

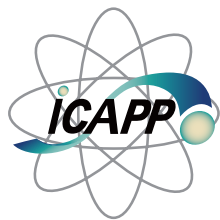
ICAPP2017 in 福井・京都

A New Paradigm in Nuclear Power Safety

April 24-28, 2017 FUKUI and KYOTO, JAPAN

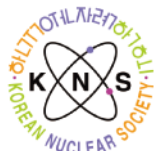
April 24-25, 2017 *Hotel Fujita Fukui*

April 26-28, 2017 *The Westin Miyako Kyoto*



2017 International Congress on Advances in Nuclear Power Plants

OFFICIAL PROGRAM



Meeting Contributors

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A New Paradigm in Nuclear Power Safety

The International Congress on Advances in Nuclear Power Plants (ICAPP) provides a forum for leaders of the nuclear industry to exchange information, present results from their work, review the state of the industry, and discuss future directions and needs for the deployment of new nuclear power plant systems around the world. ICAPP will gather industry leaders in several invited lectures in plenary sessions.

The theme for ICAPP2017 is “*A New Paradigm in Nuclear Power Safety*”. Since the Fukushima Daiichi Accident in 2011, various efforts in improving nuclear safety have been initiated not only in Japan but also in other countries. Decontamination of affected soil and steps toward decommissioning Fukushima Daiichi are proceeding steadily, but many issues to be resolved still remain. Further advances in reactor decommissioning technologies are expected in light of the rising number of old nuclear power plants being closed. The congress also provides an excellent opportunity to discuss these topics.

ICAPP is an annual event, cosponsored by AESJ, ANS, KNS, SFEN, and a number of major international nuclear societies, and is held in cooperation with the International Atomic Energy Agency. Since its inception in 2002, ICAPP has been held biannually in the USA, and in Europe and Asia during the years in between.

Welcome Message

As the General Chair of the ICAPP2017, I am delighted to invite leaders engaged in nuclear power from countries around the world.

In Japan, a great earthquake occurred off East Japan in 2011. We express our deep apologies to the people who are compelled to live in refuge because of the accident at Fukushima Daiichi Nuclear Power Station resulting from this earthquake. Also, we apologize for the inconvenience that this has caused to nuclear power industries around the world, and express great appreciation for their cooperation and support for the reconstruction of Fukushima.

All nuclear power plants in Japan were shutdown following the accident at Fukushima Daiichi Nuclear Power Station. However, nuclear power plants that meet the strictest regulations in the world are restarting operations in sequence. At the end of this year, more nuclear power plants are expected to restart operations.

To recover trust in nuclear power generation in the future, it is important that we should autonomously and continuously improve safety beyond the regulatory framework. I expect that a wide spectrum of discussions will be held in the world, regarding countermeasures against natural disasters, such as earthquakes and tsunamis, plant life extension, and safety measures of new plants, etc.

In view of such momentum, ICAPP2017 is being held with the theme “*A New Paradigm in Nuclear Power Safety*” in which we can learn the latest activities around the world for safety and others. I believe that sharing and developing such knowledge will contribute to the progress of future nuclear power generation technologies around the world.

At the end of my address, I express my sincere appreciation to the nuclear societies, ANS, KNS and SFEN, that co-sponsored ICAPP2017, and associated organizations and individuals. I sincerely hope that discussions at this congress and visits to Fukui and Kyoto will be beneficial for all participants.

Hideki TOYOMATSU

*ICAPP2017 AESJ Organizing Committee Chair
ICAPP2017 General Chair
Director and Executive Vice President, Chief Nuclear Officer
The Kansai Electric Power Co., Inc.*



Organizers

HONORARY CHAIR	Mitsuru Uesaka President of Atomic Energy Society of Japan, Professor, The University of Tokyo
	Bradley Adams Engineering Vice President, Southern Nuclear Operating Company
	Joo Ho Whang President of Korea Nuclear Society
	Noël Camarcat Special Advisor, Nuclear R&D and International Issues, EDF/Engineering and New Nuclear Projects
GENERAL CHAIR	Hideki Toyomatsu Director & Executive Vice President, Chief Nuclear Officer, The Kansai Electric Power Co., Inc.
	Rosa Yang Fellow, Electric Power Research Institute
	Kwan Sup Lee President & CEO, Korea Hydro & Nuclear Power Co.
	Bernard Carlucc International Expert Fellow on Safety and Licensing, AREVA NP
TECHNICAL PROGRAM CHAIR	Takeshi Mitsugi Senior Associate, Sector of Decommissioning and Radioactive Waste Management, Japan Atomic Energy Agency
	Richard F. Wright Consulting Engineer, Advanced Reactor Technology, Westinghouse Electric Company
	Sunkoo Kang Advisor, Doosan Heavy Industries & Construction Co., Ltd.
	Frank Carré Scientific Director, CEA
YOUNG GENERATION PROGRAM CO-CHAIR	Satoshi Konishi Professor, Kyoto University
	Brett Rampal Nuclear Engineer, NuScale Power, LLC
	Hyoung Kyu Cho Professor, Seoul National University
	Frédéric Damian Senior Expert, Nuclear Energy Division, CEA
STEERING COMMITTEE	Samim Anghaie NuTec, Inc.
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	Akehiko Hoshide Toshiba Corporation Energy Systems & Solutions Company
	Kazuaki Matsui The Institute of Applied Energy
	Hisashi Ninokata Professor, Politecnico di Milano
	Koji Nishida Hitachi-GE Nuclear Energy, Ltd.
	Goon-cherl Park Professor, Seoul National University
	Atam Rao Principal Consultant
	Atsuyuki Suzuki Professor Emeritus, The University of Tokyo
	Akira Yamaguchi Professor, The University of Tokyo
	Tomofumi Yamamoto Mitsubishi Heavy Industries, Ltd.
	Frédéric Damian CEA

Congress Schedule

Monday, April 24 / Hotel Fujita Fukui

		7:00	8:00	9:00	10:00	11:00	12:00	13:00
Hotel Fujita Fukui	Tenzan Foyer							
	Tenzan							

Tuesday, April 25 / Hotel Fujita Fukui

		7:00	8:00	9:00	10:00	10:20	10:40	11:00	12:00	12:20	13:00
Hotel Fujita Fukui	Tenzan Foyer		Registration Desk 7:00 - 13:30								
	Tenzan		Welcome and Opening Plenary A New Paradigm in Nuclear Power Safety 8:00 - 10:20			Coffee Break 20 min.	Panel Session Plant Lifecycle Management & Long Term Operation 10:40 - 12:20			Lunch Break 60 min.	
	Sakae		Speakers Breakfast 7:00 - 7:40								
	Technical Tour										
	Technical Tour										
	Technical Tour										
	Technical Tour										

* Note: On Tuesday, April 25, there will be a Registration Desk in Kyoto, open from 16:30 - 19:00.

Wednesday, April 26 / The Westin Miyako Kyoto

		7:00	8:00	9:00	10:00	10:20	11:00	12:00	13:00	
The Westin Miyako Kyoto	2F Foyer		Registration Desk 7:20 - 19:00							
	Mizuho 3		Exhibition 8:20 - 19:00							
	Mizuho 1		Plenary 1 Nuclear Energy International Outlook 8:20 - 10:00			Coffee Break 20 min.	Plenary 2 New Plant Designs and Constructions 10:20 - 12:00			Lunch Break 80 min.
	Mizuho 2									
	Cosmos Hall		Speakers Breakfast 7:20 - 8:00							
	Hiei									
	Atago									
	Take									
	Ran									
	Kiku									
	Shirakawa									
	Minori									

14:00	15:00	16:00	17:00	18:00	19:00	19:30	20:00	22:00
			Registration Desk 16:00 - 19:30					
					Welcome Reception 18:00-19:30			

13:20	13:30	14:00	15:00	15:30	16:00	17:00	18:00	19:00	20:00	22:00
		Track 5: Generic Safety Improvement, Evaluation and Regulation								
		Track 4: Examination and Monitoring								
Ohi Nuclear Power Station Site Visit (incl. transfer to Kyoto)										
Tsuruga Power Station Site Visit (incl. transfer to Kyoto)										
Prototype FBR MONJU Site Visit (incl. transfer to Kyoto)										
FUGEN Decommissioning Engineering Center Site Visit (incl. transfer to Kyoto)										
					Transfer to Kyoto					

13:20	14:00	15:00	15:20	16:00	17:00	17:10	18:00	18:30	18:50	19:00	20:00	22:00
Registration Desk 7:20 - 19:00												
Exhibition 8:20 - 19:00												
Track 1: Advances in LWR I		Track 1: Advances in LWR II				Track 1: SMR (LWR)						
Track 3: SFR Design and Technologies I		Track 3: SFR Severe Accident I				Track 3: SFR Severe Accident II						
Track 5: Safety Analysis I		Track 5: External Events I				Track 5: External Events II						
Track 3: SFR Core Design I		Track 3: SFR Core Design II				Track 3: SFR Design and Technologies II						
Track 7: CHF and Reactor Simulations		Track 7: Severe Accident Related Simulations				Track 7: LOCA Analysis and Experiment						
Track 8: MA Recycle		Track 8: SNF Reprocessing				Track 8: LLW and ILW Management						
Track 9: Advanced Cladding/Materials		Track 9: LWR Plant Materials and Structures				Track 9: Seismic Resistance						
Track 4: Plant Management		Track 4: Maintenance Experiences				Track 4: Maintenance Technologies						
Track 10: Society and Technology		Track 10: Modeling and Analysis on Nuclear Energy in the Future				Track 7: Mixed Flow Phenomena						
Coffee Break 20 min.		Break 10 min.										
										YGP Special Session "Introduction to Fukushima Study"		
										17:10 - 18:30		

Thursday, April 27 / The Westin Miyako Kyoto

		7:00	8:00	9:00	10:00	11:00	12:00	13:00	
The Westin Miyako Kyoto	2F Foyer		Registration Desk 7:20 - 19:00						
	Mizuho 3		Exhibition 8:20 - 19:00						
	Mizuho 1		Plenary 3 Nuclear Fuel Cycle and Sustainability 8:20 - 10:00				Track 1: Innovative LWR		Lunch Break 80 min.
	Mizuho 2						Track 5: Severe Accident		
	Cosmos Hall	Speakers Breakfast 7:20 - 8:00				Coffee Break 20 min.	Track 3: SFR Safety Design and Assessment		
	Hiei						Track 7: Single-Phase Flow Thermal Hydraulics		
	Atago				Track 8: Fukushima Daiichi NPP - Fuel Debris				
	Take				Track 9: Fast Reactor Materials				
	Ran				Track 4: Emergency Assessment and Measures				
	Kiku				Track 6: LWR Core Design				
	Shirakawa								

Friday, April 28 / The Westin Miyako Kyoto

		7:00	8:00	9:00	10:00	11:00	12:00	13:00	
The Westin Miyako Kyoto	2F Foyer		Registration Desk 7:20 - 17:00						
	Mizuho 3		Exhibition 8:20 - 12:00						
	Mizuho 1		Plenary 4 Fukushima Report 8:20 - 10:00				Track 8: Fukushima Daiichi NPP - Characterization and Waste Treatment -		Lunch Break 80 min.
	Mizuho 2						Track 5: Safety Analysis Code Development		
	Cosmos Hall	Speakers Breakfast 7:20 - 8:00				Coffee Break 20 min.	Track 3: LFR Design and R&D		
	Hiei						Track 7: Reactor Thermal Hydraulics		
	Atago				Track 1: Computational Technique for Design and Simulations				
	Take				Track 9: Stainless Steel and Concrete				
	Ran				Track 6: Nuclear Data				
	Kiku								

13:20	14:00	15:00	15:20	16:00	17:00	17:10	18:00	18:50	19:00	19:30	20:00	22:00
Registration Desk 7:20 - 19:00												
Exhibition 8:20 - 19:00												
Track 1: Accident Tolerant Fuel in LWR		Coffee Break 20 min.						Welcome Drink		Banquet 19:30-22:00		
Track 5: Gas Combustion/Radioactive Material Release I				Track 5: Gas Combustion/Radioactive Material Release II		Track 5: PSA/PRA						
Track 3: Thermal Hydraulics in SFR				Track 3: Innovative Plant Design		Track 3: GFR and ITER						
Track 7: Multi-Phase Flow Thermal Hydraulics I				Track 7: Multi-Phase Flow Thermal Hydraulics II		Track 7: Multi-Phase Flow Thermal Hydraulics III						
Track 8: LLW and ILW Processing and Treatment				Track 8: SNF and HLW Management		Track 7: System Analysis Code Simulations						
Track 2: HTR Engineering				Track 2: HTR PRA		Track 2: HTR Design						
Track 4: Severe Accident Management				Track 4: Plant Assessment		Track 4: Operation Supporting System						
Track 6: Advanced Core Design and Management				Track 6: Application and Verification of Reactor Physics		Track 9: Accident Tolerant Fuel Materials						
13:20	15:20	17:10	18:50									

13:20	14:00	15:00	15:20	16:00	17:00	18:00	19:00	20:00	22:00		
Registration Desk 7:20 - 17:00											
Track 5: Safety Analysis II		Coffee Break 20 min.		Track 5: Evaluation of Fukushima Daiichi Accident							
Track 3: MSR Design and R&D				Track 3: Thermal Hydraulics in MSR							
Track 7: Code Verification and Validation				Track 7: CFD Analysis							
Track 8: Decommissioning Planning of Nuclear Facilities				Track 8: Dismantling and Decontamination Technologies							
Track 9: Maintenance and Related Materials				Track 9: SCC							
Track 6: Methods for Neutronics				Track 6: Next Generation Reactor Physics							
13:20	15:20										

General Information

CONGRESS REGISTRATION

ICAPP meeting and speaker registration will be located in both venues (details see below).

Meeting registration is required for all attendees and speakers. Badges are required for admission to all plenaries, technical sessions and events.

REGISTRATION HOURS

FUKUI Hotel Fujita Fukui, Foyer in front of Tenzan, 3F
Monday, April 24 16:00 – 19:30
Tuesday, April 25 7:00 – 13:30

KYOTO The Westin Miyako Kyoto, Hallway, 2F
Wednesday, April 26 7:20 – 19:00
Thursday, April 27 7:20 – 19:00
Friday, April 28 7:20 – 17:00

LUNCH

On Tuesday, April 25 (Fukui) a lunch box will be provided for all attendees. Full meeting registrations or one-day Fukui badges are required.

There will be no lunch provided in Kyoto (April 26 – 28).

QUESTIONS ABOUT THE MEETING

Please direct any questions to the reception desk of each venues.

