Dale E. Klein, Ph.D, P.E.

Dr. Dale E. Klein rejoined The University of Texas at Austin in April, 2010 after serving almost 8 ½ years as a Presidential Appointee. He currently is a Professor of Mechanical Engineering (Nuclear Program), Associate Vice President for Research, and Associate Director of the Energy Institute.

Dr. Dale E. Klein was sworn into the U.S. Nuclear Regulatory Commission July 2006. He was appointed Chairman by President George W. Bush and served in that role from July 1, 2006, to May 13, 2009. From May 13, 2009 until March 30, 2010 he served as a Commissioner.
.
Before joining the NRC, Dr. Klein served as the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs. He was appointed to this position by President George W. Bush and confirmed by the Senate on Nov. 8, 2001. In this position, he served as the principal staff assistant and advisor to the Secretary of Defense, Deputy Secretary of Defense, and the Under Secretary of Defense for Acquisition and Technology for all policy and planning matters related to nuclear weapons and nuclear, chemical, and biological defense.

Previously, Dr. Klein served as the Vice-Chancellor for Special Engineering Programs at the University of Texas System and as a professor in the Department of Mechanical Engineering (Nuclear Program) at the University of Texas at Austin. During his tenure at the university, Dr. Klein was Director of the Nuclear Engineering Teaching Laboratory, Deputy Director of the Center for Energy Studies, and Associate Dean for Research and Administration in the College of Engineering.

Honors and awards Dr. Klein has received include Fellow of the American Society of Mechanical Engineers and the American Nuclear Society, the Joe J. King Professional Engineering Achievement Award; Engineer of the Year for the State of Texas, the University of Missouri Faculty-Alumni Award, and the University of Missouri Honor Award for Distinguished Service in Engineering.

A native of Missouri, Dr. Klein holds a bachelor's and master's degree in mechanical engineering and a doctorate in nuclear engineering, all from the University of Missouri-Columbia. He has published more than 100 technical papers and reports, and co-edited one book.
He has made more than 400 presentations on energy and has written numerous technical editorials on energy issues that have been published in major newspapers throughout the United States.

June 2010

[Title]

Technology development in electric power generation for a low carbon society

Photograph

[Name]

Shigeru AZUHATA

[Brief background]

Dr. Shigeru Azuhata has been Vice President and Executive Officer, and General Manager of the Research & Development Group of Hitachi, Ltd. since April 2009. He received his M.Eng. in mechanical engineering and D.Eng. in chemical engineering from Tohoku University, Sendai, Japan, in 1975 and 1987, respectively.

[Abstract]

Environmental issues on a global scale are becoming increasingly apparent with rising CO2 levels generated by the rapidly growing human population. On the other hand, as pointed out by the Club of Rome in 1972, this population growth is also depleting resources on a global scale. Against this background, Hitachi drafted it Environmental Vision 2025 as a corporate environmental plan towards reduce global warming, conservation of resources and the preservation of ecosystems.

In relation to CO2 reduction, Hitachi is taking a two prong approach to reduce CO2 from both the supply and demand side. On the generation side, we are concentrating on the proliferation of low-carbon energy such as nuclear and renewable energies, as well as increasing the plant efficiency of thermal power generation including carbon-capture-and-storage (CCS) technologies. On the consumption side, efficient energy storage in batteries is becoming a critical feature in efficient energy utilization together with the ongoing challenge towards ever greater efficiency in motors and inverters.

This paper discusses current research activities in power generation technologies at Hitachi.

[Title]

Research Progress in Sustainable Energy in ZJU

[Name]
Ni, Mingjiang

[Simplified personal history]
1988-now Professor, Zhejiang University
1993-1996 Chairman, Dept. of Energy Eng. ZJU
1996-2005 Vice president, ZJU
2005-2009 Provost, ZJU
now Director, Institute for Sustainable Energy, ZJU
Vice President, Chinese Society of Power Engineering

[Abstract]
Taking the Institute for Sustainable Energy (ISE) of Zhejiang University as an example of Chinese leading research institutes in power area, research progress in sustainable energy such as clean coal utilization, biomass energy, solar energy, wind energy, waste to energy, emission control, etc. will be reported.

