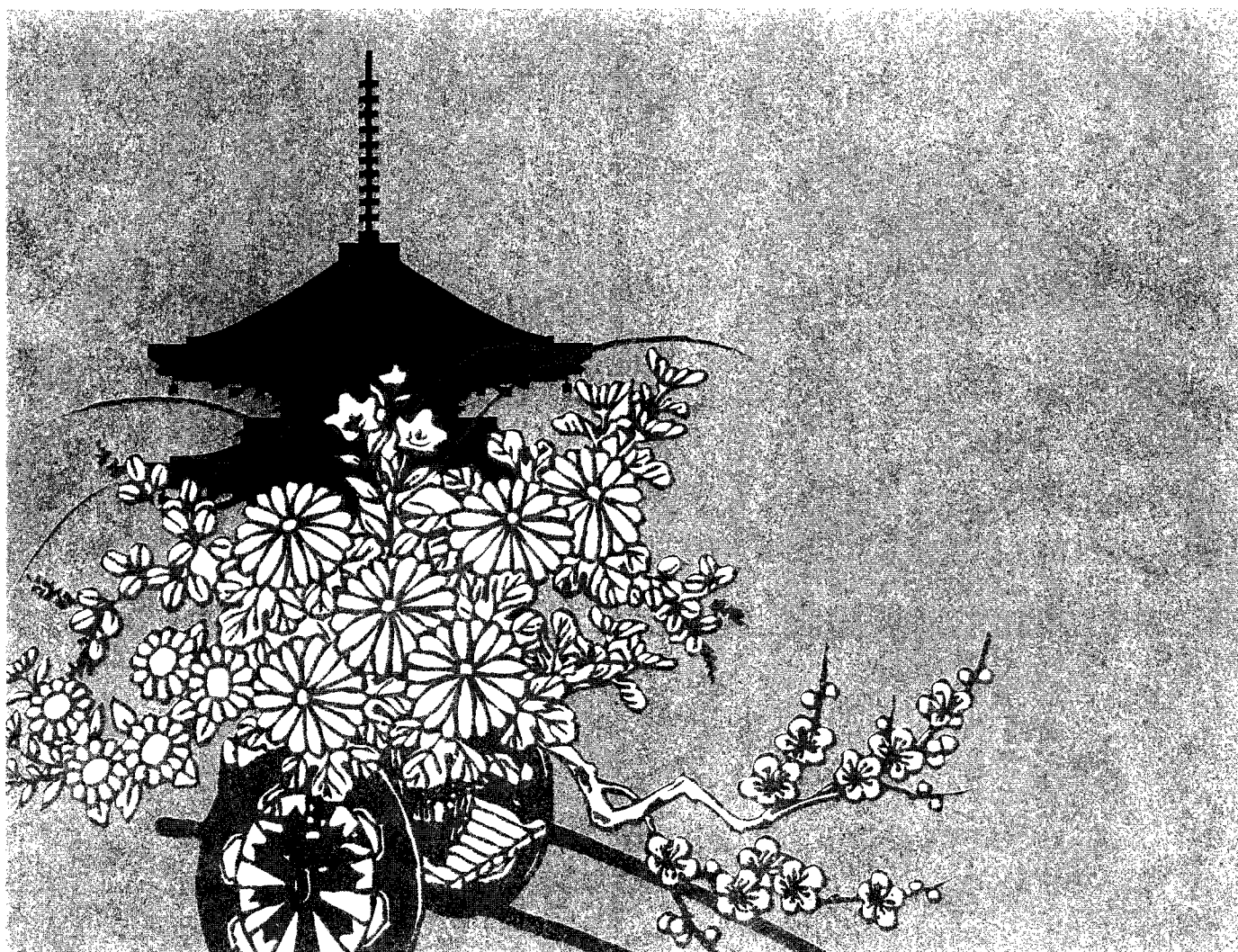


International Conference on Global Environment  
and Advanced Nuclear Power Plants

**GENES4/ANP2003**

# *Final Program*

September 15-19, 2003, Kyoto, JAPAN



Sponsor : Atomic Energy Society of Japan;  
Joint technical program with ANS

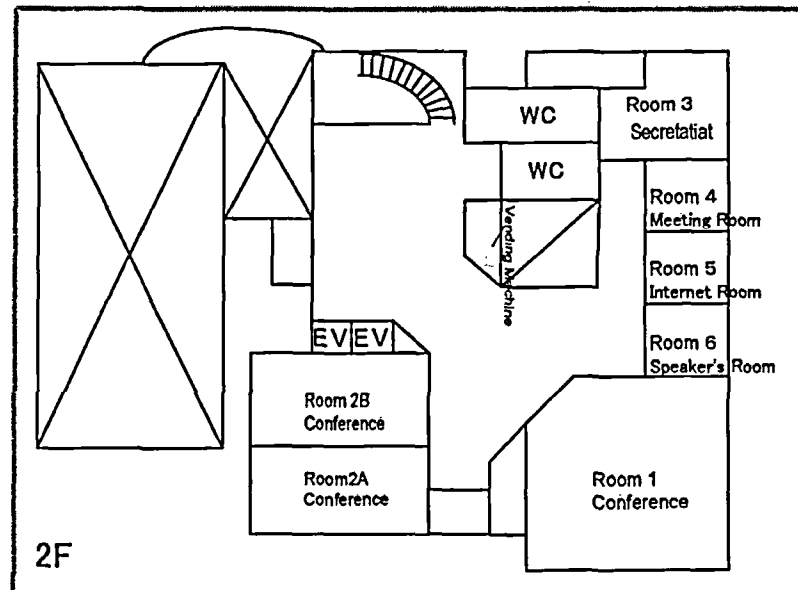
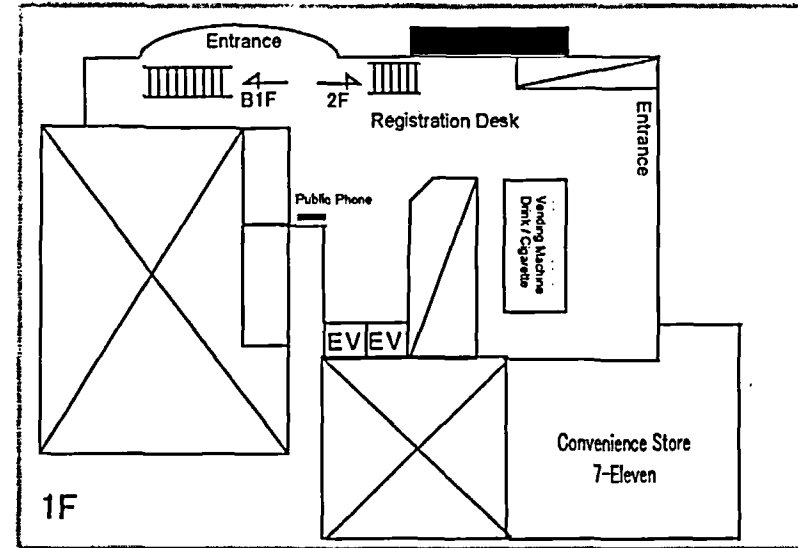
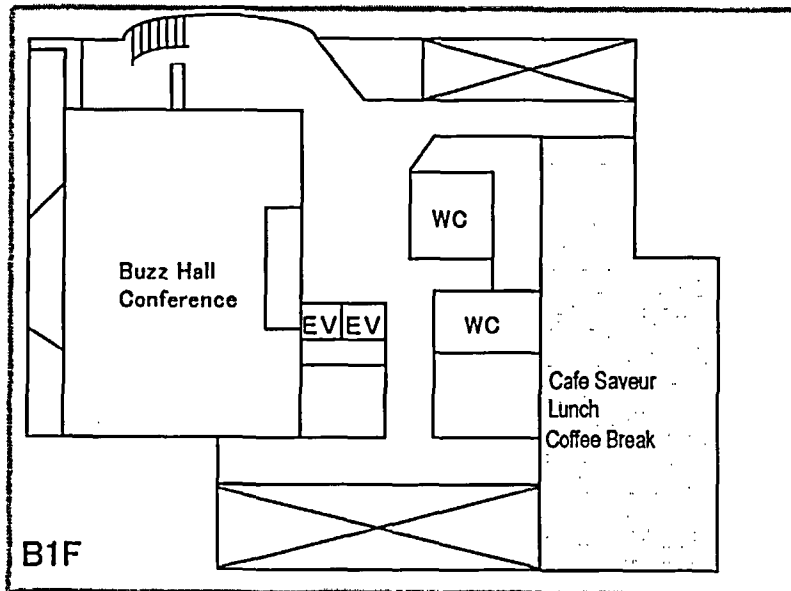
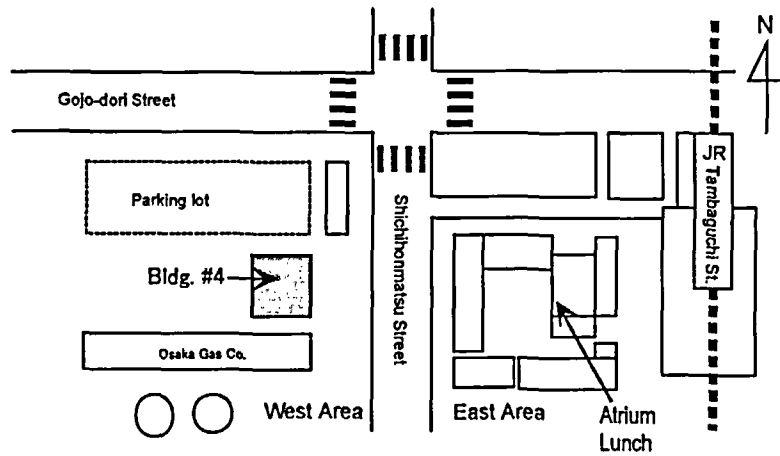
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In Cooperation with : IAEA, OECD/NEA

Organized by The University of Tokyo and Tokyo Institute of Technology



# Kyoto Research Park WEST Bldg.#4



**International Conference on Global Environment and  
Advanced Nuclear Power Plants**

**GENES4/ANP2003**

**September 15-19, 2003, Kyoto Research Park, Kyoto, JAPAN**

**Advisory Committee Co-chairs:** Mamoru Akiyama (Institute of Applied Energy, Japan), Neil Todreas (MIT, USA)

**Organizing Committee Co-chairs:** Yoshiaki Oka (University of Tokyo, Japan), Gail H. Marcus (DOE, USA)

**Technical Program Co-chairs:** Hisashi Ninokata (Tokyo Institute of Technology, Japan), Alan E. Levin (NRC, USA)

**CONFERENCE SCHEDULE** *(No coherent breaks between sessions in different rooms)*

**Monday September 15, 2003**

Registration\* 15:00-19:00

Welcome reception\* 18:30-20:30

**Tuesday September 16, 2003**

Session chair breakfast\* 07:00-07:40

Registration 08:00-17:00

Opening plenary session 08:40-11:10

Working lunch 11:20-14:00

Technical sessions 11:20-18:30

Coffee service 10:30-11:20, 15:15-16:15

**Wednesday September 17, 2003**

Session chair breakfast\* 07:00-07:40

Registration 08:00-17:00

Plenary session 08:30-09:50

Technical sessions 10:00-17:30

Working lunch 11:30-14:00

Banquet at Ganko-Nijyo-en 18:30-21:00

Coffee service 09:40-10:40, 15:00-16:00

**Thursday September 18, 2003**

Session chair breakfast\* 07:00-07:40

Registration 08:00-17:00

Technical sessions 08:30-18:00

Working lunch 11:20-14:00

Plenary session 18:10-20:10

Coffee service 10:00-11:00, 15:30-16:30

**Friday September 19, 2003**

Session chair breakfast\* 07:00-07:40

Registration 08:00-14:00

Plenary session 08:30-10:00

Technical sessions 10:20-15:30

Working lunch 11:30-14:00

Coffee service 10:00-11:00

**Saturday September 20, 2003**

Technical tour 08:00-18:00

*\*at Kyoto Tokyu Hotel*

# GENERAL INFORMATION

## ABOUT GENES4/ANP2003

GENES4/ANP2003 will provide a forum for exchanging views and information on the status and future prospects of advanced nuclear power systems and their role in improving the environment. The topics covered by the conference are relevant not only for the USA and Japan, but also for many other countries and international organizations. GENES4/ANP2003 is hosted by the Atomic Energy Society of Japan (AESJ) and is the second in a series of meetings jointly sponsored AESJ and the American Nuclear Society (ANS). It follows the first joint meeting, "Safety Goals and Safety Culture", held in Milwaukee in June 2001. GENES4/ANP2003 represents the union of two conferences held previously in Japan: Global Environment and Nuclear Energy Systems and Advanced Nuclear Power Plants. The joining of these two conferences symbolizes the belief that future nuclear power systems will contribute to improving the global environment by reducing greenhouse gas emissions and potentially providing the means to move away from fossil fuels and toward increased use of hydrogen and other alternatives to fulfill non-electric energy needs.