EXHIBITION

Opening hours:

From 8:20 to 19:00 on Wednesday, April 26

From 8:20 to 19:00 on Thursday, April 27

From 8:20 to 12:00 on Friday, April 28

Venue: The Westin Miyako Kyoto, Mizuho 3, 4F

HOTEL INFORMATION

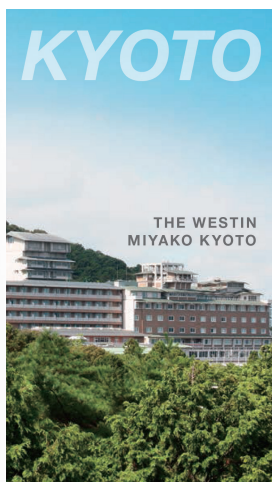


HOTEL FUJITA FUKUI

April 24 - 25, 2017

Address:
3-12-20 Ote, Fukui-shi,
Fukui 910-0005,
Japan

Tel:
+81 776 27-8811



THE WESTIN MIYAKO KYOTO

April 26 - 28, 2017

Address:
1 Awataguchi Kachocho,
Higashiyama-ku, Kyoto 605-0052,
Japan

Tel:
+81-75-771-7111

Instruction for Speakers and Chairs

GENERAL NOTICE FOR SPEAKERS

All speakers and session chairs (including plenaries and panels) must sign in at the ICAPP Registration Desk during registration hours.

SPEAKERS PREVIEW ROOM

A preview room for all speakers will be provided. Please visit the preview room to check your presentation before your session.

Locations:

FUKUI Sakae, open on April 25 from 10:00 to 12:00

KYOTO Mizuho 3 Subroom, open on April 26-27 from 7:20 to 19:00, on April 28 from 7:20 to 12:00

SPEAKERS BREAKFASTS

All speakers and chairs shall participate in the Speakers Breakfasts on the day of their assigned slot. Please bring your biography to the Speakers Breakfast and submit it to the chair of your session.

PRESENTATION TIME SCHEDULE

Speakers and chairs are requested to arrive at the designated session room at least 5 minutes prior to the scheduled starting time and confirm the presence of all speakers.

Plenary Sessions:

20 minutes including 5 minutes for discussion

Technical Sessions:

20 minutes including 5 minutes for discussion

TIME ALLOCATION

During the session, time will be notified by chairs as follows:

- 1 beep 3 minutes before the end of speaking time
- 2 beeps at the end of speaking time
- 3 beeps at the end of discussion time

We kindly ask presenters to take a seat in the front row of the session room before the start of the session. In order to ensure the smooth operation of sessions, the Organizing Committee asks all speakers to keep to the time allocation.

EQUIPMENT

Speakers should basically bring their own PC. Please make sure that the power-saving features (sleep mode, screen saver, etc.) are deactivated. Each Session Room will be equipped with the following:

- LCD Projector (VGA Cable, DE15)
- Laser Pointer
- Microphone and Lectern

ROLE OF CHAIRS

Chairs are expected to promote and stimulate discussions. In case that a presenter is absent, the next presentation should be started. Chairs are kindly requested to adjust the session time.

FOR PLENARY SPEAKERS

The room of Plenaries and Panel Sessions in Fukui (Tenzan) and Kyoto (Mizuho 1+2) will be provided with a Windows laptop computer. The specification is as below.

OS: Windows 7 Pro 64bit, English version

Software: Microsoft PowerPoint 2013, English version

When your presentation is based on a Macintosh version, please bring your own Mac.

Thank you very much for your cooperation.
ICAPP2017 Organizing Committee Secretariat

Plenary and Special Events

MONDAY, APRIL 24

WELCOME RECEPTION

6:00 pm - 7:30 pm / Tenzan (Hotel Fujita Fukui)

One ticket to the Welcome Reception is included in the full meeting and one-day Fukui registration fee.

TUESDAY, APRIL 25

WELCOME SPEECH

8:00 am - 8:30 am / Tenzan (Hotel Fujita Fukui)

CO-CHAIR

Kazushige Bunno (General Manager, The Kansai Electric Power Co., Inc.)

SPEAKERS

Hideki Toyomatsu (Director, Executive Vice President, Chief Nuclear Officer, The Kansai Electric Power Co., Inc.)

Yoshiaki Oka (Chairman, Japan Atomic Energy Commission)

Mitsuru Uesaka (AESJ President, Professor, The University of Tokyo (ICAPP2017 Honorary Chair))

OPENING PLENARY

8:40 am - 10:20 am / Tenzan (Hotel Fujita Fukui)

A New Paradigm in Nuclear Power Safety

Since the Fukushima Daiichi Accident in 2011, improvements and strengthening of nuclear safety have been discussed and implemented worldwide as well as in Japan. This session highlights and discusses key efforts and prospects under a new paradigm in nuclear safety.

CO-CHAIRS

Akira Yamaguchi (Professor, The University of Tokyo)

Tatjana Jevremovic (Team Leader for WCR Technology Development, Nuclear Power Technology Development Section, IAEA)

SPEAKERS

New Regulatory Requirements and Actions for Nuclear Safety since Fukushima Dai-ichi Accident

Mitsuhiro Kajimoto (Director, Division of Research for Severe Accident, Regulatory Standard and Research Department, The Secretariat of the Nuclear Regulation Authority)

The United States' Nuclear Safety Improvements and Regulation Trends since Fukushima

Bradley Adams (Engineering Vice President, Southern Nuclear Operating Company (ICAPP2017 Honorary Chair))

Post-Fukushima safety in France: new paradigm or normal evolution?

Thierry Charles (Deputy Director General, in charge of Nuclear Safety, IRSN)

Regulatory Approach for Nuclear Safety Improvements in Korea after Fukushima Daiichi Accident

Key Yong Sung (President, Korea Institute of Nuclear Safety (KINS))

What Constitutes Nuclear Safety: The True Lessons from Nuclear Disasters

William D. Magwood, IV (NEA Director-General, OECD)

PANEL SESSION

10:40 am - 12:20 pm / Tenzan (Hotel Fujita Fukui)

Plant Lifecycle Management & Long Term Operation

Most of the existing nuclear power plants were constructed and have been in commercial operation since the 1970s. Long-term use of existing power plants is a major solution to reduce greenhouse gas and to produce economical electricity. Many plants have had their design lifetime of 40 years extended, and developments toward an 80 year-lifetime are being conducted throughout the world. This panel session highlights recent advances and future developments for plant lifecycle management and long-term operation beyond 40 years old.

MODERATOR

Naoto Sekimura (Professor, The University of Tokyo)

PANELISTS

Garry G. Young (Director, License Renewal, Entergy Services, Inc.)

Akihiro Yamamoto (Section Chief, Aging Managing Specialist, Nuclear Safety Measures Division, Fukui Prefectural Government)

Abderrahim Al Mazouzi (EDF Lab. Les Renardières Depart. of Materials and Mechanics of components)

Zhengcao Li (Professor, School of Materials Science and Engineering Tsinghua University, Beijing, China)

WEDNESDAY, APRIL 26

PLENARY SESSION 1 8:20 am - 10:00 am / Mizuho 1 & 2 (The Westin Miyako Kyoto)**Nuclear Energy International Outlook**

Worldwide, key efforts are underway to accelerate the effective utilization of existing and new nuclear energy infrastructure. This plenary session will highlight key policy around the world, and discuss future directions for the role of nuclear energy.

CO-CHAIRS

Mitsuru Uesaka (*AESJ President, Professor, The University of Tokyo*)

Jik-Lae Jo (*EVP, Head of Nuclear Division, Kepco E&C*)

SPEAKERS**Global trends in utilization and development of nuclear power**

Dohee Hahn (*Director, Division of Nuclear Power, Department of Nuclear Energy, IAEA*)

Current Situation of Japan's Nuclear Energy Policy

Noriaki Ozawa (*Director-General for Energy and Environmental Policy, Agency for Natural Resources and Energy, Ministry of Economy Trade and Industry*)

Electrification and the Global Role of Nuclear Power

Neil M. Wilmshurst (*Vice President and CNO, Electric Power Research Institute*)

The French nuclear sector - latest developments

Sunil Felix (*Conseiller Nucléaire, Ambassade de France au Japon*)

TITLE TBD

Jong Ho Lee (*EVP, Head of Technology and Engineering Division, KHNP*)

PLENARY SESSION 2 10:20 am - 12:00 pm / Mizuho 1 & 2 (The Westin Miyako Kyoto)**New Plant Designs and Construction**

New reactor technologies ranging from advanced light water reactors, to light water small modular reactors (SMRs), to Generation IV reactors are in development, some in licensing and others at the construction stage. This plenary session will highlight current design, licensing and deployment efforts.

CO-CHAIRS

Akio Yamamoto (*Professor, Nagoya University*)

Sunil Felix (*Conseiller Nucléaire, Ambassade de France au Japon*)

SPEAKERS**Japanese plant manufacturers' activities for new nuclear power plants**

Nobuo Tada (*The Japan Electrical Manufacturers' Association*)

Investing in U.S. Energy Infrastructure: Advanced Nuclear Plants

Maria Korsnick (*President, Nuclear Energy Institute*)

Introduction to New Nuclear Power Reactors under Development in Korea

Jik-Lae Jo (*EVP, Head of Nuclear Division, Kepco E&C*)

High Power VVER Design. Reference Design and Its Localization

Sergey Svetlov (*Chief Expert in Design Engineering, ROSATOM*)

AP1000 Plant Hot Functional Testing at Sanmen-1 and Haiyang-1

Richard F. Wright, PhD (*Consulting Engineer, Advanced Reactor Technology, Westinghouse Electric Company*)

IAEA Activities in New Plants Design and Construction

Tatjana Jevremovic (*Team Leader for WCR Technology Development, Nuclear Power Technology Development Section, IAEA*)

THURSDAY, APRIL 27

Plenary and
Special
Events
KYOTO**PLENARY SESSION 3** 8:20 am - 10:00 am / Mizuho 1 & 2 (The Westin Miyako Kyoto)**Nuclear Fuel Cycle and Sustainability**

For sustainable use of nuclear power energy, it is important to establish the nuclear fuel cycle. Even the countries adopting the One-Through Policy would also need to advance measures for waste management, including spent fuel disposal. In this session, current status and issues concerning the establishment of the nuclear fuel cycle including the fast reactor, plant decommissioning, waste management and spent fuel measures will be highlighted.

CO-CHAIRS

Yuji Arita (Professor, University of Fukui)

Bernard Boullis (Director, Nuclear Fuel Cycle Back-end Programs, Nuclear Energy Division, CEA)

SPEAKERS

Current State and Future Perspective of Commercial Nuclear Fuel Cycle in Japan

Harukuni Tanaka (Fellow, Japan Nuclear Fuel Ltd.)

Nuclear fuel cycle and Fast reactor development in France

Bernard Boullis (Director, Nuclear Fuel Cycle Back-end Programs, Nuclear Energy Division, CEA)

EnergySolutions Nuclear Power Plant Decommissioning

Colin Austin (Senior Vice President, EnergySolutions)

70 Years of waste management in challenging and evolving nuclear market

Stefan Bergström (President of Consultancy Services, Studsvik AB)

BANQUET 7:30 pm - 10:00 pm / Mizuho 1 & 2 (The Westin Miyako Kyoto)

Access to the Banquet is included in the full meeting registration fee. Badges are requested.

Tickets can be purchased for guests (only in advance).

FRIDAY, APRIL 28

PLENARY SESSION 4 8:20 am - 10:00 am / Mizuho 1 & 2 (The Westin Miyako Kyoto)**Fukushima Report**

Since the Fukushima Daiichi Accident in 2011, various measures have been taken globally to regain trust in the use of nuclear power. In Japan, although decommissioning of the Fukushima Daiichi Nuclear Power Plants and soil decontamination are being steadily advanced, there are still many issues to be solved. In this session, decommissioning technologies used at the Fukushima Daiichi Nuclear Power Plants will be highlighted, as well as measures for the return of residents, and current status and issues concerning risk communication.

CO-CHAIRS

Takanori Tanaka (Managing Director, The Institute of Applied Energy)

Rosa Yang (Fellow, Electric Power Research Institute)

SPEAKERS

Decommissioning of the Fukushima Daiichi NPP - Now and the Future Plan -

Toshihiko Fukuda (Managing Director, Nuclear Damage Compensation and Decommissioning Facilitation Corporation Technological Strategy Group (NDF))

Overview of IRID R&D Projects

Atsufumi Yoshizawa (International Research Institute for Nuclear Decommissioning (IRID))

Three Mile Island Accident and Recovery Decontamination and Decommissioning

Lake Barrett (President, L. Barrett Consulting LLC)

Decontamination Outside the Plant

Seiji Ozawa (Deputy Director General, Headquarters for Fukushima Environmental Restoration, Ministry of Environment, Japan)

Exchanging with Stakeholders for Informed Decisions

Wolfgang Weiss (Bureau of the OECD/NEA Committee on Radiological Protection and Public Health)

YOUNG GENERATIONS PROGRAM

Student and Young Generations Award

Students, researchers, engineers and professionals under the age of 35 are encouraged to actively participate in the ICAPP 2017 Student and Young Generation Award. Papers were reviewed and **selected authors will be awarded during the banquet on Thursday, 27 April 2017**. To qualify for this award, candidates must be the first author of a paper, or equivalent leading author who can submit a written certificate by a responsible coauthor when requested. Candidates are also required to participate in this congress and make an oral presentation in the assigned technical sessions.

The final selection will be made by the international referees evaluating the paper and its presentation with respect to the quality of the research, significance and originality in the field. About 5 prizes each will be awarded to students, and young researchers, engineers and professionals under the age of 35.

Special Session & Networking Dinner 5:10 pm - 10:00 pm / Minori & Japanese Restaurant

Young Generation Network (YGN) of the Atomic Energy Society of Japan (AESJ) would cordially like to invite students, researchers, engineers and professionals under the age of 35 participating in ICAPP2017 to our special session and networking dinner, to be organized as a part of the Young Generation Program of the conference.

We would appreciate if you would spare your time to stay with us and socialize with young professionals and students from around the world.

Special Session "Introduction to Fukushima Study"

Date & Time: 17:10-18:30, Wednesday, 26 April 2017

Venue: Room Minori, The Westin Miyako Kyoto

Speaker: Professor Hiroshi KAINUMA (Ritsumeikan University)

The session will focus on overview of latest status, issues and challenges in Fukushima after the accident. You will be exposed to first-hand information from a well-known but young sociologist observing the situation in Fukushima for a number of years.

Networking Dinner

Date & Time: 19:30-22:00, Wednesday, 26 April 2017

Venue: Ganko Takasegawa Nijoen (Japanese restaurant)

Address: 484-6, Higashi Namasu-cho, Nijo-kudaru, Kiyamachi-dori, Nakagyo-ku, Kyoto 604-0922

Participants: Students, researchers, engineers and professionals under the age of 35 who made a reservation in advance

Expense: 4000-5000 yen (subject to change)

In the evening, we will hang out in the historical district, where we can enjoy the typical atmosphere of Kyoto and its nightlife, for the networking dinner.

Those who wish to join, please come to the lobby of Westin Miyako Hotel, the conference venue, at 19:15.