Head of Division
Energy Technology Policy Division
International Energy Agency, Paris

Dr. Peter G Taylor

Dr Peter Taylor joined the International Energy Agency in September 2006 and is currently Head of the Energy Technology Policy Division. He is responsible for leading work to analyse and promote the role of energy technologies in achieving the three goals of the IEA: energy security, economic development and environmental protection. This includes major activities on energy efficiency indicators and technology roadmaps, as well as the Energy Technology Perspectives project, which develops scenarios and strategies for dramatically reducing global CO_2 emissions.

Prior to working at the IEA, Peter was the Technical Director of Future Energy Solutions (a business of AEA Technology plc), a leading UK energy and environmental consultancy. He has also spent 15 years working in research and consultancy on a range of national and international policy issues related to energy and climate change.

Peter holds a BSc in Applied Physics from the University of Nottingham, and both an MSc in Environmental Technology and PhD in Energy Policy from Imperial College, London.

Low-carbon technologies for a secure and sustainable energy future

Global trends in energy supply and use are unsustainable. Without decisive action, energy-related emissions of CO_2 will double by 2050 and increased fossil-fuel demand will heighten concerns over the security of supplies. However, this bleak outlook can be changed, but it will take an energy revolution involving both the development and widespread deployment of a range of low-carbon energy technologies. Energy efficiency, many types of renewable energy, carbon capture and storage, nuclear power and new transport technologies will all be important to reduce greenhouse gas emissions while promoting energy security. Every major country and sector of the economy needs to be involved. This represents both a huge challenge and a huge opportunity for mechanical engineers across the world to play their part in preserving the global environment.

[Title]

IAEA ISOE Activities and Nuclear Renaissance in the world

Photograph

[Name]

Wataru Mizumachi

[Simplified personal history]

7th Chairman of ISOE Committee(IAEA,NEA)
Technical Advisor on Nuclear Safety to the Minister of
METI (Ministry of Economy, Trade and Industry)
Former Director General of Safety Information Research Division ,JNES(Japan Nuclear Energy Safety Organization

[Abstract]

Nuclear Power Plants are considered as the main solution to improve the environmental issues because they exhaust very few CO2, NOX and SOX. Therefore ,people are calling the nuclear renaissance.
However, there are still anti-nuke people in the world. Their main fear is the radiation exposure .
In 1992, OECD/NEA organized ISOE Committee to improve the technology for the nuclear power plant to reduce the radiation exposure
And IAEA joined as the joint secretariats.
Right now 29 countries join ISOE committee whose members are composed by the regulatory bodies and the utilities.
This committee is collecting the golden nugget technology how to reduce the radiation exposure and inform to all nuclear power plants to
Improve their plant condition.
There are some examples and graphs to explain these technologies.

[Title]

A Paradox in Efficient Use of Energy and the Overall Optimization

Photograph

[Name]
Teruhide HAMAMATSU, Dr.

[Simplified personal history]
1970 Master Degree (Eng.) of Keio University
1970 joined with Central Research Institute of Electric
Power Industry, CRIEPI
1991 Senior Manager of Advanced Energy Dept., CRIEPI
2001 Member of CRIEPI Managing Board
2008 Senior Advisor Emeritus for CRIEPI

[Abstract]

With respect to the state-wide energy use, there might be found a paradox that more electrification apparently causes more energy losses by the power generation loss. This easily leads to a misunderstanding. Energy end-users need energy benefits, and neither oil nor city gas of the final energy consumption. They can have the two ways to heat an object, fuel combustion generating unavailable energy and heat pump use adding available energy (exergy, actually power) to the environmental energy or waste heat. And mechanical power, e.g. driving cars can be supplied from the electric power system of the highest efficiency. Such highly efficient use of energy brings more electrification. This paradox lies in the poor understanding on energy use science. The author considers the overall optimization for the efficient use of energy.

