

# ASME FY10 Advanced Integrated Gasification Combined Cycle (AIGCC)

## Peer Review Panel

December 7 – 11, 2009

### 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 H<sub>2</sub>S removal and CO<sub>2</sub> capture and sequestration. Prior to this, Mr. Kubek was with Universal Oil Products (UOP) for 18 years as senior technology manager. His primary work was for UOP's solvent absorption, molecular sieve adsorption, and H<sub>2</sub> 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 B.S. degree in chemical engineering from Rutgers University and earned an M.S. in chemical engineering from Purdue University.

### Arie Geertsema

Dr. Geertsema was formerly with Range Fuels, a startup company which is erecting a thermochemical cellulosic ethanol plant in Georgia. Dr. Geertsema served as Chief Technical Officer responsible for technology development, intellectual property, and catalysis and as Senior Vice President Technology responsible for R&D and Engineering. Prior to joining Range Fuels, he was Director of the University of Kentucky's Center for Applied Energy Research where the main areas of activity were catalysis, carbon materials, and coal and environmental technologies. He spent two decades at Sasol in South Africa. Research fields included coal technology, gasification, gas processing and gas cleaning, Fischer-Tropsch, catalysis, petrochemical synthesis, separations technology, catalytic distillation, environmental research (air pollution, effluents, site remediation), biotechnology, fuel performance, process development, reactor design and development, piloting and commercialization of processes, and techno-economic evaluations. Dr. Geertsema is a member of both the American Institute of Chemical Engineers and the American Chemical Society. He received a B.Sc. in Ind Chem (Honors); M.Sc.; and an M.B.A. from the Potchefstroom University South Africa and a Dr-Ing (*German Engineering Doctorate Degree*) from the University of Karlsruhe, Germany.

## **Chris Higman**

Mr. Higman is principal and owner of Higman Consulting GmbH based near Frankfurt, Germany, which specializes in gasification and other syngas technologies. Mr. Higman consults to industry performing per-feasibility studies and plant audits, and runs training courses in gasification. Among his recent activities, he prepared a report for the Electric Power Research Institute (EPRI) on reliability and availability issues in operating integrated gasification combined cycle (IGCC) power plants. Before retiring from Lurgi AG after 30 years of service, Mr. Higman held numerous positions including head of the process division responsible for gasification technologies. His work was mostly in the field of complete plans based on gasification and steam reforming, including various ammonia, methanol, and syngas (GTL) plants. He also held several corporate positions including that of Managing Director of Lurgi India. Mr. Higman has a B.S. in mathematics from Oxford University and an M.S. in mechanical engineering from the University of the Witwatersrand in South Africa.

## **Arnold Keller, P.E.**

Mr. Keller is a consultant with expertise in oil, gas, and coal processing; power and heat recovery projects (including cogeneration and combined cycles); and synergistic integration of process plant facilities with power cycles. Mr. Keller was previously a Technical Director/Process Engineer at Fluor Enterprises where he was responsible for several gasification design projects. Prior to that, he was a Senior Process Engineer at ConocoPhillips where he was assigned to the E-Gas™ gasification group, which was responsible for process design development for COP Company owned E-Gas™ project developments. The design focus was on the CO-Shift, acid gas removal, Claus plant, methanation, and integration of power within an E-Gas™ complex. Mr. Keller is a member of the American Institute of Chemical Engineers (AIChE), USA, and the Institution of Chemical Engineers (I.Chem.E), United Kingdom. He has a B.Sc. in chemical engineering from the University of Manchester Institute of Science & Technology in the United Kingdom.

## **Ravi Prasad, Ph.D.**

Dr. Prasad, of Helios-NRG, LLC and formerly a corporate fellow of Praxair Inc., has 60 U.S. patents and broad industrial experience in developing and commercializing new technologies, launching technology programs (\$2–\$50MM), supporting business development, building cross-functional teams, and setting up joint development alliances. He is a founding member of an alliance involving Praxair, British Petroleum, 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, and 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 an M.S. and Ph.D. in mechanical engineering and chemical engineering from the State University of New York at Buffalo.

## **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 of new markets and as director of gasification and energy conversion. While in these positions, his achievements included developing and selling a \$26 million ultraclean fuels technology development program that was selected by 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 B.S. in chemical engineering from the California Institute of Technology and earned an M.S. in chemical engineering from Washington State University. Mr. Sorensen also earned an M.B.A in general management from Harvard Business School.

## **Ting Wang, Ph.D.**

Dr. Wang is the Jack and Reba Matthey Endowed Chair for Energy Research and Director of Energy Conversion and Conservation Center (ECCC) at the University of New Orleans. Dr. Wang has been involved in energy conservation and power generation for the past 29 years. He is an experimentalist with significant computational fluid dynamics (CFD) experience. In the area of power generation, his specialties lie in gas turbine power generation with applications on combined power generation, co-generation, integrated gasification combined cycles (IGCC); mild gasification (MaGIC), distributed generation, and micro-turbine applications. He has conducted both fundamental and applied research with funding from U.S. government agencies and industry. Dr. Wang was the recipient of the ASME George Westinghouse Silver Medal for his contributions to the power industry in general. He is a member of the ASME Gas Turbine Heat Transfer Committee and the Chair of the Coal, Biomass, and Alternative Fuels Committee. Dr. Wang received an M.S. from the State University of New York at Buffalo and a Ph.D. from the University of Minnesota.