Technical Tours

Technical tours will be held on Tuesday, April 25, 2017.

Advance registration is required. Please acknowledge that there might be cases that not all tour preferences can be fulfilled. After the technical tour, the bus will arrive at Kyoto venue. The cost is included in the registration fee.

Technical tours can be booked only with the on-line registration system (pre-registration).

Tour 1 Ohi Nuclear Power Station (The Kansai Electric Power Co., Inc.)



Location: Ohi-cho, Ohi-gun, Fukui

All 4 units are Pressurized Water Reactors.

Units 1&2 started commercial operation in 1979. They have four reactor cooling loops with a gross capacity of 1175MWe. KANSAI introduced the Containment Vessel with Ice Condenser to these two reactors.

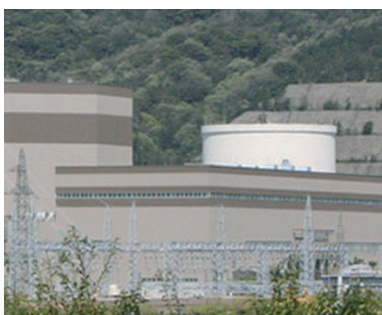
Units 3&4 started commercial operation in 1991 and 1993, respectively. They have four reactor cooling loops with a gross capacity of 1180MWe. KANSAI introduced the Prestressed Concrete Containment Vessel to these two reactors.

KANSAI has taken various enhanced safety measures taking account of the lessons learned from the accident at TEPCO's Fukushima Daiichi Nuclear Power Station.

Tour participants will see the following facilities in addition to the MCR, Turbine Building, Spent Fuel Pit from the Transparent Observation Facility.

- Enhanced power supply (large capacity high voltage emergency mobile generators and appropriation power cable)
- Enhanced cooling water supply for ultimate heat sink (large capacity pumps and fire engines)

Tour 2 Tsuruga Power Station (The Japan Atomic Power Company (JAPC))



Location: Myojin-cho, Tsuruga-shi, Fukui

Unit_1 is a Boiling Water Reactor as the first commercial Light Water Reactor in Japan, which started operation in 1970 and its commercial operation was terminated in 2015.

Unit_2 is a Pressurized Water Reactor, which started commercial operation in 1987.

It has four reactor cooling loops and its gross capacity is 1160MWe. JAPC introduced the first Prestressed Concrete Containment Vessel to Unit_2 in Japan.

JAPC has taken various enhanced safety measures taking account of the lessons learned from the accident at TEPCO's Fukushima Daiichi Nuclear Power Station.

Tour participants will see the following facilities.

- Flooding countermeasures for the building
- Enhanced power supply (large-capacity, high-voltage, emergency, mobile generators and appropriation power cables)
- Enhanced cooling water supply for the ultimate heat sink (large-capacity pumps and fire engines)

Tour 3 Prototype FBR MONJU (Japan Atomic Energy Agency)

Location: Shiraki, Tsuruga-shi, Fukui

Prototype Monju is a 280MWe, loop-type, sodium-cooled fast breeder reactor (FBR) using plutonium-uranium mixed oxide fuel. Monju achieved its initial criticality in April 1994, and connected to the grid in 1995, however, a sodium leak accident occurred due to the breakage of the sodium temperature sensor in the secondary cooling system. Monju resumed System Start-up Tests (SSTs) in 2010 after 14 years and five months of shutdown since the sodium leak accident. Currently, the reactor is shut down due to the accident of Fukushima Daiichi Nuclear Power Plants.

Monju is currently making efforts to deal with safety assessments and measures based on the lessons learned from the accident of Fukushima Daiichi Nuclear Power Plants. The tour includes the following facilities' visit:

- Information building: Learning the whole structure, features of each equipment and how Monju works using the scale model.
- Sodium Handling Training Facility: Learning the characteristics of sodium by experiencing the cutting of metallic sodium and sodium combustion experiments.
- Observatory: Providing a view of the entire appearance of Monju.
- Main Control Room: Controlling and monitoring Monju.
- Turbine building: Turbine generator to produce 280MWe. As sodium-cooled reactors can generate high-temperature, high-pressure steam, a system of thermal power generation is used.

Tour 4 FUGEN Decommissioning Engineering Center (Japan Atomic Energy Agency)

Location: Myojin-cho, Tsuruga-shi, Fukui

Fugen, which is a heavy-water-moderated-boiling light-water-cooled pressure tube reactor, was in operation from March 1979 to March 2003. After the decommissioning preparation stage, Fugen's decommissioning program was approved on February 2008 and reorganized as Fugen Decommissioning Engineering center. It launched decommissioning work ahead of any other large-scale water reactor in Japan.

Now, the dismantling work of the turbine system is in progress, and the dismantling technology for the reactor core, which is laser cutting and plasma cutting, etc., is being studied.

You can see the following facilities on the technical tour:

- Turbine Building: Dismantlement status of Turbine System
Automatic Decontamination Device
Clearance Monitor, etc.
- The other facility: Containment Vessel
Main control room

Technical Track Overview

Track 1

Water-Cooled Reactor Programs and Issues

- Accident Tolerant Fuel in LWR
- Advances in LWR I
- Advances in LWR II
- Computational Technique for Design and Simulations
- Innovative LWR
- SMR (LWR)

Track 2

High Temperature Reactors

- HTR Design
- HTR Engineering
- HTR PRA

Track 3

Advanced Reactors

- GFR and ITER
- Innovative Plant Design
- LFR Design and R&D
- MSR Design and R&D
- SFR Core Design I
- SFR Core Design II
- SFR Design and Technologies I
- SFR Design and Technologies II
- SFR Safety Design and Assessment
- SFR Severe Accident I
- SFR Severe Accident II
- Thermal Hydraulics in MSR
- Thermal Hydraulics in SFR

Track 4

Operation, Performance and Reliability Management

- Emergency Assessment and Measures
- Examination and Monitoring
- Maintenance Experiences
- Maintenance Technologies
- Operation Supporting System
- Plant Assessment
- Plant Management
- Severe Accident Management

Track 5

Plant Safety Assessment, Regulatory and Licensing Issues

- Evaluation of Fukushima Daiichi Accident
- External Events I
- External Events II
- Gas Combustion/Radioactive Material Release I
- Gas Combustion/Radioactive Material Release II
- Generic Safety Improvement, Evaluation and Regulation
- PSA/PRA
- Safety Analysis Code Development
- Safety Analysis I
- Safety Analysis II
- Severe Accident

Track 6

Reactor Physics and Analysis

- Advanced Core Design and Management
- Application and Verification of Reactor Physics
- LWR Core Design
- Methods for Neutronics
- Next Generation Reactor Physics
- Nuclear Data

Track 7

Thermal Hydraulics Analysis and Testing

- CFD Analysis
- CHF and Reactor Simulations
- Code Verification and Validation
- LOCA Analysis and Experiment
- Mixed Flow Phenomena
- Multi-Phase Flow Thermal Hydraulics I
- Multi-Phase Flow Thermal Hydraulics II
- Multi-Phase Flow Thermal Hydraulics III
- Reactor Thermal Hydraulics
- Severe Accident Related Simulations
- Single-Phase Flow Thermal Hydraulics
- System Analysis Code Simulations

Track 8

Fuel Cycle, Waste Management and Decommissioning

- Decommissioning Planning of Nuclear Facilities
- Dismantling and Decontamination Technologies
- Fukushima Daiichi NPP
 - Characterization and Waste Treatment -
- Fukushima Daiichi NPP - Fuel Debris -
- LLW and ILW Management
- LLW and ILW Processing and Treatment
- MA Recycle
- SNF and HLW Management
- SNF Reprocessing

Track 9

Materials and Structural Issues

- Accident Tolerant Fuel Materials
- Advanced Cladding/Materials
- Fast Reactor Materials
- LWR Plant Materials and Structures
- Maintenance and Related Materials
- SCC
- Seismic Resistance
- Stainless Steel and Concrete

Track 10

Nuclear Energy and Global Environment

- Modeling and Analysis on Nuclear Energy in the Future
- Society and Technology

Track 5: Generic Safety Improvement, Evaluation and Regulation 1:20 pm - 3:00 pm / Tenzan (Hotel Fujita Fukui)

Chair: Masutake Sotsu (*Japan Atomic Energy Agency*)

Co-Chair: Hongbin Zhang (*Idaho National Laboratory*)

17093 Defence in Depth Perspectives

Tania Veneau, Agnès Ferrier, Jean Barbaud (*EDF*)

17277 Beyond Design Basis External Flooding - Generic Design Assessment and Lessons Learned from the Fukushima Dai-ichi Accident

Tanya MacLeod, Leslie Smith, Tim Allmark, Peter Ford (*Office for Nuclear Regulation*)

17353 Our Reflections and Lessons from the Fukushima Nuclear Accident

Takeshi Matsuoka, Takashi Sawada, Genki Yagawa, Naoto Sekimura, Ayao Tsuge, Hideki Nariai, Hiroyuki Kameda, Masaki Shiratori, Hiroshi Miyano, Yoshitaka Yoshida (*Science Council of Japan*)

17460 Development of the Risk Monitoring System "COSMOS" and Risk-Informed Activities for Safety Enhancement in Kansai Electric's Plants

Kazuhisa Takegoshi, Jun Sugahara, Satoru Fukui, Gaku Okubo (*The Kansai Electric Power Co., Inc.*), Kagetomo Miyahara, Takamasa Kurokawa, Kaoru Ikeda (*Nuclear Engineering, Ltd.*)

Track 4: Examination and Monitoring

1:20 pm - 3:00 pm / Sakae (Hotel Fujita Fukui)

Chair: Shinobu Ookido (*Hitachi-GE Nuclear Energy Ltd.*)

Co-Chair: Hidehiko Kuroda (*Toshiba Corporation*)

17092 Neutron Radiography Method under High Gamma-Ray Environment Using Dysprosium Foil

Kohichi Nakayama, Syuji Yamamoto (*Toshiba Corporation*), Koichi Nittoh (*Toshiba Nuclear Engineering Service Corporation*), Kenichi Yoshioka, Tsukasa Sugita (*Toshiba Corporation*)

17157 Development of Ultrasonic Inspection Technique for Cast Stainless Steel and Its Application in the Field

Hitoshi Ishida (*Institute of Nuclear Safety System, Inc.*)

17708 Monitoring of Pipe Wall Thinning Using High-Temperature Thin-Film UT Sensor

Takeshi Kodaira, Takayuki Matsuura, Isao Seki, Yuko Yamamoto, Seiichi Kawanami (*Mitsubishi Heavy Industries, Ltd.*)

17459 Study on Condition Monitoring Techniques for Low Voltage Electrical Cables in Nuclear Power Plants

Hideo Hirao, Takeshi Sakai (*Nuclear Engineering, Ltd.*), Yuusaku Kajimura (*Institute of Nuclear Safety System, Inc.*)

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Track 1: Advances in LWR I

1:20 pm - 3:00 pm / Mizuho 1 (The Westin Miyako Kyoto)

Chair: Franck Morin (CEA)**Co-Chair:** Chikako Iwaki (Toshiba Corporation)

- 17036 **The European Utility Requirements for Advanced Light Water Reactors (EUR): Recent Achievements and New Challenges**
Emmanuel Vieilletoile (EDF)
- 17217 **ALISA Project: Large-Scale Experimental Facilities for Severe Accidents Studies in Europe and in China**
A. Miassoedov (Karlsruhe Institute of Technology), Y. Liao (China Nuclear Power Technology Research Institute), X. Gaus-Liu (Karlsruhe Institute of Technology), C. Journeau, N. Cassiaut-Louis (CEA), H. Zhang (China Nuclear Power Technology Research Institute), W. Bai (State Nuclear Power Software Development Center), Y.P. Zhang (Xi'an JiaoTong University), B. Kuang, P. Hu (Shanghai Jiao Tong University)
- 17709 **In-Containment Hydrogen Sensor System against Harsh Environment during a Severe Accident**
Shohei Hasegawa, Hiroyuki Ukon, Masato Oba (Mitsubishi Heavy Industries, Ltd.)
- 17688 **Load Bearing Capacities and Elastic-Plastic Behavior of Reactor Vessel Internals**
Keita Watanabe, Ryuichi Nagase (Mitsubishi Heavy Industries, Ltd.)
- 17446 **The Effect of Mass Transfer Processes on Accumulation and Crystallization of Boric Acid in VVER Core in Case of Accident**
A. V. Morozov, A. V. Pityk, S. V. Ragulin, A. R. Sahipgareev, A. S. Shlepkin (Institute for Physics and Power Engineering)

Track 3: SFR Design and Technologies I

1:20 pm - 3:00 pm / Mizuho 2 (The Westin Miyako Kyoto)

Chair: Hidemasa Yamano (Japan Atomic Energy Agency)**Co-Chair:** Bernard Carlucc (AREVA NP)

- 17155 **IAEA NAPRO Coordinated Research Project: Equations of State for Sodium**
O. Azpitarte, E. Vazquez, M. Japas, M. Chocrón, A. Villanueva (National Atomic Energy Commission of Argentina), S. Passerini, C. Gerardi, C. Grandy (Argonne National Laboratory), E. Bubelis, S. Perez-Martin (Karlsruhe Institute of Technology), S. Jayaraju, F. Roelofs (Nuclear Research and Consultancy Group), C. Latgé, A. Gerschenfeld (CEA), Bin Long (China Institute of Atomic Energy), P. Selvaraj (Indira Gandhi Centre for Atomic Research), E. Marinenko, Y. Zagorulko (Institute of Physics and Power Engineering), H. Ohira (Japan Atomic Energy Agency), V. Kriventsev (IAEA)
- 17428 **The Collaboration of Japan and France on the Design of ASTRID Sodium Fast Reactor**
Frédéric Varaine, Gilles Rodriguez (CEA), Jean-Marie Hamy (AREVA NP), Hiroki Hayafune (Japan Atomic Energy Agency), Toru Iitsuka (Mitsubishi Heavy Industries, Ltd.), Haruo Mochida (Mitsubishi FBR Systems Inc.)
- 17573 **Development of Electro-Magnetic Pump for the ASTRID Sodium-Cooled Fast Reactor**
Tetsu Suzuki, Rie Aizawa, Shingo Wakasaki (Toshiba Corporation Energy Systems & Solutions Company), Frank Dechelette, Fabrice Benoit (CEA)
- 17645 **Development of Prototype Reactor Maintenance (1) Application to Piping System of Sodium-Cooled Reactor Prototype**
Shoji Kotake (The Japan Atomic Power Company), Yoshitaka Chikazawa, Shigeru Takaya, Masahiko Ohtaka, Shigenobu Kubo, Masanobu Arai, Kosuke Kunogi (Japan Atomic Energy Agency), Takaya Ito (Mitsubishi FBR Systems Inc.), Akira Yamaguchi (The University of Tokyo)
- 17772 **Development of Prototype Reactor Maintenance (2) Application to Piping Support of Sodium-Cooled Reactor Prototype**
Masanobu Arai, Kosuke Kunogi, Kosuke Aizawa, Yoshitaka Chikazawa, Shigeru Takaya, Shigenobu Kubo (Japan Atomic Energy Agency), Shoji Kotake (The Japan Atomic Power Company), Takaya Ito (Mitsubishi FBR Systems Inc.), Akira Yamaguchi (The University of Tokyo)

