson and Nelson, PC, Belleville, IL
Expert witness concerning the operation of large road transport vehicles and mechanical systems

7/07-present Spearhead Technologies LLC
Engineering Specialist to experimentally determine the effects engine aftermarket devices on automotive fuel economy and vehicle performance.

6/07-present Advanced Technology Lubricants, Port Orange, FL
Consultant for advanced combustion and fuel injection additives for improved efficiency in automotive, tucking and railway applications

5/05-present The X1R Corporation, Ormond Beach Florida

IP2023-01234
Petitioner - Exhibit 1004

Engineering Specialist to experimentally determine the effects of oil additives on automotive fuel economy and vehicle performance

9/03-present Infinium USA, LP Linden, NJ
Engineering Specialist to experimentally determine the effects of fuel additives on automotive fuel economy and vehicle performance

9/03-present Alston and Bird, Charlotte, NC
Expert witness concerning patent infringement

10/99-present Brian Wendler, PC, Glen Carbon, IL
Expert witness concerning the operation of large road transport vehicles and mechanical systems

9/03-present James R. Dowd, St. Louis, IL
Expert witness concerning related to the safe design of mechanical systems.

6/01-present Spohrer, Wilner, Jacksonville, FL
Expert witness concerning the operation of large road transport vehicles and mechanical systems

10/03-present Harrington Law Firm, Monroe, NC
Expert witness concerning braking systems of large trucks, accident reconstruction

9/99-present The Harrison Firm, Brunswick, GA
Expert witness concerning the operation of large road transport vehicles

6/99-6/00 Susan E. Loggins & Associates, Chicago, IL
Expert witness concerning the operation of large road transport vehicles.

5/99-present Carlson, Wendler & Associates, Attorneys at Law, Edwardsville, Ill.
Expert witness concerning the operation of large road transport vehicles

6/99-6/00 Prince, Poole & Cross, Tuscaloosa, AL
Investigate structural integrity and roadability of 1994 Ford Ranger Pickup truck, accident Reconstruction

3/98-present Gene Moore, Attorney at Law, Tuscaloosa, AL
Accident reconstruction, mechanical systems expert

1986-2018 Performance Engineering, Tuscaloosa, AL.
Chief engineer for computational and experimental work related to the design, analysis and testing of fluid mechanic devices and power-producing systems.

1988-2001 National Institute of Standards and Technology, Office of Energy-Related

IP2023-01234
Petitioner - Exhibit 1004

Inventions, Gaithersburg, Maryland
Consultant to investigate the feasibility of energy-related inventions in particular regards to power producing systems through the application of the principles of thermodynamics

6/95-6/96 Parker Hannifin Corporation, Cleveland, Ohio.
Numerical investigation of the three-dimensional flowfield of airblast fuel nozzles for advanced gas turbine combustors.

6/95-2001 Boyer, Tangler, and Boyer Law Office, Jacksonville, FL.
Expert witness concerning the operation of large road transport vehicles.

3/96-present John Moore, Attorney at Law, Key West, FL
Expert Witness for automobile accident reconstruction.

5/96-5/97 Shapiro Law Group, Bradenton, FL
Expert witness for motor vehicle accident reconstruction.

4/96-4/97 Foley & Lardner Law Group, Jacksonville, FL
Expert Witness for Ergonomic Machine design at large manufacturing facility.

5/96-6/97 Terrance Kann, Attorney at Law, Gainesville, FL
Expert Witness for analysis of hydraulic systems.

4/97-6/98 Zisser, Robison, Brown, Nowlis, & Wedner, Jacksonville, FL
Expert witness concerning the operation of large road transport vehicles.

11/97-6/99 Davies, Roberts & Reid, Seattle, WA
Expert witness concerning the operation of large road transport vehicles.

10/90-1/92 Westinghouse Electric Corporation, Orlando, Florida
Consultant for design analysis of advanced turbine blade designs and development of computational analysis for turbomachinery components.

10/92-present Suncoast Chemicals, Palm Coast, FL
Engineering Specialist to determine the effects of friction modifying lubricant additives on automotive fuel economy and vehicle performance.

10/94-present Leading Edge, Inc., Bremen, IN.
Engineering Specialist to assess the effect of cryogenically treated spark plugs on combustion, pollutant emission formation and spark ignition engine performance.

10/94-present Advanced Power Systems International, Inc. Kent, CT.
Investigate the effects of fuel catalyst on the combustion process and pollutant emission formation.

IP2023-01234
Petitioner - Exhibit 1004

10/92-10/93 Combustion Tec, Inc., Orlando, FL
Engineering Specialist to develop numerical algorithms suitable for operation on an advanced workstation environment to predict pollutant emissions production, temperature distribution and flame length for industrial blast furnaces used in glass manufacturing.

9/90-1/91 Environmental Engine Products, Malabar, Florida
Consultant to determine the effect of various fuel additives on engine performance.

1982 C&H Racing Team, Speedway, Indiana.
Redesign of the body and the front and rear wings of an INDY 500 racecar to reduce overall aerodynamic drag and to increase cornering performance.

Honors/Awards

2021 Reviewer for the Department of Energy Technology Commercialization Fund – Fuel injection systems

2016-2017 ASME Outstanding Research Professor of the Year

2015-2016 ASME Outstanding Professor of the Year

2015 Pi Kappa Alpha Professor of the Month

Academic Keys Who's Who in Engineering Higher Education

2009 Society of Automotive Engineers (SAE) Faculty Advisor Award
Panelist for the 2016 National Science Foundation NSF Graduate Research Fellowship Program (GRFP)

Panelist for the 2015 National Science Foundation NSF Graduate Research Fellowship Program (GRFP)

Reviewer for the National Science Foundation Academic Research Infrastructure – Recovery and Reinvestment (ARI-R2) review panel, Washington DC, September 2009

Reviewer for the Fluid Mechanics, Fans, Compressors and Blowers, Internal Combustion Engines, Gas Turbine Engines, Refrigeration, Fuels and Combustion section of the Professional Engineers Exam (FE) for Engineers 2006

Reviewer for the Fluid Mechanics section of the Fundamentals Exam (FE) for Engineers 2005

IP2023-01234
Petitioner - Exhibit 1004

Licensed Professional Engineer, State of North Carolina, December 2004-present

NASA Space Grant Act Award October 2002

Inducted into the U.S. Space Foundation Technology Hall of Fame, April 2000

Listed in Who's Who for the International Gas Turbine Institute,
The American Society of Mechanical Engineers, 1993-2006

1997 Air Force Office of Scientific Research Summer Faculty Fellowship Award

1996 NASA/ASEE Summer Faculty Fellowship

1995 Society of Automotive Engineers (SAE) Ralph Teetor Award

Certificate of Recognition for Creative Development of a Technical Innovation, NASA Lewis Research Center 1995

1995 NASA/ASEE Summer Faculty Fellowship

1990 NASA/ASEE Summer Faculty Fellowship

1989 NASA/ASEE Summer Faculty Fellowship

Pi Tau Sigma/Engineering Honor Society, Honorary Member

Laboratories

Director, Florida Center for Automotive Research, Florida Institute of Technology
2012-present - Supervise overall operation and development of the lab. Under my direction are eleven masters' students, three PhD students.

Director, Computational Fluid Dynamics Lab, Florida Institute of Technology
2012-present - Supervise overall operation and development of the lab

Director, Computational Fluid Dynamics Lab, East Carolina University
2005-2012 - Supervise overall operation and development of the lab.

Director, Materials and Welding Lab, East Carolina University
2005-2012 - Supervise overall operation and development of the lab.

Director, Computational Fluid Dynamics Lab, University of North Carolina, Charlotte
2002-2005 - Supervised overall operation and development of the lab. Under my direction were six masters' students, one Ph.D. student and one technician.

Director, Internal Combustion Engine Lab, University of North Carolina, Charlotte, 2002-

IP2023-01234
Petitioner - Exhibit 1004

2005

Director, Computational Fluid Dynamics Lab, University of Alabama, 1996-2001
Supervised overall operation and development of the lab. Under my direction were eight master's students, two Ph.D. students and one technician

Co-Director Internal Combustion Engine Lab, University of Alabama, 1996-2001

Director, Computational Fluid Dynamics Lab, University of Florida, 1989-1996
Supervised overall operation and development of the lab. Under my direction were thirteen masters' students, three PhD students and three technicians

Director, Internal Combustion Engine Lab, University of Florida, 1992-1996.

