Technical Program
Monday 10 November 2003

Opening  (Main Hall)  9:00-9:15
Plenary Session  (Main Hall)  9:15-12:00
  Chair : Yutaka Kawata, Takeshi Nakazawa
Special Lecture
S-1  The US Electrical Power Industry - A 2003 Perspective
    William Stenzel
S-2  Pollutants Formation and Control during Coal and Waste Combustion for Power Generation
    Kefa Cen
S-3  Power Plants for the 21st Century
    Shozo Kaneko

Room A
Distributed Energy-1  13:10-14:35
  Chair : Nobuya Nishimura, Yoshinori Hisazumi
  
  Keynote
  A101  Overview of the Recent Japanese Power Industries and Distributed Resources
        Kunihiko Mouri
  A102  Assessing and Optimizing the Economy of Distributed Power Generation
        Er-shu Xu, Bing-shu Wang, Zhi-ping Song
  A103  Structural Optimization of an Energy Supply System from Economic Viewpoint
        Satoshi Gamou, Koichi Ito, Ryohieti Yokoyama, Shu Yoshida

Distributed Energy-2  14:50-16:15
  Chair : Koichi Ito, Shigeo Hatamiya
  A104  Simulation and Optimization of Districted Energy Supply System Based on Exergy
        Hitoshi Asano, Terushige Fujii, Yoshinori Hisazumi, Hideki Tsuda
  A105  Development of the New Heat Supply Unit for the Neighboring Communities Co-generation System
        Terushige Fujii, Hitoshi Asano, Hiroshi Suzuki, Kazumi Tanimoto, Yoshinori Hisazumi,
        Kunihiko Mouri, Keiko Fujioka, Yoshinobu Aso, Masahiro Muraji, Toshihiro Hori,
        Tetsuo Abiko
  A106  Development and Operation of the Co-Generation Pilot Plant Applying L20A(20MW Class) Gas Turbine
        Takashi Nagatomo, Hiroshi Yokoyama

Distributed Energy-3  16:30-17:55
  Chair : Yoshinori Hisazumi, Shigeo Hatamiya
  A107  Development of Hybrid Ammonia Absorption Refrigerator by Gas Engine Exhaust Heat
        Hiroumi Fujimoto, Toshio Nishida
  A108  Performance of a Dual-Fueled Diesel Engine Driven by Low Calorific Gas
        Daisuke Tabata, Kunio Yoshikawa, Tajin Min
  A109  A Lean Burn Miller Cycle Gas Engine with a High Thermal Efficiency and Low NOx Emissions for a
        Co-Generation System - Comparison of LIVC and EIVC Miller Cycle
        Makoto Akaike, Kazuhaisa Okamoto, Satoshi Morimoto

Room B
Power-Related Topics-1  13:10-14:35
  Chair : Isao Kataoka, Defu Che
  B101  Flow and Heat Transfer of Carbon Dioxide Flowing Through Small Tube Near the Critical Point
        Tomokazu Yokoyama, Isao Ishihara, Hideki Tonomiya, Takashi Sasajima, Ryosuke Matsumoto
  B102  Study of Absorption Heat Pump without Solution Pump (Verification of Refrigeration Using Capillary
        Pumping)
        Atsushi Tsujimori, Yoshihiko Sasaki, Hideaki Kawabata
  B103  Power Cycle Configuration Analysis Using Waste Heat with Ammonia-Water Mixtures
        Jintao Huang, Qishou Liu, Yunlu Wang, Tingkuan Chen, Yushan Luo

Waste-to-Energy-1  14:50-16:15
  Chair : Makoto Nishimura, Hao Zhou
  B104  Development of Internally Circulating Fluidized-Bed Gasification (ICFG) Technology
B105 Experimental Study on NOx Emission and Prediction by BP Algorithm in the Fluidized Bed Combustion of Municipal Solid Waste
Dongping Zhang, Jianhua Yan, Chunpeng Luo, Xiangpai Li, Yong Chi

B106 Gasification Performance of Solid Fuels Using High Temperature Air Blown Pebble Bed Gasifier
Shinobu Sugiyama, Kunio Yoshikawa, Toru Ishii, Emi Yoshitaka, Takashi Kiga

Waste-to-Energy-2  16:30-17:55
Chair : Makoto Nishimura, Hao Zhou

B107 Design & Operational Results of the Combined Cycle Waste to Energy with Two Gas-Turbine Generators
Tadashi Katsuragi, Kenichi Kashiwabara, Yukio Kouzai, Shoji Murakami

B108 Development of Waste Gasification System
Hideki Nakagome, Tsuyoshi Noma, Hiroshi Matsu, Takashi Amemiya, Kiyoshi Imai, Ryo Nakajima

B109 The Action of Primary Air Regulation and Its Distribution in the Low Heating Value Waste Pusher Type Grate Incinerator
Debin Cui, Fangchao Zuo

Room C

Turbine-1  13:10-14:35
Chair : Yoshiharu Tsujikawa, David Y.S. Lou

Keynote
C101 Inlet Fogging for Gas Turbine Power Augmentation (A State-of-the-Art Review)

C102 Effects of Free-Stream Turbulence Intensity on Unsteady Midspan Flow in a Turbine Rotor at Low Reynolds Number
Takayuki Matsumuna, Yasukata Tsutsui

C103 Conjugate Heat Transfer, Internal Flow, and External Flow Analyses for a Film-Cooled Blade
Karsten Kusterer, Dieter Bohn, Takao Sugimoto, Ryozo Tanaka

Turbine-2  14:50-16:15
Chair : Yoshiharu Tsujikawa, David Y.S. Lou

Keynote
C104 Toward the Realization of the Finger-Top Gas Turbines
Eito Matsuo, Haruo Yoshiki, Toshio Nagashima, Chisachi Kato

C105 Heat/Mass Transfer of Array Impinging Jets with Protruding Effusion Holes Ejecting Spent Air
Sang Dong Hwang, Dong-Ho Rhee, Pil-Hyun Yoon, Hyung Hee Cho

C106 Experimental Study of High Temperature Wear Resistant Coatings for Gas Turbine Component
Hideyuki Matsuoka, Nobuo Shinohara, Yuji Sugita, Kunihiro Ichikawa, Hideyuki Arikawa, Kazuya Nishi

Turbine-3  16:30-17:55
Chair : Naoyuki Yamashita, Anzhong Jiang

C107 Outline of the Unit 4-1 Train of Our Higashi Niigata Thermal Power Station and Operating Records
N. Endou, N. Sakuma, S. Ohno, Y. Nishimura, N. Fujita