## FEATURES OF GENES4/ANP2003

Advanced nuclear power plants and their role of protecting environment are the major topics. "Advanced" is the key word characterizing the technical program. It covers all types of advanced reactors and their technologies. The experiences of the current generation of nuclear power plants in design, construction and testing are welcome for the future. GENES4/ANP2003 is a good forum for exchanging views between university/national institute people and utility/manufacture people. It will be neither too academic/research-oriented nor too conservative in near term/ present application. Both parties are welcome for the exchange of views and information. It will be the step toward the success of reactor innovations such as Gen4 systems. Advanced reactors do not necessarily mean the innovative reactors, but include all future reactors. Future developments for current generation plants are welcome. Hydrogen production and nuclear energy products are the hot topic and will be highlighted. GENES4/ANP2003 provides a good opportunity to be familiar with the modern design and construction technologies of nuclear power

plants in Asia where active construction programs are going on. A variety of Japanese experiences related to advanced technologies for design, construction and operation of LWRs will be presented, since these technologies were first displayed at the first meeting of ANP.92 in 1992. Not only TEPCO's experience, but the construction and testing experiences of Chubu, Tohoku and other electric power companies will be presented.

The technical program consists of invited plenary sessions and focused in-depth technical sessions. The technical sessions are organized along specific technical areas. Each presentation has 25 minutes including Q&A. This enables experts to have meaningful interactions of ideas.

The opening plenary session of GENES4/ANP2003 has prominent speakers from USA and Japan as well as cosponsoring countries. Plenary/panel sessions are held on the Business Climate, Public information and Role of Nuclear Energy in the 21st century. Keynote speeches are delivered at selected sessions.

This conference will have full-length peer reviewed technical papers published on a CD-ROM available at the meeting. All authors will be expected to present their papers in English.

## PLENARY SESSION ON PUBLIC INFORMATION AND OUTREACH: NUCLEAR ENERGY AND PEOPLE'S CHOICE

The aim of this plenary session is to illustrate the important role of communication for enhancing public acceptance of nuclear energy. A communication process involves the following five innate factors: the Source, the Message, the Audience, the Channel and the Effect of Communication. Whether people accept nuclear energy may depend upon a combination of these factors, which in turn variably affect the people's choice and decisions. This plenary session focuses upon the current state of affairs in public attitudes toward nuclear energy, the important socio-psychological factors affecting the people's decision process, and the methods of communications between different groups of stakeholder.

# GENERAL INFORMATION

## REGISTRATION

Kyoto Tokyu Hotel; Monday (15:00-19:00)  
Kyoto Research Park; Tuesday-Thursday (08:00-17:00)  
Friday (08:00-14:00)

## WELCOME RECEPTION

Monday, September 15, 18:30-20:30  
Kyoto Tokyu Hotel, Miyabi room (2F)  
Cost included in full registration.

## SESSION CHAIR'S BREAKFAST

07:00-07:40 at Kyoto Tokyu Hotel  
Tuesday and Thursday at Kurama room (1F)  
Wednesday and Friday at Gion room (1F)

Session co-chairs, plenary and keynote speakers are invited for breakfast each morning on the day of their session to become acquainted and ensure an understanding of the session format. Session co-chairs, plenary and keynote speakers should give a brief biography for their introductions, if it was not submitted to the conference secretary before the conference.

## TRANSFER BETWEEN KYOTO TOKYU HOTEL AND KYOTO RESEARCH PARK

Although the distance is only 15-20 minutes walk, bus transfer is arranged for the convenience of the participants once in the morning and once in the evening at no charge.

From Kyoto Tokyu Hotel to Kyoto Research Park:  
Depart from Tuesday to Friday at 7:50 and 8:00  
From Kyoto Research Park to Kyoto Tokyu Hotel  
Depart Tuesday 18:40, Wednesday 17:40,  
Thursday 20:20 and Friday 15:40

Taxi fare between Kyoto Tokyu Hotel and Kyoto Research Park will be only 660-740Jyen (6US\$)

## WORKING LUNCH

Tuesday (11:20-14:00), Wednesday (11:30-14:00),  
Thursday (11:20-14:00), Friday (11:30-14:00)  
Cost included in full registration.  
Lunch is served at "Café Saveur"(B1F) and "Atrium"  
(East area of KRP)

## SPEAKER'S ROOM: Room 6 (2F, Bldg. #4)

Tuesday-Thursday (08:00-17:00), Friday (08:00-14:00)  
Room is equipped with 2 projectors and laptop computer with CD-R/RW drive.

## INTERNET ROOM: Room 5 (2F, Bldg. #4)

Tuesday-Thursday (08:00-17:00), Friday (08:00-14:00)  
Room is equipped with 4 laptop computers with CD-R/RW drives, printer, connection to Internet.

## TECHICAL EQUIPMENT IN SESSION ROOMS

Buzz Hall is equipped with overhead projector, LCD projector and laptop computer with CD-ROM drive.  
Software: Windows XP or Windows 2000 – Microsoft PowerPoint 2000. Maximum resolution of the LCD projector: pixels. Power: AC100V, 60Hz.

Room 1, 2A and 2B are equipped with overhead projector, LCD projector and laptop computer with CD-ROM drive.

Software: Windows XP or Windows 2000 – Microsoft PowerPoint 2000. Maximum resolution of the LCD projector: 1208x1024 pixels. Power: AC100V, 60Hz.

## BANQUET

Wednesday, September 17, 18:30-21:00

At Ganko Nijyo-en

**Bus departs at 17:40 from Kyoto Research Park  
and at 18:00 from Kyoto Tokyu Hotel**

Ganko Takasegawa Nijyo-en is a Japanese restaurant. It was a traditional Japanese villa of Suminokura-Ryoi, a famous merchant in Edo period who constructed Takasegawa canal, trading path to Kyoto. The villa is surrounded by a large Japanese garden and stream of Takasegawa-river. Authentic Japanese dishes will be served with friendly manner. The participants will enjoy Maiko (Geisha-girl) dance and will have time to talk with her after the dance. No formal banquet speech is planned.

## TECHNICAL TOUR

Demonstration LMFBR Monju and Tsuruga-2 PWR  
Saturday, September 20, 2003 (8:00-18:00)

**Bus departs at 8:00 at the main entrance of  
Kyoto Tokyu Hotel.**

You are heartily welcomed to attend the bus tour. Technical tour will visit Japanese demonstration FBR, Monju (260MWe) and JAPC's Tsuruga-2 PWR (1160MWe). The tour will depart at 8:00 on September 20 (Saturday) from Kyoto Tokyu Hotel. It will take 2.5 hour to Monju by bus. Monju is a loop type liquid sodium cooled fast breeder reactor. A box lunch will be served at the international technical center of Monju. Tsuruga-2 is a 4 loop PWR. The bus is scheduled to return to Kyoto Tokyu Hotel at 18:00. There may be a delay of up to 1 hour depending on traffic conditions. Japan Atomic Power Company will financially support the expenses of the bus. Attendance needs to be confirmed at the registration desk by Wednesday, September 17. Foreign participants need to take their passports, and Japanese participants need to have their photo IDs for the tour.

# PROGRAM HIGHLIGHTS

(A listing of invited plenary sessions and keynote speeches)

## Monday September 15, 2003

Welcome reception  
at Kyoto Tokyu Hotel (18:30-20:30)  
*Cost included in full registration.*

## Tuesday September 16, 2003

Opening plenary (8:40-11:10)  
Chair: Mamoru Akiyama (IAE, Japan)  
Speakers: Tetsuo Takeuchi (AEC of Japan)  
Joe Colvin (NEI, USA)  
Joong-jae Lee (KHNP, Korea)  
Dave Torgerson (AECL, Canada)  
Yoshihiko Sumi (JAPC, Japan)  
Bill Martin (DOE/NERAC, USA)  
Sue Ion (BNFL, UK)

## Wednesday September 17, 2003

"Business Climate" plenary (8:30-9:50)  
Chair: Regis Matzie (Westinghouse, USA)  
Speakers: Dan Keuter (Entergy, USA)  
Ken Hedges (AECL, Canada)  
Yutaka Nakahara (Mitsubishi Heavy Industries, Ltd., Japan)  
Yoon Young Lee (Doosan Heavy Industry Co., Korea)

## Thursday September 18, 2003

"Public Information and Outreach" plenary  
(18:10-20:10)  
Chairs: Yasumasa Tanaka (Gakushuin University)  
Ann Bisconti (Bisconti Research Inc. USA)  
Speakers: Yasumasa Tanaka (Gakushuin University)  
Etsuko Akiba (ASCA Energy Forum, Japan)  
Sumiko Masano (Fukui-Prefecture Women's Energy Association, Japan)  
Scott Peterson (Nuclear Energy Institute, USA)  
Ann Bisconti (Bisconti Research Inc. USA)

## Friday September 19, 2003

"Role of Nuclear Energy in the 21st century" plenary  
(8:30-10:00)  
Chairs: Shunsuke Kondo (Univ. of Tokyo, Japan)  
Gail H. Marcus (DOE, USA)  
Speakers: Somporn Chongkum (Nuclear Society Thailand, Thailand)  
Hoang Anh Tuan (Atomic Energy Commission, Vietnam)  
Zaki Su'ud (Bandon Institute of Technology, Indonesia)  
Tin Hlaing (Atomic Energy Department, Myanmar)

## KEYNOTE SPEECHES

"Advanced Design and Construction Technology for ABWR", Akira Kawahara (Hitachi, Japan), Session 2, Tuesday afternoon, September 16

"Harmonized R&Ds for Commercialization of Fast Reactors and Related Fuel Cycle Systems in Japan", Kiyoto Aizawa (JNC, JAPAN), Session 18, Tuesday afternoon, September 16

"HTGR--The High School Physics Class Choice for Nuclear", Linden Blue (GA, USA), Session 9, Wednesday afternoon, September 17

"Nuclear and Hydrogen - Teaming Up", Steve Melancon (Entergy, USA), Session 11, Thursday morning, September 18