Committee Assignments at Florida Institute of Technology

Automotive Engineering Concentration Development Committee, chair

Advisory Board Development Committee, co-chair

Faculty Search Committee, Mechanical Engineering, chair

PhD Advisory Committee

College of Engineering Promotion Committee, member

Undergraduate Curriculum Committee

College of Engineering and Science College Council Committee

Committee Assignments at East Carolina University

Mechanical Engineering Concentration Development Committee, Engineering, chair

Promotion and Tenure Committee, Engineering, chair

Promotion and Tenure Committee, Science and Technology, member

Promotion and Tenure Committee, Construction Management, member

Far Evaluation Rubric Committee, Chair

Student Organizations and Student Life, member

Regional K-12 Marketing and Outreach, member

IP2023-01234
Petitioner - Exhibit 1004

Capstone Committee, member

College Elections Committee, Chair

College Code Committee, Chair

College Strategic Planning Committee, member

College Graduate Curriculum Committee, member

College Undergraduate Curriculum Committee, member

College Scholar-Teacher Award Committee, member

Dean's Administrative Counsel, member

Engineering Personnel Committee, chair

Industry Outlook Committee, member

Core Curriculum Committee, member

University Grievance Committee, Vice Chair

University Research Information Technology Committee, member

University Technology Transfer Committee, member

University Research and Creative Achievement Committee, member

University Senate, alternate

Student and Student Society Involvement

Sponsored Society of Automotive Engineers Carolina Section Student Night, held at Cummins Rocky Mount Engine Plant February 2010

Professional Engineers of North Carolina (PENC) Faculty Advisor 2007-2008, East Carolina University

Society of Automotive Engineers (SAE) Faculty Advisor 2005-present, East Carolina University

Society of Automotive Engineers (SAE) Faculty Advisor 1995 – 2001, University of Alabama

IP2023-01234
Petitioner - Exhibit 1004

Society of Automotive Engineers (SAE) Faculty Advisor 1988 – 2095, University of Florida

Formed a Student Branch of the PENC, 2008, East Carolina University

Formed a Student Branch of the SAE 2006, East Carolina University

Formed a Student Branch of the SAE 2000, University of Alabama

Formed a Student Branch of the SAE 1995, University of Florida

Director of SAE Mini-Baja and Formula Car projects, 1992-2001

Advisor for SAE Mini-Baja and Formula Car projects, 2013

Mini-Baja Team placed first in the nation 1992

Formula Car team placed fifth in the nation - 1994

Sponsored 186 undergraduate student research projects, chaired seven high honor thesis and a committee member on 5 high honors projects.

These projects among others have included:

1. The analysis, design and fabrication of a vehicle for drag racing applications under the International Hot Rod Association Hot Rod class. This project required three years of student effort and involved 42 student senior design projects. It is the first project in the nation where the undergraduate students have completely designed and fabricated a vehicle for national professional racing competitions.
2. The design and construction of an open loop subsonic wind tunnel with a moving floor for ground vehicle testing. The redesign of the wind tunnel for increased efficiency and flow uniformity using advanced computational fluid dynamic techniques.
3. The design and construction of an automotive cylinder head flow bench.
4. The design and construction of a closed loop computer-controlled engine dynamometer test facility capable of testing engines up to 1000 horsepower. The majority of the parts were fabricated from materials found at the state salvage yard.
5. The programming of a data acquisition system of design and fabrication of the probes for taking data from the existing SuperFlo engine dynamometer.
6. Construction of experimental setup for a micro-gravity droplet combustion experiment for use on a KC-135 aircraft. The undergraduate student team was selected to participate in the 1998 NASA Reduced Gravity Flight Program.

IP2023-01234
Petitioner - Exhibit 1004

Graduate Committee Activities

Home Department

Master Degrees - Chair

Total	55

Masters Degrees - Committee Member

Total	22

Doctoral Degrees - Chair

Total	15

Doctoral Degrees - Committee Member

Total	10
Total All Committees	**102**

Research

"Choke Flutter in Advanced Gas Turbine Compressors", 1 June 1977 – 1 June 1978, NASA Lewis Research Center, $65,000, Principal Investigator

"Channel Flow Analysis for Choke Flutter in Advanced Gas Turbine Compressors", 1 June 1978 – 1 June 1979, NASA Lewis Research Center, $150,000, Principal Investigator

"Rotor-Stator Flow Interaction", Allison Gas Turbines, Indianapolis, Indiana, $75,000, 1 June 1983 - 20 December 1987, Principal Investigator. **Note:** This research was funded while completing my Ph.D. degree and I was employed as a full-time faculty member. I wrote the proposal and my Ph.D. adviser was funded from my contract.

"Numerical Predication of Airblast/Air Assist Fuel Injectors in Rich Burn/Quick Quench/Lean Burn High Speed Civil Transport Combustors", NASA Lewis Research Center, Cleveland, Ohio, $40,000, 1 December 1989 - 1 December 1990, Principal Investigator.

"Numerical Prediction of Airblast/Assist Fuel Injectors with Complex Geometries in Rich Burn/Quick Quench/Lean Burn Combustors (Phase II)", NASA Lewis Research Center,

IP2023-01234
Petitioner - Exhibit 1004

Cleveland, Ohio, $65,263, 1 January 1991 -31 December 1991, Principal Investigator.

"Efficient Calculation of Complex 2- and 3-Dimensional Flowfields of Reacting and Non-reacting Fluids", Northeast Regional Data Center (NERDC), University of Florida, RCI Computing Award for 2500 CPU hours on an IBM super computer, 2 February 1991 -1995, Principal Investigator.

“IBM Graphics Workstation Software Development", International Business Machines Corp., Armonk, NY, Advanced Workstation Software Development Program, $80,000, March 1991, Principal Investigator.

"Numerical Prediction of Airblast Fuel Injectors with Complex Geometries in Advanced Low Emission Combustors", NASA Lewis Research Center, Cleveland, Ohio, $122,600, 1 January 1992 - 31 December 1992, Principal Investigator.

"Advanced Graphics Visualization for Complex Fluid Dynamic Flowfields", College of Engineering, University of Florida, Gainesville, Fl, $65261, August 1992, Principal Investigator.

"Two and Three Dimensional Code Development & Numerical Prediction of Advanced Low Emission Gas Turbine Combustors", NASA Lewis Research Center, Cleveland, Ohio, $90,000 1 January 1993 - 31 December 1993, Principal Investigator.

"Two and Three Dimensional Code Development & Numerical Prediction of Advanced Low Emission Gas Turbine Combustors", NASA Lewis Research Center, Cleveland, Ohio, $85,000 1 January 1994 - 1 February 1995, Principal Investigator.

1994 SAE Formula Car Development, $4000, Ford Motor Company, Jan. 1994.

1995 SAE Formula Car Development, $6000, Ford Motor Company, Jan. 1995.

“Numerical Prediction of Advanced Low Emission Direct Injection Diesel Engine Performance”, School of Mines and Energy Development, University of Alabama, 1 April 1997 - 1 April 1 1998, $17,300, Principal Investigator.

“Analysis of the Influence of an Electric Field on the Combustion Characteristics of a Hydrocarbon Droplet in a Microgravity Environment”, NASA Marshall Space Flight Center, 1 February 1998- 1 May 1998, $9691, Principal Investigator.

High Speed Ship Design: HSS PE 2.3.1.1, CSULB - Long Beach, CA, Project Director: T.S. Piwonka, Co-PIs: Mark Weaver, C.E. Brett, Gerald Micklow, Tim Haskew, Will Schreiber, and Alton Highsmith, $92,473 (5/15/1998 – 8/15/1998), OSEP Proposal No. 98-70.

High Speed Ship Design: HSS PE 2.3.1.2, CSULB - Long Beach, CA, Project Director:

IP2023-01234
Petitioner - Exhibit 1004

T.S. Piwonka, Co-PIs: Mark Weaver, C.E. Brett, Gerald Micklow, Tim Haskew, Alton Highsmith, and John Jackson, $48,271 (5/15/1998 – 8/15/1998), OSEP Proposal No. 98-71.

Specialized Engineering Services, United States Air Force through the Proteus Corporation and the University of Alabama 9/97-3/98, $3000.

"The-State-Of-The-Art in Engine Monitoring Systems, A Benchmark Study", Federal Aviation Administration, $100,000, 5/98-5/99, Principal Investigators - Micklow, M^{c}Inerny.

"Micro-Pilot Ignition Studies for Alternative Fueled Vehicles", Caterpillar Inc, U.S. Department of Energy, and The Alabama Department of Economic and Community Affairs, Principal Investigators - Bell, Midkiff, Micklow, $900,000.

"Intrinsic Standard Research for U.S. Army Transfer Level Calibration", U.S. Army Space and Missile Defense Command, Computer Sciences Corporation, Principal Investigators - Cuttino, Micklow, Haskew, 6/1/98-10/15/98, $14,993.

"Analysis of the Influence of an Electric Field on the Combustion Characteristics of a Hydrocarbon Droplet in a Microgravity Environment", Alabama Space Grant Consortium and NASA Marshall Space Flight Center, Principal Investigators, Micklow, Jackson, $14,500.

"Development of a Portable Josephson Junction Intrinsic Standard for U.S. Army Transfer Level Calibration-Phase 1", U.S. Army Space and Missile Defense Command, Huntsville, AL, PIs - Cuttino, Micklow, Haskew, 6/15/99-2/15/00, $56,705.

"Development of a Portable Josephson Junction Intrinsic Standard for U.S. Army Transfer Level Calibration-Phase 2", U.S. Army Space and Missile Defense Command, Huntsville, AL, Principal Investigators - Cuttino, Micklow, Haskew, 2/15/00-9/30/00, $116,000.

"Baseline Modeling of an Automotive CIDI Engine with Variation of Intake Air Composition", Argonne National Laboratory, Argonne, IL, Center for Advanced Vehicle Technology Center, University of Alabama, Tuscaloosa, AL, PIs- Micklow, Midkiff, Schrieber, $111,782, 8/11/1999-8/10/2000.

"Experimental and Numerical Investigation of Jets for Active Aerodynamic Control", DEPSCoR, AFSOR, Huntsville, AL. $623,626. Principal Investigators, Bowersox, Karr, Micklow, Sharif, 2/25/00-2/25/02

SAE Formula Car Development 2000, Center for Advanced Vehicle Technology, $6250, Spring 2000.