Track 5: Safety Analysis I

1:20 pm - 3:00 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Tania Veneau (EDF)**Co-Chair:** Koichi Nakamura (Central Research Institute of Electric Power Industry)

- 17047 **Demonstration of Uncertainty Quantification and Sensitivity Analysis for PWR Fuel Performance with BISON**
Hongbin Zhang (Idaho National Laboratory), Jacob Ladd (Brigham Young University), Haihua Zhao, Ling Zou, Douglas Burns (Idaho National Laboratory)
- 17737 **Modeling of Accident Tolerant Fuel for PWR and BWR Using MAAP5**
Eugene van Heerden, Chan Y. Paik, Sung Jin Lee, Martin G. Plys (Fauske & Associates, LLC)
- 17464 **The Analysis of Kuosheng Nuclear Power Plant Spent Fuel Pool by Using FRAPTRAN-2.0**
Wan-Yun Li, Yu Chiang (National Tsing Hua University), Jong-Rong Wang (National Tsing Hua University / Nuclear and New Energy Education and Research Foundation), Yung-Shin Tseng (National Tsing Hua University), Hao-Tzu Lin (Atomic Energy Council), Jung-Hua Yang, Yuh-Ming Ferng, Shao-Wen Chen (National Tsing Hua University), Chunkuan Shih (National Tsing Hua University / Nuclear and New Energy Education and Research Foundation)
- 17729 **Fuel Cycle Facility Safety Analysis and Source Term Tool FATE**
Martin Plys, Sung Jin Lee, Robert Apthorpe, James Burelbach (Fauske & Associates, LLC)
- 17614 **Simplified Pipe-To-Pipe Impact and Break Evaluation Method for Postulated Pipe Rupture**
Redha Mahzar, Xu Qiang, Yushi Sakamoto, Akira Nebu, Akihiko Hirano, Noriyuki Takamura (Hitachi-GE Nuclear Energy Ltd.)

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Track 3: SFR Core Design I

1:20 pm - 3:00 pm / Hiei (The Westin Miyako Kyoto)

Chair: Shigeo Ohki (*Japan Atomic Energy Agency*)**Co-Chair:** Thierry Beck (*CEA*)

- 17247 **Design Study of a 750 MWe Japan Sodium-Cooled Fast Reactor with Metal Fuel**
Kazuya Ohgama (*Japan Atomic Energy Agency*), Hirokazu Ohta (*Central Research Institute of Electric Power Industry*),
Yoshihisa Ikusawa, Shigeo Ohki (*Japan Atomic Energy Agency*), Takanari Ogata (*Central Research Institute of Electric Power Industry*)
- 17169 **Comparative Study on Burnup Characteristics of a 1500 MWe Metal Fuel Sodium-Cooled Fast Reactor**
Kazuya Ohgama (*Japan Atomic Energy Agency*), Gerardo Aliberti, Nicolas E. Stauff (*Argonne National Laboratory*),
Shigeo Ohki (*Japan Atomic Energy Agency*), Taek K. Kim (*Argonne National Laboratory*)
- 17207 **Tradeoff Analysis of Metal-Fueled Fast Reactor Design Concepts**
Nicolas E. Stauff (*Argonne National Laboratory*), Kazuya Ohgama (*Japan Atomic Energy Agency*),
Gerardo Aliberti (*Argonne National Laboratory*), Shigeo Ohki (*Japan Atomic Energy Agency*),
Taek K. Kim (*Argonne National Laboratory*)
- 17171 **Core Concept of Minor Actinides Transmutation Fast Reactor with Improved Safety**
Koji Fujimura (*Hitachi-GE Nuclear Energy Ltd. / Hitachi, Ltd.*), Satoshi Itooka (*Hitachi-GE Nuclear Energy Ltd.*),
Shigeo Ohki (*Japan Atomic Energy Agency*), Toshikazu Takeda (*University of Fukui*)
- 17739 **Concept of Small Candle Burning Reactor with Melt and Refining Process**
Toru Obara, Van Khanh Hoang, Jun Nishiyama (*Tokyo Institute of Technology*)

Track 7: CHF and Reactor Simulations

1:20 pm - 3:00 pm / Atago (The Westin Miyako Kyoto)

Chair: Michio Murase (*Institute of Nuclear Safety System, Inc.*)**Co-Chair:** Gumersindo Verdu (*Institute for Industrial, Radiophysical and Environmental Safety*)

- 17429 **A Critical Heat Flux Model for Flow Boiling in the IVR Conditions**
Hae Min Park (*CEA / Korea Advanced Institute of Science and Technology*), Sofia Carnevali, Fabrice Gaudier (*CEA*),
Yong Hoon Jeong (*Korea Advanced Institute of Science and Technology*)
- 17755 **Enhanced Pool Boiling Critical Heat Flux with Cr-Sputtered Superhydrophilic Metal Surface**
Hong Hyun Son, Gwang Hyeok Seo, Uiju Jeong, Sung Joong Kim (*Hanyang University*)
- 17218 **An Experimental Investigation on CHF Enhancement of Saturated Water with Coated Surfaces by Cellulose Nano Fiber**
Won-Ki Hwang, Minji Hyun, Hundong Choi (*Handong Global University*),
Seunghwan Choy, Dong Soo Hwang (*Pohang University of Science and Technology*),
Kwon-Yeong Lee (*Handong Global University*)
- 17472 **NPP Process Systems Testing by Means of CSS "VEB" on the Example of Operating Regimes Verification of the Make-Up and Boron Control System**
Evgenii Obraztsov, Maxim Gavrillov, Evgeny Tretyakov, Vladimir Bezlepkin (*JSC ATOMPROEKT*)

Track 8: MA Recycle

1:20 pm - 3:00 pm / Take (The Westin Miyako Kyoto)

Chair: Supathorn Phongikaroon (*Virginia Commonwealth University*)**Co-Chair:** Koichi Uozumi (*Central Research Institute of Electric Power Industry*)

- 17322 **Control of Fine Particles Accumulation in the Extraction Chromatography Column System for Minor Actinide Recovery**
Sou Watanabe, Ichiro Goto, Yuichi Sano, Kazunori Nomura, Yoshikazu Koma (*Japan Atomic Energy Agency*)
- 17356 **Granulation Study of Porous Silica Particles for MA Recovery Process**
Ichiro Goto, Hirohide Kofuji, Akio Oriuchi, Sou Watanabe, Masayuki Takeuchi (*Japan Atomic Energy Agency*)
- 17392 **Minor Actinides Recovery from Irradiated Fuel for SmART Cycle Test**
M. Takeuchi, Y. Sano, S. Watanabe, M. Nakahara, H. Aihara, H. Kofuji, T. Koizumi, T. Mizuno (*Japan Atomic Energy Agency*)
- 17252 **Study on Full Recycling Scheme of TRU Utilizing Features of LWR and FR**
R. Shimada, H. Yamaguchi, S. Takeda, T. Kitada (*Osaka University*)
- 17388 **Americium Early Transmutation in Thermal Reactors: An Option to a Better Nuclear Spent Fuel Management**
A.-A. Zakari-Issoufou, X. Doligez, A. Somaini, M. Ernoult, S. David, S. Bouneau (*Université Paris-Sud*),
F. Courtin, B. Leniau, N. Thiollière (*SUBATECH*), B. Mougnot (*University of Wisconsin-Madison*),
A. Bidaud (*Phelma-INP Grenoble*)

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Track 9: Advanced Cladding/Materials

1:20 pm - 3:00 pm / Ran (The Westin Miyako Kyoto)

Chair: Masahiro Furuya (Central Research Institute of Electric Power Industry)**Co-Chair:** Ken Kurosaki (Osaka University)**17227 Study of Microstructure and Mechanical Properties of Dilute Binary Zr-Nb Model Alloys for the Applications of Nuclear Fuel Cladding**H.L. Yang, S. Kano (The University of Tokyo), Z.G. Duan, Y. Matsukawa (Tohoku University),
K. Murakami (The University of Tokyo), H. Abe (The University of Tokyo / Tohoku University)**17288 Improvement of In-Situ Transmission Electron Microscope Technique for Analysis of Cascade Damage**

Kenta Murakami, Dongyue Chen, Hiroaki Abe, Naoto Sekimura (The University of Tokyo)

17290 Irradiation Effects on Localized Deformation Behaviors in Zr-Nb Alloys

Sho Kano, Huihong Yang, Kenta Murakami, Hiroaki Abe (The University of Tokyo)

17790 Development of M-MDA as Reliable Cladding and Structural MaterialsYuji Okada, Seiichi Watanabe, Hideyuki Teshima (Mitsubishi Nuclear Fuel Co., Ltd.),
Toshiya Kido (Nuclear Development Corp.), Yasushi Kameda (The Kansai Electric Power Co., Inc.)**17481 Zirconium Hydride: The Physical Properties and High-Temperature Stability**Ken Kurosaki (Osaka University / JST PRESTO), Yuji Ohishi, Hiroaki Muta (Osaka University),
Shinsuke Yamanaka (Osaka University / University of Fukui)**Track 4: Plant Management**

1:20 pm - 3:00 pm / Kiku (The Westin Miyako Kyoto)

Chair: Masutake Sotsu (Japan Atomic Energy Agency)**Co-Chair:** Norimasa Mori (Mitsubishi Heavy Industries, Ltd.)**17313 Development of Sub-Criticality Monitoring Method during Shutdown Modes of Nuclear Power Plants**Shoichi Tashiro (Global Nuclear Fuel-Japan Co., Ltd. / University of Fukui), Masayuki Tojo (Global Nuclear Fuel-Japan Co., Ltd.),
Yoichiro Shimazu (University of Fukui)**17564 Verification of Sub-Criticality Monitoring Method with Actual Startup Range Neutron Monitor Signals during Shutdown Modes in a BWR**Masayuki Tojo (Global Nuclear Fuel-Japan Co., Ltd.), Shoichi Tashiro (Global Nuclear Fuel-Japan Co., Ltd. / University of Fukui),
Yoichiro Shimazu (University of Fukui), Suguru Murakami (Hokuriku Electric Power Co., Inc.)**17725 Impact of the Primary Coolant ⁵⁸Co Activity at Last Reactor Cooling Pump Shutdown on the Reactor Cavity Floor Dose Rates**

T. Jobert, C. Dinse (EDF)

17536 Experiences of Takahama Unit 3 and 4 Plant Start-Up Water Chemistry Management after Long Term OutageMasanori Aoki, Tetsuya Tanabe (The Kansai Electric Power Co., Inc.),
Akihiro Maeda, Nobuo Ishihara, Yasuhiko Shoda (Mitsubishi Heavy Industries, Ltd.)**17637 Result of Water Quality during Restart at Ikata Unit 3**

Seitaro Mishima, Hiroyuki Urado, Yasuhiro Miyoshi, Akihiro Okita, Kazushi Fujita (Shikoku Electric Power Co., Inc.)

Track 10: Society and Technology

1:20 pm - 3:00 pm / Shirakawa (The Westin Miyako Kyoto)

Chair: Kazuaki Matsui (The Institute of Applied Energy)**Co-Chair:** Kazuhiro Tsuzuki (The Institute of Applied Energy)**17213 Key Technologies for the Current and Future Challenges of the Nuclear Industry**

Lou Martinez-Sancho, Martin Rouleaux Dugage (AREVA NP)

17233 A Study of Environmental Design Planning for Nuclear Power Plants

Yeonjung Kim, Selin Kim (Ewha Womans University)

17554 Nuclear Safety Cooperation in Southeast Asia: Lessons from Asia's Regional Networks

Julius Cesar I. Trajano (Nanyang Technological University)

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Track 1: Advances in LWR II

3:20 pm - 5:00 pm / Mizuho 1 (The Westin Miyako Kyoto)

Chair: Tomohiko Ikegawa (*Hitachi, Ltd.*)**Co-Chair:** Franck Morin (*CEA*)

- 17443 **iB1350 #1 – A Generation III.7 Reactor after the Fukushima Daiichi Accident**
Takashi Sato, Keiji Matsumoto, Kenji Hosomi, Yoshihiro Kojima, Keisuke Taguchi (*Toshiba Corporation*)
- 17253 **iB1350 #2 - Level 1 PRA for Optimization of Safety Systems of the iB1350**
Yuji Komori, Go Tanaka, Tetsuro Yamaoka, Takashi Sato, Geoffrey Carter (*Toshiba Corporation*)
- 17447 **iB1350 #3 – Passive Double Confinement and SA Population Dose Evaluation for the iB1350**
Takashi Sato, Keiji Matsumoto, Kenji Hosomi, Ryuji Iwasaki (*Toshiba Corporation*)
- 17445 **iB1350 #4 – Innovative Passive Containment Cooling System for the iB1350**
Takashi Sato, Keiji Matsumoto, Nobuhiro Hara, Ryuji Iwasaki (*Toshiba Corporation*)
- 17583 **Mitigations of Station Blackout Accident of an Advanced Boiling Water Reactor**
Y.S. Wang, F.J. Tsai, Min Lee (*National Tsing Hua University*)

Track 3: SFR Severe Accident I

3:20 pm - 5:00 pm / Mizuho 2 (The Westin Miyako Kyoto)

Chair: Yoshitaka Fukano (*Japan Atomic Energy Agency*)**Co-Chair:** Frederic Olivier Serre (*CEA*)

- 17270 **Analysis of SCARABEE BE+3 Experiment with ASTEC-Na and Comparison with Other SFR Safety Analysis Codes**
Giacomino Bandini, Stefano Ederli (*Italian Agency for New Technologies, Energy and Sustainable Economic Development*), Sara Perez-Martin, Werner Pfrang (*Karlsruhe Institute of Technology*), Nathalie Girault, Laure Cloarec (*Institute for Radiological Protection and Nuclear Safety*)
- 17144 **Fundamental Experiments of Jet Impingement and Fragmentation Simulating the Fuel Relocation in the Core Disruptive Accident of Sodium-Cooled Fast Reactors**
Yuya Imaizumi, Kenji Kamiyama, Ken-ichi Matsuba, Mikio Isozaki, Tohru Suzuki, Yuki Emura (*Japan Atomic Energy Agency*)
- 17111 **A New Design of Experimental System and Preliminary Numerical Analysis of Local Fuel-Coolant Interactions in a Simulated Molten Fuel Pool**
Ting Zhu, Songbai Cheng, Shaopeng Lin, Minli Chen, Wanqi Feng, Qingyun Hu (*Sun Yat-Sen University*)