"New Challenges in Thermal-Hydraulics", George Yadigaroglu (ETH, Switzerland), Session 29, Wednesday morning, September 17

"Nuclear Energy as an Environmental Answer", Scott Peterson (NEI, USA), Session 36, Friday morning, September 19

## ORGANIZERS

### Advisory Committee

Co-chairs: Mamoru Akiyama (Institute of Applied Energy, Japan), Neil Todreas (MIT, USA)

Yoichi Aeba (MHI, Japan)	Steve Hucik (GE, USA)	Regis Matzie (Westinghouse, USA)
Linden Blue (GA, USA)	Akira Kawahara (Hitachi, Japan)	Yasuo Nakagami (JNC, Japan)
Joe Colvin (NEI, USA)	Dan Keuter (Entergy, USA)	Masao Niwano (Toshiba, Japan)
Toshiaki Enomoto (TEPCO, Japan)	Shunsuke Kondo (Univ. Tokyo, Japan)	John Sackett (ANL, USA)
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Bill Horak (BNL, USA)	Kumiaki Moriya (Hitachi Ltd., Japan)	Bob Twilley (Framatome, USA)
Hiroyuki Iokibe (Techno Chubu, Japan)	Akira Omoto (TEPCO, Japan)	
Takamichi Iwamura (JAERI, Japan)		

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Ann Bisconti (Bisconti, USA)	Masaki Morishita (JNC, Japan)
Mario Carelli (Westinghouse, USA)	Hideo Nagasaka (NUPEC, Japan)
F.O. Carre (CEA, France)	Masanori Naito (NUPEC, Japan)
Dave Diamond (BNL, USA)	Masuro Ogawa (JAERI, Japan)
Hideyuki Funasaka (JNC, Japan)	Masaya Ohtsuka (Hitachi Co, Japan)
Robert Gamble (GE Nuclear Energy, USA)	Hiroyuki Oigawa (JAERI, Japan)
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Yassin Hassan (Texas A&M, USA)	Toshitaka Osugi (JAERI, Japan)
Hideaki Heki (Toshiba Co, Japan)	Jose Reyes (Oregon State, USA)
Jeremy Hopwood (AECL, Canada)	Masaki Saito (TIT, Japan)
Masao Hori (NSA, Japan)	Hiroshi Sekimoto (TIT, Japan)
Greg Hudson (Framatome, USA)	Spencer Semmes (Dominion, USA)
Ken Hughey (Entergy, USA)	Undine Shoop (NRC, USA)
Masakazu Ichimiya (JNC, Japan)	---> Kune Y. Suh (Seoul National Univ., Korea)
S. Y. Jiang (INET-Tsinghua Univ., China)	Hideki Takano (JAERI, Japan)
Fumio Kasahara (NUPEC, Japan)	Yasumasa Tanaka (Gakusyuin Univ., Japan)
Yoshio Kitada (NUPEC, Japan)	Nobuyuki Ueda (CRIEPI, Japan)
Hideya Kitamura (TPC, Japan)	Shigeharu Ukai (JNC, Japan)
Seiichi Koshizuka (Univ. Tokyo, Japan)	Karen Vierow (Purdue U., USA)
Satoshi Kurata (Chubu Electric Co., Japan)	George Yadigaroglu (ETH, Swiss)
Jose March-Leuba (ORNL, USA)	Kazuhiko Yamamoto (JAPC, Japan)
Kaichiro Mishima (Kyoto Univ., Japan)	Toru Yamamoto (NUPEC, Japan)
Mohammad Modarres (Univ. Maryland, USA)	Yoshio Yoshizawa (TIT, Japan)

### Conference secretaries

Y. Ishiwatari (Univ. of Tokyo, Japan),  
J. Liu (Univ. of Tokyo, Japan),  
Y. Kato (TIT, Japan)  
T. Sawada (TIT, Japan)

# GENES4/ANP2003 PROGRAM

## TUESDAY SEPTEMBER 16, 2003

✓ Session chair's breakfast  
(07:00-07:40) at Kyoto Tokyu Hotel, Kurama room

Opening plenary session  
(08:40-11:10) Buzz Hall  
Chair: Mamoru Akiyama (IAE, Japan)

✓ "Japan's Ways to Promote the R&D of Innovative Nuclear Systems in the Future", Tetsuo Takeuchi (AEC of Japan)  
"Nuclear Energy: Advancing Toward a Bright Future", Joe Colvin (NEI, USA)  
"Challenge and Future Prospects of Nuclear Power in Korea", Joong-jae Lee (KHNP, Korea)  
"Future Development and Applications of Nuclear Power", Dave Torgerson (AECL, Canada)  
"Nuclear Power in Japan", Yoshihiko Sumi (JAPC, Japan)  
"Nuclear Power -- a Solution to Energy Security and Environmental Problems", Bill Martin (DOE/NERAC, USA)  
"European Perspectives of the State of the Nuclear Industry and Future Prospects", Sue Ion (BNFL, UK)

Coffee service  
(10:30-11:10, 15:15-16:15) at "Café Saveur"

1. ABWR and ABWR-II  
(13:00-15:30) at Buzz Hall  
Chairs: Akira Omoto (TEPCO, JAPAN)  
Dan Keuter (Entergy, USA)

1053 Development of ABWR and ABWR-II  
H. Kitamura, A. Omoto, H. Okada (TEPCO, JAPAN)

1054 ABWR Operation Experience at Kashiwazaki-Kariwa NPS  
K. Yahagi, M. Ishikawa, H. Kitamura, T. Kobayashi (TEPCO, Japan)

1108 Design of ABWR and ABWR-II - Core and Fuel-  
T. Mochida, M. Aoyama (Hitachi, Japan), K. Sakurada, K. Hiraiwa (Toshiba, Japan)

1161 ABWR design and its evolution (5) Primary system design of ABWR and ABWR-II  
K. Yamada, S. Tajima (Toshiba, Japan), M. Tsubaki, H. Soneda (Hitachi, Japan)

1211 ABWR design and its evolution (6) Safety System Design of ABWR and ABWR-II  
H. Oikawa, T. Sato (Toshiba, Japan), K. Sato, M. Matsuura (Hitachi, Japan)

1107 Development of Control and Instrumentation System for ABWR and ABWR II Plants  
H. Suzuki, S. Arita (Hitachi, Japan), T. Ito, H. Hosono (Toshiba, Japan)

2. Advanced Design and Construction Technology  
(15:50-18:25) at Buzz Hall  
Chairs: Shigenori Shiga (Toshiba, Japan)  
Ken Hedges (AECL, Canada)

(keynote) Advanced Design and Construction Technology for ABWR  
Akira Kawahara (Hitachi, Japan)

1117 Hitachi's challenges and experience in ABWR Construction  
T. Inoue, J. Miura, K. Murayama (Hitachi, Japan)

1116 ABWR Construction Experience in Japan  
J. Kawahata, J. Miura (Hitachi, Japan), F. Saito, H. Mori (Toshiba, Japan)

1007 Design and Construction of Hamaoka Unit 5, 1380MWe ABWR  
H. Yamazaki (Chubu Electric Power Co., Japan)

1071 Characteristic approaches of construction at Higashidori Nuclear Power Station  
A. Obonai, K. Watanabe (Tohoku Electric Power Co., Japan)

1217 Advanced Operating Technique Using the VR Database System  
I. S. Lee, S. H. Yoon, K. Y. Suh (PhiloSOPhIA, Inc., Korea)

18. LMFBR Design and its Evolution  
(12:30-15:30) at Room 1  
Chairs: Mutsuhiko Hayano (FBEC, Japan)  
W. Maschek (FZK, Germany)

(keynote) Harmonized R&Ds for Commercialization of Fast Reactors and Related Fuel Cycle Systems in Japan  
Kiyoto Aizawa (JNC, Japan)

1175 LMFBR design and its evolution (1) -- Fuel design of LMFBR --  
T. Mizuno, M. Naganuma (JNC, Japan)

1176 LMFBR design and its evolution (2) -- Core design of LMFBR --  
N. UTO, T. MIZUNO (JNC, Japan)

1154 LMFBR design and its evolution (3) -- Safety System Design of LMFBR --  
H. Niwa (JNC, Japan), S. Kubo (JAPC, Japan), K. Kurisaka (JNC, Japan)

1076 An Innovative Concept of Sodium-Cooled Middle-Scale Modular Reactor Pursuing High Economic Competitiveness  
M. Hishida, M. Konomura (JNC, Japan), M. Toda (Mitsubishi Heavy Industries, Japan)

1067 Evaluation Methodology and Prospective Introduction Scenarios of FR Cycle Systems  
F. Sumio (JNC, Japan)

1231 Progress on the Design and Construction of China Experimental Fast Reactor  
D. Lu, M. Xu (China Institute of Atomic Energy, China)



# GENES4/ANP2003 PROGRAM

## 19. LMR Design and Development

(15:50-17:05) at Room 1

Chairs: Nobuyuki Ueda (CRIEPI, Japan)  
Phillip Billot (CEA, France)

### 1114 Design Study of Sodium Cooled Small Fast Reactor

N. Ueda, I. Kinoshita, A. Minato (CRIEPI, Japan), S. Kasai, S. Maruyama (Toshiba, Japan)

### 1085 Conceptual Design of a Medium Scale Lead-Bismuth Cooled Fast Reactor

Y. Enuma, T. Mizuno, Y. Soman, M. Konomura (JNC, Japan), M. Mito (Advanced Reactor Technology Co., Japan), M. Tanji (Mitsubishi Heavy Industries, Japan)

### 1213 Development of 3D CAD System as a Design Tool for PEACER Development

K. J. Jeong, S. H. Jeong, H. W. Lee, J. G. Shin, I. S. Hwang (Seoul National Univ., Korea)

## 15. SCR-3; Supercritical-Water Cooled Reactor, Heat Transfer

(17:15-18:30) at Room 1

Chairs: Shinichi Morooka (Toshiba, Japan)  
J.D. Jackson (Univ. Manchester, UK)

### 1119 Heat Transfer Study under Supercritical Pressure Conditions

T. Yamashita, S. Yoshida, H. Mori (Kyushu Univ., Japan), S. Morooka, H. Komita (Toshiba, Japan), K. Nishida (Hitachi, Japan)

### 1177 Experimental Studies of Buoyancy-influenced Convective Heat Transfer in Heated Vertical Tubes at Pressures Just Above and Just Below the Thermodynamic Critical Value

J. D. Jackson, KOJ Evans Lutterodt, R. Weinberg, J. Fewster (Univ. of Manchester, UK)

### 1010 A Supercritical Water Loop for Heat Transfer Studies of Generation-IV Supercritical Light Water Reactors

G. E. McCreery, K. G. Condie, D. M. McEligot, J. Buongiorno (INEL, USA)

## 35. Corrosion, Materials & Water Chemistry

(11:20-13:00, 14:00-15:15) at Room 2A

Chairs: Tadasu Yotsuyanagi (Toshiba, Japan)  
Gary S. Was (Univ. of Michigan, USA)

### 1178 Fundamental R&D program on water chemistry of supercritical pressure water under radiation field

Y. Katsumura (Univ. of Tokyo, Japan), K. Kiuchi (JAERI, Japan), M. Domaie (CRIEPI, Japan), Y. Wada (Hitachi, Japan), T. Yotsuyanagi (Toshiba, Japan)