IP2023-01234
Petitioner - Exhibit 1004

"Development of a Portable Josephson Junction Intrinsic Standard for U.S. Army Transfer Level Calibration-Phase 3", U.S. Army Space and Missile Defense Command, Huntsville, AL, Principal Investigators, Cuttino, Micklow 10/30/00-9/30/01, $100,000

"Development of a Portable Josephson Junction Intrinsic Standard for U.S. Army Transfer Level Calibration-Phase 4", U.S. Army Space and Missile Defense Command, Huntsville, AL, PIs - Cuttino, Micklow 10/15/01-9/30/02, $100,000

"Modeling of Diesel Fuel Sprays for Direct Injection Diesel Engine Configurations" University of North Carolina Graduate School, $6,500, Micklow, 1/15/2002-6/15/2002

"Computational Fluid Dynamic Investigation of Advanced Propulsion Systems", North Carolina Supercomputing Center, Principal Investigator, Micklow, 10/1/2002-10/1/2003, $50,000

"Development of a Portable Josephson Junction Intrinsic Standard for U.S. Army Transfer Level Calibration-Phase 4", U.S. Army Space and Missile Defense Command, Huntsville, AL, Principal Investigators, Cuttino, Micklow 10/15/02-9/30/03, $50,595

"A Blowdown Flow Bench for Obtaining Transonic Flow in Advanced Engine Cylinder Heads for Racing Applications", Evernham Motorsports, Principal Investigator, Micklow 5/2004-5/2005, $52,500.

"Establishment of the North Carolina Motorsports and Automotive Research Center (NCMARC)", State of North Carolina, Principal Investigators, Cuttino, Micklow, Hill $4,000,000, 6/2005-6/2006

"Acquisition of a High-Performance Computing Cluster Environment in Support of Scientific and Engineering Applications", National Science Foundation, Major Research Instrumentation program, Principal Investigators, Bond, Bartolotti, Fletcher, Micklow, Sargent, $400,000, June 2006

SAE Baja Car Development 2007, Carolina Section of the SAE, $1500, Spring 2007.

"The Use of Triethylaluminum as a Scramjet Fuel Conditioner and Ignition Source", Principal Investigators, Micklow, Abdel-Salam, East Carolina University Research Development Award, $15,100, June 2007

"Modeling of Biodiesel Fuel Sprays for Direct Injection Diesel Engine Configurations", Principal Investigators, Micklow, Abdel-Salam, East Carolina University Research Development Award, $15,600, June 2007

"Non-Destructive Testing Techniques for Composite Structures", Principle Investigators, Micklow, Abdel-Salam, Vertical Lift Center of Excellence, NavAir, Office of Naval Research, $90,000, March 2008.

IP2023-01234
Petitioner - Exhibit 1004

SAE Baja Car Development 2008, Carolina Section of the SAE, $1250, Spring 2008.

SAE Baja Car Development 2009, Carolina Section of the SAE, $1250, Spring 2009.

"Development of an Engine Test Facility for Alternative Renewable Fuels", Principal Investigator, Micklow, $500,000, Cummins Rocky Mount Engine Plant, April 2010, funded.

SAE Baja Car Development 2010, Carolina Section of the SAE, $1000, Spring 2010.

High Performance Computing, North Carolina Assembly to be used for teaching and research in the fields of health, science, engineering and technical education, November 2010, $600,000.

"Development of an Engine Test Facility for Alternative Renewable Fuels", Principal Investigator, Micklow, $500,000, Cummins Rocky Mount Engine Plant, December 2010, funded.

"Development of an Engine Test Facility for Alternative Renewable Fuels", Principal Investigator, Micklow, $250,000, Cummins Rocky Mount Engine Plant, April 2011, funded.

"Development of an Engine Test Facility for Alternative Renewable Fuels", Principal Investigator, Micklow, $45,000, Dyne Systems, July 2011, funded.

“Design and Testing of a Prototype Battlefield Smoke Obscurant System”, Principal Investigator, SCIS, Melbourne, FL April 2013, $14,750

"Development of a Gas Turbine Engine Test Facility for Alternative Renewable Fuels", Principal Investigator, Micklow, $50,000, Mainstream Engineering, November 2013, funded

“Aerodynamic Design and Development of a Low-Speed Wind Turbine Blade” Chelakara S. Subramanian (PI), Gerald Micklow (co-PI), *Florida Institute of Technology*, submitted to the National Science Foundation, January 2014, $300,000, pending.

“Highly Efficient, Compact Hydrogen Generator for use in Marine Diesel Engines”, Advanced Cooling (PI), Gerald Micklow (co-PI), Phase 1 SBIR, SOCOM, June 2014, $100,000, funded.

“Engine testing to investigate the effects of engine modifications on fuel economy for Reefer Trailer configurations”, Vapster Diesel, November 2014, $4320 funded

“Development of Fuel Property Laboratory”, Paul Jennings (PI), Gerald Micklow (co-

IP2023-01234
Petitioner - Exhibit 1004

PI), Research Equipment Program, Florida Institute of Technology, December 2014, $62,223, funded

“Engine testing to investigate the effects of engine modifications on fuel economy for Reefer Trailer configurations”, Vapster Diesel, February 2015, $7890 funded

“Alternative Fuel Storage Testing” Stephen Cusick (PI), Gerald J. Micklow (co-PI), Federal Aviation Administration, April 2015, $72,314, funded.

“Hypersonic Propulsion Heat Transfer – Phase I Cold Side Convection”, Gerald J. Micklow (PI), Aerojet Rocketdyne, August 2015, $80,000 funded.

“Evaluation and Performance Assessment of the eCombustible Hydrogen Injection System through a Joint Experimental/Computation Program”, Gerald J. Micklow (PI), eCombustible Inc., August 2015, $10,320 funded.

“Test Plan Development of the eCombustible Hydrogen Injection System”, Gerald J. Micklow (PI), eCombustible Inc., August 2015, $3680 funded.

“Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery Turbine Material Standards Roadmapping Project”, Gerald J. Micklow (PI), Daniel Kirk, co-PI, $4808, funded Energy Florida, October 2015

“Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery Turbine Material Standards Roadmapping Project”, Gerald J. Micklow (PI), Daniel Kirk, co-PI, $7058, funded Energy Florida, January 2016

“Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery Turbine Material Standards Roadmapping Project”, Gerald J. Micklow (PI), Daniel Kirk, co-PI, $22,758, funded Energy Florida, June 2016

“Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery Turbine Material Standards Roadmapping Project”, Gerald J. Micklow (PI), Daniel Kirk, co-PI, $12,753, funded Energy Florida, December 2016

“A Joint Computational/Experimental Investigation to Optimize the use of Biofuels and Biofuel Blends in Advanced Compression Ignition Engines - Fuel Properties”, Gerald J. Micklow, PI, submitted to Department of Energy (DOE), Office of Energy Efficiency and Renewable Energy (EERE), $1,400,000, pending, submitted October 2016

“Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery Turbine Material Standards Roadmapping Project”, Gerald J. Micklow (PI), Daniel Kirk, co-PI, $11,734, funded Energy Florida, June 2017

"Reduction of Particulate Pollution from Medium and Heavy Duty Commercial Vehicles

IP2023-01234
Petitioner - Exhibit 1004

(M&HCV- Bus and Truck Sector), Especially Old Vehicle Retrofit", Gerald J. Micklow co-PI, United States-India Science and Technology Endowment Fund, $450,000 submitted August 2017, pending

"Optimization of the Polimotor "Plastic" Engine to Maximize Power Output and Minimize Fuel Consumption, Phase 1", Gerald J. Micklow, PI submitted to PoliMotor Inc. $112,500 August 2017, pending.

"Consortium for Advanced Production and Engineering of Gas Turbines and Rotating Machinery Turbine Material Standards Roadmapping Project", Gerald J. Micklow (PI), Daniel Kirk, co-PI, $11,534, funded Energy Florida, January 2018

"Design and Testing of an Air Scrubber with a Proprietary Oxidant to Treat Odorous Compound", Gerald J. Micklow (PI), funded Vapex Environmental Technologies, LLC, $40,000, February 2019

"Evaluation and Performance Assessment of the eCombustible Hydrogen-based Fuel a Joint Experimental/Computation Program for Gas Turbine Engines", Gerald J. Micklow (PI), eCombustible Inc., January 2021 $165,000 funded

Membership and Activities in the Professional Societies

Reviewer for the Fluid Mechanics, Fans, Compressors and Blowers, Internal Combustion Engines, Gas Turbine Engines, Refrigeration, Fuels and Combustion section of the Professional Engineers Exam (FE) for Engineers 2006

Reviewer for the Fluid Mechanics section of the Fundamentals Exam (FE) for Engineers 2005

American Society of Nondestructive Testing (ASNT), member, 2008 - present.

American Society of Mechanical Engineers (ASME), member, 1988 - present.

ASME International Gas Turbine Institute Turbomachinery Committee, member, 1992 - present.

ASME Technical Propulsion Committee, member, 1992-present.

Reviewer, ASME Internal Combustion Engine Division, 2012-present

American Institute of Astronautics and Aeronautics (AIAA), member, 1988-present.

American Society of Engineering Education (ASEE), member, 1988-present.

Society of Automotive Engineers (SAE), Member, 1994 –present

IP2023-01234
Petitioner - Exhibit 1004

Society of Automotive Engineers Powertrain Committee, member 2017-present

Society of Automotive Engineers Combustion and Fuels Committee, member 2006-present

Society of Automotive Engineers Fuels and Lubricants Committee, member 2011-present

Society of Automotive Engineers Formula Design Committee, member 2006-present

Society of Automotive Engineers Student Collegiate Design Series Committee, member 2006-present

Society of Automotive Engineers Trailer Committee

Society of Automotive Engineers Trailer - Gooseneck and 5th Wheel Task Force -

Society of Automotive Engineers Trailer Dynamics Task Force

Society of Automotive Engineers Conventional Towing System up to 20,000 lbs Task Force

Society of Automotive Engineers Trailer Terminology Task Force

Faculty Advisor for SAE Student Branch 1993-2000, 2006-2012

Pi Tau Sigma Engineering Honor Society, Honorary Member.

