Electrification of the Army's Light Combat Vehicle Fleet: A Workshop

Committee

John J. Koszewnik

Chair

Mr. John Koszewnik (NAE) is an independent product development and technology consultant. In 2018, he retired as Chief Technical Officer for Achates Power where his team was responsible for the design and development of advanced diesel and gasoline internal combustion engines. Among these is the Advanced Combat Engine (ACE) now being jointly developed with Cummins, providing leap-ahead capabilities for the U.S. Army Ground Combat Fleet. Prior to joining Achates Power in 2011, Koszewnik worked at Ford Motor Company as Director of North American Diesel where he led engineering and business responsibilities for Ford diesel offerings within North America and as Chief Engineer V-Engine Engineering responsible for forward model engineering of all Ford's gasoline V6, V8, and V10 engines. Following Ford, Koszewnik was Senior Vice President of Construction Equipment Product Development at CNH where he was responsible for multiple construction platforms and managed 10 engineering centers worldwide. Koszewnik also worked for FEV, a German consulting company, where he was the Director of Production Programs responsible for ensuring all customer programs met their functional, cost, timing and quality targets. Koszewnik earned a Bachelor of Engineering degree from Stevens Institute of Technology and a Master of Business Administration from Harvard Business School. He was elected as a member of the National Academy of Engineering in 2016 based on his past and present work in engine design. He served as a co-chair of the NASEM consensus study entitled “Powering the US Army of the Future” which was published in June 2021.

Vincent Freyermuth

Member

Vincent Freyermuth is a research engineer in the Transportation Systems Simulation and Vehicle and Mobility Simulation Group at Argonne National Laboratory. Over the past 25 years, he focused on vehicle simulation, vehicle integration and product development. He started at General Motors running fuel economy and performance simulations, then focused on hybrid technology at Ford Motor Company where he developed full vehicle models, vehicle control strategies to maximize fuel consumption and ran chassis dyno testing in preparation for EPA fuel economy certification. Vincent also worked at Cummins on hybrid powertrain for commercial vehicles, off-road and military applications. Vincent spent 2 years in China leading battery development activities for the development of a hybrid powertrain system for commercial vehicles.

Sean MacFarland

Member

Sean MacFarland is a retired US Army Lieutenant General. He commanded armored and cavalry units, beginning with an armored cavalry platoon and culminating with command of more than 100,000 Soldiers in the Third Armored Corps. LTG (Ret) MacFarland is credited with fostering the Sunni “Awakening” in 2006 that turned the tide of war in Iraq and commanded the war against ISIS from 2015-2016, liberating almost half of enemy held territory. He served in CONUS, Germany, the Balkans, Afghanistan, Iraq, and Syria and has over 20 awards for distinguished service in peace and war. He graduated from West Point in 1981 and has three Masters Degrees. As VP of Weapons Programs at General Atomics Electromagnetic Systems Group, he formed a new division with oversight of hypersonic weapons, electro-optical systems, missiles, projectiles, and advanced electronics. He more than tripled its revenue in three years. In 2016, Time Magazine selected him as one of the 100 Most Influential People in the World.

William Earl Mustain

Member

William (Bill) Mustain is the Director of Emerging Energy Programs at the University of South Carolina (UofSC) and Professor in the Department of Chemical Engineering. In 2017, Professor Mustain moved to UofSC from the Department of Chemical & Biomolecular Engineering at the University of Connecticut where he was an Associate Professor and the United Technologies Corporation Professor of Engineering Innovation. Before his independent academic career, he was a postdoctoral fellow at Georgia Tech and earned his Ph.D. from the Illinois Institute of Technology in 2006. Professor Mustain has worked in several areas related to electrochemical energy generation and storage including: high capacity materials for Li-ion batteries, Li-S batteries, primary and secondary alkaline batteries, catalysts and supports for proton exchange membrane and anion exchange membrane fuel cells and electrolyzers, electrochemical synthesis of fuels, electrochemical control of biological systems, the purposeful use of carbonates in low temperature electrochemical systems, and the electrochemical capture and utilization of CO2. Professor Mustain has been the PI or Co-PI on approximately $14 M of externally funded research projects. He has published over 130 peer reviewed articles and three book chapters to date and has over 100 invited and conference talks. He has been the recipient of several awards including 2013 U.S. Department of Energy Early Career Award, 2014 Connecticut Quality Improvement Platinum Award, 2014 Supramaniam Srinivasan Young Investigator Award (Awarded by the Energy Technology Division of the Electrochemical Society), the 2009 Illinois Institute of Technology Young Alumnus Award, 2017 UConn Chemical Engineering Faculty of the Year Award, 2019 UofSC Chemical Engineering Publication Award and 2015-2016 Fulbright Scholar Fellowship.