Track 5: External Events I

3:20 pm - 5:00 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Ichiro Tamura (*The Chugoku Electric Power Co., Inc.*)**Co-Chair:** Tanya MacLeod (*Office for Nuclear Regulation*)

- 17197 **Seismic Margin Analysis for Reactor and Spent Fuel Storage Pool**
Bumpei Fujioka, Naoki Hirokawa, Daisuke Taniguchi (*Hitachi-GE Nuclear Energy Ltd.*)
- 17358 **Continuous Improvements of Earthquake and Tsunami Resistant Measures at Onagawa Nuclear Power Station**
Kenzo Nakano (*Tohoku Electric Power Co., Inc.*)
- 17577 **Development of Evaluation Method for Seismic Isolation Systems of Nuclear Power Facilities - Proposal of Fragility Evaluation Method and Study on Application of Fail-Safe System -**
Takahide Akimoto (*Obayashi Corporation*), Tetsuo Imaoka (*Hitachi-GE Nuclear Energy Ltd.*), Kunihiko Sato (*MHI Nuclear Systems And Solution Engineering Co., Ltd.*), Tomofumi Yamamoto (*Mitsubishi Heavy Industries, Ltd.*), Masakazu Jimbo (*Toshiba Corporation*), Tsutomu Hirotsu (*Shimizu Corporation*), Koichi Yabuuchi (*Kajima Corporation*), Yasuo Okouchi (*Chubu Electric Power Co. Inc.*)
- 17757 **Dynamic Approach for Scenario Quantification of Combined Event of Internal Flooding and Earthquake in Nuclear Power Plant**
Sunghyon Jang, Akira Yamaguchi (*The University of Tokyo*)
- 17783 **The Seismic Assessment of Wheeled Vehicle Type Equipment (e.g. Emergency Power Supply Vehicle) against Severe Accident for Nuclear Power Plant in Japan**
Takuya Ikeda, Daisuke Mitsuzawa, Yoshikazu Yamaguchi, Motohiko Hasebe, Ryutaro Imamura, Yuji Tomitani (*Mitsubishi Heavy Industries, Ltd.*), Ippei Ueyama (*The Kansai Electric Power Co., Inc.*), Takahiro Kawamoto (*Hokkaido Electric Power Co., Inc.*)

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Track 3: SFR Core Design II

3:20 pm - 5:00 pm / Hiei (The Westin Miyako Kyoto)

Chair: Koji Fujimura (*Hitachi-GE Nuclear Energy Ltd.*)**Co-Chair:** Paolo Ferroni (*Westinghouse Electric Company LLC*)**17374 Core Performance Requirements and Design Conditions for Next-Generation Sodium-Cooled Fast Reactor in Japan**Shigeo Ohki, Shuhei Maruyama, Yoshitaka Chikazawa, Akira Ohtaki, Shigenobu Kubo (*Japan Atomic Energy Agency*), Koki Hibi (*Mitsubishi FBR Systems Inc.*), Taro Kan (*Mitsubishi Heavy Industries, Ltd.*)**17221 Core Design of the Next-Generation Sodium-Cooled Fast Reactor in Japan**Taro Kan (*Mitsubishi Heavy Industries, Ltd.*), Masashi Ogura, Koki Hibi (*Mitsubishi FBR Systems Inc.*), Shigeo Ohki, Seiichiro Maeda, Shuhei Maruyama, Kazuya Ohgama (*Japan Atomic Energy Agency*)**17201 Improvement of Minor Actinides Transmutation Performances in Fast Reactors Using Fissile Material**Timothée Kooyman, Laurent Buiron, Gérald Rimpault (*CEA*)**17248 Conceptual Design of ASTRID Radial Shielding Sub-Assemblies**T. Beck (*CEA*), N. Chapoutier (*AREVA NP*), J-M. Esclaine (*CEA*), L. Gauthier, D. Occhipinti, B. Perrin (*AREVA NP*), M. Phelip, C. Venard (*CEA*)**Track 7: Severe Accident Related Simulations**

3:20 pm - 5:00 pm / Atago (The Westin Miyako Kyoto)

Chair: Marco Pellegrini (*The Institute of Applied Energy*)**Co-Chair:** Kazuyuki Takase (*Nagaoka University of Technology*)**17134 Modeling of RPV Lower Head under Core Melt Severe Accident Condition Using OpenFOAM**Hiroshi Madokoro, Frank Kretzschmar, Alexei Miassoedov (*Karlsruhe Institute of Technology*)**17345 Assessment on Direct Debris Interaction at High Pressure Melt Ejection Scenario**Hiromasa Chitose, Tomohiko Ikegawa, Naoya Kamei, Ryusuke Kimura (*Hitachi-GE Nuclear Energy Ltd.*)**17640 Development of a Numerical Simulation Method to Evaluate Molten Material Behavior in Nuclear Reactors**Susumu Yamashita, Shinichiro Uesawa, Hiroyuki Yoshida (*Japan Atomic Energy Agency*)**17168 Numerical Analysis of Effect of Solidification on Molten Jet Breakup**Yuan Zhou (*Sichuan University*), Mingjun Zhong (*Shanghai Jiao Tong University*), Xing Fan, Jing Tan Chen (*Sichuan University*)**17102 Preliminary Numerical Analysis of Flow-Regime Characteristics in Debris Bed Formation Behavior with Eulerian Model**Shixian Wang, Songbai Cheng, Shuo Li, Guangyu Jiang, Zhiyi Pan, Hantao Lin, Jiahuan Yu (*Sun Yat-Sen University*)**Track 8: SNF Reprocessing**

3:20 pm - 5:00 pm / Take (The Westin Miyako Kyoto)

Chair: Masayoshi Uno (*University of Fukui*)**Co-Chair:** Jong-Il Yun (*Korea Advanced Institute of Science and Technology*)**17263 Development of U and Pu Co-Processing Process****-Demonstration of U, Pu and Np Co-Recovery with Centrifugal Contactors-**Atsunari Kudo, Kazuaki Kurabayashi, Futoshi Yanagibashi, Shunichi Sasaki, Takehiko Sato, Ikuo Fujimoto, Tomoyuki Ohbu (*Japan Atomic Energy Agency*)**17494 Sulfur-Free HPLC Method for Quantification Assay of Uranium in Nuclear Fuel Reprocessing Plants**Satsuki Kai, Hirofumi Hayashibara, Takashi Miyazaki (*Mitsubishi Heavy Industries, Ltd.*), Takaaki Ichinohe, Kouichi Nishimura, Nobuharu Sato (*Japan Nuclear Fuel Limited*)**17727 Measurement of Exchange Current Density of LaCl₃ in LiCl-KCl Eutectic Salt**Hunter B. Andrews, Supathorn Phongikaroon (*Virginia Commonwealth University*)**17612 Development of Zeolite Column Systems for Treatment of Molten Chloride Salt Generated in Pyro-Reprocessing of Nuclear Fuel**K. Uozumi, T. Hijikata, K. Inagaki (*Central Research Institute of Electric Power Industry*)**Technical Sessions:**Wednesday
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Track 9: LWR Plant Materials and Structures 3:20 pm - 5:00 pm / Ran (The Westin Miyako Kyoto)**Chair:** Masayuki Kamaya (*Institute of Nuclear Safety System, Inc.*)**Co-Chair:** Naoki Soneda (*Central Research Institute of Electric Power Industry*)17305 **Research Plan of Irradiation Embrittlement Using Decommissioning Hamaoka Unit-1**Hideki Yuya, Masataka Oyama (*Chubu Electric Power Co. Inc.*)17398 **APT Analysis of Neutron-Irradiated Stainless Steels**Katsuhiko Fujii, Koji Fukuya (*Institute of Nuclear Safety System, Inc.*)17136 **Coupled 3D CFD and FEM Assessments of RPV Stress Intensity Factor during PTS Events**Xiaoyong Ruan, Toshiki Nakasuji, Kazunori Morishita (*Kyoto University*)17642 **Safety Design of MSF-Type Cask for Long Term Storage and Subsequent Transportation of Spent Nuclear Fuels**Hideaki Mitsui, Yoshiyuki Saito, Yuichi Saito, Junichi Kishimoto (*Mitsubishi Heavy Industries, Ltd.*)17638 **Stator Winding Service Life Analysis of Wet Winding Motor RCP**Eing Yee Yeoh, Linsen Li, Ziguang Wang, Feng Shen (*State Power Investment Corporation Research Institute*)**Track 4: Maintenance Experiences** 3:20 pm - 5:00 pm / Kiku (The Westin Miyako Kyoto)**Chair:** Nobuo Tada (*The Japan Electrical Manufacturers' Association*)**Co-Chair:** Thomas Jobert (*EDF*)17116 **Wearable System for Supporting Field Operation of Nuclear Power Plant**Musashi Shigeyama, Kenji Osaki, Takaki Kato, Yukinori Hirose (*Toshiba Corporation*)17625 **Maintenance Service for Major Component of PWR Plant: Replacement of Pressurizer Safe End Weld**Yoshiyuki Miyoshi, Yuki Kobayashi, Kazuhide Yamamoto, Takeshi Ueda, Naoki Suda, Takashi Shintani (*Mitsubishi Heavy Industries, Ltd.*)17693 **Development of Maintenance Procedure for Plate Type Heat Exchanger Taking into Account Preventing Radioactive Contamination**Kensuke Terai, Hiroyuki Someki, Yuya Ueda (*Mitsubishi Heavy Industries, Ltd.*)17655 **Maintenance Services of Nuclear Power Plant Using 3D As-Built Database Management System**Kazutaka Okumura, Kazuhito Nakashima (*Nuclear Plant Service Engineering Co., Ltd.*), Norimasa Mori, Takashi Azuma (*Mitsubishi Heavy Industries, Ltd.*)**Track 10: Modeling and Analysis on Nuclear Energy in the Future** 3:20 pm - 5:00 pm / Shirakawa (The Westin Miyako Kyoto)**Chair:** Charles Forsberg (*Massachusetts Institute of Technology*)**Co-Chair:** Kazuhiro Tsuzuki (*The Institute of Applied Energy*)17582 **Environmental Life Cycle Assessment of High Temperature Nuclear Fission and Fusion Biomass Gasification Plants**Shutaro Takeda, Shigeki Sakurai, Ryuta Kasada, Satoshi Konishi (*Kyoto University*)17674 **Feasibility of Waste to Bio-Diesel Production via Nuclear-Biomass Hybrid Model; System Dynamics Analysis**Hoseok Nam, Ryuta Kasada, Satoshi Konishi (*Kyoto University*)17758 **Integrating Nuclear and Renewable Electricity in a Low-Carbon World: MIT-Japan Future of Nuclear Power Studies**Geoffrey Haratyk (*Massachusetts Institute of Technology*), Ryoichi Komiyama (*The University of Tokyo*), Charles Forsberg, Richard Lester (*Massachusetts Institute of Technology*), Yasumasa Fujii (*The University of Tokyo*), Akira Omoto, Tomihiro Taniguchi (*Tokyo Institute of Technology*), Daniel Curtis, Nestor Sepulveda (*Massachusetts Institute of Technology*)17797 **Investigation of Role of Nuclear toward 2050 -World and Japanese Cases-**Kazuhiro Tsuzuki, Hidetaka Shimizu, Syuichi Takeji, Tomoyuki Takeda, Etsushi Kato, Atsushi Kurosawa, Takanori Tanaka (*The Institute of Applied Energy*)**Technical Sessions:**Wednesday
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Track 1: SMR (LWR)

5:10 pm - 6:50 pm / Mizuho 1 (The Westin Miyako Kyoto)

Chair: John Sulley (*Rolls-Royce*)**Co-Chair:** Ko Mizutani (*Mitsubishi Heavy Industries, Ltd.*)

- 17308 **SMR Built-In Pressurizer Operation Transients Analysis**
Songwei Li, Yu Liu, Xi Chen, Zhongchun Li, Danrong Song (*Nuclear Power Institute of China*)
- 17135 **Preliminary Study of Load-Following Operation in Small Modular Boiling Water Reactor Combined with Gas Fired Superheater**
Andhika Feri Wibisono, Eugene Shwageraus (*University of Cambridge*)
- 17442 **Verification of DeCART/CAPP Code System for VHTR Core with PMR-200 Benchmark**
Eun Jeong, Jinsu Park, Deokjung Lee (*Ulsan National Institute of Science and Technology*),
Hyun Chul Lee (*Pusan National University*)
- 17332 **Conceptual Design of Heat Transfer System for the Co-Generation Small-To-Medium Sized BWR**
Tomohiko Ikegawa, Kazuaki Kito (*Hitachi, Ltd.*), Koji Nishida (*Hitachi-GE Nuclear Energy Ltd.*)

Track 3: SFR Severe Accident II

5:10 pm - 6:50 pm / Mizuho 2 (The Westin Miyako Kyoto)

Chair: Hidemasa Yamano (*Japan Atomic Energy Agency*)**Co-Chair:** Bernard Carlucc (*AREVA NP*)

- 17147 **SAS4A Analysis Study on the Initiating Phase of ATWS Events for Generation-IV Loop-Type SFR**
Ryuzaburo Kubota (*Japan Atomic Energy Agency*),
Kazuya Koyama, Hiroyuki Moriwaki, Yumi Yamada, Yoshio Shimakawa (*Mitsubishi FBR Systems Inc.*),
Suzuki Tohru, Kenichi Kawada, Shigenobu Kubo, Hidemasa Yamano (*Japan Atomic Energy Agency*)
- 17378 **France-Japan Collaboration on the Severe Accident Studies for ASTRID: Outcomes and Future Work Program**
F. Serre, F. Bertrand, A. Bachrata, N. Marie (*CEA*), S. Kubo, K. Kamiyama (*Japan Atomic Energy Agency*),
B. Carlucc, B. Farges (*AREVA NP*), K. Koyama (*Mitsubishi FBR Systems Inc.*)
- 17654 **Effect of Rupture Size in Ex-Pin Phenomena of Severe Accident in SFR**
Min Ho Lee, Hyo Heo (*Ulsan National Institute of Science and Technology*), Dong Wook Jerng (*Chung-Ang University*),
In Cheol Bang (*Ulsan National Institute of Science and Technology*)
- 17072 **Analytical Study on Safety Margins against Significant Core Damage during Loss-of-Heat-Removal-System Events in a Sodium-Cooled Fast Reactor**
Yoshitaka Fukano (*Japan Atomic Energy Agency*)

Track 5: External Events II

5:10 pm - 6:50 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Akira Nakamura (*Institute of Nuclear Safety System, Inc.*)**Co-Chair:** Tania Veneau (*EDF*)