### 1027 Corrosion and Stress Corrosion Cracking of Austenitic Alloys in Supercritical Water

D. B. Mitton, H. Kim, J-K Kim (Univ. of Michigan, USA), R. M. Latanision, J. McKinley, S. Teyseyre, G. S. Was (MIT, USA)

### 1096 SCC and Irradiation Properties of Metals under Supercritical-water Cooled Power Reactor Conditions

Y. Tsuchiya, F. Kano, N. Saito, S. Shiga (Toshiba, Japan), S. Kasahara, K. Moriya (Hitachi, Japan), H. Takahashi (Hokkaido Univ., Japan)

### 1183 Environmentally Assisted Cracking of Alloys in Superheated Steam and Supercritical Water

Y. Watanabe, Y. Daigo, Y. Yanagisawa, H. Abe (Tohoku Univ., Japan)

### 1132 General corrosion of iron, nickel and titanium alloys as candidate materials for the fuel claddings of the supercritical-water cooled power reactor

S. Kasahara, J. Kuniya, K. Moriya (Hitachi, Japan), N. Saito, S. Shiga (Toshiba, Japan)

### 1198 Development of Fuel Clad Materials for High Burn-up Operation of LWR

A. Kimura (Kyoto Univ., Japan), S. Ukai (JNC, Japan), M. Fujiwara (KOBELCO, Japan)

### 1190 Advanced Energy Materials for Fission/Fusion Reactor Systems - Similarity and Difference in Materials R & D Activities -

A. Kohyama (Kyoto Univ., Japan)

## 27. Accelerator-Driven Systems

(15:35-18:05) at Room 2A

Chairs: H. Takano (JAERI, Japan)  
L. Luzzi (Politecnico de Milano, Italy)

### 1184 Design Study of Accelerator-driven Transmutation System at JAERI

T. Sasa, H. Oigawa, K. Tsujimoto, K. Nishihara, M. Umeno, H. Takano (JAERI, Japan)

### 1005 Behavior of Transmuter Fuels of Accelerator Driven Systems under Severe Accident Conditions

W. Maschek, T. Suzuki, X. Chen, M. Mori, C. Matzerath Beccacini, M. Flad (FZK, Germany), K. Morita (Kyushu Univ., Japan)

### 1155 ADS-Demo Fuel Rod Performance Analysis

L. Luzzi, F. Vettraino (Politecnico di Milano, Italy), R. Calabrese (ENEA, Italy)

### 1149 Development of Dynamics Code for Accelerator Driven System

T. Sugawara, T. Chiba, T. Iwasaki (Tohoku Univ., Japan)

### 1044 Neutron Multiplication of Subcritical Core through Cascade Core Concept

K. Ikeda, T. Shiraki, K. Nakai (Mitsubishi Heavy Industries, Japan), H. Yokobori (Advanced Reactor Technology Co., Japan)

### 1113 High brightness gamma ray generation and its application to nuclear transmutation

K. Imasaki, M. Aoki, D. Li, C. Yamanaka (Institute for Laser Technology, Japan), S. Miyamoto, S. Amano, T. Mochizuki, K. Aoki, K. Hosono, S. Hasimoto, A. Andoh (Himeji Institute of Technology, Japan), J. Mizui, K. Nemoto (Mitsubishi Heavy Industries, Japan)

## 16A. IRIS Design

(11:20-13:00) at Room 2B

Chairs: Shigeru Urata (Kansai EPC, Japan)  
Antonio Barroso (CENEN, Brazil)

### 1130 IRIS Economics

K. Miller (British Nuclear Fuels plc, UK)

### 1136 Enabling 48 Month Maintenance Intervals for IRIS

R. Boroughs, J. Wilson, W. Eberly, G. Boles, R. Emrath  
(Tennessee Valley Authority, USA)

### 1144 A Plant Control System Development Approach for IRIS

R.T. Wood, C. R. Brittain, J. A. March-Leuba (Oak Ridge  
National Laboratory, USA), L.E. Conway, L. Oriani  
(Westinghouse, USA)

### 1140 Sizes for Secondary Plant Components for Modularized Iris Balance of Plant Design

M. R. Williamson, L. W. Townsend (Univ. of Tennessee,  
USA)

## 16B. IRIS Safety

(14:00-15:40) at Room 2B

Chairs: Takashi Sawada (Mitsubishi Heavy Industries,  
Japan)  
Carlo Lombardi (Politecnico de Milano, Italy)

### 1146 IRIS Pre-Application Licensing

M. D. Carelli, C.L. Kling (Westinghouse, USA)

### 1078 Preliminary Level-1 Probabilistic Risk Assessment of the IRIS Plant in a Conceptual and Preliminary Design Phase

Y. Mizuno, L. Oriani, L. E. Conway, H. Ninokata (TIT, Japan)

### 1142 Use of PRA Techniques to Optimize the Design of the IRIS Nuclear Power Plant

M. D. Muhlheim, J. W. Cletcher, II (Oak Ridge National  
Laboratory, USA)

### 1131 Development of a Coupled Containment-Reactor Coolant System Methodology for the Analysis of IRIS Small Break LOCA

A. Manfredini, F. Oriolo, S. Paci, D. Grgi., T. Bajs (Pisa Univ.,  
Italy), L. Oriani (Politecnico de Milano, Italy)

## 17. Internal CRDM and IRIS Development

(16:00-18:30) at Room 2B

Chairs: Hisashi Ninokata (TIT, Japan)  
Mario Carelli (Westinghouse, USA)

### 1028 Hydraulically Driven Control Rod Concept for Integral Reactors: Fluid Dynamic Simulation and Preliminary Test

M.E. Ricotti, E. Colombo, M. Passoni, C. Rizzo, M.D  
(Politecnico di Milano, Italy), Carelli (Westinghouse, USA), C.  
Lombardi (Politecnico di Milano, Italy)

### 1233 Development of Internal CRD for Next Generation BWR

T. Narabayashi, T. Yamamoto, M. Sato, N. Kobayashi, T.  
Kameda, T. Tokumasu, S. Kawano, T. Hagiwara (Toshiba,  
Japan), M. Mori, S. Ohmori (TEPCO, Japan), T. Terai, H.  
Madarame, Y. Morimoto (Univ. of Tokyo, Japan)

### 1232 In-vessel Type Control Rod Drive Mechanisms for Integral-type Reactors

T. Ishida (JAERI, Japan), S. Imayoshi (Shinsei Giken, Japan),  
T. Kanagawa (Mitsubishi Heavy Industries, Japan)

### 1153 Selection of an Appropriate Turbulence Modeling in a CFD code for an Ultra-long Life Core for the "IRIS" Reactor

E. Baglietto, H. Ninokata (TIT, Japan)

### 1185 Identification of Iris Reactor Transients Using Self-Organized Maps

B. D. B. Filho (Instituto de Pesquisas Energéticas e Nucleares,  
Brasil), A. C. de O. Barroso (Comissão Nacional de Energia  
Nuclear, Brasil)

### 1016 Robust Techniques for Monitoring and Fault Diagnosis of Helical Coil Steam Generators

B.R. Upadhyaya, K. Zhao (Univ. of Tennessee, USA), R.T.  
Wood (Oak Ridge National Laboratory, USA)

## WEDNESDAY SEPTEMBER 17, 2003

### Session chair's breakfast

(07:00-07:40) at Kyoto Tokyu Hotel, Gion room

### "Business Climate" plenary

(8:30-9:50) at Buzz Hall

Chair: Regis Matzie (Westinghouse, USA)

### "A Vendor's Perspective on the Business Climate for Advanced Nuclear Power Plants", Regis Matzie (Westinghouse, USA)

"The Promise of New Nuclear", Dan Keuter (Entergy, USA)

"ACR Program Status", Ken Hedges (AECL, Canada)

"Development of APWR and Next Generation Plant", Yutaka  
Nakahara (Mitsubishi Heavy Industries, Ltd., Japan)

"Business Environment of Nuclear Power Industry in Korea",  
Yoon Young Lee (Doosan Heavy Industry Co., Korea)

### Coffee service

(09:40-10:40, 15:00-16:00) at "Café Saveur"

## 3. Advanced PWR design and development

(10:00-12:05) at Buzz Hall

Chairs: Susumu Ueda (JAPC, Japan)

Larry Conway (Westinghouse, USA)

### 1064 Design and Licensing Experiences of the Advanced Power Reactor 1400 Development

S. J. Cho, D. W. Jerng, E. J. Lee, J. H. Na (Korea Hydro &  
Nuclear Power Co., Korea)

### 1063 Constructibility Assessment of APR1400

S. J. Cho, Y. C. Kang, J. G. Lee, W. S. Lim (Korea Hydro &  
Nuclear Power Co., Korea)

### 1099 Core and fuel design of APWR

K. Seki, T. Tanaka (Kansai Electric Power Co., Japan), S.  
Ueda (JAPC, Japan)

1103 Safety design of APWR

H. Hamamoto (Mitsubishi Heavy Industries, Japan), T. Tanaka (Kansai Electric Power Co., Japan), S. Ueda (JAPC, Japan)

1141 Reactor Internals structural design of PWR and APWR

T. Ichikawa (Mitsubishi Heavy Industries, Japan), T. Tanaka (Kansai Electric Power Co., Japan), S. Ueda (JAPC, Japan)

9. HTGR Design

(13:00-15:10) at Buzz Hall

Chairs: K. Kunitomi (JAERI, Japan)  
H.L.Brey (consultant, USA)

(keynote) HTGR-The High School Physics Class  
Choice for Nuclear

Linden Blue (GA, USA)

✓ 1194 The Evolution and Future Development of the High  
Temperature Gas Cooled Reactor

H. L. Brey (Consultant to JAERI, Japan)

✓ 1221 The High Temperature Gas Cooled Reactor Fuel

K. Sawa (JAERI, Japan)

✓ 1222 High Temperature Gas Cooled Reactor Core Design  
Future Material Consideration

B. J. Marsden, S. L. Fok, G. Hall (Univ. of Manchester, UK)

1059 Design and Development of Gas Turbine High  
Temperature Reactor 300 (GTHTR300)

K. Kunitomi, S. Katanishi, S. Takada, T. Takizuka, X. Yan, S. Kosugiyama (JAERI, Japan), H. Okada, Y. Sakuragi (TEPCO, Japan)

10. HTGR, Testing, Research and Design

(15:25-17:30) at Buzz Hall

Chairs: T. Iyoku (JAERI, Japan)  
Steve Melancon (Entergy, USA)

✓ 1094 Present Status and Future Plan of HTTR Project

T. Iyoku, T. Nakazawa, K. Kawasaki, H. Hayashi, S. Fujikawa (JAERI, Japan)

✓ 1095 Safety Demonstration Tests using High Temperature  
Engineering Test Reactor (HTTR)

Y. Tachibana, S. Nakagawa, K. Sawa, T. Iyoku (JAERI, Japan)

✓ 1069 Research and development programs on helium gas  
compressor and magnetic bearing suspended rotor for the Gas  
Turbine High Temperature Reactor (GTHTR300)

S. Takada, T. Takizuka, K. Kunitomi, X. Yan, S. Kosugiyama (JAERI, Japan), I. Minatuski, H. Itaka, I. Atsumoto (Mitsubishi Heavy Industries, Japan)

✓ 1106 FAPIG HTGR Plant Concept of Small Cost and Small  
Power

M. Nakano, N. Tuji, Y. Kiso, F. Okamoto, H. Hayakawa (Fuji Electric Co., Japan)

1057 ACACIA: a small scale power plant with pebble bed  
cartridge reactor and indirect Brayton cycle

D.F. da Cruz, J.B.M. de Haas, A.I. van Heek, M.M. Stempniewicz (NRG, Netherlands)

