

ASME FY09 Fuels Peer Review Panel

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Calvin. H. Bartholomew, Ph.D.

Dr. Bartholomew is a professor of Chemical Engineering and the founder and head of the Catalysis Lab at Brigham Young University. He teaches courses treating kinetics, catalysis, catalyst deactivation, air pollution control, creativity, and engineering materials. He has over 38 years of research experience in the areas of catalysis and combustion and has been principle or co-investigator on over 60 grants and contracts. He is the author or co-author of 5 books and 120 peer-reviewed papers and reviews with emphasis on catalyst design, catalyst deactivation, chemisorption, syngas production/conversion catalysis, and selective catalytic reduction of NO_x and has consulted with over 40 companies on problems related to catalysis and air pollution. He was appointed Pope Professor of Chemical Engineering from 1997 through 2002, and in 2006 received a lifetime achievement award from colleagues and former students.

Brian Gleeson, Ph.D.

Dr. Gleeson is the Henry S. Tack Professor in the Department of Mechanical Engineering and Materials Science at the University of Pittsburgh. His primary research focus is on the thermodynamics and kinetics of gas/solid and solid/solid reactions. Particular emphasis is on the high-temperature degradation of metallic alloys and coatings. Related to this, current research interests include active and passive high-temperature oxidation of alloys and coatings; deposition and characterization of metallic coatings; diffusion and thermodynamic treatments of both gas/solid and solid/solid interactions; and structure/property relationships of materials. He is the Editor of the international journal *Oxidation of Metals*. Dr. Gleeson has a B.S. and M.S. in Materials Science and Engineering from the University of Western Ontario in Canada, and a Ph.D. in Materials Science and Engineering from the University of California at Los Angeles. He also completed a post doctoral fellowship at the University of New South Wales in Australia.

J. Stephen Herring, Ph.D.

Dr. Herring is Technical Director, High Temperature Electrolysis, DOE Nuclear Hydrogen Initiative at the Idaho National Laboratory (INL.) He originated concepts and formed a team for the development of solid oxide electrolytic cells. Research has grown to include the use of nuclear heat and electricity for the production of synthetic diesel; jet fuel and gasoline; and the recovery and upgrading of unconventional fossil fuels such as oil sands, oil shale and heavy crude. Previous responsibilities at INL include the evaluation of nuclear designs in conjunction with electrolytic and thermochemical processes for the production of elemental hydrogen and other hydrogen-transport compounds. Dr. Herring received Bachelor of Science degrees with distinction in both mechanical and electrical engineering from the Iowa State University and a Ph.D. in nuclear engineering at the Massachusetts Institute of Technology.

James R. Katzer, Ph.D.

Dr. Katzer is an independent energy consultant and member of the National Academy of Engineering. He has recently worked on several panel studies at the National Research Council, including “Resource Needs for Fuel Cell and Hydrogen Technologies” and “Alternative Liquid Transportation Fuels.” As a Visiting Scholar at MIT (2004 to 2007), he was the Executive Editor/Director of the MIT study on “The Future of Coal in a Carbon Constrained World.” In 2003 he retired from his position as Manager of Strategic Planning and Performance Analysis for ExxonMobil Research and Engineering Company, responsible for technology-planning and analysis activities. During his career, Dr. Katzer also served as Vice President of Technology for Mobil Oil Corporation and Vice President of Planning & Finance for the Mobil Research & Development Corporation. Dr. Katzer has more than 80 publications in technical journals, holds several patents, co-authored and edited several books, and developed the Center for Catalytic Science and Technology at the University of Delaware with Prof. B. C. Gates. He is a member of the National Academy of Engineering, and has received two awards from the Catalysis Club of Philadelphia. He received a B.S. degree from Iowa State and a Ph.D. in Chemical Engineering from MIT.

Daniel J. Kubek, Panel Chair

Mr. Kubek is a consultant specializing in synthesis gas and natural gas purification and separation. His clients include the Electric Power Research Institute (EPRI) – CoalFleet, for whom he provides technical guidance on integrated processes for Gasification projects, and the Gasification Technologies Council (GTC), where he serves as an advisor on technical issues related to Gasification, particularly in the areas of H₂S removal and CO₂ capture and sequestration. Prior to this, Mr. Kubek was with UOP for 18 years as Senior Technology Manager. His primary work was for UOP’s Solvent Absorption, Molecular Sieve Adsorption, and H₂ Processing technologies as applied to natural gas and synthesis gas processing. He was the Process Manager responsible for all Process Design Packages for multiple Gasification projects and served as Development Manager for their Gas Processing Business. In 2005, Mr. Kubek was awarded UOP’s Don Carlson Award for Career Technical Innovation. Before joining UOP, he spent 17 years with Union Carbide. Mr. Kubek received a Bachelor of Science degree in Chemical Engineering from Rutgers University and earned a Master of Science in Chemical Engineering from Purdue University.

William R. Owens, Ph.D.

Dr. Owens is vice president of fossil energy projects at Princeton Energy Resources International. He has extensive experience in system engineering principles, cost estimation, project economics, environmental control technologies, project management, and project control of power generation systems including conventional and emerging technologies. This experience includes fuel cells, turbines, gasifiers, fluidized bed combustors, etc. Dr. Owens’s experience includes systems with bituminous coal, anthracite coal, and sub-bituminous western coals. He has worked with alternate fuel systems including natural gas, hydrogen, gasifier fuel-gas, oil, and oil-shale systems. Dr. Owens has provided DOE with detailed support in outreach programs, deregulation of the

electric utility industry, and international programs. He has a B.S. from Pennsylvania State University, a M.S. from Drexel University, and a Ph.D. from the University of Maryland. All of his degrees are in mechanical engineering.