Chairman, ASME Technical Propulsion Committee, Best Paper Committee for 1993 AIAA/ASME/SAE/ASEE Joint Propulsion Conference

Chairman, Advanced Fuel Injector Session for the 1996 32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Lake Buena Vista, FL.

Chairman, Advanced Fuel Injector Session for the 1998 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cleveland, OH.

Chairman, Advanced Fuel Injector Session for the 1999 35th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Los Angeles, CA.

Chairman, Advanced Fuel Injector Session for the 2004 40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Fort Lauderdale, FL

Chairman, Advanced Fuel Injector Session for the 2006 42nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Sacramento, CA

IP2023-01234
Petitioner - Exhibit 1004

Chairman, Direct Injection SI Engine Technology for the 2008 SAE World Congress, Detroit, MI.

Chairman, Diesel Fuel Injection and Sprays for the 2008 SAE World Congress, Detroit, MI.

Chairman, Direct Injection SI Engine Technology for the 2009 SAE World Congress, Detroit, MI.

Chairman, Diesel Fuel Injection and Sprays for the 2009 SAE World Congress, Detroit, MI.

Chairman, Fuel Injection and Sprays for the 2009 SAE International Powertrains, Fuels and Lubricants Congress, June 15-17, 2009 Florence, Italy

Chairman, Advanced Powertrain Development for HCCI Combustion for the 2009 SAE International Powertrains, Fuels and Lubricants Congress, June 15-17, 2009 Florence, Italy

Chairman, Advanced Powertrain Development for Hybrid Vehicles for the 2009 SAE International Powertrains, Fuels and Lubricants Congress, June 15-17, 2009 Florence, Italy

Chairman, Fuel & Additive Effects on SI Engine Performance Session for the 2009 SAE Powertrains, Fuels and Lubricants Meeting, November 2-5, 2009 San Antonio, TX.

Chairman, Advanced On-Board Diagnostics Session for the 2009 SAE Powertrains, Fuels and Lubricants Meeting, November 2-5, 2009 San Antonio, TX.

Chairman, Direct Injection SI Engine Technology Session for the 2010 SAE World Congress, Detroit, MI.

Chairman, Diesel Fuel Injection and Sprays Session for the 2010 SAE World Congress, Detroit, MI.

Chairman, Multi-Dimensional Engine Modeling Session for the 2010 SAE Powertrains, Fuels and Lubricants Meeting, May 05-07, 2010, Rio de Janeiro, Brazil

Chairman, Advanced On-Board Diagnostics Session for the 2010 SAE Powertrains, Fuels and Lubricants Meeting, May 05-07, 2010, Rio de Janeiro, Brazil

Chairman, Modeling of Diesel and SI Engines Session for the 2010 SAE Powertrains, Fuels and Lubricants Meeting, October 25-27, 2010, San Diego, Calif.

Chairman, Direct Injection SI Engine Technology Session for the 2011 SAE World

IP2023-01234
Petitioner - Exhibit 1004

Congress, Detroit, MI.

Chairman, High Efficiency Engines Session for the 2011 SAE World Congress, Detroit, MI.

Chairman, Effects of Fuels and Fuel Additives on Engine Performance Session for the 2011 SAE World Congress, Detroit, MI.

Chairman, Direct Injection SI Engine Technology Session for the 2012 SAE World Congress, Detroit, MI.

Chairman, High Efficiency Engines Session for the 2012 SAE World Congress, Detroit, MI.

Chairman, Effects of Fuels and Fuel Additives on Engine Performance Session for the 2012 SAE World Congress, Detroit, MI.

Chairman, Cold Starts and Transients Session for the SAE 2012 Powertrains, Fuels & Lubricants Meeting - September 18-20, 2012, Malmo, Sweden

Chairman, Direct Injection SI Engine Technology Session for the 2013 SAE World Congress, Detroit, MI.

Chairman, High Efficiency Engines Session for the 2013 SAE World Congress, Detroit, MI.

Chairman, Effects of Fuels and Fuel Additives on Engine Performance Session for the 2013 SAE World Congress, Detroit, MI.

Chairman, Fuel Injection and Sprays Session for the SAE 2013 Powertrains, Fuels & Lubricants Meeting October 21-23, 2013 in Seoul, Korea

Chairman, High Efficiency Engines Session for the SAE 2013 Powertrains, Fuels & Lubricants Meeting October 21-23, 2013 in Seoul, Korea

Chairman, Multi-Dimensional Engine Modeling Session for the SAE 2013 Powertrains, Fuels & Lubricants Meeting October 21-23, 2013 in Seoul, Korea

Chairman, Fuel and Additive Effects on Engine Systems for the 2014 SAE World Congress, Detroit, MI.

Chairman, Fuel Injection and Sprays Session for the SAE 2014 Powertrains, Fuels & Lubricants Meeting October 20-23, 2014 in Birmingham, UK

Chairman, Engine Boosting Systems Session for the SAE 2014 Powertrains, Fuels &

IP2023-01234
Petitioner - Exhibit 1004

Lubricants Meeting October 20-23, 2014 in Birmingham, UK

Chairman, Heavy Duty Diesel Lubricants for the 2015 SAE World Congress, Detroit, MI.

Chairman, Fuel Injection and Sprays Session for the 2015 SAE World Congress, Detroit, MI

Chairman, High Efficiency Engines Session for the SAE 2016 Powertrains, Fuels & Lubricants Meeting October 24-26, 2016 in Baltimore, Maryland, USA

Chairman, High Efficiency Engines Session for the SAE 2017 International Powertrains, Fuels & Lubricants Meeting, October 16-19, 2017 in Beijing, CHINA

Chairman, Homogeneous Charge Compression Ignition Session for the SAE 2017 International Powertrains, Fuels & Lubricants Meeting, October 16-19, 2017 in Beijing, CHINA

Chairman, Combustion in Compression Ignition Engines Session for the SAE 2017 International Powertrains, Fuels & Lubricants Meeting, October 16-19, 2017 in Beijing, CHINA

Chairman, Fuel Injection and Sprays Session for the SAE 2017 International Powertrains, Fuels & Lubricants Meeting, October 16-19, 2017 in Beijing, CHINA

Chairman, Dual Fuel Combustion Session for the SAE 2017 International Powertrains, Fuels & Lubricants Meeting, October 16-19, 2017 in Beijing, CHINA

Chairman, Fuel Injection and Sprays Session for the SAE 2018 International Powertrains, Fuels & Lubricants Meeting, September 17-19, 2018 in Heidelberg, Germany

Chairman, High Efficiency Engines Session for the SAE 2019 International Powertrains, Fuels & Lubricants Meeting, January 22-24, 2019 in San Antonio, Texas.

Chairman, Homogeneous Charge Compression Ignition Session for the SAE 2019 International Powertrains, Fuels & Lubricants Meeting, January 22-24, 2019 in San Antonio, Texas.

Chairman, Holistic Session on Fuel Consumption and Fuel Economy, Session for the 2020 SAE World Congress, Detroit, MI

Chairman, Fuel Injection and Sprays Session for the SAE 2020 International Powertrains, Fuels & Lubricants Meeting, September 22-24, 2020, Krakow, Poland

Chairman, Dual Fuels Session for the SAE 2020 International Powertrains, Fuels & Lubricants Meeting, September 22-24, 2020, Krakow, Poland

Chairman, Fuel Injection and Sprays Session for the 2021 WCX SAE World Congress Experience, Detroit, MI

IP2023-01234
Petitioner - Exhibit 1004

Chairman, Partially Premixed Compression Ignition, PCCI Session for the 2021 WCX SAE World Congress Experience, Detroit, MI

Chairman, Fuel Injection and Sprays Session for the SAE Powertrains, Fuels and Lubricants Digital Summit, September 28-30, 2021 Online

Chairman, Homogeneous Charge Compression Ignition, HCCI Session for the SAE Powertrains, Fuels and Lubricants Digital Summit, September 28-30, 2021 Online

Chairman, Fuel Injection and Sprays Session for the 2022 WCX SAE World Congress Experience, Detroit, MI

Chairman, High Efficiency Engine Concepts Session for the 2022 WCX SAE World Congress Experience, Detroit, MI

Chairman, Fuel Injection and Sprays Session for the 2023 WCX SAE World Congress Experience, Detroit, MI

Chairman, Automotive Gasoline Engine Lubricants Session for the 2023 WCX SAE World Congress Experience, Detroit, MI

Reviewer/Editor for Scholarly Journals

9/92 - present, American Society of Mechanical Engineers (ASME) Transactions Journal of Turbomachinery.

1992 - present, American Institute of Astronautics and Aeronautics (AIAA) Journal.

1992 - present, AIAA Journal of Propulsion and Power.

1993 - present, ASME Journal of Engineering for Gas Turbines and Power.

1993 - present, ASME International Gas Turbine Institute.

1994 - present, ASME Journal of Energy Resources Technology.

1994 - Reviewer for ASME Solar Engineering 1994 - Proceedings of 1994 International Solar Energy Conference, March 27-30, 1994, San Francisco, CA.