13. SCR-1; Supercritical-Water Cooled Reactor,  
Design

(10:00-13:20) at Room 1

Chairs: Katsumi Yamada (Toshiba, Japan)  
Jim Lake (INEEL, USA)

1168 Overview of Design Studies of High Temperature  
Reactor Cooled by Supercritical Light Water at the University  
of Tokyo

Y. Oka, S. Koshizuka, Y. Ishiwatari, A. Yamaji (Univ. of Tokyo, Japan)

1040 Fuel Design of High Temperature Reactors Cooled and  
Moderated by Supercritical Light Water

A. Yamaji, Y. Oka, S. Koshizuka (Univ. of Tokyo, Japan)

1041 Core Design of a High Temperature Reactor Cooled and  
Moderated by Supercritical Light Water

A. Yamaji, Y. Oka, S. Koshizuka (Univ. of Tokyo, Japan)

1158 Plant control of high temperature reactor cooled and  
moderated by supercritical water

Y. Ishiwatari, Y. Oka, S. Koshizuka (Univ. of Tokyo, Japan)

1159 Safety analysis of high temperature reactor cooled and  
moderated by supercritical water

Y. Ishiwatari, Y. Oka, S. Koshizuka (Univ. of Tokyo, Japan)

1160 LOCA analysis of high temperature reactor cooled and  
moderated by supercritical water

Y. Ishiwatari, Y. Oka, S. Koshizuka (Univ. of Tokyo, Japan)

1036 Startup of a High-Temperature Reactor Cooled and  
Moderated by Supercritical-Pressure Light Water

Tin Tin Yi, Y. Ishiwatari, S. Koshizuka, Y. Oka (Univ. of Tokyo, Japan)

1166 Stability Analysis of a high temperature reactor cooled  
by supercritical light water

S. Koshizuka, Y. Oka, S. Ji (Univ. of Tokyo, Japan)

14. SCR-2; Supercritical-water Cooled Reactors,  
Development

(14:00-17:20) at Room 1

Chairs: Kumiaki Moriya (Hitachi, Japan)  
Dietmar Bittermann (Framatome ANP, Germany)

1121 Development of Supercritical-water Cooled Power  
Reactor Conducted by a Japanese Joint

A. Shioiri (Toshiba, Japan), K. Moriya (Hitachi, Japan), Y. Oka (Univ. of Tokyo, Japan), H. Mori (Kyushu Univ., Japan), H. Takahashi (Hokkaido Univ., Japan)

1115 Development of Supercritical-water Cooled Power  
Reactor - Core design study with 3-D core simulator -

S. Sakurai, N. Yoshida, S. Shiga, K. Moriya (Toshiba, Japan), Y. Oka (Univ. of Tokyo, Japan)

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1100 Investigation of fuel assembly by using subchannel analysis for supercritical-water cooled power reactor  
K. Kitou, K. Nishida, M. Matsuura (Hitachi, Japan) S. Shiga (Toshiba, Japan)

1003 Economic Prospects of the HPLWR  
D. Bittermann (Framatome-ANP, Germany), D. Squarer, T. Schulenberg (FZK, Germany), Y. Oka (Univ. of Tokyo, Japan)

1223 Potential Safety Features and Safety Analysis Aspects for High Performance Light Water Reactor (HPLWR)  
N. Aksan (Paul Scherrer Institut, Switzerland), T. Schulenberg, D. Squarer, X. Cheng, D. Struwe, V. Sanchez (FZK, Germany), P. Dumaz (CEA, France), R. Kyrki-Rajmaki (VTT Energy, Finland), D. Bittermann (Framatome-ANP, Germany), A. Souyri (EDF, France), Y. Oka, S. Koshizuka (Univ. of Tokyo, Japan)

1009 Safety Characteristics of a New Supercritical Light Water Reactor  
C. Davis, J. Buongiorno, P. MacDonald (INEEL, USA)

1023 Conceptual Design of a Supercritical-Pressure Light Water Reactor with Internal Recirculating flow  
H. O. Kang, Y. Y. Bae (KAERI, Korea)

1022 Feasibility Study of Passive Safety Systems for a Supercritical Pressure Water Cooled Reactor  
H. Y. Yoon, Y. Y. Bae (KAERI, Korea)

31. Containment Design and Thermal Hydraulics of LWR Severe Accidents  
(10:00-12:05) at Room 2A  
Chairs: K. Arai (Toshiba, Japan)  
K. Y. Suh (Seoul National Univ., Korea)

✓ 1179 Conceptual Study on the Containment Design aiming at "No Evacuation"  
K. Andou, T. Takii, T. Kikuyama (Hitachi, Japan), T. Taminami (TEPCO, Japan)

✓ 1084 Integrated Catalyst System for Removing Buildup-Gas in BWR Inert Containments During a Severe Accident  
K. Arai, K. Murakami, N. Ichikawa, R. Hamazaki, H. Oikawa (Toshiba, Japan)

✓ 1215 Experimental Study of Critical Heat Flux in Inclined Rectangular Gap  
S. J. Kim, Y. H. Kim, S. W. Noh, K. Y. Suh (Seoul National Univ., Korea), J. L. Rempe (INEEL, USA), F. B. Cheung (The Pennsylvania State Univ., USA), S. B. Kim (KAERI, Korea)

✓ 1218 Natural Convection Heat Transfer in a Rectangular Pool with Volumetric Heat Sources  
S. D. Lee, K. H. Lee, K. Y. Suh (Seoul National Univ., Korea)

✓ 1220 Computer Aided Analysis of Bypass of Emergency Core Coolant in Direct Vessel Vertical Injection System  
Y. H. Yu (PhiloSOPhIA, Inc., Korea), S. H. Yoon, K. Y. Suh (Seoul National Univ., Korea)

29. LOCA Behaviors and Passive Systems  
(13:30-16:30) at Room 2A  
Chairs: Fumio Kasahara (NUPEC, Japan)  
Y. Hassan (Texas A&M Univ., USA)

(keynote) New Challenges in Thermal-Hydraulics  
George Yadigaroglu (ETH, Switzerland)

1065 The Best Estimate Large Break Loss of Coolant Accident Analysis using TRAC-M/F90 for APR1400  
H. G. Kim, S. J. Oh (Korea Hydraulic & Nuclear Power Co., Korea)

1205 Velocity and Temperature Distribution Measurements Inside a Scaled Calandria in Support of CANDU X Passive Moderator Cooling System Design  
H.F. Khartabil, R.B. Duffey (AECL, Canada)

1173 Experimental observation of thermal-hydraulic behavior in PCCS horizontal heat exchanger  
M. Kondo, H. Nakamura (JAERI, Japan), T. Kurita, K. Arai (Toshiba, Japan), K. Yamamoto, R. Shimada (JAPC, Japan), H. Tokuma (TEPCO, Japan)

1216 Visualization of Flow in Impingement Region on a Vertical Wall  
W. J. Kim, J. H. Ku, H. M. Son (PhiloSOPhIA, Korea), S. H. Yoon, K. Y. Suh (Seoul National Univ., Korea)

1093 Graphical User Interface Development for the MARS Code  
J. J. Jeong, M. Hwang, Y. J. Lee, K.D. Kim, B.D. Chung (KAERI, Korea)

1124 Passive ECC Penetration Duct  
T. S. Kwon, C. H. Song, W. P. Baek (KAERI, Korea)

21. Aseismic Technologies  
(10:30-12:35, 14:00-15:15) at Room 2B  
Chairs: Y. Kitada (NUPEC, Japan)  
Andy Klein (Oregon State, USA)

1088 Study on Application of Seismic Isolation System to ABWR Building  
H. Saito, H. Tanaka, A. Noguchi (TEPCO, Japan), J. Suhara (Shimizu Co., Japan), Y. Fukushima (Kajima Co., Japan)

1110 Development of 3D Seismic Isolation Technology for Advanced Nuclear Power Plant Application  
M. Morishita, S. Kitamura (JNC, Japan), S. Moro, M. Fushimi (JAPC, Japan)

1195 3D Seismic Isolation for Advanced N.P.P Application - Development of Three-Dimensional Base Isolation System with Cable  
M. Kageyama, T. Iba, K. Umeki, T. Somaki (Obayashi Co., Japan), S. Moro (JAPC, Japan), M. Morishita (JNC, Japan)

1206 3D Seismic Isolation for Advanced N.P.P Application-Development of Three Dimensional Seismic Isolation Device with Multi Rubber Bearing and Rolling Seal Type Air Spring  
Y. Okada, J. Suhara, T. Tamura, S. Moro (Shimizu Co., Japan), M. Morishita (JAPC, Japan)

1207 3D Seismic Isolation for Advanced N.P.P Application - Hydraulic 3-Dimensional Base-Isolation System -  
T. Shimada, A. Kashiwazaki, T. Fujiwaka, M. Morishita (IHI, Japan), S. Moro (JAPC, Japan)

1167 A Vibration Amplification Device for the Seismic Margins Test of NPP Equipment  
Y. Kitada, H. Abe (NUPEC, Japan), K. Suzuki (Tokyo Metropolitan Univ., Japan)

1172 Seismic Proving Test of Heavy Component with Energy Absorbing Support  
T. Iwatsubo, H. Abe, K. Kuroda (NUPEC, Japan), I. Ichihashi (Kansai Univ., Japan), K. Tai (Mitsubishi Heavy Industries, Japan)

1056 Vibration Control of Nuclear Components Using Simply Supported Dynamic Damper  
D. Iba, A. Sone, A. Masuda (Kyoto Institute of Technology, Japan)

22. Structural Design  
(15:35-17:15) at Room 2B  
Chairs: M. Morishita (JNC, Japan)  
G.H. Koo (KAERI, Korea)

1089 A Probabilistic Approach in the Structural Design of Fast Breeder Reactors, Part 1: A Potential Concept  
T. Asayama, N. Kawasaki, M. Morishita (JNC, Japan)

1090 A Probabilistic Approach in the Structural Design of Fast Breeder Reactors, Part 2: A Procedure Based on Monte-Carlo Simulation and Its Extension  
T. Asayama (JNC, Japan), T. Kato (Joyo Industry Co., Japan), M. Morishita (JNC, Japan)

1060 R&D issues in Structural Design Standard for commercialized Fast Reactor Components  
H. Shibamoto, Y. Tanaka, K. Inoue (JAPC, Japan), N. Kasahara, M. Morishita (JNC, Japan)

1011 Structural Design of Liquid Metal Reactor for Elevated Temperature Cycles  
G. H. Koo, J. H. Lee (KAERI, Korea)

## **THURSDAY SEPTEMBER 18, 2003**

Session chair's breakfast  
(07:00-07:40) at Kyoto Tokyu Hotel, Kurama room

Coffee service  
(10:00-11:00, 15:30-16:30) at "Café Saveur"

6. Advanced Reactor Development and ITER  
(08:30-10:35) at Buzz Hall  
Chairs: Shinzaburo Matsuda (JAERI, Japan)  
John Cleveland (IAEA)

1212 IAEA Activities in Technology Development for Advanced Water-Cooled Nuclear Power Plants  
P. E. Juhn, J. Kupitz, J. Cleveland, R. Lyon, J. W. Park (IAEA)

1186 User Requirements for Innovative Nuclear Fuel Cycle Technologies in the Area of Environment, Safety, Proliferation Resistance and Cross-Cutting Issues and Methodology for Innovative Technologies Assessment  
J. Kupitz, F. Depisch, C. Allan (IAEA)

1180 The Role of Expert Evaluation System for Deploying Advanced NPPs in China  
M. Yang (China Guangdong Nuclear Power Holding Co., China), Z. Zhou, S. Zhu (Tsinghua Univ., China)