[Title] (tentative)

Development of the Ultra High Efficiency Thermal Power Generation Facility

Photograph

[Name]
Toshihiro Sano

[Simplified personal history]
1977 Graduated from the department of mechanical engineering,the faculty of science and engineering, Waseda University
1977 Joined Tokyo Electric Power Company
2008 General Manager, Thermal Power Department
2009 Exective Officer
General Manager, Thermal Power Department

[Abstract] (tentative)
In order to combat global warming, attention has been increasingly shifting towards nuclear and renewable energy such as wind and solar power generation as feasible power resource alternatives. The electric power suppliers of Japan are aiming to increase the amount of nuclear and non-fossil fuel power generation by over 50% of total power generation by 2020. However, this does not translate into the complete eradication of the traditional model as the remaining half will still be fossil fuel-based thermal power generation. Given these circumstances, Japan has aggressively implemented of further measures to enhance the efficiency of thermal power generation.

[Title]

History, Evolution and Future trend of Large Flame Gas turbine for Power Generation

[Name]
Atsushi Maekawa

[Simplified personal history]

[Abstract]
Mitsubishi Heavy Industries, Ltd. (MHI) developed a 1,100oC class D-type gas turbine In the 1980s and constructed the world's first successful large-scale combined cycle power plant. Since then, MHI has developed the F-type and G-type gas turbines with even higher turbine inlet temperature and has delivered many of them in Japan as well as overseas while accumulating successful commercial operations. MHI has constantly improved these gas turbines, adding to their successful operation. Now, MHI is participating in a national project to promote the development of component technology for the next generation 1,700oC class gas turbine, whose thermal efficiency will be improved significantly by raising the turbine inlet temperature.
The MHI developed a 1,600oC class J-type gas turbine with utilizing some of the National Project. MHI will introduce this history and evolution of large frame gas turbine for power generation and our activities for environmental improvement in future.

[Title]

R&D for Environmentally Compatible Thermal Power Plant

[Name]
Yukihiko Kazao

[Simplified personal history]
1980 Joined Toshiba Corporation
Heavy Apparatus Engineering Laboratory
2002 Senior Manager, Power And Industrial Systems Research and Development Center
2007 Technology Executive, Thermal & Hydro Power Engineering, Power Systems Company

[Abstract]
Activities for environmentally compatible thermal power plants will be presented. For example, a study for efficiency improvement of steam turbine using large scale testing equipment and a development of large scale indirect hydrogen cooled generator. Also development of advanced ultra super critical system (A-USC) to increase plant efficiency will be presented. Finally, activities to develop post combustion carbon dioxide capture system from flue gas for realization of zero-emission thermal power plant.

[Title]

Satisfaction of Low Carbon Society
- Latest Technical Approach on Coal-fired Power Plant

[Name]

YUKIYA　MURANO

[Simplified personal history]

Apr. 1978 : Entered Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI)

Jul. 2004 : General Manager, Project Dept, Power Systems Division, Aero Engine & Space Operations

Apr. 2006 : Deputy Division Director, Power Systems Division, Aero Engine & Space Operations & General Manager, Sales and Marketing Division

Apr. 2007 : Deputy Division Director, Power Systems Division, Power Systems Operations

Jan. 2008 : Director, Power systems Division, Power Systems Operations

Apr. 2008 : Associate Director of IHI ＆ Director, Power systems Division, Power Systems Operations

Apr. 2010 : Associate Director of IHI ＆ Vice President of Energy Systems Operations, Division Director, Power Plant Division

[Abstract]

CO2 emission is one of the big issues for preservation of global environment. So, the use of nuclear energy and/or nature energy, as energy source not to generate CO2, will increase. However, the coal-fired power plant will be still major electricity source in the future from the viewpoint of economical and stability of electricity and fuel security reasons.

Therefore, the reducing CO2 from coal-fired power plant is urgently required.

IHI Corporation, as a supplier of power plant equipment including Boiler, is facing to CO2 emission issue by various technical approaches. Latest status of following advanced technologies is introduced.

1. Advanced Ultra Super Critical Boiler (A-USC) - Improvement in Efficiency.
2. Oxy-fuel Combustion Technology – CO2 Separation / Capture
3. Use of Biomass Fuel – Renewable Energy

These advanced technologies certainly contribute to reduce CO2 emission economically.