1999-present Atomization and Sprays, International Journal of the Institute of Liquid Atomization and Sprays

2005-present American Society of Engineering Education (ASEE) SE Conference

IP2023-01234
Petitioner - Exhibit 1004

2007-present Editor, Scientific Journals International, *Journal of Mechanical, Aerospace and Industrial Engineering*

2007-present Proceedings of the Institution of Mechanical Engineers, Part D, Journal of Automobile Engineering

2010-present Editor, *International Journal of Green Energy, Energy and Environment*

2013-present, Associate Editor (AE) for the *SAE International Journal of Fuels and Lubricants*

2013-present, Fuel, Elsevier Editorial System

2015-present Editor, International Journal of Mechanical and Aerospace Engineering

Book Reviews

Fluid Mechanics Theory and Application, Deutschmon A.D., Aug, 1994, West Educational Publishing, Amesbury, MA

Introduction to Thermodynamics, Sonntag, R. and C. Borgnakke John Wiley and Sons, 1999

Applied Combustion Dynamics, Taylor & Francis, New York, NY, 2000

Computation of Unsteady Incompressible Viscous Flows: Methods Overview with Case Studies, Taylor & Francis, New York, NY, 2000

High Speed Gas Dynamics, Taylor & Francis, New York, NY, 2000

Theory of Aerospace Propulsion by Dr. Pasquale Sforza, Elsevier, Inc 2015

Lectures, Seminars, Workshops, Films

"Contemporary Use of Computational Fluid Dynamics in Industry Today"
American Society of Mechanical Engineers Southern Regional May Meeting, 1991, Gainesville, Florida.

"Performance Prediction of Advanced Airblast Fuel Injectors for Low Emission Combustors", presented at the High-Speed Research Program Analytical Combustion Research Workshop, NASA Lewis Research Center, September 9-10, 1991.

"Numerical Methods in Combustion", presented for the College of Engineering Seminar Series, University of Florida, Nov. 1, 1991.

IP2023-01234
Petitioner - Exhibit 1004

"Advanced Low Emission Gas Turbine Combustor Concepts", film created based on numerical simulation of advanced gas turbine combustor concepts and visualized on state of the art graphics workstation, presented at the 1993 Meeting of the Division of Fluid Dynamics Gallery of Fluid Motion in Albuquerque, New Mexico, October, 1993

"The Role of Lubricants and Lubricant Additives on Vehicle Fuel Economy and Performance", presented at the First Annual Lubrication Seminar, Suncoast Chemicals, Ormund Beach, FL, November 7-8, 1994

"Computational Fluid Dynamics Highlights of Advanced Aerospace Propulsion Systems", presented to the Division of Engineering, University of Texas, San Antonio, Texas, April 18, 1995

"Computational Fluid Dynamics Highlights of Advanced Propulsion Systems", presented to the Mechanical Engineering Department, Tennessee Technological Institute, Cookeville, TN, April 1995.

"Computational Fluid Dynamics Highlights of Advanced Propulsion Systems for Aerospace and Automotive Applications", presented to the Mechanical Engineering Department, University of Alabama, Tuscaloosa, Alabama, May 22, 1995.

High Speed Sealift Workshop, Attended at the Office of Navy Research, Carderock Naval Weapons Research Center, West Bethesda, MD, September 1997.

"Computational Fluid Dynamics Highlights of Advanced Propulsion Systems", presented to the Mechanical Engineering Department, University of Louisville, Louisville, KY, April 2000.

"Combustion System Modeling", presented to the Gas Research Institute, Gas Engine Advisory Committee Meeting, Chicago, IL, May 2000.

Automotive Technology for the 21st Century, It Doesn't Take a Rocket Scientist or Does it?, presented for the University of North Carolina, Charlotte Seminar Series, televised Fall 2001

"Applications of Computational Fluid Dynamics in Advanced Engineering Design in Industry Today", American Society of Mechanical Engineers, Fall meeting, October 2003.

"Automotive Technology for the 21st Century, From NASA to NASCAR", presented at the American Society of Professional Engineers Fall Regional Meeting, fall 2003

"Computational Fluid Dynamics and Automotive Technology for the 21st Century", presented at Eastern Carolina University, spring 2005

"The In's and Out's of Getting Funded", presented at Eastern Carolina University, Fall 2005

IP2023-01234
Petitioner - Exhibit 1004

"Computational Fluid Dynamics, From NASA to NASCAR", presented at the Professional Engineers of North Carolina, January 2006

"Computational Fluid Dynamics for the Design of Advanced Power Producing and Fluid Flow Systems", presented at the North Carolina A&T University CSE Seminar Series, October 2006.

"Engineering Education at East Carolina University", presented to the Greenville Rotary Club, November 2006.

Advanced Automotive Technology, seminar given for the Professional Engineers of North Carolina, North Carolina State University, Dec 14, 2006.

"Welcome to ECU Engineering", presented to the East Carolina Engineers Club, Kinston, NC, October 2007.

"Aerodynamic and Combustion Research for a Green Environment in Trucking and Railway Applications", H2 Fuel Sciences Inc, Miami, FL, June 2008

"The Use of Triethylaluminium as a Scramjet Fuel Conditioner and Ignition Source" Aerojet Rocketdyne, West Palm Beach Florida, January 2015.

"|Emission System Design Requirements and Regulations and the Effect on Internal Combustion Engine Performance", Gerald J. Micklow**,** Harris-Martin's Volkswagen Diesel Emissions Litigation Conference, Hotel Fontainebleau Miami, October 2015.

"|Emission System Design Requirements and Regulations and the Effect on Internal Combustion Engine Performance, An Update", Gerald J. Micklow**,** Harris-Martin's Volkswagen Diesel Emissions Litigation Conference, Windsor Court Hotel, New Orleans, December 2015.

Short Courses

Investigating Failures in Gas Turbine Engines, AIAA Short Course, 1998, AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cleveland, Ohio, July 1998, attended.

Fire Training Course, AVL Powertrain Engineering, Advanced Simulation Technologies, Plymouth, MI, November 1999, attended.

Professional Development Seminar, "Homogeneous Charge Compression Ignition (HCCI) Combustion", SAE 2010 Powertrains, Fuels & Lubricants Meeting, San Diego, CA October 25-27, 2010, presenter

IP2023-01234
Petitioner - Exhibit 1004

Professional Development Seminar, “Homogeneous Charge Compression Ignition (HCCI) Combustion”, SAE 2011 International Congress and World Expo, Detroit, MI April 14-15, 2011, presenter

“Fundamentals of Advanced Internal Combustion Engine Configurations”, Florida Institute of Technology, Visiting Scholars Lecture Series, 2013.

Jiangxi Province Workshop Lecture - Fundamentals of Advanced Internal Combustion Engine Configurations, 2013

Northrup Grumman Learning University, “Combustion Fundamentals”, 2019.

Miscellaneous: Media Releases

Micklow, G.J., H.L. Nguyen and A. Dogra, "Twisted Vanes would Enhance Fuel/Air Mixing in Turbines," NASA Tech Briefs, pp. 64-65, April 1994.

Community and Public School Service

"Career Opportunities in Mechanical Engineering", Career Day, Eastside High School, Gainesville, Florida, March 21 1993.

Eastside High School Career Shadowing Day, Mechanical Engineering Department, University of Florida, December 8, 1993.

J.J. Finley Elementary School - Career Day 1994.

Tour Mechanical Engineering Department for Pensacola Community College 1994.

YMCA Buddyball Coach, Summer 1994.

Volunteer for Tau Beta Pi, pie throwing booth for the March of Dimes, May 1994.

Engineering Outreach Program for Hispanic Students, Mechanical Engineering Lab Tours, November 1994, and December 1994.

Engineering Outreach Program for Elementary School Students, Mechanical Engineering Lab Tours, January 1995.

Engineering Career Day, Internal Combustion Engine Laboratory, University of Alabama, September 1997.

Engineering Career Day, Internal Combustion Engine Laboratory, University of Alabama,

IP2023-01234
Petitioner - Exhibit 1004

September 1998.

Engineering Career Day, Internal Combustion Engine Laboratory, University of Alabama, September 1999.

University Open House, East Carolina University, October 2005

Engineering Open House for High School Students, East Carolina University, September 2005, November 2005

Engineering and Technology Day, East Carolina University, February 2007

Engineering and Technology Day, East Carolina University, 300 students visited from over 14 high schools, November 2007

Engineering Open House for High School Students, East Carolina University, September 2005, November 2008

Engineering and Technology Day, East Carolina University, February 2009

Engineering and Technology Day, East Carolina University, November 2010

Publications

1. Micklow, G.J., "Unsteady Channel Flow Theory for Compressor Flutter Prediction", M.S. Thesis, Pennsylvania State University, Feb. 1981.

2. Micklow, G.J., "Aerodynamic Loading Calculation on a Nosecap at Angle of Attack Using Slender Body Theory", TM 450-081-GM-001, March 1981, Tracor Aerospace, Austin, Texas.

3. Micklow, G.J., and J. Jeffers, "Semi-Actuator Disk Theory for Compressor Choke Flutter Prediction", NASA CR 3426, June 1981.

4. Micklow, G.J., "Determination of Aerodynamic Forces and Moments Utilizing Free Molecular Flow Theory", TM 450-081-JM-008, June 1981, Tracor Aerospace, Austin, Texas.

5. Micklow, G.J., "Viscous Hypersonic Aerodynamics for Blunt Bodies at Angle of Attack", TM 450-081-JM-009, June 1981, Tracor Aerospace, Austin, Texas.

6. Jeffers, J. D., G.J. Micklow, M.R. Chi, and D.A. Hilliard, "F-100 High Pressure Compressor Flutter Analysis", AFWAL-TR-81-2014, 1981.

7. Micklow, G.J., and W.F. O'Brien, "Research on Compressor Rotor-Stator Flow Interaction",

IP2023-01234
Petitioner - Exhibit 1004

Report No. WFOB/85-02-1, Dec. 1984, Turbomachinery Research Group, VPISU, Blacksburg, Virginia.