1188 Overview of ITER Project - Objective, History, Status of Development, Structure and Its Future -  
S. Matsuda (JAERI, Japan)

1191 Overview of Large-scale Technology R&D's for ITER, Engineering Challenges  
M. Seki (JAERI, Japan)

4. Advanced CANDU and Experience of FUGEN  
(10:55-12:35) at Buzz Hall  
Chairs: S. Shibuya (JNC, Japan)  
J. Hopwood (AECL, Canada)

1200 Advanced CANDU Reactor Design for Operability  
B. M. Soulard, R. Lalonde, E. Choy, S. Yu, J. M. Hopwood (AECL, Canada)

1004 Twenty-Four-Year Experience of Industrial-Scale Plutonium Utilization in the Fugen Nuclear Power Station  
T. Iijima, T. Okawa, Y. Katano (JNC, Japan)

1152 Design and Operating Experience of CECE D2O Upgrader in Fugen  
S. Kiyota, T. Kitabata (JNC, Japan), R. Ninomiya, S. Senrui (Showa Engineering, Japan), S. Isomura (Technolab, Japan)

1151 The pressure tube inspection and integrity evaluation in Fugen  
N. Ishizuka, K. Nakai, K. Takayama (JNC, Japan)

37. Russian and Chinese Nuclear Power Program  
(14:00-14:50) at Buzz Hall  
Chairs: Yoshiaki Oka (Univ. of Tokyo, Japan)  
Fil N. S. (Gidropress, Russia)

1229 Status and Perspectives of Advanced WWER Plants  
Fil N. S., Dragunov Y. G., Ryzhov S. B., Trunov N.B. (EDO Gidropress, Russia)

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1224 Nuclear Power Perspective in China

X. Liu, C. Xu (Beijing Institute of Nuclear Engineering, China)

## 5. SMART and Integral PWR

(15:10-17:40) at Buzz Hall

Chairs: Takamichi Iwamura (JAERI, Japan)  
S.H. Kim (KAERI, Korea)

1047 Design Verification Program of SMART

S.H. Kim, K. K. Kim, J. W. Yeo, M. H. Chang, S. Q. Zee (KAERI, Korea)

1048 Nuclear and Thermal Hydraulic Design Characteristics of SMART

D. H. Hwang, C. Lee, M. H. Chang, S. Q. Zee (KAERI, Korea)

1049 Plant System Design Features of SMART

J. Yoon, S. Y. Ryu, B. S. Choi, D. J. Lee, S. Q. Zee (KAERI, Korea)

1050 Safety Analysis of SMART

H. C. Kim, Y. J. Chung, K. H. Bae, S. Q. Zee (KAERI, Korea)

1008 Optimization of the coupling of nuclear reactors and desalination systems

T. Konishi (IAEA), M. M. Megahed (Nuclear Power Plants Authority, Egypt)

1081 Performance of Safety System of Passive Safety Small Reactor for Distributed Energy Supply System

T. Ishida, T. Yonomoto, K. Sawada, T. Yoritune, N. Nakajima (JAERI, Japan)

## 11. Hydrogen Production by Nuclear Reactors

(08:30-10:35, 10:55-12:40) at Room 1

Chairs: S. Shiozawa (JAERI, Japan)  
Doug Chapin (MPR ASSO., USA)

(keynote) Nuclear and Hydrogen – Teaming Up  
Steve Melancon (Entergy, USA)

1055 Evaluation of Hydrogen Production Systems with High Temperature Gas-Cooled Reactors

S. Shiozawa, M. Ogawa, Y. Inagaki, K. Onuki (JAERI, Japan)

1181 The U.S. Department of Energy Program on Hydrogen Production

D. Henderson, M. D. Paster (DOE, USA)

1126 European Research and Development on HTGR Process Heat Applications

K. Verfondern, W. von Lensa (Research Center Jülich, Germany)

1143 Hydrogen Production by Nuclear Heat

L. M. Crosbie, Dr. D. M. Chapin (MPR ASSO., USA)

1189 STAR-H2: A Lead-Cooled Fast Reactor for Hydrogen Manufacture Using the Ca-Br Thermochemical Water Cracking Cycle

D. C. Wade, R. D. Doctor (ANL, USA), K. L. Peddicord (Texas A&M Univ., USA)

1202 Pollution-free hydrogen from nuclear power  
A. I. Miller, Romney B. Duffey (AECL, Canada)

1199 Advanced CANDU Reactor Cogeneration Configuration - An Economical Energy Solution for the Oil Sands

H. Keil, L. Fiorino, S. Lam (AECL, Canada), R. Dunbar (CERI, Canada), J. M. Hopwood, D. Bock (AECL, Canada)

1043 Nuclear Hydrogen Production and its Safe Handling

H. Chung, S. Paek, K. R. Kim, D. H. Ahn, J. H. Chang (KAERI, Korea)

## 12. Technology of Hydrogen production

(13:30-16:00) at Room 1

Chairs: Y. Inagaki (JAERI, Japan)  
L. Sandell (EPRI, USA)

1062 R&D Program on HTTR Hydrogen Production System

Y. Inagaki, T. Takeda, T. Nishihara, K. Hayashi, Y. Inaba, H. Ohashi (JAERI, Japan)

1037 Conceptual Design of a Hydrogen Production System by DME Steam Reforming and High-Efficiency Nuclear Reactor Technology

K. Fukushima, T. Ogawa (Toshiba, Japan)

1072 R&D Program on Thermochemical Water-Splitting Iodine-Sulfur Process at JAERI

S. Kubo, H. Nakajima, S. Higashi, T. Masaki, S. Kasahara, M. Nomura, S. Ishiyama, K. Onuki, S. Shimizu (JAERI, Japan)

1091 Application of a membrane reactor system to the Bunsen reaction of the thermochemical water splitting IS process

M. Nomura, K. Ikenoya (JAERI, Japan), S. Fujiwara (Toshiba, Japan), H. Nakajima, S. Kasahara, S. Kubo, K. Onuki (JAERI, Japan)

1038 Thermal Efficiency of the IS Process for Thermochemical Hydrogen Production Using the HTGR

S. Kasahara (JAERI, Japan), G. J. Hwang (Korea Institute of Energy Research, Korea), S. Kubo (JAERI, Japan), H. S. Choi (Kyungil Univ., Korea), K. Onuki, M.o Nomura (JAERI, Japan)

1020 A new thermochemical and electrolytic hybrid hydrogen production process for FBR

T. Nakagiri, T. Hoshiya, K. Aoto (JNC, Japan)

## 7. Operation and Management of LWR

(16:20-18:00) at Room 1

Chairs: Hideya Kitamura (TEPCO, Japan)  
Garry G. Young (Entergy, USA)

1070 Startup Test of Onagawa Nuclear Power Plant Unit 3

M. Abe, I. Kato, R. Nakata, T. Watanabe (Tohoku Electric Power Co., Japan)

# GENES4/ANP2003 PROGRAM

1104 Feasibility study of 24-months cycle operation  
Y. Sakuya, D. Fujiwara, H. Takeuchi, T. Kamada, M. Kaino  
(TEPCO Systems, Japan)

1133 Long-Term Optimization of Outage Performance  
A. Hümmler, N. Jakobs (Framatome ANP, Germany)

1058 Economics of License Renewal in the U.S. – Entergy's  
Perspective  
G. G. Young (Entergy Nuclear, USA)

## 28. Boiling Transition

(08:30-11:25, 12:20-14:00) at Room 2A

Chairs: Isao Kataoka (Osaka Univ., Japan)  
George Yadigaroglu (ETH, Switzerland)

1068 Application of the Post-BT standard to future BWR  
licensing assessment  
S. Mizokami, H. Kitamura (TEPCO, Japan), M. Chaki, Y.  
Gotoh (Hitachi, Japan), S. Omizu (Toshiba, Japan), Y. Kudo  
(Global Nuclear Fuel-Japan Co., Japan)

1013 Development of Generalized Boiling Transition Model  
Applicable for Wide Variety of Fuel Bundle Geometries  
H. Ninokata (TIT, Japan), M. Sadatomi (Kumamoto Univ.,  
Japan), T. Okawa (Osaka Univ., Japan), A. Serizawa, K.  
Mishima (Kyoto Univ., Japan), S. Koshizuka (Univ. of Tokyo,  
Japan), K. Yoshiro (Global Nuclear Fuel Japan, Japan), A.  
Hotta (TEPCO Systems, Japan), S. Morooka, Y. Yamamoto, N.  
Shirakawa (Toshiba, Japan), K. Nishida (Hitachi, Japan)

1024 Development of Boiling Transition Analysis Code with  
Mechanistic Methods for BWR Rod Bundles = Prediction of  
Transient Fuel Rod Temperature during Dry-out =  
N. Ishida, H. Utsuno, F. Kasahara (NUPEC, Japan)

1162 Subchannel Analysis of Fluid Dynamics Behavior in  
PWR Fuel Assembly  
T. Mitsunashi (Fuji Research Institute Co., Japan), M. Naitoh  
(NUPEC, Japan), R. Kubota (Fuji Research Institute Co.,  
Japan), I. Kataoka (Osaka Univ., Japan)

1083 Thermal-Hydraulic Performance and Visible Test Results  
of Tight Lattice Bundle  
M. Akiba, Y. Yamamoto, S. Morooka, K. Hiraiwa (Toshiba,  
Japan)

1021 Numerical Simulation on Film Flow Distribution and  
Boiling Transition in Tight-Lattice Rod Bundles with Spacers  
H. Tamai, A. Hotta, H. Shirai, H. Akimoto (JAERI, Japan)

1111 Numerical Simulation of Liquid Film around Grid  
Spacer with Interface Tracking Method  
H. Yoshida (JAERI, Japan), Y. Ose (Yamato System Engineer,  
Japan), H. Tamai, K. Takase, H. Akimoto (JAERI, Japan)

1128 Analytical Study of a Liquid Film Flow on a Ribbed  
Surface in a RMWR core  
K. Takase, H. Yoshida, H. Tamai (JAERI, Japan), Y. Ose  
(Yamato System Engineer, Japan)

1148 Subchannel Analysis of CHF Experiments for Tight  
Lattice Core

T. Nakatsuka, H. Tamai, M. Kureta, T. Okubo, H. Akimoto, T.  
Iwamura, K. Yamamoto, H. Okada (JAERI, Japan)

1031 Prediction of Turbulent Diffusion Coefficient of Liquid  
Droplet Using Lagrangian Simulation  
K. Matsuura (Nuclear Fuel Industries), I. Kataoka (Osaka  
Univ., Japan), A. Serizawa (Kyoto Univ., Japan)

1075 Numerical prediction of dryout heat flux in vertical  
uniformly heated round tubes  
T. Okawa, A. Kotani, I. Kataoka (Osaka Univ., Japan), M.  
Naito (NUPEC, Japan)

30. The Particle Method; Innovative Gridless  
Calculation for Thermal Hydraulics and  
Structural Mechanics  
(14:20-16:00) at Room 2A  
Chairs: Masanori Naitoh (NUPEC, Japan)  
John Sackett (ANL-W, USA)

1165 Advanced analysis of complex thermal-hydraulic  
phenomena using particle method  
S. Koshizuka, Y. Oka (Univ. of Tokyo, Japan)

1073 Analysis of Two-Dimensional Elastic Structure by  
Particle Method  
M. S. Song, S. Koshizuka, Y. Oka (Univ. of Tokyo, Japan)