C108 Excellent Experience of the 1050MW Steam Turbine with Highest Temperatures 600/610° and Further Application Technology Up to 630°
Yoshinori Tanaka, Yoshikuni Kadoya, Takashi Nakano, Yoshihiro Tarutani, Koji Tanaka

C109 Modernization of Nuclear and Fossil Steam Turbines Using Siemens Technology
Ralf M. Bell, Chris Briggs, Andreas Feldmueller

Room D

Boiler-1  13:10-14:35
Chair : Tatsuo Ino, Daolin Li

D101 Add Limestone for Desulfuration Effect on CFB Boiler Efficiency
Yigong Zhou

D102 Features and Operational Results of Biomass Fired Bubbling Fluidized Bed Boiler
Isao Torii, Yoshihisa Arakawa, Hitoji Yamada, Tatsuo Yokoshiki, Hiroshi Ohtani

D103 Effect of Different Operation Parameters on Desulfurization Efficiency with New Multi-Stage Liquid Curtain Spray-Abstersion Method
Weiguo Pan, Quan Lin, Puyan Zheng, Zhangguo Hua, Jianrong Sun, Maode Li
Boiler-2 14:50-16:15

Chair: Tatsuo Ino, Daolin Li

D104 Updated Low NOx Combustion Technologies for Boilers, 2003
Takanori Yano, Kaz Sakai, Kenji Kiyama, Osamu Okada, Kenichi Ochi

D105 Cold Model Aerodynamical Test of Air-Staged Combustion in a Tangential Firing Utility Boiler
Huijuan Zhang, Zhengqiang Gao, Ke Zhao, Ming Tao, Qulan Zhou, Shi-en Hui, Tongmo Xu

D106 HBC Advanced 600MW Subcritical Utility Boiler
Lei Xue, Zhong-ming Yang, Ming-ren Liu

Boiler-3 16:30-17:55

Chair: Isao Kataoka, Defu Che

Keynote

D107 The Estimated Hydrodynamic Performance of the Supercritical 900MW Boiler
Daolin Li, Yunliang Chen, Guoxiong Chen, Weiming Shi

D108 Boiling Heat Transfer Characteristics with Highly Wettable Heated Surface under Forced Convection
Conditions
Toru Mitsutake, Akio Sayano, Fumihisa Kano, Tetsuo Oosato, Miyuki Akiba, Shinichi Morooka

D109 Effectiveness of Control Measures on the Dynamic Behaviour of Once Through Heat Recovery Steam
Generators
D. Hein, Th. Weiss

Room E

Combustion-1 13:10-14:35

Chair: Masashi Katsuki, Weiping Yan

E101 Low NOx Combustion System for Heavy Oil (2nd Report)
Noriaki Nishiyama, Koji Taniguchi, Takayuki Aoki, Hideki Sasaki

E102 Clean Combustion of Heavy Oils with High Temperature Air Combustion Technology
Kunio Yoshikawa, Nobuo Shimo, Masashi Satoh, Minoru Yoneyama

E103 Test for Regeneration of Used Fire-Resisting Oil by Pulverized Coal Ash
Zhi Li

Combustion-2 14:50-16:15

Chair: Masashi Katsuki, Weiping Yan

E104 An Experimental and Numerical Study of Spray Characteristics on Multi-Component Fuel
Kwang-Jae Myong, Motoyuki Arai, Tomoyuki Tanaka, Jiro Senda, Hajime Fujimoto

E105 The Clarification of Fuel-Vapor Concentration on the Process of Initial Combustion and Soot Formation in a
DI Diesel Engine
Fumiya Koto, Tasuku Yanagimoto, Kazuhiro Mori, Jiro Senda, Hajime Fujimoto

E106 Numerical Simulation of Fuel Droplet Extinction Due to Forced Convection
Daniel N. Pope, George Gogos

Combustion-3 16:30-17:55

Chair: Isao Torii, Huachun Zhou

E107 Effect of Gas Composition of Reducing Atmosphere on Coal Ash Melting Behavior in Coal Gasifier
Y. Oki, J. Inumaru

E108 Experiments and Single Photon Absorption Analysis on ArF Laser-Ignition on CH4-Air Mixture at High
Temperature and High Pressure
Takeshi Saito, Kyoji Shinotsuka, Hirohide Furutani, Sanyo Takahashi

E109 Thermodynamic Analysis and Experimental Investigation into Nonflame Combustion Technology (NFCT)
Using Thermal Cyclic Carrier
Fang He, Hua Wang, Yongnian Dai

Room F

Operation & Maintenance-1 13:10-14:35

Chair: Kenji Morimoto, Yoshihiro Sakai

F101 Application of Potential Drop Technique to the Inspection of Welded Boiler Pressure Parts
Seiichi Hamada, Hideo Iida, Hiroshi Ozaki

F102 Failure Diagnosis Technique and Residual Life Evaluation Models Investigation of Power Boiler Tube
Based on Failure Mechanisms
Hongkai Liao, Hua Yang, Bin Ma, Guogang Shu, Yaojun Li, Changxin Fan

F103 Development of Ultrasonic Flaw Detection Equipment for Inspection of Dovetails of Low-Pressure Turbine
Rotors
Operation & Maintenance-2  14:50-16:15
Chair : Kenji Morimoto, Yoshihiro Sakai
F104 Failure Analysis of Gas Turbines - Procedures and Case Studies
   Rakesh K. Bhargava, Cyrus B. Meher-Homji
F105 Virtual Sensor of the Steam Turbine Unit Analysis and Diagnosis System and Its Input Parameter Optimization
   Niansu Hu, Yafei Huangfu, Yu Zhao, Sheng Hu
F106 Recent Damaging in Power Plant Events - Detection, Analysis and Lessons Learned
   Charles J. Mozina

Operation & Maintenance-3  16:30-17:55
Chair : Ryohei Yokoyama, Rakesh K. Bhargava
F107 Diagnosis of Thermal Efficiency of Combined Cycle Power Plants Using Optical Torque Sensor
   Shuichi Umezawa, Hajime Obikawa
F108 FREEDOM-A Fossil Power Plant Maintenance Strategy Optimization System
   Hirotoshi Matsumoto, Nobuhiko Nishimura, Fumitoshi Sakata, Yasuharu Chuman,
   Kimihiko Tominaga, Akira Shiibashi
F109 Real-Time Power Plant Performance Monitoring
   Sastry Munukutla, Daolin Li
Tuesday 11 November 2003