- 17209 **Impact of Cable Fire Products on Severe Accident Processes**
H.-J. Allelein (*RWTH Aachen University / Forschungszentrum Jülich*), C. Kubelt (*RWTH Aachen University*),
E.-A. Reinecke (*Forschungszentrum Jülich*)
- 17506 **Improvement of Flame Resistance of Non-Flame Retardant Cables by Applying Fire Protection Measures**
Yujiro Takemura, Yoshinori Segoshi, Susumu Jinno, Kazuki Mii (*The Kansai Electric Power Co., Inc.*)
- 17548 **Development of Long Life Volcanic Ash Filters Which Reduce Replacement Frequency**
Ryota Isobe, Yoshitaka Suzuki, Michita Mizuno, Takanori Nagura (*Chubu Electric Power Co. Inc.*),
Mamoru Hosaka, Akiko Kojima (*Shin Nippon Air Technologies Co., Ltd.*), Akihiko Matsue (*UNIPAC Co., Ltd.*)
- 17763 **Study on Lightning Protection for Structures of Hamaoka Nuclear Power Station**
Satoshi Ozawa, Yoshitaka Suzuki, Hiroyasu Takeyama, Takanori Nagura (*Chubu Electric Power Co. Inc.*)
- 17768 **Development of a Method to Evaluate the Effect of Forest Fire Thermal Radiation by Using FARSITE "Fire Area Simulator"**
Nobuhide Suzuki, Hironori Noguchi, Tomoyuki Hayakawa, Kohei Sugita (*Mitsubishi Heavy Industries, Ltd.*),
Jun-ichi Masuzawa, Makoto Enosawa (*Mitsubishi Research Institute, Inc.*),
Shigenori Hatazawa (*The Kansai Electric Power Co., Inc.*), Taku Shibata (*Hokkaido Electric Power Co., Inc.*),
Keiji Fujita (*Shikoku Electric Power Co., Inc.*), Takashi Kasamo (*Kyushu Electric Power Co., Inc.*),
Shogo Wada (*The Japan Atomic Power Company*)

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Track 3: SFR Design and Technologies II

5:10 pm - 6:50 pm / Hiei (The Westin Miyako Kyoto)

Chair: Shoji Kotake (*The Japan Atomic Power Company*)**Co-Chair:** Osvaldo Enrique Azpitarte (*National Atomic Energy Commission of Argentina*)**17091 Enhancement of Structural Design Margin for the Commercial Scale JSFR**Yoshifumi Niitsu, Shigenobu Kubo, Koji Dozaki (*The Japan Atomic Power Company*),
Masahiro Yui, Junichi Orita (*Mitsubishi Heavy Industries, Ltd.*),
Mikio Toda, Koichi Kurita, Tomoyuki Inoue (*Mitsubishi FBR Systems Inc.*)**17383 Dry Cleaning Process Test for Fuel Assembly of Fast Reactor Plant System**Atsushi Katoh, Keiichi Nagai, Kuniaki Ara, Masahiko Ohtaka (*Japan Atomic Energy Agency*),
Nobuki Oka, Masako Tanaka, Yuichi Ohtani (*Mitsubishi Heavy Industries, Ltd.*),
Akihiro Ide (*Mitsubishi FBR Systems Inc.*)**17385 Numerical and Experimental Validation of the Performance of an Electromagnetic Pump for a Sodium Fast Reactor**E. Martin Lopez (*CEA / Université Grenoble Alpes*), Y. Delannoy (*Université Grenoble Alpes*),
F. Benoit, R. Martinie, S. Vitry (*CEA*)**17408 Status of ASTRID Architecture in Starting of Basic Design Phase**Philippe Amphoux (*CEA*), Philippe Gama (*AREVA NP*), Loïc Raquin, Benoît Levoir (*NOX*)**17419 Status of the ASTRID Sodium Fast Reactor Project:
From Conceptual Design to Basic Design Phase**Frédéric Varaine, Gilles Rodriguez (*CEA*), David Settimo (*EDF*), Jean-Marie Hamy (*AREVA NP*),
Hiroki Hayafune (*Japan Atomic Energy Agency*), Salah Romdhane (*Airbus Safran Launchers*), René-Paul Benard (*ALCEN SEIV*),
Alain Remy (*General Electric / ALSTOM*), Thomas Chauveau (*BOUYGUES*), Ludovic Vandendriesche (*CNIM*),
Grégoire Lambert (*COMEX Nucléaire*), Jean-Philippe Helle (*NOX/JACOBS France*), Haruo Mochida (*Mitsubishi FBR Systems Inc.*),
Toru Iitsuka (*Mitsubishi Heavy Industries, Ltd.*), Dan Robertson (*Rolls-Royce*), Michel Lefrancois (*TECHNETICS*),
Masaru Fukuie (*Toshiba Corporation*), Jean-Luc Mazel (*VELAN*)**Track 7: LOCA Analysis and Experiment**

5:10 pm - 6:50 pm / Atago (The Westin Miyako Kyoto)

Chair: Chikako Iwaki (*Toshiba Corporation*)**Co-Chair:** In Cheol Bang (*Ulsan National Institute of Science and Technology*)**17333 Experimental Investigation on Small Break Loss of Coolant Accident of Direct Vessel Injection Line**Chuan-Xin Peng, Yan Zhang, Zhi-Gang Huang, Yuan-Feng Zan, Wen-Bin Zhuo, Xiao Yan (*Nuclear Power Institute of China*)**17334 Experimental Study of the Core Makeup Tank Injection Characteristics under Different DVI Break Size Conditions**Zhi-Gang Huang, Chuan-Xin Peng, Yuan-Feng Zan, Xue-Song Bai, Wen-Bin Zhuo, Xiao Yan (*China National Nuclear Corporation*)**17341 Mechanism Study of Siphon Break Using RELAP5/MOD3**Yi-Yun Cheng, Min Lee (*National Tsing Hua University*)**Track 8: LLW and ILW Management**

5:10 pm - 6:50 pm / Take (The Westin Miyako Kyoto)

Chair: Jong-Il Yun (*Korea Advanced Institute of Science and Technology*)**Co-Chair:** Mamoru Numata (*Kurion-Veolia*)**17367 Development of the Reasonable Confirmation Methods Concerning Radioactive Wastes from Research Facilities**Hirokazu Hayashi, Shota Okada, Sari Izumo, Yuzuru Hoshino, Tomoyuki Tsuji, Hisakazu Nakata, Akihiro Sakai,
Hiroya Amazawa, Yoshiaki Sakamoto (*Japan Atomic Energy Agency*)**17448 Optimization for Radioactivity Conversion Factor of Portable Semiconductor Detector for Clearance (Free Release)**Masato Watanabe, Hanae Kanzaki, Motonori Nakagami (*Chubu Electric Power Co. Inc.*)**17685 Countermeasure against the Tight Condition of Radioactive Waste Drum Yard
— Promote Burning Activity of the Substances Difficult to Incinerate—**Yoshitaka Nimura, Hiroshi Nishio (*KANDEN POWER-TECH, Corporation*)**17061 Effective Sequestering of Cobalt, Copper and Nickel Using Ethylenediaminetetraacetic Acid Modified Mesoporous Silica**Sajid Iqbal, Jong-Il Yun (*Korea Advanced Institute of Science and Technology*)**Technical Sessions:**Wednesday
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Track 9: Seismic Resistance

5:10 pm - 6:50 pm / Ran (The Westin Miyako Kyoto)

Chair: Yusaku Maruno (*Hitachi, Ltd.*)**Co-Chair:** Ken-ichi Kimura (*Fujita Corporation*)

- 17229 **Establishment of the Technical Basis for Applying Viscous Dampers to Nuclear Power Plants**
Yukiko Narahara, Tomokazu Higuchi, Hiroshi Katayama, Ryo Ito, Kiyoshi Hattori, Jun Nakajima (*Toshiba Corporation*)
- 17543 **A Study about the Effectiveness of Seismic Safety Improvement by Installing Viscoelastic Dampers at Piping Systems and Components**
Ichiro Tamura, Masashi Kuramasu (*The Chugoku Electric Power Co., Inc.*)
- 17482 **A Fatigue Damage Assessment Procedure for Seismic Loads Considering Aftershocks**
Masayuki Kamaya (*Institute of Nuclear Safety System, Inc.*)
- 17498 **On-Site Vibration Test of PWR Nuclear Power Plant Reactor Coolant Loop Using Large Size Hammering Device**
Taisuke Nosaka (*Mitsubishi Heavy Industries, Ltd.*), Shinichiro Kuhara, Teruhisa Tanaka (*The Kansai Electric Power Co., Inc.*), Takeo Baba (*Mitsubishi Heavy Industries, Ltd.*), Takeshi Numata, Hiroaki Shirako (*The Kansai Electric Power Co., Inc.*)
- 17537 **Development of Seismic Design Method for Free Standing Rack and Applicability to Japanese Nuclear Power Plant**
Yu Takaki, Katsuhiko Taniguchi, Junichi Kishimoto, Akihisa Iwasaki, Yoshitsugu Nekomoto (*Mitsubishi Heavy Industries, Ltd.*), Tohru Kuga, Masashi Kameyama (*The Kansai Electric Power Co., Inc.*)

Track 4: Maintenance Technologies

5:10 pm - 6:50 pm / Kiku (The Westin Miyako Kyoto)

Chair: Kosei Taguchi (*Toshiba Corporation*)**Co-Chair:** Takehiro Kusunoki (*The Japan Atomic Power Company*)

- 17163 **Stereo Camera Localization System for Remotely Operated Robots**
Takaaki Konishi, Ryosuke Kobayashi (*Hitachi, Ltd.*)
- 17584 **Development of Bus Duct Inspection Robot at Nuclear Power Plant**
Mamoru Hamada, Teruaki Hoshi, Yoshinari Komura (*Kanden Plant Corporation*)
- 17236 **Wireless System Controlling of Electromagnetic Wave Distribution in Nuclear Power Plant Use**
Hidehiko Kuroda, Naoto Kume, Tomomi Oshima, Kei Takakura, Naotaka Oda, Takeshi Hasegawa, Shigeru Odanaka (*Toshiba Corporation*)
- 17095 **Driftless Pressure Transmitter**
Ryo Kuwana, Daisuke Shinma, Atsushi Fushimi, Isao Hara (*Hitachi, Ltd.*), Hiroyuki Sugimoto (*Hitachi High-Tech Solutions Corp.*), Takayuki Ichikawa (*Hiroshima University*)

Track 7: Mixed Flow Phenomena

5:10 pm - 6:50 pm / Shirakawa (The Westin Miyako Kyoto)

Chair: Kazuyuki Takase (*Nagaoka University of Technology*)**Co-Chair:** Koroush Shirvan (*Massachusetts Institute of Technology*)

- 17129 **Monitoring Procedure for Wall Temperature Fluctuation by Temperature Measurement of Pipe Outer Surface at a Mixing Tee**
Koji Miyoshi, Masayuki Kamaya (*Institute of Nuclear Safety System, Inc.*)
- 17673 **Flow Rate Influence on Temperature Fluctuations in Thermal-Mixing Pipe-Flow Experiments at a 90° T-Junction**
Mi Zhou, Rudi Kulenovic, Eckart Laurien (*University of Stuttgart*)
- 17190 **CFD and System Analysis Code Investigations of the Multidimensional Flow Mixing Phenomena in the Reactor Pressure Vessel**
S. C. Ceuca, J. Herb, P. J. Schoeffel, T. Hollands, H. Austregesilo, H. V. Hristov (*Gesellschaft für Anlagen- und Reaktorsicherheit gGmbH*)
- 17137 **CFD Analysis and Experimental Validation of Mixed Convection Sodium Flow**
U. Bieder (*CEA*), L. Ishay, G. Ziskind (*Ben-Gurion University of the Negev*), A. Rashkovan (*Nuclear Research Center Negev*)

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Track 1: Innovative LWR

10:20 am - 12:00 pm / Mizuho 1 & 2 (The Westin Miyako Kyoto)

Chair: Hiroki Takezawa (*Tokyo City University*)**Co-Chair:** Eugene Shwageraus (*University of Cambridge*)**17249 Development of RBWR (Resource-Renewable BWR) for Recycling and Transmutation of Transuranium Elements (1) Overview and Concept**Takeshi Mitsuyasu, Tetsushi Hino, Junnichi Miwa, Masaya Ohtsuka (*Hitachi, Ltd.*)**17222 Development of RBWR (Resource-Renewable BWR) for Recycling and Transmutation of Transuranium Elements (2) Dynamic Insertion Analyses of Control Rods under Seismic Condition**Shigeyuki Koyama, Yuichi Koide (*Hitachi, Ltd.*)**17117 Development of RBWR (Resource-Renewable BWR) for Recycling and Transmutation of Transuranium Elements (3) Materials for Core Component**Takahiro Ishizaki, Yusaku Maruno (*Hitachi, Ltd.*)**17194 Preliminary Study on Flexible Core Design of Super FBR with Multi-Axial Fuel Shuffling**Sukarman, Akifumi Yamaji, Takayuki Someya, Shogo Noda (*Waseda University*)**17534 Fuel Performance Modeling of Transuranic Burning Boiling Water Reactor**Yanin Sukjai, Koroush Shirvan, Ronald G. Ballinger (*Massachusetts Institute of Technology*)**Track 5: Severe Accident**

10:20 am - 12:00 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Michio Murase (*Institute of Nuclear Safety System, Inc.*)**Co-Chair:** Michael Klauck (*RWTH Aachen University*)**17086 Development of a Regime Map for Predicting Debris Bed Formation Behavior**Guangyu Jiang, Songbai Cheng, Shixian Wang, Shaopeng Lin, Jiahuan Yu, Zhiyi Pan, Hantao Lin (*Sun Yat-Sen University*)**17133 Study on In-Vessel Retention - Effect of Nanofluids on CHF Enhancement under Flow Conditions during In-Vessel Retention -**Chikako Iwaki, Hisaki Sato, Satoshi Tsuda (*Toshiba Corporation*), Daisuke Kanamori (*The Kansai Electric Power Co., Inc.*)**17170 Study on In-Vessel Retention -Analysis of In-Vessel Retention Using Risk Oriented Accident Analysis Methodology-**Satoshi Tsuda, Yoshio Kawano, Hisaki Sato, Chikako Iwaki (*Toshiba Corporation*), Daisuke Kanamori (*The Kansai Electric Power Co., Inc.*)**17324 Failure Evaluation Analysis of Reactor Pressure Vessel Lower Head in BWR Due to Severe Accident**Yoshiyuki Kaji, Jinya Katsuyama, Yoshihito Yamaguchi, Yoshiyuki Nemoto, Masahiko Osaka (*Japan Atomic Energy Agency*)**17646 Development of Non-Transfer Type Plasma Heating Technology to Address CMR Behavior during Severe Accident with BWR Design Conditions**Yuta Abe, Ikken Sato, Toshio Nakagiri, Akihiro Ishimi, Yuji Nagae (*Japan Atomic Energy Agency*)**Track 3: SFR Safety Design and Assessment**

10:20 am - 12:00 pm / Hiei (The Westin Miyako Kyoto)

Chair: Hidemasa Yamano (*Japan Atomic Energy Agency*)**Co-Chair:** Kazuhiro Kamei (*Toshiba Corporation*)**17327 Design Study on Measures to Prevent Loss of Decay Heat Removal in a Next Generation Sodium-Cooled Fast Reactor**Yoshitaka Chikazawa, Shigenobu Kubo (*Japan Atomic Energy Agency*), Yoshio Shimakawa, Fumiaki Kaneko, Takashi Shoji, Shuhei Nakata (*Mitsubishi FBR Systems Inc.*)**17439 Safety Evaluation of Self Actuated Shutdown System for Gen-IV SFR**Hiroyuki Saito, Yumi Yamada, Kazuhiro Oyama, Shoko Matsunaga (*Mitsubishi FBR Systems Inc.*), Hidemasa Yamano, Shigenobu Kubo (*Japan Atomic Energy Agency*)**17500 ASTRID Project: Main Progress on Safety Design Provisions**P. Lo Pinto, L. Costes, P. Quellien (*CEA*), B. Carlucci, S. Beils, A. Verdier (*AREVA NP*), L. Bourgue (*EDF*)**17046 Investigation of CO₂ Pipe Break Accidents for a sCO₂ Brayton Cycle Coupled to a Sodium-Cooled Fast Reactor**Anton Moisseytsev, James J. Sienicki (*Argonne National Laboratory*)**17661 Development of Seismic Evaluation Method Considering Three Dimensional Fuel Assembly Displacement in FBR Core**Shinichiro Matsubara, Akihisa Iwasaki, Masatsugu Monde, Yuto Homma, Toru Tsuboi, Yohei Kamiyama (*Mitsubishi Heavy Industries, Ltd.*)**Technical Sessions:**

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Track 7: Single-Phase Flow Thermal Hydraulics 10:20 am - 12:00 pm / Atago (The Westin Miyako Kyoto)

Chair: Ulrich Bieder (CEA)

Co-Chair: Shiro Takahashi (Hitachi, Ltd.)