Ravi Prasad, Ph.D.

Dr. Prasad, a corporate fellow of Praxair Inc., has 60 US Patents and broad industrial experience in developing and commercializing new technologies, launching technology programs (\$2-50MM), business development, building cross-functional teams, and setting up joint development alliances. He is a founding member of an alliance involving Praxair, BP, Amoco, Phillips Petroleum, Statoil, and Sasol to develop ceramic membrane syngas technology for gas-to-liquid processes. He established and led programs for ceramic membrane oxygen technology; co-developed proposals to secure major DOE programs worth \$35MM in syngas and \$20MM in oxygen; identified novel, solid-state oxygen generation technology; and conceived and implemented a coherent corporate strategy in nanotechnology. He has championed many initiatives in India, including small on-site hydrogen plants, small gasifiers, aerospace business opportunities; and developed implementation plans resulting in a new R&D center in Shanghai. Dr. Prasad has a B.S. in Mechanical Engineering from the Indian Institute of Technology in Kanpur, India, and a M.S. and Ph.D. in Mechanical Engineering and Chemical Engineering from the State University of New York, Buffalo, New York.

Gregory M. Shaver, Ph.D.

Dr. Greg Shaver is an Assistant Professor of Mechanical Engineering at Purdue University, studying and developing advanced powertrain solutions. His research interests include work in modeling and control of novel combustion methodologies, utilization of environmentally friendly alternative fuels, and incorporation of advanced IC engines on hybrid powertrains. He has written for multiple journals, including the International Journal of Engine Research, the ASME Journal of Dynamic Systems, Measurement and Control, and the IFAC Journal on Control Engineering Practice, writing on such subjects as the physics-based modeling and control of residual-affected HCCI engines and the modeling of cycle-to-cycle coupling and mode transition in HCCI engines with variable valve actuation. He is the editor of the 2007 International Federation of Automatic Control (IFAC) Symposium on Advances in Automotive Control. He received a B.S. in Mechanical Engineering from Purdue University, and an M.S. and Ph.D. from Stanford University.

James C. Sorensen

Mr. Sorensen is a consultant specializing in the conception and development of clean coal and other energy programs with a focus on Integrated Gasification Combined Cycle (IGCC), Oxy-Fuel Combustion, Gas-To-Liquids (GTL), and Air Separation and Hydrogen/syngas technology. Prior to this, he worked for Air Products and Chemicals both as Director, New Markets and as Director, Gasification and Energy Conversion. While in these positions, his achievements included developing and selling a \$26 million Ultra Clean Fuels technology development program that was selected by the US Department of Energy (DOE), selling a \$30 million single train separation facility for a

250 mw IGCC power plant, proposing and developing a \$22.5 million fossil fuel R&D program selected by DOE, and leading Air Products effort on a multi-team proposal selected by DOE for a \$180 million Clean Coal Technology award. Mr. Sorensen is the founding chairman of the Gasification Technologies Council. He received a Bachelor of Science degree in Chemical Engineering from the California Institute of Technology and earned a Master of Science in Chemical Engineering from Washington State University. Mr. Sorensen also earned a Master of Business Administration in General Management from Harvard Business School.

Martin J. Van Sickels

Mr. Martin Van Sickels, President of MVS Consulting LLC, has been in the process and engineering construction business for over forty two years. During a thirty year career with Kellogg Brown & Root, Inc. (KBR), he was responsible for all research and development programs, including Onshore, Offshore, Operations and Maintenance, and Infrastructure. He led the development of a ranking methodology for all R&D activities to fully align them with KBR's strategic and business plans, and was member of the Inquiry Review and Pricing Committees and Chairman of Technology Screening and Patent Committees. His last position at KBR was Vice President and Chief Technology Officer, a member of the Executive Committee. His duties in this position included worldwide responsibility for the management, marketing and development of all KBR proprietary and licensed technologies (chemicals, fertilizers, olefins, petroleum refining, and coal gasification) and special execution technologies (liquid-nitrogen gas, gas-to-liquid, gas processing, and offshore technology). He received a B.S. in chemical engineering from the City College of New York and a M.S. in chemical engineering from New York University.

Michael R. von Spakovsky, Ph.D

Dr. von Spakovsky is a professor of mechanical engineering and director of the Center for Energy Systems Research at the Virginia Polytechnic Institute and State University. He teaches undergraduate and graduate level courses in thermodynamics, kinetic theory, fuel cell systems, and energy system design. His research interests include computational methods for modeling and optimizing complex energy systems; methodological approaches for integrated synthesis, design, operation, control, and diagnosis of such systems; and fuel cell applications for both transportation and distributed power generation. He is associate editor for the *ASME International Journal of Fuel Cell Science and Technology* and an ASME Fellow. He is also editor-in-chief of the *International Journal of Thermodynamics* as well as chairman of the Executive Committee of the International Center for Applied Thermodynamics. He received a B.S. in aerospace engineering from Auburn University and a M.S. and Ph.D. in mechanical engineering from the Georgia Institute of Technology.