Room A

Distributed Energy-4  9:00-10:25
Chair : Takemi Chikahisa, Tadashi Tanuma
A201 AHAT: Gas Turbine Power Generation Technology Using High Humidity Air
Shigeo Hatamiya, Katsuhiko Sagae, Nobuhiro Seiki
A202 Optimal Operation of a Gas Turbine Cogeneration Plant with Steam Injection and Inlet Air Cooling
Atsushi Nishino, Haruyuki Yamamori, Ryoei Yokoyama, Koichi Ito
A203 Development of Compact Superheater for Radial Steam Turbine
Kazuto Okada, Hideaki Kuwabara, Toshiya Miyake

Distributed Energy-5  10:40-12:05
Chair : Takemi Chikahisa, Tadashi Tanuma
A204 Development of a 150 kW Microturbine System
S. Nakano, S. Dodo, M. Yagi, K. Tsubouchi, Y. Hayasaka, M. Watanabe, T. Inoue, M. Takagi,
M. Ichinose, M. Takahashi
A205 Proposal of the Atmospheric Pressure Turbine (APT) and High Temperature Fuel Cell Hybrid System
Y. Tsujikawa, K. Kaneko, J. Suzuki
A206 Medium-Pressure Hydrogen-Oxygen Combustion Turbine Systems for Utilization of Industrial Waste Heat
Hirohide Furutani, Nikolaj Uzunow

Distributed Energy-6  13:10-14:35
Chair : Nobuya Nishimura, Yoshinori Hisazumi
A207 Interconnection Protection of Distributed Generation
Charles J. Mozina
A208 Basic Characteristics of Performance and Strategy to Maximize CO₂ Reduction Extent of Cogeneration Systems
Takemi Chikahisa, Yukio Hishinuma
A209 Availability of Ice Storage System in the Operational Planning of ACGS Based on Modeling Components with Delay
Masao Tomizawa, Keisuke Takeshita, Yoshiharu Amano, Takumi Hashizume

Renewable Energy-1  14:50-16:15
Chair : Hiro Yoshida, Hyung Hee Cho
Keynote
A210 Recent Trends about Wind Turbines
Yoshinori Ueda, Kousuke Inoue
A211 Explicit Design Formulas of Efficient Wind Generators
Karam Y. Maalawi, Mervat A. Badr
A212 Large Eddy Simulation of Flowfields around NACA0012 and Wind Turbine Airfoils at High Angle of Attack
Nobuhiko Yamasaki, Tomohiko Iwashita

Renewable Energy-2  16:30-17:55
Chair : Yuso Oki, Takashi Yoshiyama
A213 Prospect on New Fuel BCDF (Bio-Carbonised-Densified-Fuel): The Effect of Semi-Carbonization
Manabu Fuchihata, Takako Honjo, Tamio Ida, Hiroshi Sano
A214 Modeling of Biomass Combustion in a Fluidized Bed
R. Sreenivasa, K. Aung
A215 The Moisture Estimation of Biomass Fuel: A Neural Network Based Method
Yuefeng Yu, Roland Berger, Klaus R. G. Hein

Room B

Waste-to-Energy-3  9:00-10:25
Chair : Isao Torii, Huachun Zhou
B201 Development of New Typied Waste-to-Energy Technologies
Kichiro Ogawa, Naoto Asami, Satoshi Atoji, Mizuhiiko Tanaka, Masaki Tajima
B202 In-Furnace Reduction of HCl Emission by Alkali-Based Sorbents during PVC Combustion in Fixed Bed
S.-Q. Li, Q. Yao, Y. Chi, J.-T. Huang, J.-H. Yan, K.-F. Cen
B203 Performance Demonstration of Power Generation from Solid Wastes by Combination of Pyrolysis and Steam Reforming
Taijin Min, Kunio Yoshikawa, Hiroaki Shingu, Tsutomu Hara, Hironao Matsubara

Thermal-Hydraulics-1  10:40-12:05
Chair : Masuo Kaji, Dietmar Hein

B204 Breakup of a Liquid Bubble Due to Airstreams for Power Engineering
Teruhiko Yoshida

B205 Distribution of Void Fraction and Heat Transfer Coefficient around Vertical Tube Banks in Fluidized Bed
Shuji Furui, Masakazu Tsubuki, Hisashi Umekawa, Mamoru Ozawa, Nobuyuki Takenaka

B206 Experimental Study on Convection-Condensation Heat Transfer Characteristics of High Moisture Flue Gases
Defu Che, Yaodong Da, Zhengning Zhuang

Thermal-Hydraulics-2  13:10-14:35
Chair : Masuo Kaji, Dietmar Hein

B207 Experimental Study on Adiabatic Counter-Current Two-Phase Flow in Inclined Pipe (Effect of Pipe Inclination on the Onset of Flooding and Fundamental Parameters)
Deendarlianto, Akiharu Ousaka, Akira Kariyasaki, Koji Kusano

B208 Critical Power Correlation for Tight Lattice Bundles
W. Liu, M. Kureta, T. Okubo, H. Akimoto

B209 The Experimental Study of Enhanced Heat Transfer with Ni-Based Implanted Spiral Finned Tubes: Thermal Characteristics
Feng-zhong Sun, Xin-yuan Huang, Nai-hua Wang, Yue-tao Shi, Ya-ming Ping

Thermal-Hydraulics-3  14:50-16:15
Chair : Masahiro Osakabe, Masafumi Katsuta

B210 Measurement Method of Refrigerant Mass Fraction in Ammonia Absorption Refrigerator
Keisuke Takeshita, Masao Tomizawa, Yoshiharu Amano, Takumi Hashizume, Toshitaka Takei

B211 Preparation and Characterizations of a Heat Storage Material Combining Porous Metal with Molten Salt
Hua Wang, Fang He, Yongnian Dai, Jianhang Hu

B212 Heat Transfer Characteristic of Compact Evaporative Heat Exchanger
Kenji Yoshida, Masahiro Awane, Testuo Moriguchi, Isao Kataoka

Thermal-Hydraulics-4  16:30-17:55
Chair : Masahiro Osakabe, Masafumi Katsuta

B213 Three-Dimensional Numerical Analyses of Liquid-Metal Magnetohydrodynamic Flow in Magnetic-Field Outlet-Region
Hiroshige Kumamaru