17400 Evaluation of the Thermal Hydraulics Phenomenon at Upper Plenum in the Reactor Vessel for the Improvement in Safety of PWR

Kazuhiro Yoshida, Hideyuki Sakata, Tomoaki Ogata, Yasushi Makino, Hirokazu Sugiura, Shigeyuki Watanabe (Mitsubishi Heavy Industries, Ltd.), Daisuke Kanamori (The Kansai Electric Power Co., Inc.)

17452 Evaluation of the Thermal Hydraulic Phenomenon at Lower Plenum in the Reactor Vessel for the Improvement in Safety of PWR

Kei Higashi, Kazuhiro Yoshida, Hideyuki Sakata, Tomoaki Ogata, Yasushi Makino, Hirokazu Sugiura, Shigeyuki Watanabe (Mitsubishi Heavy Industries, Ltd.), Daisuke Kanamori (The Kansai Electric Power Co., Inc.)

17643 Mitigation of Heat Transfer Deterioration in Supercritical Water Using Vortex Generator

Hui Cheng, Jiyun Zhao (City University of Hong Kong)

Track 8: Fukushima Daiichi NPP - Fuel Debris - 10:20 am - 12:20 pm / Take (The Westin Miyako Kyoto)

Chair: Christine Georges (CEA)

Co-Chair: Takeshi Tsukada (Central Research Institute of Electric Power Industry)

17731 Process Modeling and Optimization for Fukushima Fuel Debris Using FATE Software

Martin Plys, James Burelbach, Sung Jin Lee, Robert Apthorpe (Fauske & Associates, LLC)

17103 Characterization of Fuel Debris by Large-Scale Simulated Debris Examination for Fukushima Daiichi Nuclear Power Stations

Shohei Kawano, Takahiro Hayashi, Yasuo Morishima, Yuya Takahashi, Masamitsu Toyohara (International Research Institute for Nuclear Decommissioning / Toshiba Corporation), Viktor V. Baklanov, Alexander A. Kolodeshnikov, Vladimir A. Zuev (National Nuclear Center)

17225 Criticality Control System Development for Fuel Debris Removal in Fukushima Daiichi

Yasuhiro Harada, Makoto Nakano (International Research Institute for Nuclear Decommissioning / Mitsubishi Heavy Industries, Ltd.), Yamato Hayashi (International Research Institute for Nuclear Decommissioning / Toshiba Corporation), Kazuya Ishii (International Research Institute for Nuclear Decommissioning / Hitachi-GE Nuclear Energy Ltd.)

17279 Development of Criticality Prevention Technology by Using Insoluble Neutron Absorbers for Fuel Debris Removal in the Fukushima-Daiichi Nuclear Power Plants

Ryo Ishibashi (International Research Institute for Nuclear Decommissioning / Hitachi-GE Nuclear Energy Ltd.), Toshiyuki Fujita (International Research Institute for Nuclear Decommissioning / Toshiba Corporation), Kazuya Ishii (International Research Institute for Nuclear Decommissioning / Hitachi-GE Nuclear Energy Ltd.), Yasuhiro Harada (International Research Institute for Nuclear Decommissioning / Mitsubishi Heavy Industries, Ltd.)

17551 Synthesis and Microstructural Properties of Porous UO_2/B_2O_3 Eutectic Ceramic Composites as Mock Nuclear Fuel Debris

Aikebaier Yusufu, Masayoshi Uno (University of Fukui)

17749 Effects of High Burn-Up Operation of LWR and Extended Cooling Period of Spent Fuel on High-Level Waste Properties for Vitrification and Storage

Kota Kawai, Hiroshi Sagara, Kenji Takeshita (Tokyo Institute of Technology), Masahiro Kawakubo, Hidekazu Asano (Radioactive Waste Management Funding and Research Center), Yaohiro Inagaki (Kyushu University), Yuichi Niibori (Tohoku University), Seichi Sato (Hokkaido University)

Track 9: Fast Reactor Materials 10:20 am - 12:00 pm / Ran (The Westin Miyako Kyoto)

Chair: Shigeharu Ukai (Hokkaido University)

Co-Chair: Yeon Soo Kim (Argonne National Laboratory)

17024 Quantum Chemical Comparison between the Reaction of Water with Liquid Sodium Containing Ti-Nanoparticles and Pure Liquid Sodium

Ai Suzuki, Patrick Bonnaud, Masayuki Miyano, Hokuto Hata, Ryuji Miura (Tohoku University), Jun-ichi Saito (Japan Atomic Energy Agency), Kuniaki Ara (Tohoku University / Japan Atomic Energy Agency)

17124 Study on Performance of Oxygen Sensors with Solid and Liquid Reference Electrodes in Liquid LBE with the Parameters of Oxygen Potential and Temperature

Pribadi Mumpuni Adhi, Masatoshi Kondo, Minoru Takahashi (Tokyo Institute of Technology)

17538 Evaluation on Tolerance to Failure of ODS Ferritic Steel Claddings at the Accident Conditions of Fast Reactors

Tomoyuki Uwaba, Yasuhide Yano, Satoshi Ohtsuka, Masayuki Naganuma, Takashi Tanno, Hiroshi Oka, Shoichi Kato, Takeji Kaito (Japan Atomic Energy Agency), Shigeharu Ukai (Hokkaido University), Akihiko Kimura (Kyoto University), Shigenari Hayashi (Tokyo Institute of Technology), Tadahiko Torimaru (Nippon Nuclear Fuel Development Co., Ltd.)

17299 Study on Cobalt Free Hardfacing Materials for Wear Resistance in Sodium Fast Reactors

Pascal Aubry, Cécile Blanc, Fabien Rouillard (Université Paris-Saclay), Gilles Rolland (EDF), Thorsten Marlaud (AREVA NP), Rafael Robin, Hicham Maskrot (Université Paris-Saclay), Martine Blat-Yrieix (EDF), Laetitia Nicolas (Université Paris-Saclay)

17475 Evaluation of Fuel Assembly Inlet Boundary Conditions and Methodology for Inclusion in Core Restraint Analysis Software

James J. Grudzinski, Rick Fischer (Argonne National Laboratory), H.-K. Kim, Y.-H. Lee, J.-S. Cheon, K.-H. Yoon (Korea Atomic Energy Research Institute), C. Grandy (Argonne National Laboratory)

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Track 4: Emergency Assessment and Measures 10:20 am - 12:20 pm / Kiku (The Westin Miyako Kyoto)**Chair:** Masutake Sotsu (*Japan Atomic Energy Agency*)**Co-Chair:** Richard F. Wright (*Westinghouse Electric Company LLC*)

- 17276 **Sizing of Lithium-Ion Stationary Batteries for Nuclear Power Plant Use**
Exavier Zakaria Barie, Choong-Koo Chang (*KEPCO International Nuclear Graduate School*)
- 17149 **Lithium-Ion Backup Batteries for Coping Extended Loss of AC Power (ELAP)**
Choong-Koo Chang (*KEPCO International Nuclear Graduate School*)
- 17112 **Aspects of Heat Transfer in Containment Spot Cooling Circuit**
A.M. Khizbullin, M.A. Kamnev, O.V. Tyurikov (*Afrikantov OKB Mechanical Engineering*)
- 17113 **Heat Transfer during Steam Condensation from the Steam Gas Mixture on Coiled- and Straight-Tube Heat Exchangers of the Emergency Heat Removal System**
M. Kamnev, A. Khizbullin (*Afrikantov OKB Mechanical Engineering*)
- 17321 **Transient Evaluation Using EMTP at Single Open Phase with the Offsite Power Transformer for the Emergency Power Supply Systems of Nuclear Power Plants**
Yoshio Shimada (*Institute of Nuclear Safety System, Inc.*)
- 17776 **Emergency Power Systems with Gas Turbine for Nuclear Power Plant**
Ryutaro Imamura, Seiji Nishikawa, Kazuto Yoshida, Yasuhito Oshima (*Mitsubishi Heavy Industries, Ltd.*)

Track 6: LWR Core Design 10:20 am - 12:00 pm / Shirakawa (The Westin Miyako Kyoto)**Chair:** Rei Kimura (*International Research Institute for Nuclear Decommissioning / Toshiba Corporation*)**Co-Chair:** Gumersindo Verdu (*Institute for Industrial, Radiophysical and Environmental Safety*)

- 17174 **Validations of BWR Nuclear Design Code Using ABWR MOX Numerical Benchmark Problems**
Shou Takano, Masaru Sasagawa, Teppei Yamana, Tadashi Ikehara (*Global Nuclear Fuel-Japan Co., Ltd.*),
Naoki Yanagisawa (*Electric Power Development Co., Ltd.*)
- 17450 **Validations of BWR Nuclear Design Code Using MOX Critical Experiments and Operational Data of MOX Loaded BWR Core**
Masaru Sasagawa, Hiroko Hayakawa, Asuka Matsui, Tadashi Ikehara (*Global Nuclear Fuel-Japan Co., Ltd.*),
Naoki Yanagisawa (*Electric Power Development Co., Ltd.*)
- 17096 **PARCS-Subchanflow-Transuranus Multiphysics Coupling for Improved PWR's Simulations**
Joaquín R. Basualdo, Victor H. Sánchez-Espinoza, Robert Stieglitz (*Karlsruhe Institute of Technology*),
Rafael Macián-Juan (*Technische Universität München*)
- 17657 **Centrally-Shielded Burnable Absorber for LWR Fuel**
Mohd-Syukri Yahya, Yonghee Kim (*Korea Advanced Institute of Science and Technology*)
- 17487 **Validation of AEGIS/SCOPE2 System through Actual Core Follow Calculations with Irregular Operational Conditions**
M. Tabuchi, M. Tatsumi (*Nuclear Engineering, Ltd.*), Y. Ohoka, H. Nagano (*Nuclear Fuel Industries, Ltd.*),
K. Ishizaki (*The Kansai Electric Power Co., Inc.*)

Track 1: Accident Tolerant Fuel in LWR 1:20 pm - 3:00 pm / Mizuho 1 & 2 (The Westin Miyako Kyoto)**Chair:** Tomohiko Ikegawa (*Hitachi, Ltd.*)**Co-Chair:** Paolo Ferroni (*Westinghouse Electric Company LLC*)

- 17387 **Preliminary Study on the Radiation Heat Removal Capacity in SMR Core under High Temperature Condition**
Zhongchun Li, Shuhua Ding, Songwei Li, Jian Deng (*Nuclear Power Institute of China*)
- 17707 **Preliminary Performance Evaluation of FeCrAl-ODS Steel Fuel Cladding under Accident Conditions of BWRs**
K. Sakamoto, T. Torimaru (*Nippon Nuclear Fuel Development Co., Ltd.*), S. Ukai, N. Oono (*Hokkaido University*),
T. Kaito (*Japan Atomic Energy Agency*), A. Kimura (*Kyoto University*), S. Hayashi (*Tokyo Institute of Technology*)
- 17162 **Fuel Behavior Analysis of Accident Tolerant Fuel with SiC/SiC-Composite Cladding**
Hiroshi Matsumiya, Kenichi Yoshioka, Shungo Sakurai, Kazuo Kakiuchi (*Toshiba Corporation*),
Shinichiro Yamashita, Fumihisa Nagase (*Japan Atomic Energy Agency*)

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Track 5: Gas Combustion/Radioactive Material Release I 1:20 pm - 3:00 pm / Cosmos Hall (The Westin Miyako Kyoto)**Chair:** Naoyuki Ishida (*Hitachi, Ltd.*)**Co-Chair:** Melany Gouello (*VTT Technical Research Centre of Finland Ltd.*)

- 17206 **Investigation of Ignition Characteristics of Passive Autocatalytic Recombiners**
A. Chakraborty, E.-A. Reinecke (*Forschungszentrum Jülich*),
N. Meynet, A. Bentaib (*Institute for Radiological Protection and Nuclear Safety*), N. Chaumeix (*Laboratoire ICARE*),
H.-J. Allelein (*Forschungszentrum Jülich / RWTH Aachen University*)
- 17216 **CFD-Based Blind Simulation of Medium-Scale Hydrogen Deflagration Experiment**
Tadej Holler (*Jožef Stefan Institute*), Po Hu, Shuwei Zhai (*Shanghai Jiao Tong University*),
Ed M.J. Komen (*Nuclear Research and Consultancy Group*), Mike Kuznetsov (*Karlsruhe Institute of Technology*),
Ivo Kljenak (*Jožef Stefan Institute*)
- 17266 **Effect of Steam Condensation on Pressure and Temperature under Hydrogen Jet Fire in a Vented Enclosure**
Mike Kuznetsov, Jianjun Xiao (*Karlsruhe Institute of Technology*), Jack Travis (*Engineering and Scientific Software Inc.*)
- 17284 **Experimental Studies on PAR Start-Up under Severe Accident Conditions**
M. Klauck, D. Heidelberg (*RWTH Aachen University*), P.-M. Steffen, E.-A. Reinecke (*Forschungszentrum Jülich*),
H.-J. Allelein (*RWTH Aachen University / Forschungszentrum Jülich*)
- 17304 **Study on the Combustion Behavior of Radiolytically Generated Hydrogen Explosion in Small Scale Annular Vessels at the Reprocessing Plant**
Tatsuya Kudo, Yoshikazu Tamauchi, Nobuyuki Arai (*Japan Nuclear Fuel Limited*),
Wenbin Dai, Motohiro Sakaiharu, Osamu Kanehira (*Mitsubishi Materials Corporation*)