8. Micklow, G.J., and W.F. O'Brien, "Research on Compressor Rotor-Stator Interactions", Dec. 1986, Turbomachinery Research Group, VPISU, Blacksburg, Virginia.

9. Micklow, G.J., "Turbomachinery Cascade and Wake Calculation for Two-Dimensional Laminar and Turbulent Flow", Ph.D. Dissertation, May 1989, VPISU, Blacksburg, Virginia.

10. Micklow, G.J., and H.L. Nguyen, "The Design and Performance of Swirlers and Analysis of Airblast/Assist Fuel Injector Flow Passages", Western States Combustion Institute, 1989 Fall Meeting.

11. Micklow, G.J., and H.L. Nguyen, "Effect of Vane Twist on Performance of Dome Swirlers for Gas Turbine Air-Blast Atomizers", AIAA Paper No. 90-1955, AIAA/ASME/SAE/ASEE/ 26th Joint Propulsion Conference, 1990, Orlando, Florida.

12. Micklow, G.J., and W. F. O'Brien, "Viscous-Inviscid Interaction for Calculating the Flow in Compressor Cascade Blade Passages and Wake with Separation", AIAA Paper No. 90-2125, AIAA/ASME/SAE/ASEE 26th Joint Propulsion Conference, 1990, Orlando, Florida.

13. Micklow, G.J., and H.L. Nguyen, “Effects of Nozzle Lip Geometry on Spray Atomization and Emissions for Fuel Rich Combustion of Advanced Gas Turbine Combustors", AIAA Paper No. 91-2201, AIAA/SAE/ASME/ASEE 27th Joint Propulsion Conference, Sacramento, Calif.

14. Micklow, G.J., and H. Li "Efficient Numerical Solution of Two Dimensional Compressible Fluid Flow Fields Using a Cell Centered Finite Volume Approach", AIAA Paper No. 91-2362, AIAA/SAE/ASME/ASEE 27th Joint Propulsion Conference, Sacramento, Calif..

15. Micklow, G.J., Roychoudhury, S. and H. Li, "A Parametric Study of Swirl on Fuel Distribution and NO_x Production", Computational Fluid Dynamics Group, Report No. 91-001.

16. Yang, S.L., R. Chen, G.J. Micklow, M.C. Cline, H.L. Nguyen, "Numerical Simulation of Low Emissions Gas Turbine Combustor Using KIVA-II, Part 1: Fuel Nozzle/Rich-Burn Analysis, International Journal for Numerical Methods in Fluids, Vol. 15, pp 865-881, 1992.

17. Micklow, G.J., S. Roychoudhury, H.L. Nguyen, and M.C. Cline, "Emissions Reduction by Varying the Swirler Airflow Split in Advanced Gas Turbine Combustors", ASME Paper No. 92-GT-110, ASME IGTI, Cologne, Germany, June, 1992, ASME Transactions Journal of Engineering for Gas Turbine and Power, pp 563-569, Vol 115, Number 3, July 1993.

18. Micklow, G.J., M.R. Harper, "The Effects of Turbulence Modeling on the Numerical

IP2023-01234
Petitioner - Exhibit 1004

Prediction of Confined Swirling Flows", AIAA Paper 93-1976, presented at the 1993 AIAA/ASME/SAE/ASEE Joint Propulsion Conference, June 1993, Monterey, CA.

19. Micklow, G.J., K. Shivaraman, "A Non-Periodic Boundary Approach for Computation of Compressible Viscous Flows in Advanced Turbines Cascades", AIAA Paper 93-1799 presented at the 1993 AIAA/ASME/SAE/ASEE Joint Propulsion Conference, June 1993, Monterey, CA.

20. Cline M. C., G.J. Micklow, M. R. Harper, J. Deur and K. Kundu, "Computation of the Flow Field in an Annular Gas Turbine Combustor", AIAA Paper 93-2074 presented at the 1993 AIAA/ASME/SAE/ASEE Joint Propulsion Conference, June 1993, Monterey, Calif.

21. Micklow, G.J., K. Shivaraman, and H.L Nguyen, "Three-Dimensional Performance Prediction of Advanced Swirler Vanes for Gas Turbine Airblast Atomizers", Presented at the 38th International Gas Turbine Institute and Aeroengine Congress and Exposition, May 24-27, 1993, Cincinnati, Ohio.

22. Micklow, G.J. "A Comprehensive Test Plan and Results for the Validation of Vehicle Fuel Economy Improvements Utilizing Friction Modified Lubricants" 329 pages, prepared for Suncoast Chemicals, Palm Coast, FL, June 1993.

23. Micklow, G.J., J. P. Sauve, "Quasi-Three Dimensional Calculation for the Effect of Axial Gap Variation on the Performance of an Advanced Compressor Stage", AIAA Paper 94-0150, presented at the 1994 AIAA 32nd Aerospace Sciences Meeting Jan 1994, Reno, Nev..

24. Micklow, G.J., K. Shivaraman, "Effect of Swirl and Wall Geometry on the Emissions of Advanced Gas Turbine Combustors", presented at the 39th ASME International Gas Turbine Institute and Aeroengine Congress and Exposition, June 13-16, 1994, The Hague, The Netherlands.

25. Cline M. C., G.J. Micklow, M. R. Harper, J. Deur and K. Kundu, "Numerical Analysis of the Flowfields in a Staged Gas Turbine Combustor", AIAA Journal of Propulsion and Power ,vol. 11 number 5 pp 894 - 898 Sept. 1995.

26. Micklow, G.J., E. Parker, and C. Fornilli, “A Comprehensive Test Plan and Results for the Validation of Vehicle Fuel Economy Improvements Utilizing Friction Modified Lubricants", ASME Internal Combustion Engine Division Spring Meeting, Marietta, Ohio, April 1995.

27. Micklow, G.J., and K. Shivaraman, "Shroud Influence on Gas Turbine Airblast Atomizer Swirler Flowfields", presented at the 40th ASME International Gas Turbine Conf., Houston, TX, June 1995.

28. Micklow, G.J., and I. Cho, "Validation of a Stochastic Particle Fuel Injection Model for Gas

IP2023-01234
Petitioner - Exhibit 1004

Turbine Combustors", presented at the 40th ASME International Gas Turbine Conf, Houston, TX, June 1995.

29. Micklow, G.J., P. Sauve and K.Shivaraman, "Numerical Simulation of Advanced Transonic Compressor Stages using a Quasi-Three Dimensional Flow Solver", presented at the 40th ASME International Gas Turbine Conference, Houston, Texas, June 1995.

30. Micklow,G.J., P. Sterchi, "Three-Dimensional Calculation for the Prediction of Annular Airblast Fuel Nozzle Performance in Fuel Rich Combustion", presented at the 33rd AIAA/ASME/ASEE/SAE 1995 Joint Propulsion Conference, San Diego, CA, July 1995.

31. Micklow, G.J., and K. Shivaraman, "The Effect of Shroud Angle on Gas Turbine Airblast Nozzle Performance", presented at the 33rd AIAA/ASME/ASEE/SAE 1995 Joint Propulsion Conference, San Diego, CA, July 1995.

32. Micklow, G.J. "Fuel/Air Cycle Analysis for Fuel-Inducted Internal Combustion Engine Configurations", NASA Langley Research Center, August 1995.

33. Micklow, G.J., and M. Benjamin, "Three-Dimensional Analysis of Advanced Swirl Vane/Nozzle Assemblies", presented at the 41st ASME International Gas Turbine Conference, Birmingham, England, June 1996.

34. Micklow, G.J. and P. Sterchi, "Three-Dimensional Calculation to Investigate the Effects of Swirl Vane Design on Fuel Injector/Combustor Performance Part I - Fuel Distribution", presented at the 32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Lake Buena Vista, FL, July 1996.

35. Micklow, G. J., "Cooling Duct Analysis for Transpiration/Film Cooled Liquid Propellant Rocket Engines", NASA Marshall Space Flight Center, Huntsville, AL, August 1997.

36. Micklow, G.J. and K. Kling, "Optimizing Port Design for Maximizing Volumetric Efficiency of Two-Stroke Engines", ASME Internal Combustion Engine Division Spring Meeting, Fort Lauderdale, FL. April 1998

37. Micklow, G.J. and P. Sterchi, "Effect of Swirler Design on Fuel Distribution and Pollutant Emission Formation in Advanced Gas Turbine Engine Concepts", presented at the 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cleveland, OH, July 1998.

38. Hoxie, S., G. Welch, W. Lear and G. J. Micklow, "CFD Study of Wave Rotor Losses due to Gradual Opening of the Rotor Passage Inlets", presented at the 34th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cleveland, OH, July 1998.

39. Micklow, G.J. "Fuel/Air Cycle Analysis for Fuel-Inducted Internal Combustion Engine Configurations", Proc. of the Inst. Of Mech Engr's Journal of Automotive Engineering, Vol 215, Part D, pp. 115-125, 2001

IP2023-01234
Petitioner - Exhibit 1004

40. Micklow, G.J. and Weidong Gong, “A Multi-Stage Combustion Model for Direct-Injection Diesel Engines”, 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, July 2001

41. Micklow, G.J. and R. Srinivasan, “Computational Modeling of the Three-Dimensional In-Cylinder Flow of an Advanced Direct-Injection Engine Configuration”, presented at the 38th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, July 2001

42. Micklow, G.J. and W. Gong, “Combustion Modeling for Direct Injection Diesel Engines”, Proc. of the Inst. Of Mech Engr’s Journal of Automotive Engineering Vol 215 No. D5, pp. 651-662, 2001

43. Gong, W., S.R. Bell, G.J. Micklow, S.B Fiveland, L. Willi, “Using Pilot Diesel Injection in a Natural Gas Fueled HCCI Engine”, SAE Transactions, 2002-01-2866, 2002

44. Micklow, G.J. and W. Gong, “A Multi-Stage Combustion Model and Soot Formation Model for Direct-Injection Diesel Engines”, Proceedings of the I MECH E Part D Journal of Automobile Engineering, Vol 216, Part D, pp. 495-504, 2002

45. Micklow, G.J. and W. Gong, “Mechanism of HC Reduction Using Multiple-Injection in a NG Fueled/Micro-Pilot Diesel Ignition Engine”, Proceedings of the I MECH E Part D Journal of Engine Research, Vol 3 No.1 D5, pp. 13-21, 2002.