B214 Magnetic Power Loss of Magnetic Driving Submersible Pump
Fengyu Yang, Xueyi Qi, Xijin Ma, Yi Liu, Zhengyan Yu

B215 Fluid Flow and Heat Transfer of Natural Convection around Heated Vertical Cylinders (Effect of Cylinder Diameter)
Fumiyoshi Kimura, Tatsuhiko Tachibana, Kenzo Kitamura, Tsutomu Hosokawa

Room C

Turbine-4  9:00-10:25
Chair : Ralf M. Bell, Jong-Po Park

Keynote
C201 Steam Turbine in the New Century
Yoshiki Kadoya

C202 A Steam Turbine Mathematical Model for On-Line Optimization of Load Distribution
Krzysztof Badyda

C203 Study on Low Cycle Fatigue Life Assessment with Safety Confidence of Large Steam Turbine Components
Jing-yuan Shi, Yu Yang, Qing Sun, Xian-yue Hu

Turbine-5  10:40-12:05
Chair : Ralf M. Bell, Jong-Po Park

C204 Analysis and Measurement of Resonant Vibratory Stress of Integral Shroud Blade for Steam Turbine
Yasutomo Kaneko, Kazushi Mori, Naoto Tochitani

C205 Reaction Type Compact HP/IP Combined Turbine and LP Turbine with 48-Inch/40-Inch Steel Blades
Hiroharu Ohyma, Yoshihiro Miyawaki, Takashi Nakano, Keizo Tanaka

C206 A Method Evaluating Service Life of Steam Turbine Rotor Based on Artificial Neural Network
Chun Ye, Hanping Chen, Anzhong Jiang, Jianhua Xin, Xing Jin, Boying Yuan, Haiqing Zhai
Turbine-6  13:10-14:35

Keynote
C207  Applications of Higher-Order Accurate Computational Fluid Dynamic Method to Steam Turbine Blade Designs
Xin Yuan, Zhirong Lin, Tadashi Tanuma, Sakae Kawasaki, Jun-ichi Tominaga, Yuyang Lai

C208  Application of CFD to Performance Evaluation of Steam Turbine
Naoto Sakai, Hidenori Yoshida, Tetsuya Harada, Yoshinobu Imai

C209  Aerodynamic Design and Development of Steel 48/40Inch Steam Turbine LP End Bucket Series
Douglas Hofer, Jonathon Slepski, Tadashi Tanuma, Tohru Shibagaki, Naoki Shibukawa, Tsuguhisa Tashima

Turbine-7  14:50-16:15

Keynote
C210  Cutting Edge Steam Turbine Technology Ready for the Challenges of Future Markets
Uwe Hoffstadt, Wilfried Ulm

C211  Vibration Analysis of Blade Groups for Steam Turbines
Jong-Po Park, Seok-Ju Ryu, Zili Xu

C212  Aerodynamic Stability of Continuous Cover Blade Structure
Yutaka Yamashita, Kiyoshi Namura, Eiji Saito, Yoshi Shikano, Yoshiaki Yamazaki

Power-Related Topics-2  16:30-17:55

C213  Automatic Detection - Localization of Fault Point on Waveform and Classification of Power Quality Disturbance Waveshape Fault Using Wavelet and Neural Network
Chosok Dilokratanatrakool, Piyasawat Navaratana Na Ayudhya, Tasanee Chayavanich, Cherdchait Prapanavarat

C214  Development of Utilization of CFB Boiler Ash
Dengxin Li, Meng Xu, Junfu Lu, Qing Liu, Jiangsheng Zhang, Guangxi Yue, Jiexi Li

C215  Steam-Water Distribution Standard Equation of Thermo System for Coal-Fired Power Plant
Chunfa Zhang, Liping Li, Mingzhi Zhang, Quangui Fan

Room D
Boiler-4  9:00-10:25

Chair : Shuichi Umezawa, Karsten Kusterer

D201  Diffusion Combustion in a Tube-Nested Combustor
Tetsuji Seko, Ryosuke Matsumoto, Yoshitomo Shintani, Isao Ishihara, Mamoru Ozawa

D202  The Influence on the Angular Momentum Flux by Changing the Sequence of the Whirl-Depressing Air Shifa Ding, Pingyuan Liu, Chao song Chen, Xingsheng Hu, Li Tao, Handing Cao, Jinyuan Xu

D203  Separated Vortices Generated by Spiral Up Flow and Thin-Plate Airfoils
Yong-fa Diao, Wei-wei Jin, Bo-shu He, Jin-yuan Xu, Chang-he Chen

Boiler-5  10:40-12:05

Chair : Shuichi Umezawa, V. I. Baranenko

D204  Design and Construction of IHI Tower-Type Boiler for New No.1 Unit of Isogo Thermal Power Station
Shinya Ohashi, Tetsuya Iwasaki, Yasufumi Mochizuki, Kunihiko Obara

D205  Visualization of 2-D Temperature Distribution in a Pulverized-Coal-Fired Furnace by Flame Image Processing
Chun Lou, Hao Liu, Zhi-wei Jiang, Huai-chun Zhou, Yao-ping Liu, Qian-feng Li, Ning Zhang

D206  Simulation on an Optimal Combustion Control Strategy for 3-D Temperature Distributions in PC-Fired Utility Boiler Furnaces
Xi-fen Wang, Da-wei Wang, Huai-chun Zhou, Jin He, Zheng-lin Pei, Chuan-xin Lu

Boiler-6  13:10-14:35

Chair : Nobuo Okita, Baotian Zhu

D207  Development of Low-NOx Emission DME (Dimethyl Ether) Combustor
Ryosuke Matsumoto, Isao Ishihara, Mamoru Ozawa, Keizo Imahori

D208  Three Dimensional Numerical Simulation of the Aerodynamic Field for W-Shape Flame Boiler Furnace
Qisheng Xu, Bin Ma, Meng Luo, Tinghua Zen

D209  Experimental Research of Temperature Distribution in Furnace with Swirl Burners
Qu-lan Zhou, Tong-mo Xu, Shi-en Hui
Boiler-7  14:50-16:15
Chair : Nobuo Okita, Baotian Zhu
D210 Low NOx Combustion Method of Slag-Tap Firing Boiler (Teilkammer Boiler)
Yoshitaka Oomura, Takashi Yoshiyama, Masaharu Yamamoto
D211 Experimental Study on the Improved Horizontal Bias Burner
Tai-sheng Liu, En-qing Ye, Zhong-yong Deng, Ben-rong Yao, Jin-yuan Xu
D212 Experimental Study on Tangential Circle Characteristic in High Ratio of Length and Width, Hexagonal
Arranged Utility Burner
Xinyu Cao, Kai Zhao, Liang Yang, Ning Ding, Xianqiao Zhao, Junhu Zhou, Zhenyu Huang, Jianzhong Liu, Kefa Cen