1019 Numerical Simulation of a single drop impact on liquid  
surface using particle method  
H. Xie, S. Koshizuka, Y. Oka (Univ. of Tokyo, Japan)

1077 Numerical Analysis of Jet Breakup Behavior using  
Particle Method  
K. Shibata, S. Koshizuka, Y. Oka (Univ. of Tokyo, Japan), T.  
Yamauchi (JAPC, Japan)

32. Severe Accident Analysis  
(16:20-18:00) at Room 2A  
Chairs: Masaki Saito (TIT, Japan)  
Karen Vierow (Purdue Univ., USA)

1074 PWR and BWR plant analyses by Severe Accident  
Analysis Code SAMPSON for IMPACT Project  
H. Ujita (Institute of Applied Energy), Y. Nakadai (Fuji  
Research Institute Co., Japan), T. Ikeda (Hitachi, Japan),  
M. Naitoh (NUPEC, Japan)

1080 Analyses of International Standard Problems,  
QUENCH06 Test at FZK and Phebus FPT-1 Test at IRSN by  
Detailed Severe Accidents Analysis Code, IMPACT/  
SAMPSON  
T. Ikeda, M. Terada, M. Naitoh (NUPEC, Japan)

1139 Verification of the MELCOR Code Against  
SCDAP/RELAP5 for Severe Accident Analysis  
J. Johnson Colbert, K. Vierow (Purdue Univ., USA)

1156 Scoping Studies of Core Disruptive Accident Energetics  
in a Metal-Fueled Fast Reactor  
S. D. Suk, Y. B. Lee, D. Hahn (KAERI, Korea)

# GENES4/ANP2003 PROGRAM

## 25. Fuel and Core Performance

(08:30-11:50) at Room 2B

Chairs: T. Matsumura (CRIEPI, Japan)  
B. Cheng (EPRI, USA)

1196 Fuel Performance Under Evolving Operating Conditions in Light Water Reactors

B. Cheng, R. Yang, J. Deshon, K. Edsinger, O. Ozer, S. Yagnik (EPRI, USA)

1026 Framatome ANP's ATRIUM-10 Fuel Assemblies for Flexible and Economic BWR Operation

P. Urban, T. W. Patten, N. L. Garner (Framatome ANP, Germany)

1042 An Applicability of the Advanced Fuel Assembly Design Code NEUPHYS for LWR Next Generation Fuels

Y. Kanayama, T. Ito, Y. Inaba (Nuclear Fuel Industries, Japan)

1086 Fuel cladding stress evaluation in changing control rods pattern of Shimane Nuclear Power Station Unit No1, 2

S. Shimatani, M. Tamura, I. Kawanaka, M. Kuwatani (Chugoku Electric Power Co., Japan), K. Tokunaga (Global Nuclear Fuel Japan, Japan), T. Mochida (Hitachi, Japan)

1098 Development of a Start-Up Procedure Automatic Generation System

K. Tate (TEPCO Systems, Japan)

1030 Application of MSHIM Core Control Strategy For Westinghouse AP1000 Nuclear Power Plant

M. Onoue, T. Kawanishi (Mitsubishi Heavy Industries, Japan), W. R. Carlson, T. Morita (Westinghouse, USA)

1046 PWR Core Tracking Using a Next-Generation Core Calculation Code, SCOPE2

M. Tatsumi, A. Yamamoto, H. Nagano (Nuclear Fuel Industries, Japan)

1082 Improvement of SSR Core Design for ABWR-II

M. Moriwaki, M. Aoyama (Hitachi, Japan), H. Okada, H. Kitamura (TEPCO, Japan), K. Sakurada (Toshiba, Japan), A. Tanabe (Global Nuclear Fuel Japan, Japan)

## 24. Core Design for MOX and Actinide Fuel

(12:40-14:45) at Room 2B

Chairs: T. Yamamoto (NUPEC, Japan)  
Marco Ricotti (Politecnico di Milano, Italy)

1150 ATR-MOX Fuel Design and Development

S. Maeda, H. Nakazawa, T. Abe (JNC, Japan)

1102 MA/LLFP Transmutation Experiment Options in the Future Monju Core

A. Kitano, J. Ishibashi, H. Nishi (JNC, Japan), M. Yamaoka (Toshiba, Japan)

1203 A Fast Lead-cooled Incinerator for Economical Actinide Burning

A. Romano, P. Hejzlar, N. E. Todreas (MIT, USA)

1079 Application of CANDLE Burnup to Block-Type High Temperature Gas Cooled Reactor for Incinerating Weapon Grade

Plutonium

Y. Ohoka, H. Sekimoto (TIT, Japan)

1169 Design Study on Sodium Cooled Fast Reactor Core Loaded with LLFP Transmutation Sub-Assemblies

N. Takaki, T. Mizuno (JNC, Japan)

## 26. Innovative Reactors and Their Physics

(15:05-18:00) at Room 2B

Chairs: H. Sekimoto (TIT, Japan)  
T.H.J.J. van der Hagen (Delft Univ. of Technology, Netherlands)

1197 Simulation Study on CANDLE Burnup Applied to an LBE-Cooled Metallic Fuel Fast Reactor

T. Takada, Y. Udagawa, H. Sekimoto (TIT, Japan)

1230 Optimization of Small and Very Small Nuclear Liquid Metal Cooled Energy System for the Use in Indonesia

Zaki Su'ud, Bakri Arbie (Bandung Institute of Technology, Indonesia)

1039 RAPID and RAPID-L Operator-Free Fast Reactor Concepts Without Any Control Rods

M. Kambe (CRIEPI, Japan), H. Tsunoda, K. Mishima (Mitsubishi Research Institute, Japan), T. Iwamura (JAERI, Japan)

1015 Conceptual Design of Inherently Safe Fast Reactor (ISFR)

Y. Asahi (JAERI, Japan)

1135 Monte-Carlo and Deterministic Models for Void Effect Calculations in the Super Critical Water Fast Reactor

M. Mori, A. Rineiski (FZK, Germany), V. Sinita (Institute for Physics and Power Engineering, Russia)

1122 Influence of Bubbles on Reactivity and Power in a Fluidized Bed Nuclear Reactor

A. Agung, D. Lathouwers, T. H. J. J. van der Hagen, H. van Dam (Delft Univ. of Technology, Netherlands), C. C. Pain, C. R. E. de Oliveira, A. J. H. Goddard (Imperial College of Science, Technology and Medicine, UK)

1001 The Dynamics Study of Intrinsically Safe Pellet Suspension Reactors

A. Ghasemi-Zad (Gilan Univ., Iran)



# GENES4/ANP2003 PROGRAM

"Public Information and Outreach" plenary  
(18:10-20:10) at Buzz Hall

Chairs: Yasumasa Tanaka (Gakushuin Univ., Japan)  
Ann Bisconti (Bisconti Research Inc. USA)

✓ "Is the NIMBY Syndrome Real and Remediable? A Case for Complex Decision-Making", Yasumasa Tanaka (Gakushuin Univ., Japan)

✓ "Communicating between People Living in Electricity-Producing Rural Areas and People Living in Electricity-Consuming Urban Areas", Etsuko Akiba (ASCA Energy Forum, Japan)

✓ "Energy Think Together: Story-Telling in Energy Education", Sumiko Masano (Fukui-Prefecture Women's Energy Association, Japan)

✓ "U. S. Nuclear Industry---Winning Public Approval", Scott Peterson (Nuclear Energy Institute, USA)

✓ "U.S. Public Opinion about Nuclear Energy", Ann Bisconti (Bisconti Research Inc., USA)

## FRIDAY SEPTEMBER 19, 2003

Session chair's breakfast  
(07:00-07:40) at Kyoto Tokyu Hotel, Gion room

"Role of Nuclear Energy in the 21st century" plenary  
(8:30-10:00) at Buzz Hall

Chairs: Shunsuke Kondo (Univ. Tokyo, Japan)  
Gail H. Marcus (DOE, USA)

✓ "Role of Nuclear Energy in Thailand", Somporn Chongkum (Nuclear Society Thailand, Thailand)

✓ "Role of Nuclear Energy in Vietnam", Hoang Anh Tuan (Atomic Energy Commission, Vietnam)

✓ "The Prospect of Nuclear Energy in Indonesia", Zaki Su'ud (Bandan Institute of Technology, Indonesia)

✓ "The Role of Nuclear Energy in Myanmar", Tin Hlaing (Atomic Energy Department, Myanmar)

Coffee service  
(10:00-11:00) at "Café Saveur"

23. Fuel MOX ABWR  
(10:20-12:00) at Buzz Hall

Chairs: Yuzo Inaba (Nuclear Fuel Industries, Japan) ✓  
A. E. Levin (NRC, USA)

1018 Full Mox Core Design in ABWR  
T. Ihara (Electric Power Development Co., Japan), T. Mochida (Hitachi, Japan), S. Izutsu, S. Fujimaki (Global Nuclear Fuel Japan Co., Japan)

1017 Study on High Performance MOX Fuel and Core Design in Full MOX ABWR(1) by GNF-J  
S. Izutsu, D. Goto, J. Saeki, T. Kokubun (Global Nuclear Fuel Japan Co., Japan), J. Yokoya (Electric Power Development Co., Japan)

1035 Study on High Performance MOX Fuel and Core Design in Full MOX ABWR(2) by NFI  
Y. Inaba, M. Tokashiki (Nuclear Fuel Industries, Japan), J.

Yokoya (Electric Power Development Co., Japan)

1123 Core Physics Experiments and Their Analyses of High Moderation Full MOX BWR  
T. Yamamoto (NUPEC, Japan)

8. High Conversion BWR and Advanced Reactor Design  
(13:00-15:30) at Buzz Hall

Chairs: Junichi Yamashita (Hitachi, Japan)  
Douglas Carroll (GE, USA)

1052 Nuclear Energy Options for 21st Century with the Reduced Moderation BWR and the FLUOREX reprocessing  
J. Yamashita, F. Kawamura, T. Sanda, T. Mochida (Hitachi, Japan)

1145 Design Study on Reduced-Moderation Water Reactor (RMWR) Core for Plutonium Multiple Recycling  
T. Okubo, T. Iwamura (JAERI, Japan), R. Takeda (Hitachi, Japan), T. Yamauchi (JAPC, Japan), H. Okada (TEPCO, Japan)

1163 Design of 300MWe Class Small Reduced-Moderation Water Reactor  
K. Moriya, R. Takeda (Hitachi, Japan), T. Okubo, T. Iwamura (JAERI, Japan), K. Yamamoto (JAPC, Japan), M. Aritomi (TIT, Japan)

1012 Compact Modular BWR (CM-BWR)  
L. Fennern, C. Boardman, D. Carroll, (GE Nuclear Energy, USA) T. Hida (JAPC, Japan)

1109 Probable Variations of Passive Safety BWR  
T. Sato, H. Oikawa (Toshiba, Japan)

1092 Ability of New Concept Passive-Safety Reactor "KAMADO" Safety, Economy and Hydrogen Production  
T. Matsumura, T. Kameyama, Y. Nauchi, I. Kinoshita (CRIEPI, Japan)

20. Instrumentation and Control Systems  
(10:10-13:05) at Room 1

Chairs: Shunsuke Utena (Hitachi, Japan)  
D.L. Harmon (Westinghouse, USA)

1066 Advanced MMIS design characteristics of APR1400  
Y. C. Shin, H. Y. Chung, T. Y. Song (Korea Hydro & Nuclear Power Co., Korea)