46. Gong, W., L. M. Willi, S.B. Fiveland and G.J. Micklow, “Mechanism of HC Reduction Using Multiple-Injection in a NG Fueled HCCI Engine”, presented at the 2002 SAE Powertrain & Fluid Systems Conference

47. Micklow, G.J., “Fire Investigation in a Confined Space Related to Heater Design Defects”, Harrington Law Firm, Monroe, NC, January 2006.

48. Micklow, G.J. and T. Abdel-Salam, “Numerical Study of Two-Dimensional Turbulent Jets”, presented at the 2006 ASME Joint U.S. - European Fluids Engineering Summer Meeting July 17-20, 2006 Miami, FL.

49. Micklow, G.J. Kotha, S., and T. Abdel-Salam, “Three-Dimensional Bluff Body Aerodynamic Analysis for Automotive and Racing Applications”, presented at the 2006 SAE Motorsports Conference, Dearborn, MI Dec 5-7, 2006.

50. Micklow, G.J., B. Murphy, and T Abdel-Salam, "An Efficient Thermodynamic Cycle Analysis for the Performance Prediction of Fuel Inducted Spark Ignition Engines” presented at the SAE 2008 World Expo. Paper # 08PFL-142, Detroit, MI.

IP2023-01234
Petitioner - Exhibit 1004

51. Micklow, G.J., K. Ankem, and T Abdel-Salam, "Fuel Spray Modeling for Direct Injection Compression Ignition Engine Configurations", presented at the SAE 2008 World Expo, Paper # 08PFL-141, Detroit, MI.

52. Micklow, G.J., "A Computer Data Acquisition System for On-Road Vehicle Testing", July 2007, X1R Corporation, Daytona Beach, FL.

53. Micklow, G.J. and W. Gong, "Intake and the In-Cylinder Flow of a 4-Valve Diesel Engine", Proceedings of the I MECH E Part D Journal of Automobile Engineering, 2007, vol.221, issue D11, pp1425-1440.

54. Abdel-Salam, T, G.J. Micklow, and K. Williamson, "Numerical Study of Two-Dimensional Turbulent Jets issued from an Inclined Wall", International Journal of Fluid Mechanics Research, vol. 35, no. 1, 2008.

55. Micklow, G.J. and W. Gong, "Investigation of the Grid and Intake Generated Tumble on the In-Cylinder Flow of a Direct Injection Compression Ignition Engine", Proceedings of the I MECH E Part D Journal of Automobile Engineering, Volume 222, Number 5, 2008 , pp. 775-788(14).

56. Micklow, G.J. and T. Abdel-Salam, "Numerical Investigation of the Effect of the Inlet Conditions on Supersonic Mixing and Combustion", presented at the 2008 AIAA Aerospace Sciences Meeting, Reno, Nevada, Jan 2008

57. Micklow, G.J. K. Ankem and T. Abdel-Salam, "A Comprehensive Fuel Spray Model for High Pressure Fuel Injectors", presented at the International ASME Turbo Expo, Berlin, Germany, June 2008.

58. Micklow, G.J. "Engineering and Ergonomic Analysis of Injuries Related to Slips and Falls while Loading/Unloading Car Carriers", November 2007, Nelson and Nelson, PC, Belleville, IL

59. Micklow, G.J., "On-Road Vehicle Testing to Investigate the Effects of Engine Modifications and Fuel Additives on Fuel Economy for Class 8 Trucks", December 2007, EngineMaxx. Inc.

60. Abdel-Salam, T. M., G.J. Micklow, "Study of Mixing Characteristics of Rectangular Turbulent Jets", *ASME/JSME Fluids Engineering Summer Conference, FEDSM2008*, 2008.

61. Micklow, G.J., "On-Road Vehicle Testing to Investigate the Effects of Oil and Fuel Additives on Fuel Economy for Automotive Applications", September 2008, Advanced Technology Lubricants.

IP2023-01234
Petitioner - Exhibit 1004

62. Micklow, G.J., "On-Road Vehicle Testing to Investigate the Effects of Fuel Spray Enhancement Additive on Fuel Economy for Automotive Applications", September 2008, Viscon Technology Applications, Inc

63. Micklow, G.J., "Operator Injuries Related to the Use of the Ratchet Tiedown System on Automobile Transport Trailers", Wendler Law, PC, March 2009.

64. Micklow, G.J., "Biomechanics of Injuries Related to Automobile Transport Trailers", Wendler Law, PC, January 2010

65. Micklow, G.J., "Injuries Related to Slips and Falls on Automobile Transport Trailers", Wendler Law, PC, January 2010

66. Professional Development Seminar, "Homogeneous Charge Compression Ignition (HCCI) Combustion", SAE 2010 Powertrains, Fuels & Lubricants Meeting, San Diego, CA October 25-27, 2010

67. Professional Development Seminar, "Homogeneous Charge Compression Ignition (HCCI) Combustion", SAE 2011 International Congress and World Expo, Detroit, MI April 14-15, 2011

68. Micklow, G.J., "Injuries Related to Slips and Falls from Elevated Platforms for Automobile Transport", Charles Armbruster, Attorney at Law, Armbruster, Dripps, Winterscheidt & Blotevogel, April 2011

69. Micklow, G.J., "Injuries Related to Over-exertion while Securing Vehicles on an Automobile Transport", Charles Armbruster, Attorney at Law, Armbruster, Dripps, Winterscheidt & Blotevogel, April 2011

70. Micklow, G.J. "Engineering and Ergonomic Analysis of Injuries Related to Slips and Falls while Loading/Unloading Car Carriers", Charles Armbruster, Attorney at Law, Armbruster, Dripps, Winterscheidt & Blotevogel, April 2011

71. Micklow, G.J. ", "On-Road Vehicle Testing to Investigate the Effects of Oil and Fuel Additives on Fuel Economy for Class 8 Trucks", June 2011, Advanced Technology Lubricants Inc.

72. Micklow, G.J. "Investigation Effect of the Water Content in Emulsified Fuels on Diesel Engine Performance and Pollutant Emission Formation" June 2011.

73. Abdel-Salam, T. M., G.J. Micklow, "A Three Dimensional Computational Study of the Effect Inlet Conditions On Supersonic Mixing and Combustion", Proceedings of the I MECH E Part D Journal of Aerospace Engineering, 2012.

74. Micklow, G.J., "Slips and Falls from Elevated Platforms for Car Carriers", Stabinski & Funt, Attorneys at Law, 757 NW 27th Ave, Third Floor, Miami, Florida, April 2012

75. Micklow, G.J., "Injuries from Falls from Elevated Platforms for Automotive Transports", Smith, Gildea & Schmidt, LLC, 600 Washington Avenue, Suite 200, Towson, MD 21204, December 2012

IP2023-01234
Petitioner - Exhibit 1004

76. Micklow, G.J., H. von Helldorff, "The Effect of Fuel Temperature on the Performance of Direct Injection Compression Ignition Engine Configurations", *ILASS Americas 26th Annual Conference on Liquid Atomization and Spray Systems, Portland, OR, May 2014*

77. Micklow, G.J., "The Effect of Local Equivalence Ratio on the Performance and Pollutant Emission Formation of Direct Injection Compression Ignition Engine Configurations", ASME 2014 Internal Combustion Engine Division, Fall Technical Conference, October 19-22, 2014 Columbus, IN, USA

78. Micklow, G.J., "Engine Testing to investigate the effects of engine modifications on fuel economy for Reefer Trailer configurations" November 2014

79. Micklow, G.J., E. Tootoonchi "Pollutant Emission and Increased Efficiency for Compression Ignition Engines Utilizing Biodiesel through Optimization of the Fuel Injection Process", SAE World Congress, 2015, Detroit, MI.

80. Micklow, G.J., Rodiouchkina, M., Pettersson, H., Hefazi, H., "Development of a synthesis level design model in automobile application suitable for MDO using CO approach", SAE World Congress, 2015, Detroit, MI.

81. Micklow, G.J., D. Becknell, E. Tootoonchi, H. von Helldorff, D. Levine "The Effect of Local Fuel/Air Ratio on the Performance and Pollutant Emission Formation of Direct Injection Compression Ignition Engine Configurations", International Journal of Modern Studies in Mechanical Engineering, Volume 1, Issue 1, 2015

82. Micklow, G.J. "An Enhanced Correlation Thermodynamic Model for Fuel Inducted Spark-Ignition Engine Cycle Optimization", Journal of Multidisciplinary Engineering Science and Technology, Volume. 2, Issue. 12, December 2015.

83. Micklow, G.J. "Analysis of a Ram air driven turbine generator battery charging system using to extend the range of an electric vehicle", December 2015.

84. Tootoonchi, E., G.J. Micklow, "Thermophysical properties validation for Soy Methyl Ester (SME) biodiesel through experimental spray data", Biofuels, Taylor and Francis, April 2016.