Environmental Protection-1  16:30-17:55
Chair : Kahoru Torii, Ryoichi Kurose
D213 Development and Application of Flue Gas Carbon Dioxide Recovery Technology by Chemical Absorption
Method
Yasuyuki Yagi, Takashi Nojo, Tomio Mimura, Masaki Iijima, Ryuji Yoshiyama
D214 Behavior of Condensate of Carbon Dioxide and Heat Transfer in Subcritical Region
Koichi Takemori, Isao Ishihara, Ryosuke Matsumoto, Hironori Mori
D215 Discussion of Some Questions in FGD Engineering
Degang Ren

Room E
Combustion-4  9:00-10:25
Chair : Jiro Senda, Rajender Gupta
E201 High Tar Reduction with Porous-Particles for Low Temperature Biomass Gasification: A Consideration of
Mechanism of Capacitance Effect
Tomoaki Namioka, Kunio Yoshikawa, Yoshizo Suzuki, Hiroyuki Hatano
E202 Wood Biomass as Substitute for Coal in Thermal Power Plants
Emi Yoshitaka, Takashi Kiga
E203 Preliminary Efficiency Evaluation of Sludge and Coal Co-Gasification Power Plants
Xun Wang, Yunhan Xiao

Combustion-5  10:40-12:05
Chair : Jiro Senda, Rajender Gupta
E204 Pressurized Fluidized Bed Combustion of Sewage Sludge (Energy Recovering from Sewage Sludge by
Power Generation System)
Yoshizo Suzuki, Tomoyuki Nojima, Akihiko Kakuta, Hiroshi Moritomi
E205 Tar and Soot in Low Calorific Value Gas Combustion
M. C. van der Wel, W. de Jong, H. Spliethoff
E206 Lab Test of Bituminous Coal Reburning for NO Reduction
Weiping Yan, Zhengyang Gao, Zhong Liu

Combustion-6  13:10-14:35
Chair : Toshikazu Kadota, George Gogos
Keynote
E207 Using Light Fluctuation Method to Study the Gas-Solid Burner Flow
E208 Prediction of Influence of Operating Conditions on Gasification Performance of Entrained Flow Air Blown
Coal Gasifier
Hiroaki Watanabe, Jun Inumaru, Saburo Hara, Maromu Otaka
E209 Application of the A-PM Burner for Low-Combustibility Petroleum Coke
Ryuhei Takashima, Akiyasu Okamoto, Tokushi Maruta, Hitoji Yamada, Hiroshi Fujii

Combustion-7  14:50-16:15
Chair : Toshikazu Kadota, George Gogos
E210 Experimental Study on the Particle Behaviors and the Structure of a Turbulent Pulverized Coal Flame
Seung-Min Hwang, Ryoichi Kurose, Kazutoshi Oomagari, Fumiteru Akamatsu, Hirofumi Tsuji, Hisao Makino, Masashi Katsuki
E211 Staged Sorbent Injection Under Air-Staged Combustion Conditions for SO2 Reduction in a Pulverized Coal
Fired Boiler
Jun Cheng, Xiang Zhao, Hongyu Fan, Xinyu Cao, Zhijun Zhou, Jianzhong Liu, Junhu Zhou, Kefa Cen
E212  Influence of Two-Stage Air Injection Conditions on NOx and Unburned Carbon of Sub-Bituminous Coal Combustion  
M. Ikeda, H. Makino, H. Morinaga, K. Higashiyama

Fuel Utilization-1  16:30-17:55  
Chair : Masami Ashizawa, Mitsuru Inada

E213  Aspect of Emulsified Fuel Droplet Combustion in an Experimental Chamber  
Tao Zhang, Tatsuro Tsukamoto, Kenji Ohe, Hiroshi Okada

E214  Application of CWS Combustion Technology to Power Plants in Guangdong Province of China  
Jiliang Zeng, Xinyu Cao, Xiang Zhao, Jianzhong Liu, Junhu Zhou, Kefa Cen

E215  Retrofitting and Operation Adjusting of a 230 T/H Pulverized Coal Boiler for Combusting Coal Sludge  
Guangmin Li, Guangjian Li, Hao Liu, Hao Wu, Jianguo Qiu

Room F

Fuel Cell-1  9:00-10:25  
Chair : Yukio Hishinuma, Jans Andries

F201  Development of MOLB Type SOFC  
Masatoshi Hattori, Hitoshi Miyamoto, Koichi Takenobu

F202  Multi-Stage Model for Indirect Internal Reforming Type Solid Oxide Fuel Cells  
Tae Won Song, Jae Hwan Kim, Sung Tack Ro, Kenjiro Suzuki

F203  Study on Simulation Model for Tubular-Type Solid Oxide Fuel Cells  
Hiroshi Shigefuji, Akio Ikebata, Hiroaki Takeuchi, Susumu Aikawa

Fuel Cell-2  10:40-12:05  
Chair : Yukio Hishinuma, Jans Andries

F204  Electricity Generating 10kW-Class MCFC Stack Performance Fuelled by Various Gas Compositions  
F. Yoshiba, Y. Mugikura, Y. Izaki, T. Watanabe, T. Okuda, Y. Arai, M. Watanabe, Y. Kuno,  
T. Matsuyama

F205  300kW-Class MCFC Power Plant and Commercial Plan of IHI  
Hidehisa Tani, Masaaki Tooi, Toshiya Matsuyama, Kazuhiro Ito, Shogo Sonoda,  
Yoshihiro Aimono

F206  The Structure of Catalyst Layers and Cell Performance in Proton Exchange Membrane Fuel Cell (PEMFC)  
Hiroyuki Inoue, Hirofumi Daiguiji, Eiji Hihara

Fuel Cell-3  13:10-14:35  
Chair : Takao Watanabe, Hiroumi Fujimoto

F207  Optimization of the Flow-Field for PEMFCS and Prospect from Visualization of Temperature Distribution  
Yasushi Kondo, Hirofumi Daiguiji, Eiji Hihara

F208  The Design and Performance of a PEFC at a Temperature below Freezing  
Yukio Hishinuma, Takemi Chikahisa, Fumio Kagami, Tomohiro Ogawa