Omer C. Onar

Member

Omer C. Onar received his Ph.D. degree from Illinois Institute of Technology (IIT) in Electrical Engineering, in July 2010, Chicago, IL. At IIT, he was a doctoral research assistant and a PhD student at the Energy Harvesting and Renewable Energies Laboratory at the Electric Power and Power Electronics Center. He is the recipient of the IEEE-Vehicular Technology Society's 2008 "Transportation Electronics Fellowship" (world-wide single award) and the IEEE-Power Electronics Society's 2009 "Joseph J. Suozzi INTELEC® Fellowship in Power Electronics" (world-wide single award). In July 2010, he received the Alvin M. Weinberg Fellowship at the U.S. Department of Energy's Oak Ridge National Laboratory (ORNL), where he joined the Power Electronics and Electric Machinery Group. At Oak Ridge National Laboratory, he has been working on advanced power electronics and electric drives, renewable energies, energy storage systems, wireless power transfer systems, and smart grids. He has been the "Top Reviewer" of IEEE Transactions on Vehicular Technology, elected by the Editor-in-Chief and Editorial Board of the Vehicular Technology Society in October 2011. Onar is an Associate Editor at IEEE Transactions on Transportation Electrification and IEEE Transactions on Power Electronics. Dr. Onar is the recipient of a Department of Energy Vehicle Technologies Office Distinguished Achievement Team Award and UT-Battelle Research Accomplishment Team Award for his work on wireless power transfer systems in 2016. He also received an R&D 100 Award jointly with Toyota TEMA for the wireless charging of EVs project in 2016. Dr. Onar is currently leading the Vehicle Power Electronics Research Group at ORNL.

Chester A. Osborne

Member

Chester Osborne, or "Ozzy" as he is most often is known, is the Massachusetts Dept. of Transportation first Director of Transportation Systems Management & Operations. This is a second career for "Ozzy" after spending 20 years in the US ARMY, the majority of that time serving as a special forces soldier, or what is more commonly known as a "Green Beret".

His background includes managing the MassDOT Operations Center that manages the "big dig", experience conducting battery management as a special forces communication sergeant and conducting mounted vehicle combat patrols across a variety of terrain and operational environments.

Ozzy holds a Master's in public administration, a graduate certificate in transportation & urban systems and was a member of the inaugural enterprise management program at the Joint Special Forces University. He was awarded the Bronze Star for actions in a combat zone and the meritorious service medal for actions outside of a combat zone as well as co-recipient if the 2021 MassDOT managers performance award. He is the executive director of a nonprofit and sits on several boards of directors for organizations who focus on veteran, environmental, and emergency management lines of effort.

Cynthia Powell

Member

Dr. Cynthia (Cindy) Powell is the Chief Science & Technology Office for Energy & Environment at the Pacific Northwest National Laboratory, where she is focused on identifying and fostering ideas that will translate into tomorrow's technology breakthroughs; building and demonstrating new research capabilities; and facilitating R&D partnerships that support the U.S. Department of Energy in its goal to realize a net-zero emissions economy by 2050. She was previously the Director of the Energy Processes & Materials Division at PNNL. Prior to joining PNNL in 2017, Dr. Powell worked at the National Energy Technology Laboratory, where she held a variety of leadership positions, including Executive Director of Research and Innovation and Chief Research Officer. Dr. Powell earned a bachelor's and master's degree in Ceramic Engineering from Clemson University, and a doctorate in Materials Science from Case Western Reserve University.