85. A. Bhargava, G. J. Micklow, "Review of the Characteristics of Low Temperature Combustion", *ILASS Americas 28th Annual Conference on Liquid Atomization and Spray Systems,* Detroit, MI, May 2016

86. Micklow, G.J. Injuries related to Slips and Falls When Loading/Unloading Vehicles on Car Carriers, Circuit Court of Escambia County, Florida, Case No. 2013 CA 002331, September 2016, 42 pages

87. Arshad, M., G.J. Micklow., "Hydrogen Enrichment of Conventionally Fueled Spark Ignition Engines for Ultra-Low Pollutant Emission Transportation Applications", Journal of Multidisciplinary Engineering Science and Technology, Volume 4, Issue 9, September 2017.

IP2023-01234
Petitioner - Exhibit 1004

88. Andrea, D.A., M. J. Jensen, G.J. Micklow, J. Brenner, H. von Helldorff, "Simulation and Thermodynamic Analysis of Extended Expansion on a Concept Rotary Engine Including Its effect on Fuel Efficiency", Cogent Engineering (OAEN), OAEN 1418131, Taylor Francis, December 2017.

89. Responsive EXPERT REPORT OF Gerald J. Micklow, PhD, PE, regarding the Non-Infringement OF EcoServices LLC'S PATENTS-IN-SUIT (U.S. PATENT NOS. 5,868,860 AND 9,162,262), United States District Court, Central District of California, Eastern Division, February 2018, 65 pages

90. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 7,154,200, Case IPR2017-01537, in the United States Patent and Trademark Office, June 2017, 85 pages

91. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 7,067,952, Case IPR2017-01497, in the United States Patent and Trademark Office, June 2017, 80 pages

92. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 7,067,944, Case IPR2017-01497, in the United States Patent and Trademark Office, June 2017, 83 pages

93. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 7,154,400, Case IPR2018-00442, in the United States Patent and Trademark Office, January 2018, 84 pages

94. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 7,067,944, Case IPR2018-00441, in the United States Patent and Trademark Office, January 2018, 56 pages

95. Expert Report of GERALD MICKLOW regarding Invalidity of United States Patent No. 5,954,781, Civil Action No. 1:13-cv-08419, United States District Court for the Northern District of Illinois, February 2018, 204 pages.

96. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 6,644,115, Case IPR2018-01061, in the United States Patent and Trademark Office, May 2018, 56 pages

97. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 6,757,157, Case IPR2018-01061, in the United States Patent and Trademark Office, May 2018, 82 pages

98. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 7,143,501, Case IPR2018-01077, in the United States Patent and Trademark Office, May 2018, 62 pages

99. Declaration of Dr. Gerald John Micklow in Support of the Petition for Inter Partes Review of United States Patent NO. 6,561,565, in the United States Patent and Trademark Office, July 2018, 44 pages

100. Declaration of Gerald J. Micklow, PhD, P.E. Regarding Patentability of Claims 1-9, 19, and 20 of U.S. Patent NO. 7,942,471, Case IPR2018-00737 in the United States Patent and Trademark Office, December 2018, 139 pages.

101. Micklow, G.J., E. Tootoonchi, H. von Helldorff, **"**The Effects of Hydrogen Injection on Ultra Lean Combustion in Diesel Engines", Journal of Multidisciplinary Engineering Science and Technology, Volume 5, Issue. 11, November 2018.

102. H. von Helldorff, G.J. Micklow, "Gaseous and Liquid Jet Direct Injection Simulations Using KIVA-3V", Journal of Multidisciplinary Engineering Science and Technology, Volume 6, Issue. 1, January 2019.

103. H. von Helldorff, G.J. Micklow, "A Comprehensive Compressible Injection Model for High Pressure Gaseous Fuel Injectors", Journal of Multidisciplinary Engineering Science and Technology, Volume 6, Issue. 2, February 2019.

104. H. von Helldorff, G.J. Micklow, "Primary and Secondary Spray Breakup Modelling for Internal Combustion Engine Applications", Journal of Multidisciplinary Engineering Science and Technology, Volume 6, Issue. 4, April 2019.

105. Arshad, M., G.J. Micklow, " Paramteric Analysis of a Gasoline Fueled Premixed Spark-Ignition (SI) Race Car Engine by using Methanol and Methanol-Water Blends", Journal of Multidisciplinary Engineering Science and Technology, Volume 6, Issue 6, June 2019.

106. Declaration of Gerald J. Micklow, PhD, PE In Support of Petition for *INTER PARTES* Review of US Patent Number 6,588,260, in the United States Patent and Trademark Office, February 2020, 169 pages.

107. Declaration of Gerald J. Micklow, PhD, PE In Support of Petition for *INTER PARTES* Review of US Patent Number 6,763,804, in the United States Patent and Trademark Office, February 2020, 160 pages.

108. Cline, C., G.J. Micklow, "A Complilation of Conventional Fuel Additives - A Literature Review of Chemical Additives in Diesel and Biodiesel Fuels for Improved Combustion", Journal of Multidisciplinary Engineering Science and Technology, Volume 7, Issue 5, May 2020.

109. Panuwatsuk, P, G.J. Micklow, "A Study on Reaction Rate Factors of a Single Step Combustion Mechanism for Gasoline HCCI Combustion", Journal of Multidisciplinary Engineering Science and Technology, Volume 7, Issue 5, May 2020.

110. Piersa, R, G.J. Micklow, "Numerical Modeling of Cryogenic Cooling Flows in a Rocket Combustor – A Research Summary", Journal of Multidisciplinary Engineering Science and Technology, Volume 7, Issue 7, July 2020.

111. Micklow, G.J. von Helldorff H, "A Compressible Turbulence Model for High-Speed Flows", Journal of Multidisciplinary Engineering Science and Technology, Volume 7, Issue 10, October 2020.

112. Declaration of Gerald J. Micklow, PhD, PE In Support of Petition for *INTER PARTES* Review of US Patent Number 6,302,169, in the United States Patent and Trademark Office, September 2020, 175 pages.

113. Nivedha K. M., G.J. Micklow, "Numerical and Thermochemical Analysis of Hybrid Rocket Motors with Metallic Additives", Journal of Multidisciplinary Engineering Science and Technology, Volume 7, Issue 11, November 2020.

114. Declaration of Gerald J. Micklow, PhD, PE In Support of Petition for *INTER PARTES* Review of US Patent Number 6,588,260, in the United States Patent and Trademark Office, November 2020, 168 pages**.**

115. Micklow, G.J., "Additive Manufacturing of Fuel Grains for Hybrid Rocket Motors for Increased Efficiency", Journal of Multidisciplinary Engineering Science and Technology, Volume 8, Issue 5, May 2021.

116. Nivedha K. M., G.J. Micklow, "A Review of Aftermarket Treatment Systems for State-of-the-Art Engine Applications", Science and Technology Publishing (SCI & TECH) ISSN: 2632-1017 Vol. 5 Issue 11, November - 2021.

117. H. von Helldorff, Micklow, G.J., "Chemical Kinetic Modeling of Hydrogen-Diesel Co-Combustion in Compression Ignition Engines", Manuscript Number: JFL-2021-0032R1, SAE International Journal of Fuels and Lubricants, January 2022

118. Expert Report of Gerald J. Micklow, PhD, PE IN THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF PENNSYLVANIA CUSTFORTH, INC., Plaintiff, v. WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORPORATION, MOTIVEPOWER, INC. and LEMM LIQUIDATING COMPANY, LLC *f/k/a* FULMER COMPANY, LLC, July 2022.

119. Callinan A., G.J. Micklow, "Dual-Fuel Solutions at Low Additive Percentages for Minimizing Pollutant Emission Formation and Maximizing Energy Generation", Journal of Multidisciplinary Engineering Science and Technology, Volume 9, Issue 9, September 2022.

Journal / Conference Publications Submitted 2022

IP2023-01234
Petitioner - Exhibit 1004

1. Micklow, G.J. and T. Abdel Salam, “Efficient Modeling of Fuel Sprays in Compression Ignition Engine Configurations”, submitted for publication Proc. of the Inst. of Mech Engr’s Journal of Engines Research.

2. Micklow, G.J. and T. Abdel Salam, “Prediction of Three-Dimensional Automobile Aerodynamics for Highway and Racing Applications”, submitted for publication in the Engineering Applications of Computational Fluid Mechanics Journal.

3. Abdel Salam,T. and G.J. Micklow, “The Effect of the Inlet Conditions on Supersonic Mixing and Combustion for SCRAMjet Operation”, submitted for publication in the AIAA Journal for Propulsion and Power.

4. Micklow, G.J. and J. Turner, “A Blowdown Flow Bench for Obtaining Transonic Flow in Advanced Engine Cylinder Heads for Racing Applications”, submitted for publication Proc. of the Inst. Of Mech Engr’s Journal of Engines Research.

5. Micklow, G.J. “Cooling Duct Analysis for Transpiration/Film Cooled Liquid Propellant Rocket Engines”, submitted to the AIAA Journal of Propulsion and Power.

6. Micklow, G.J. and M.R. Harper, “The Effects of Turbulence Modeling on the Numerical Simulation of Confined Swirling Flows”, submitted to the AIAA Journal of Propulsion and Power.

7. Micklow, G.J. and K. Kling, “Optimization of Two-Stroke Engine Port Geometry for Minimizing Pollutant Emissions and Maximizing Power Output”, submitted to the SAE Journal of Automotive Engineering

Books

1. *Mechanical Aspects of Engines*, Chapter 2 of a yet untitled book to be published by the National Institute of Standards and Technology, Gaithersburg, MD.

IP2023-01234
Petitioner - Exhibit 1004