F209  Development of 5kW PEFC System  
Hiroaki Ohara, Yasuo Yamanaka, Minoru Mizusawa, Akira Suzuki, Kazunori Kobayashi

Fuel Cell-4  14:50-16:15  
Chair : Takao Watanabe, Hiroumi Fujimoto

F210  Fuel Cell Power Units Using Biogas from Garbage  
Hisanobu Yokoyama, Koji Akiyama, Hirao Kudo

F211  Flame Stability Limit and Exhaust Emissions of Low Calorific Fuel Combustion in Turbulent Diffusion  
Combustor for a Small-Scale Fuel Cell  
Hidenori Koseki

F212  Influence of Fuel Gas Components on SOFC Operation Downstream of a Thermochemical Biomass  
Gasifier  
J. Andries, P.V. Aravind, H. Spliethoff

Operation & Maintenance-4  16:30-17:55  
Chair : Shin Yoshino, Masafumi Sasaki

F213  Plant Maintenance Optimization on Thermal Power Plant  
Satoshi Otuka, Hideyuki Ishigami, Kenji Takahashi, Satoshi Yamamoto

F214  Online Monitoring System for Safety Performance of Superheater and Reheater of Utility Boiler  
Fang Lu, Yonghao Luo

F215  Service Life Management and Transient Operation Analysis for 300MW Steam Turbine Units  
Jianhua Xin, Anzhong Jiang, Chun Ye, Haiqing Zhai, Beying Yuan, Xing Jin
Wednesday 12 November 2003

Room A

Power-Related Topics-3  9:00-10:25
Chair : Yoshifumi Kato, Sastry Munukutla
A301 Development of the Equipment to Measure Voltage at the Momentary Discharge for Stationary Lead-Acid Batteries
   Hiroshi Okamoto, Tsuneki Kogi, Fumihiko Ohashi, Noriya Shingu
A302 Development of a Redox-Flow Battery - Various Applications of Vanadium Redox-Flow Battery
   Nobuyuki Tokuda, Yasumitsu Tsutsui
A303 Current Change and Theoretical Analysis on Grinding Capacity Adjustment of Ball Mill
   Yueliang Shen, Hongkai Liao

Renewable Energy-3  10:40-12:05
Chair : Yoshiharu Amano, Hirohide Furutani
A304 Development of an Environment Symbiotic Micro Cogeneration System for Sustainable Marine City
   Nobuya Nishimura, Tomohiro Nomura, Hiroyuki Iyota, Yoshiyuki Fujii, Takatoshi Sakaguchi
A305 Annual Estimations of Electric and Thermal Energy Balances and Amount of Carbon Dioxide Emissions in Renewable Electric-Thermal Hybrid Power Systems
   Masafumi Sasaki, Noboru Endoh, Katsuhiro Doi
A306 Metallic Glasses as a Hydrogen Accumulators-Thermal Stability of Metallic Glasses
   Marta Dus - Sitek, Eugeniusz Sitek

Room B

Component & Equipment-1  9:00-10:25
Chair : Toshiya Miyake, Nobuhiko Yamasaki
B301 Hybrid Gas Bearing with Water Evaporation from Ultra-Fine Porous Medium
   Hideo Yoshida, Hideomi Ishibe, Hiroki Matsui, Takeshi Egawa, Motohiro Saito, Satoshi Yoshitomi
B302 Theoretical Analysis of Sound Multiple Scattering by Cylindrical Tubes in Boiler
   Liansuo An, Xiaopeng Tong, Genshan Jiang, Songling Wang
B303 The Monitoring Model and its Experimental Study of Fan Performance Based on Hybrid Neural Network
   Liansuo An, Haiyan Hu, Songling Wang, Junhu Hou, Xiongjun Yuan

Component & Equipment-2  10:40-12:05
Chair : Toshiya Miyake, Liansuo An
B304 Development of Components for Chemically Recuperated Gas Turbine with Natural Gas Steam-Reforming
   Takao Nakagaki, Katsuya Yamashita, Masahiko Yamada
B305 Selection of Condensate Polishing System for Huozhou Power Plant Second Phase Project
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<tr>
<td><strong>Component &amp; Equipment-3</strong></td>
<td>The Measurement Method of Efficiency for Auxiliary Steam Turbine Driven Feed Pump</td>
<td>13:10-14:35</td>
<td>Jingyan Liu, Honghua Hu</td>
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<tr>
<td><strong>Component &amp; Equipment-3</strong></td>
<td>Effect of Non-Condensable Gas Mass Fraction on Condensation Heat Transfer for Water-Ethanol Vapor Mixture</td>
<td>13:10-14:35</td>
<td>Shixue Wang, Yoshio Utaka</td>
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<tr>
<td><strong>Component &amp; Equipment-4</strong></td>
<td>Study on Condenser Fault Diagnosis via ANN and Fuzzy Math</td>
<td>14:50-16:15</td>
<td>Xue-lei Zhang, Song-ling Wang, Lan-xin Zhou, Hai-ping Chen</td>
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**Room C**

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<tr>
<td><strong>Power System-1</strong></td>
<td>Compact Condensing Heat Exchanger for Exhaust Gas from Fuel Cell</td>
<td>9:00-10:25</td>
<td>Masahiro Osakabe, Jin Quin</td>
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<tr>
<td><strong>Power System-1</strong></td>
<td>Relation between Heat Transfer and Frictional Pressure Loss for Flow Boiling of Water</td>
<td>9:00-10:25</td>
<td>Masuo Kaji, Toru Sawai, Koji Mori</td>
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<tr>
<td><strong>Power System-1</strong></td>
<td>Two Kind of Rotating Stall Characteristic Analysis of Centrifugal Fans Based on Harmonic Wavelet</td>
<td>9:00-10:25</td>
<td>Songling Wang, Junhu Hou, Liansuo An</td>
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<tr>
<td><strong>Keynote</strong></td>
<td>System Outline and Operational Status of Karita Power Station New Unit 1 (PFBC)</td>
<td>9:00-10:25</td>
<td>A.Asai, K. Izaki, Y. Egami, K. Tsuji, S. Kumagai, Y. Nishijima</td>
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<tr>
<td><strong>Keynote</strong></td>
<td>The Calculating Method of Thermal System for the Coal-Fired Power Unit Base on Mass Unit</td>
<td>9:00-10:25</td>
<td>Hai-ping Chen, Chun-fa Zhang, Ji-zhen Liu, Liang-yu Ma, Shu-fang Zhang</td>
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<tr>
<td><strong>Keynote</strong></td>
<td>Research on the Application of the Combined Cycle Used in the Power Plant for Ship Propelling Systems</td>
<td>9:00-10:25</td>
<td>Bin Xia, Shigeo Tanaka, Takeshi Nakazawa, Hideaki Sugita</td>
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<td><strong>Power System-2</strong></td>
<td>250MW Air Blown IGCC Demonstration Plant Project</td>
<td>10:40-12:05</td>
<td>Shozo Kaneko, Yoshitaka Ishibashi, Jun Wada</td>
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<tr>
<td><strong>Power System-2</strong></td>
<td>The Development of IGCC in China</td>
<td>10:40-12:05</td>
<td>Baotian Zhu, Shirang Wei, Junfeng Xiao</td>
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<tr>
<td><strong>Power System-2</strong></td>
<td>The Development of Coal Energy Application for Gas, Liquid &amp; Electricity EAGLE</td>
<td>10:40-12:05</td>
<td>Sadao Wasaka, Masao Sotooka, Keichi Kobori</td>
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**Power System-3**