1127 Have It Your Way: A Modular Approach to Custom Compact Control Rooms  
D. Harmon, K. Scarola (Westinghouse, USA)

1034 Nuclear Power Plant C&I Design Verification by Simulation  
J. Storm (STN ATLAS Elektronik), K. Yu (GE Nuclear Energy, USA), D. Y. Lee (Taiwan Power Co., Taiwan)

# GENES4/ANP2003 PROGRAM

1105 Development of Distributed Plant Monitoring and Diagnosis System at "Monju"  
K. Okusa (JNC, Japan), T. Kitamura (NESI Inc., Japan), K. Tamayama (JNC, Japan)

1006 Verification of Core Monitoring System with Gamma Thermometer  
H. Shiraga (Global Nuclear Fuel - Japan Co., Japan)

1134 Recent Experience with In-Core Sipping Techniques  
K. Knecht (Framatome ANP, Germany)

1174 Feasibility Study of Noise Analysis Techniques for Estimating Reactivity Coefficient in a BWR  
A. Takagi (TEPCO, Japan), R. Oguma (GSE Power Systems AB, Sweden)

34. Thermal Hydraulics-General  
(10:20-12:50) at Room 2A  
Chairs: A. Yamaguchi (JNC, Japan)  
Z. Zhou (Tsinghua Univ., China)

1045 Overview on Stability of Natural-circulation-cooled Boiling Water Reactors during Start-up - an Experimental and Modeling Analysis  
A. Manera, T. H. J. J. van der Hagen (Delft Univ. of Technology, Netherlands), U. Rohde, H.-M. Prasser (Forschungszentrum Rossendorf e.V., Germany)

1170 Study on Start-up Procedure for NHR-5 Heating Reactor with ATHLET Code  
Z. Zhou, J. Fang (Tsinghua Univ., China)

1125 Studies on the turbulence modification affected by the wavy interface on liquid film in vertical upward annular flow  
K. Yoshida, H. Tanaka (Osaka Univ., Japan), K. Matsuura (Nuclear Fuel Industries, Japan), I. Kataoka (Osaka Univ., Japan)

1112 Prediction of Multi-Dimensional Void Fraction Distribution in Upward Bubbly Two-Phase Flow with Sudden Expansion  
K. Kondo (Marine Technical College, Japan), K. Yoshida, T. Okawa, T. Matsumoto, I. Kataoka (Osaka Univ., Japan)

1210 Void Fraction and Pressure Drop Profile of Vertical Two-Phase Flow with Contraction  
Y. Morimoto (Univ. of Tokyo, Japan)

1061 Flow-Induced Vibrations of Circular and Cross-Shaped Tube Bundles in Cross Flow  
R. Morita, F. Inada, T. Nishihara, A. Yasuo (CRIEPI, Japan), A. Sakashita, J. Mizutani (TEPCO, Japan)

33. Thermal Hydraulics of Gas and Liquid Metal  
(13:50-15:30) at Room 2A  
Chairs: Y. Yoshizawa (TIT, Japan)  
Sandro Paci (Univ. of Pisa, Italy)

1204 LES Simulation in Pebble Bed High Temperature Gas Cooled Reactor Core through Randomly and Regularly

Arranged Fuels  
G. Yesilyurt, Y. A. Hassan (Texas A&M Univ., USA)

1214 Pre-analysis of Heavy Eutectic Loop for Investigation of Operability and Safety (HELIOS) of Pb-Bi Cooled Reactor PEACER  
C. S. Kim, S. H. Jeong (Seoul National Univ., Korea), I. S. Lee (PhiloSOPhIA, Inc., Korea), K. Y. Suh, C. H. Kim, I. S. Hwang (Seoul National Univ., Korea)

1025 Sodium Combustion Analysis Code: ECHOES and Its Application to Sodium Burning in an LMFBR Secondary System  
K. Haga, F. Kasahara, Y. Ishida, I. Komatsu (NUPEC, Japan)

1164 Natural and Gas-injection Enhanced Circulation in a Loop with Variable Friction  
W. Ambrosinia, G. Forasassi, N. Forgiione, F. Oriolo, M. Tarantino (Univ. of Pisa, Italy)

36. Environmental Protection and Nuclear Energy  
(10:20-12:05, 13:05-14:45) at Room 2B  
Chairs: Kazuaki Matsui (IAE)  
J.M. Noterdaeme (Max Plank Inst., Germany)

(keynote) Nuclear Energy as an Environmental Answer  
Scott Peterson (NEI, USA)

1051 CO2 Emissions Reduction by Fast Breeder Reactor based on Long Term Energy Optimization  
K. Kazumi (Mitsubishi Heavy Industries, Japan), M. Hatano (The Institute of Applied Energy, Japan), M. Tashimo (Advanced Reactor Technology Company, Japan), H. Sekimoto (TIT, Japan)

1014 Zero-emission Fuel Cell Vehicle System Based on Nuclear Power System  
Y. Kato, K. Ando, Y. Yoshizawa (TIT, Japan)

1118 Roles of Nuclear Power under the Uncertainties of CO2 Emissions Trading and Deregulation of the Electric Market in Japan  
E. Kiriyama, R. Takashima, A. Suzuki (Univ. of Tokyo, Japan)

1193 Controlled Nuclear Fusion, a Challenging Task with a Big Payoff  
J-M Noterdaeme (Univ. Gent, Belgium and Max Planck Institute for Plasmaphysics, Germany)

1201 Inertial Fusion-A Modular Approach to Fusion Energy  
E. Michael Campbell (General Atomics Co., USA)

1097 The Basic Planning for the Environmental Aspect of Improved Nuclear Power Plant  
S. Ho Choi, H. S. Jung (Korea Power Engineering Co., Korea), D. H. Lee (Seoul National Univ., Korea)

1120 Axiological Approach to the New Era of Nuclear Energy  
T. Sawada (TIT, Japan)

## GENERAL INFORMATION

### 1. The registration desk will open during the following hours:

September 15 (Mon)	15:00-19:00	Lobby, 1st Floor, Kyoto Tokyu Hotel
September 16 (Tue)	08:00-17:00	Bldg. #4, Kyoto Research Park
September 17 (Wed)	08:00-17:00	Bldg. #4, Kyoto Research Park
September 18 (Thu)	08:00-17:00	Bldg. #4, Kyoto Research Park
September 19 (Fri)	08:00-14:00	Bldg. #4, Kyoto Research Park

### 2. Social Program

Reception	September 15 (Mon)	18:30-20:30	Kyoto Tokyu Hotel (All registered members are welcome.)
Banquet	September 17 (Wed)	18:30-21:00	Ganko Nijo-en (Banquet tickets are needed for admission.)

### 3. Bus Schedule between Kyoto Tokyu Hotel and Kyoto Research Park

	Depart from Kyoto Tokyu Hotel	Depart from Kyoto Research Park
Sept. 16 (Tue)	07:50, 08:00	18:40
Sept. 17 (Wed)	07:50, 08:00	17:40
Sept. 18 (Thu)	07:50, 08:00	20:20
Sept. 19 (Fri)	07:50, 08:00	15:40

### 4. Secretariat: Room 3 (2F, Bldg. #4)

Internet service is available in Room 5. (2F, Bldg. #4)

Message Board: Notification of changes of agenda, telephone messages, and so on, are put on the message board at the registration desk. (1F, Bldg. #4)

Coffee Service: "Café Saveur" (B1F, Bldg. #4)

### 5. Public Phone, Photocopier and Facsimile

Public Phone: Prepaid card can be bought at 7-ELEVEN. (1F, Bldg. #4)

1F, Bldg. #4 (Domestic calls only)

1F, Bldg. #1 (International calls are possible.)

Photocopier: 7-ELEVEN, 1F, Bldg. #4

FAX: 7-ELEVEN, 1F, Bldg. #4 (Domestic calls only)

KRP Convention Team Office, 3F, Bldg. #1 (Overseas)

### 6. Telephone & Fax numbers

Kyoto Research Park:

Tel: +81-75-322-7888 Fax: +81-75-314-2968

Kyoto Tokyu Hotel:

Tel: +81-75-341-2411 Fax: +81-75-341-2488

# GENES4/ANP2003 Conference Schedule (Draft as of August 15)

**September 15 (Monday, Japanese holiday)**

Welcome Reception at Kyoto Tokyu Hotel (18:30-20:30)

**September 16 (Tuesday)**

	9	10	11	12	13	14	15	16	17	18	19	20
Buzz Hall	Opening Plenary (8:40-11:10)				1 ABWR and ABWR2 (13:00-15:30)			2 Advanced technology (15:50-18:25)				
Room 1	18 LMFBF design and its evolution (12:30-15:30)						19 LMR design and development (15:50-17:05)		15 SCR-3 (17:15-18:30)			
Room 2A	35 Corrosion material and water chemistry (11:20-13:00)				35 Corrosion material and water chemistry (14:00-15:15)			27 Accelerator driven systems (15:35-18:05)				
Room 2B	16A IRIS-1 (11:20-13:00)				16B IRIS-2 (14:00-15:40)			17 IRIS-3 (16:00-18:30)				

**September 17 (Wednesday)**

	9	10	11	12	13	14	15	16	17	18	19	20	21	
Buzz Hall	Business climate Plenary (8:30-9:50)	3 Advanced PWR (10:00-12:05)			9 HGTR design (13:00-15:10)			10 HTGR testing, research and design (15:25-17:30)						
Room 1	13 SCR-1 (10:00-13:20)				14 SCR-2 (14:00-17:20)									Banquet at "Ganko-nijyo-en" (18:30-21:00)
Room 2A	31 Containment design and TH of severe accidents (10:00-12:05)				29 LOCA behaviors and passive systems (13:30-16:30)									
Room 2B	21 Aseismic technologic (10:30-12:35)				21 Aseismic technologic (14:00-15:15)			22 Structural design (15:35-17:15)						

### September 18 (Thursday)

	9	10	11	12	13	14	15	16	17	18	19	20	21
Buzz Hall	6 Advanced reactor development and ITER (8:30-10:35) ↓		4 CANDU and FUGEN (10:55-12:35)			37 Russian and Chinese program (14:00-14:50)	5 SMART (15:10-17:40)		Plenary session Public Information and Outreach (open to public) (18:10-20:10)				
Room 1	11 Hydrogen production by nuclear reactors (8:30-10:35)		→ 11 Hydrogen production by nuclear reactors (10:55-12:40)		→ 12 Technology of hydrogen production (13:30-16:00)		7 Operation and management of LWR (16:20-18:00)						
Room 2A	28 Boiling transition (8:30-11:25)			28 Boiling transition (12:20-14:00)		30 Particle method (14:20-16:00)		32 Severe accidents analysis (16:20-18:00)					
Room 2B	25 Fuel and core performance (8:30-11:50)				24 Core design for MOX and actinide fuel (12:40-14:45)		26 Innovative reactors and physics (15:05-18:00)						

### September 19 (Friday)

	9	10	11	12	13	14	15	16	17	18	19	20
Buzz Hall	Plenary " Role of Nuclear Energy" (8:30-10:00)		23 Full MOX ABWR (10:20-12:00)			8 High conversion BWR (13:00-15:30)						
Room 1			20 I&C (10:10-13:05)									
Room 2A			34 Thermal hydraulic - general (10:20-12:50)			33 Thermal hydraulics gas and liquid metal (13:50-15:30)						
Room 2B			36 Environmental protection and nuclear energy (10:20-12:05)			36 Environmental protection and nuclear energy (13:05-14:45)						

**September 20 (Saturday) 8am-6pm**  
**Technical tour Monju and Tsuruga-2 PWR**