Peter Schihl

Member

Dr. Peter Schihl is a member of the Scientific and Professional (ST) cadre of the Senior Executive Service and serves as the United States Army's Senior Research Scientist in Ground Vehicle Propulsion and Mobility at the Combat Capabilities Development Command (CCDC) Ground Vehicle Systems Center (GVSC). His current research interests are internal combustion engines, powertrain systems, power generation devices, power pack systems, energy storage devices, and power transfer elements. He first joined the Army civilian workforce at the Tank Automotive Command Research, Development, and Engineering (TACOM RD&E) Center in 1991 and has worked in the GVSC Propulsion Laboratory since 1993.

His research throughout the last twenty plus years has concentrated on developing and experimentally validating simplified combustion and ignition models for military relevant diesel engines including a focus on combustion characteristic differences between diesel fuel and JP-8. To date, many articles have resulted from his work and he has received the 'Best Paper in Session' award at the 1996, 1998, 2000, 2004, 2006, 2008, and 2010 Army Science Conferences and twice has received Department of Army Research and Development Achievement Awards (2005 and 2009) along with an Society of Automotive Engineers Arch T Colwell award for one of the best papers in 2012. Dr. Schihl earned a Ph.D. from the University of Michigan that was focused on high pressure spray combustion and has M.S. and B.S. degrees in Mechanical and Systems Engineering from Oakland University.

Anna Stefanopoulou

Member

Anna G. Stefanopoulou is the William Clay Ford Professor of Technology at the University of Michigan. She has been on the faculty of the Department of Mechanical Engineering since 2000. She served as the Director of the Automotive Research Center a multi-university U.S. Army Center of Excellence in Modeling and Simulation of Ground Vehicles (2009-2018) and the Energy Institute (2018-2020). She was an assistant professor (1998-2000) at the University of California, Santa Barbara and a technical specialist (1996-1997) at Ford Motor Company where she developed and implemented multivariable controllers for advanced engines and powertrains. She has been recognized as a Fellow of the ASME (08), IEEE (09), and SAE (18). She was an elected member of the Executive Committee of the ASME Dynamics Systems and Control Division and the Board of Governors of the IEEE Control Systems Society. She is the Founding Chair of the ASME DSCD Energy Systems Technical Committee and a member of two U.S. National Research Council committees on the 2025 and 2035 US. Light Duty Vehicle Fuel Economy Standards. Her recent awards are the 2019 AACC Control Engineering Practice award, the 2018 ASME Charles Stark Draper Innovative Practice Award, and the 2017 IEEE Control System Technology award. She has co-authored a book, 23 U.S. patents, and more than 400 publications (seven of which have received awards) on estimation and control of engine, fuel cells, and batteries.

Levi T. Thompson

Member

Levi T. Thompson is the Dean of the College of Engineering and Elizabeth Inez Kelley Professor of Chemical Engineering at the University of Delaware (UD). Before joining UD, Thompson was the Richard Balzhiser Professor of Chemical Engineering and Professor of Mechanical Engineering at the University of Michigan. He also served as Associate Dean for Undergraduate Education, Director of the Hydrogen Energy Technology Laboratory and Director of the Michigan-Louis Stokes Alliance for Minority Participation.

Thompson’s research focuses on nanomaterials for catalytic and energy storage applications, and he is author on more than 150 publications and co-inventor on more than 10 patents. He was elected as a member of the National Academy of Engineering and Fellow of the American Institute of Chemical Engineers, and is recipient of awards including a 2006 Michiganian of the Year Award for his research, entrepreneurship, and teaching, and NSF Presidential Young Investigator Award. Thompson currently serves as an Associate Editor of the PNAS Nexus and on the Editorial Board of the Annual Review of Chemical and Biomolecular Engineering.

Thompson is an experienced consultant, and co-founder and founding CEO of T/J Technologies, a developer of nanomaterials for advanced batteries (acquired by A123 Systems). More recently Thompson co-founded Inmatech.