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<td><strong>Keynote</strong></td>
<td>Sustainable Energy Supply in Europe - Strategies and Consequences for Research and Development</td>
<td>13:10-14:35</td>
<td>Klaus R. G. Hein</td>
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<tr>
<td><strong>Keynote</strong></td>
<td>Research and Development for Gas Turbine System in GTHTR300</td>
<td>13:10-14:35</td>
<td>Kazuhiko Kunitomi, Shoji Katanishi, Shoji Takada, Takakazu Takizuka, Xing Yan, Shinichi Kosugiya</td>
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**Power System-4**

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<tr>
<td><strong>Keynote</strong></td>
<td>Large Turbine Generating Units of Three Gorges Power Plant</td>
<td>14:50-17:20 (16:15-16:30 Break)</td>
<td>Haifeng Cheng</td>
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Rakesh K. Bhargava
C312 The Research of Calculating Method of Heat Economy of Auxiliary System for the Coal-Fired Power Unit
Hai-ping Chen, Chun-fa Zhang, Ji-zhen Liu, Jiang-long Guo, Liang-yu Ma
C313 Study about SOFC-Gas Turbine Combined Cycle
Toru Takahashi, Eiichi Koda, Tsunehisa Sasaki, Hiroyuki Yoshida, Toru Inagaki
C314 A Study of Renewable Energy Hydrogen-Fired Power Generation Plants
Mohammed Ghiyath Soufi, Terushige Fujii, Katsumi Sugimoto, Hitoshi Asano

Room D
Environmental Protection-2  9:00-10:25
Chair : Hiroshige Kumamaru, Weiguo Pan
D301 LCA Environmental Load Minimization for Operating Different Cogeneration Systems
Seizo Kato, Yucho Sadamichi, Anugerah Widiyanto
D302 LCA-NETS Evaluation of Coal-Fired and Natural Gas-Fired Power Generations in Thailand
Sate Sampattagul, Seizo Kato, Tanongkiat Kiatsirirop, Anugerah Widiyanto
D303 Operation and Optimization of Wet Limestone/Gypsum FGD System
Tinghua Zeng, Bin Ma, Yongjin Liao, Li Wang, Hua Yang

Environmental Protection-3  10:40-12:05
Chair : Hiroshige Kumamaru, Weiguo Pan
D304 Development of Double-Contact-Flow Scrubber for Flue Gas Desulfurization
T. Fujimori, H. Nakashoji
D305 Micro-Pore Structure and Desulphurization Characteristics of Ca-Based Absorbents
Shiqing Cheng, Jianli Zhao, Guanpeng Li, Kuihua Han, Chunmei Lu
D306 Experiments and Mathematical Model on Flue Gas Desulfurization of Circulating Fluidized Bed
Xu Han, Hongming Tang, Hai Jiang, Kefa Cen

Environmental Protection-4  13:10-14:35
Chair : Kahoru Torii, Michitaka Ikeda
D307 Poisoning Kinetics by Arsenic on the De-NOx Catalyst
Masayoshi Ichiki
D308 The Mechanism and Application of DeNOx Technology for Coal Fired Utility Boilers
Honghui Xu, Daolin Li
D309 Low NOx Emission with Ammonia Injection during Coal Combustion
Zhihua Wang, Junhu Zhou, Hao Zhou, Xinyu Cao, Xiang Zhao, Jianzhong Liu, Zhenyu Huang, Zhijun Zhou, Jun Cheng, Kefa Cen

Materials  14:50-16:55 (16:15-16:30 Break)
Chair : Shin Yoshino, Ichiro Kajigaya
D310 Characteristics of the Welded Joints of Ferritic Heat Resistant Pipe and Tube Steels for Advanced Steam Power Plants
D311 Improvement in Creep Strength of Precipitation Strengthened 15Cr Ferritic Steel by Controlling of Carbon and Nitrogen Contents
Yoshiaki Toda, Toshio Takenaka, Hideaki Kushima, Kazuhiro Kimura, Fujio Abe
D312 Influence of Chemical Composition and Heat Treatment Condition on Impact Toughness of 15Cr Ferritic Creep Resistant Steel
Kazuhiro Kimura, Yoshiaki Toda, Hideaki Tohyama, Toshio Takenaka
D313 Corrosion Resistance of Materials for Geothermal Steam Turbines
Yoshihiro Sakai, Mitsuo Yamashita, Kunio Shiokawa, Li-Bin Niu, Hiroshi Takaku

Room E
Fuel Utilization-2  9:00-10:25
Chair : Kunio Yoshikawa, Yong Chi
E301 Innovative Coal Gasification in Supercritical Water
Wataru Saiki, Yutaka Usami, Kazuaki Ota, Takeshi Onoue, Akio Umemura, Hiroshi Tanaka
E302 Gasification Characteristics for Extra Heavy Oil - Refinery Residue Gasification Test Result -
Kazuhiro Kidoguchi, Saburo Hara, Masami Ashizawa, Jun Inumaru
E303 Experimental Investigation of the Transformation of Pyridinic-Nitrogen in Coal during Combustion by Means of Model Compounds
Houzhang Tan, Xiaowei Liao, Ke Zhao
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<td>Kunio Yoshikawa</td>
<td>Rajender Gupta, Tang Lianguang, Changdong Sheng, Terry Wall, Yoshishiko Endou,</td>
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<td>Yong Chi</td>
<td>Takashi Kiga, Graham O'Brien, Zhengyang Gao, Weiping Yan</td>
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<td>E304 Char Morphology from the Automated Reflectogram of a Coal and its</td>
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<td>Implications on Burnout and Ash Formation</td>
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<td>Investigation on Non-Fourier Heat Transfer Effect for Coal Particles under</td>
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<td>Experimental Study on Performance of Combustion and NO Emission for Low</td>
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<td>Volatilization Coals</td>
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<td>Low Volatilization Coals</td>
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<td>Lijun Fang, Shi-en Hui, Hongwei Chen, Weiping Yan, Qulan Zhou, Houzhang Tan</td>
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| Fuel Utilization-4 | 13:10-14:35                                                                   | Masami Ashizawa   | Hidehiko Yamashita, Kunio Yoshikawa, Yoshiro Hashimoto, Kazuhiro Matsuoka        |
|                    |                                                                               | Mitsuru Inada     | Jiahu Li, Weiping Yan                                                           |
|                    | E307 Development of Micro-Gasification and Power Generation System for On-Site|                   | Treatment of Solid Wastes                                                       |
|                    | E308 Experimental Study on Explosive Behaviors of Ultra-Fine Coal Dust        |                   | Jiahu Li, Weiping Yan                                                           |
|                    | E309 The Transition of the Activation Energy of Semi-Char during Oxidation   |                   | Shouyu Zhang, Junfu Lu, Guangxi Yue                                              |

| Fuel Utilization-5 | 14:50-17:20 (16:15-16:30 Break)                                              | Takashi Kiga      | Hidehiko Yamashita, Kunio Yoshikawa, Yoshiro Hashimoto, Kazuhiro Matsuoka        |
|                    |                                                                               | Hua Wang          | Jiahu Li, Weiping Yan                                                           |
|                    | E310 Investigation on SO₂ Emission during the Co-Combustion of MSW and Coal   |                   | Yanhua Liu, Defu Che, Tongmo Xu                                                |
|                    | E311 A New Distinguish Method of Blending Coals Slagging Characteristic        |                   | Yonghua Li, Hongwei Chen, Jizhen Liu, Zhaoping Feng, Jianxun Dong, Qili Huang    |
|                    | E312 Compact Hydrogen Production System for Hydrogen Infrastructure            |                   | Takaaki Asakura, Shigezuki Yamauchi, Takayuki Azuma                             |
|                    | E313 Sustainable Production of Hydrogen Using Thermochemical Gasification of   |                   | Biomass J. Andries, W. de Jong, H. Spliethoff                                   |
|                    | E314 Application of a Soft Computing Method in Judgment on Characteristic of   |                   | Coal Ash Slagging                                                               |
|                    | Coal Ash Slagging                                                             |                   | Jun-jie Gu, Xu-ao Lu, Lu, Lan-ying Zhang, Xiao-yong Zhang                         |

| Room F Operations & Maintenance-5 | 9:00-10:25                                                               | Kuniyoshi Tsubouchi | Koji Tamura, Genroku Nakao, Yoshito Shiraishi, Keizaburoh Yamaguchi            |
|                                  |                                                                         | Haifeng Cheng      | F301 Risk-Based Maintenance (RBM) of Elevated Temperature Pressure Components in Boilers |
|                                  |                                                                         |                   | F302 On-Line Optimization of the Load Distribution in Power Generating Installation |
|                                  |                                                                         |                   | F303 Development of Training Simulator for Refuse Incineration Plants Using Virtual Reality |
|                                  |                                                                         |                   | F304 Simulation Training System for Marine Boiler                              |
|                                  |                                                                         |                   | F305 Turbine-Generator Set Intelligent Fault Diagnosis Method Based on Fast BP Algorithm |
|                                  |                                                                         |                   | F306 Benefits from Upgrading Generator Protection at an Industrial Plant - A Case Study |
|                                  |                                                                         |                   | F307 Dynamic Simulation and Optimization of Start-Up Processes in Combined Cycle Power Plants |
|                                  |                                                                         |                   | F308 Small Disturbance Theory and Its Applications in the Power Plant Thermo-Economic Analysis |
|                                  |                                                                         |                   | F309 Improvement of Engine Reliability and Cost Reduction of Electric Power Generation by a New Lubricating and Fuel Oil System |

| Operations & Maintenance-6      | 10:40-12:05                                                               | Kuniyoshi Tsubouchi | Charles J. Mozina                                                               |
|                                  |                                                                         | Haifeng Cheng      | F304 Simulation Training System for Marine Boiler                              |
|                                  |                                                                         |                   | F305 Turbine-Generator Set Intelligent Fault Diagnosis Method Based on Fast BP Algorithm |
|                                  |                                                                         |                   | F306 Benefits from Upgrading Generator Protection at an Industrial Plant - A Case Study |
|                                  |                                                                         |                   | F307 Dynamic Simulation and Optimization of Start-Up Processes in Combined Cycle Power Plants |
|                                  |                                                                         |                   | F308 Small Disturbance Theory and Its Applications in the Power Plant Thermo-Economic Analysis |
|                                  |                                                                         |                   | F309 Improvement of Engine Reliability and Cost Reduction of Electric Power Generation by a New Lubricating and Fuel Oil System |

|                                  |                                                                         | Charles J. Mozina| F307 Dynamic Simulation and Optimization of Start-Up Processes in Combined Cycle Power Plants |
|                                  |                                                                         |                   | F308 Small Disturbance Theory and Its Applications in the Power Plant Thermo-Economic Analysis |
|                                  |                                                                         |                   | F309 Improvement of Engine Reliability and Cost Reduction of Electric Power Generation by a New Lubricating and Fuel Oil System |
F310  Damage Probability of the Steam Generator Heat Exchange Pipelines in VVER NPP  
V. I. Baranenko, S. G. Oleynik, V. N. Merkushev, O. E. Kostyukov, O. A. Belyakov, A. V. Kumov

F311  The Analysis of Generator Excitation Current Harmonics on Stator and Rotor Winding Fault  
Shuting Wan, Heming Li, Yonggang Li, Zhaofeng Xu, Ershu Xu

F312  Development of Transportable Plasma Spraying System  
Kazuaki Kawamoto, Shizuma Shintani

F313  Rewind of Four Water Cooled Generators in South Korea  
William G. Moore, Edmond Hwang, J. H. Lee