Track 3: Thermal Hydraulics in SFR 1:20 pm - 3:00 pm / Hiei (The Westin Miyako Kyoto)**Chair:** Takero Mori (*Japan Atomic Energy Agency*)**Co-Chair:** Gilles Rodriguez (*CEA*)

- 17230 **Study on Reactor Vessel Coolability of Sodium-Cooled Fast Reactor under Severe Accident Condition - Water Experiments Using a Scale Model -**
Ayako Ono, Akikazu Kurihara, Masaaki Tanaka, Hiroyuki Oshima, Hideki Kamide (*Japan Atomic Energy Agency*),
Yasuhiro Miyake (*NDD corporation*), Masami Ito (*Ascend Co., Ltd.*), Shigeru Nakane (*NESI Incorporation*)
- 17733 **Optimized Design of an Ex-Vessel Cooling Thermosyphon for Decay Heat Removal in SFR**
Jae Young Choi (*Korea Advanced Institute of Science and Technology*), Sub Lee Song (*BEEES Inc.*),
Soon Heung Chang (*Handong University*), Yong Hoon Jeong (*Korea Advanced Institute of Science and Technology*)
- 17407 **The Qualification Processes of Simulation Tools, Components and Systems within the Framework of the ASTRID Project – Description and Examples**
Geneviève Gaillard-Groleas, Marie-Sophie Chenaud, Lionel Cachon, Thierry Lambert (*CEA*),
Alejandro Mourgues, Benoit Perrin, Claude Bois (*AREVA NP*)
- 17652 **Experimental Study on Performance of U-Pattern Wire Wrap Spacer of Fast Reactor Fuel Assembly Using PIV**
Yeong Shin Jeong, In Cheol Bang (*Ulsan National Institute of Science and Technology*)

Track 7: Multi-Phase Flow Thermal Hydraulics I 1:20 pm - 3:00 pm / Atago (The Westin Miyako Kyoto)**Chair:** Kenichi Katono (*Hitachi Ltd.*)**Co-Chair:** Kazuyuki Takase (*Nagaoka University of Technology*)

- 17049 **Interfacial Friction for Countercurrent Flows in Nearly Horizontal Pipes**
Michio Murase, Yasunori Yamamoto, Takayoshi Kusunoki, Ikuo Kinoshita (*Institute of Nuclear Safety System, Inc.*)
- 17418 **Experimental Investigation of Temperature Distribution in Condensing Steam-Air Flow in a Circular Tube**
Katsuya Mori, Kosuke Hayashi, Shigeo Hosokawa, Akio Tomiyama (*Kobe University*),
Yoichi Utanohara, Yasunori Yamamoto, Michio Murase (*Institute of Nuclear Safety System, Inc.*)
- 17394 **Preliminary Study on Numerical Simulations for Temperature Field of Steam-Air Mixture in a Circular Tube with Condensation**
Yoichi Utanohara, Yasunori Yamamoto, Michio Murase (*Institute of Nuclear Safety System, Inc.*),
Katsuya Mori, Shigeo Hosokawa, Akio Tomiyama (*Kobe University*)
- 17337 **The Application of Lagrangian Particle Tracking Method in the Study of Steam Generator Sludge Collector**
Ge Wu, Xiang Cheng, Wei Huang (*Nuclear Power Institute of China*)

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Track 8: LLW and ILW Processing and Treatment 1:20 pm - 3:00 pm / Take (The Westin Miyako Kyoto)**Chair:** David L. Perkins (*Electric Power Research Institute*)**Co-Chair:** Yoshihiko Horikawa (*Nuclear Engineering, Ltd.*)**17774 Development of Technology for Biotreatment of Laundry Drain in Nuclear Power Plant**Sho Kato, Atsushi Kinugasa, Naoki Ogawa, Yuji Nakajima (*Mitsubishi Heavy Industries, Ltd.*)**17426 A Tritium Management Tool for Light Water Detritiation**J. Whitcomb, N. Bonnet, D. Carlson (*Kurion-Veolia*)**17373 Treatment of Electric Hydraulic Control Fluid (EHC Oil) with Steam-Reforming System**Yoshihiro Okadome, Yoshio Aoyama, Yu Sasaki, Mineo Fukushima (*Japan Atomic Energy Agency*)**17395 Impurity Removal Technologies of Heavy Water**Takashi Hashimoto, Yuji Sato (*Japan Atomic Energy Agency*)**17128 Development of a Geopolymer Solidification Method for Radioactive Wastes by Compression Molding and Heat Curing**Chiaki Shimoda, Kanae Matsuyama, Hirofumi Okabe, Masaaki Kaneko, Shinya Miyamoto (*Toshiba Corporation*)**Track 2: HTR Engineering**

1:20 pm - 3:00 pm / Ran (The Westin Miyako Kyoto)

Chair: Matt Richards (*Ultra Safe Nuclear Corporation*)**Co-Chair:** Sunao Oyama (*Mitsubishi Heavy Industries, Ltd.*)**17223 Design Space Exploration Studies of an FHR Concept Leveraging AGR Technologies**Zhiyao Xing, Eugene Shwageraus (*University of Cambridge*)**17659 Study of ETF-HC for Helium Circulator with Dry Gas Seal for HTR-PM**Ping Ye, Gang Zhao, Jie Wang, Wei Peng (*Tsinghua University*)**17566 Effect of Internal Coolant Crossflow with Two Rows of Film Cooling Holes on Film-Cooling of HTGR**Xiaokai Sun, Wei Peng, Jie Wang, Peixue Jiang (*Tsinghua University*)**17244 Benchmark Study on Realized Random Packing Model for Coated Fuel Particles of HTTR Using MCNP6**H. H. Quan (*Japan Atomic Energy Agency*), K. Morita (*Kyushu University*), Y. Honda (*Japan Atomic Energy Agency*), N. Fujimoto (*Kyushu University*), S. Takada (*Japan Atomic Energy Agency*)**17090 Measurement of Temperature Response of Intermediate Heat Exchanger in Heat Application System Abnormal Simulating Test Using HTTR**Masato Ono, Yusuke Fujiwara, Yuki Honda, Hiroyuki Sato, Yosuke Shimazaki, Daisuke Tochio, Fumitaka Homma, Hiroaki Sawahata, Kazuhiko Iigaki, Shoji Takada (*Japan Atomic Energy Agency*)**Track 4: Severe Accident Management**

1:20 pm - 3:00 pm / Kiku (The Westin Miyako Kyoto)

Chair: Takashi Shoji (*Chubu Electric Power Co. Inc.*)**Co-Chair:** Choong-Koo Chang (*KEPCO International Nuclear Graduate School*)**17251 Development of High-Performance Monitoring System under Severe Accident Condition**T. Takeuchi, K. Tsuchiya (*Japan Atomic Energy Agency*), H. Komanome (*Ikegami Tsushinki Co., Ltd.*), K. Miura (*Sukegawa Electric Co., Ltd.*), M. Ishihara (*Japan Atomic Energy Agency*)**17692 Monitoring and Operation System for Severe Accidents**Toshiki Fukui, Shinji Niida, Yumeto Kato (*Mitsubishi Heavy Industries, Ltd.*)**17610 Monitoring and Periodic Evaluation of Caldera Volcanoes for Nuclear Safety**Kazutoshi Eto, Katsuhiko Hongou, Jirou Akashi, Takehiro Ootsubo, Hisaya Okano (*Kyushu Electric Power Co., Inc.*)**17441 The Raising of Tsunami-Wall Based on Tsunami Evaluation at Onagawa Nuclear Power Plant**Jun Takahashi, Kazuo Hirata (*Tohoku Electric Power Co., Inc.*)**17431 An Application of Gravel Bed to Extinguish a Large-Scale Fire**Hiroaki Yamashita, Akihiro Shima, Kazuyuki Nagasawa (*Tokyo Electric Power Company Holdings, Inc.*), Seiichi Hamada (*Maritime Disaster Prevention Center*), Izumi Fukasawa, Natsumi Kurabe (*Toyo Engineering Corporation*)**Technical Sessions:**Thursday
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Track 6: Advanced Core Design and Management 1:20 pm - 3:00 pm / Shirakawa (The Westin Miyako Kyoto)**Chair:** Masao Chaki (*Hitachi, Ltd.*)**Co-Chair:** Laurent Buiron (*CEA*)

- 17664 **Erbium Burnable Absorber to Improvement Safety Parameters of CANDU Loaded with Recovered Uranium**
 Mohammad Abdul Motalab, Woosong Kim, Yonghee Kim (*Korea Advanced Institute of Science and Technology*)
- 17281 **Impact of Thorium-Enrichment on the PWR Core-Characteristics of Plutonium-Thorium Mixed Oxide Fuels and Uranium Oxide Fuels**
 Kazumasa Kobayashi, Ren Shimada, Satoshi Takeda, Takanori Kitada (*Osaka University*)
- 17212 **Development of an In-Core Fuel Management Tool for Boiling Water Reactors**
 Luca Gilli, Pieter H. Wakker (*Nuclear Research and Consultancy Group*), Brian R. Elder (*Tennessee Valley Authority*)
- 17309 **Reactor Physics Assessment of Candidate Accident-Tolerant Cladding Concepts for Long-Life Civil Nuclear Marine Propulsion Cores**
 Syed Bahauddin Alam (*University of Cambridge*), Cameron Goodwin (*Rhode Island Nuclear Science Centre*), Geoffrey T. Parks (*University of Cambridge*)
- 17528 **Evaluation of the n/γ Discrimination Performance of the Neutron Detector with Eu Doped TRUST-LiCaAlF₆**
 Kensuke Maeno, Tomohiro Endo, Akio Yamamoto (*Nagoya University*)

Track 5: Gas Combustion/Radioactive Material Release II 3:20 pm - 5:00 pm / Cosmos Hall (The Westin Miyako Kyoto)**Chair:** Michael Klauck (*RWTH Aachen University*)**Co-Chair:** Yoichi Wada (*Hitachi, Ltd.*)

- 17631 **Hydrogen Concentration Measurement Technique in Gases Containing Oxygen by Proton Conductive Solid Electrolyte**
 Kaoru Tanigawa, Ikumasa Koshiro, Akihiro Sawata, Masato Oba (*Mitsubishi Heavy Industries, Ltd.*)
- 17678 **Examination of Airborne Release Fraction of Hydrogen Explosion at a Reprocessing Plant**
 Yoshikazu Tamauchi, Tatsuya Kudo, Takashi Kodama (*Japan Nuclear Fuel Limited*)
- 17037 **Combination of Ozone Feed and Wet Electrostatic Precipitator: Experimental Study of an Innovative System to Filter Gaseous Iodine and Iodine Containing Particles**
 Mélanie Gouëlle, Jouni Hokkinen, Teemu Kärkelä, Ari Auvinen (*VTT Technical Research Centre of Finland Ltd.*)
- 17087 **The European PASSAM Project: R&D Outcomes Towards Enhanced Severe Accident Source Term Mitigation**
 T. Albiol (*Institute for Radiological Protection and Nuclear Safety*), L. Herranz (*CIEMAT*), E. Riera (*CSIC*), C. Dalibart (*EDF*), T. Lind (*PSI*), A. Del Corno (*RSE*), T. Kärkelä (*VTT Technical Research Centre of Finland Ltd.*), N. Losch (*AREVA GmbH*), B. Azambre (*Université de Lorraine*)
- 17328 **Assessment of Medium-Term Radioactive Releases in case of a Severe Nuclear Accident on a Pressurized Water Reactor: Experimental Study of Fission Products Re-Vaporisation from Deposits (Cs, I)**
 D. Obada (*Institute for Radiological Protection and Nuclear Safety / Lille 1 University*), L. Gasnot, A.-S. Mamede (*Lille 1 University*), A.-C. Grégoire (*Institute for Radiological Protection and Nuclear Safety*)

Track 3: Innovative Plant Design 3:20 pm - 5:00 pm / Hiei (The Westin Miyako Kyoto)**Chair:** Kazuhiro Kamei (*Toshiba Corporation*)**Co-Chair:** Anton Moiseyev (*Argonne National Laboratory*)

- 17471 **Investigation to Reduce Mass of an Ultra-Light Solid Reactor for Electricity Supply in Environments without Human Maintenance**
 Hiroshi Akie (*Japan Atomic Energy Agency*), Akifumi Yamaji (*Waseda University*), Teruhiko Kugo, Takamichi Iwamura, Kenya Suyama (*Japan Atomic Energy Agency*)
- 17514 **Ship Collision Security for an Offshore Nuclear Platform**
 G. Genzman, K. Shirvan, N. Todreas, J. Buongiorno, M. Golay (*Massachusetts Institute of Technology*)
- 17608 **Performance Analysis of Brayton Cycle System for Space Power Reactor**
 Zhi Li, Xiaoyong Yang, Gang Zhao, Jie Wang, Zuoyi Zhang (*Tsinghua University*)
- 17705 **A Physics Study for Passively-Autonomous Daily Load-Follow Operation in Soluble-Boron-Free SMR**
 Ahmed Amin E. Abdelhameed, Haseeb ur Rehman, Yonghee Kim (*Korea Advanced Institute of Science and Technology*)

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Track 7: Multi-Phase Flow Thermal Hydraulics II 3:20 pm - 5:00 pm / Atago (The Westin Miyako Kyoto)Chair: Yoichi Utanohara (*Institute of Nuclear Safety System, Inc.*)Co-Chair: Fang Chen (*CEA*)

- 17234 **Estimation of Primary Containment Vessel Pressure of Fukushima Daiichi NPS Unit-3 Considering Occurring of Thermal Stratification in Suppression Chamber**
Daisuke Yamauchi (*Tokyo Electric Power Company Holdings, Inc.*),
Nejdet Erkan, Byeongnam Jo, Koji Okamoto (*The University of Tokyo*)
- 17121 **Applicability of Numerical Simulations to Counter-Current Flow Limitation at Lower End of a Vertical Pipe Simulating Inverted U-Tubes in Steam Generator**
Takayoshi Kusunoki, Yoichi Utanohara, Michio Murase (*Institute of Nuclear Safety System, Inc.*),
Shigeo Hosokawa, Akio Tomiyama (*Kobe University*)
- 17188 **Condensation Heat Transfer Coefficient of Air-Cooled Condensing Heat Exchanger of Emergency Cooldown Tank in Long-Term Passive Cooling System**
Seon Jeong Huh (*Kookmin University*), Joo Hyung Moon, Youngmin Bae, Young In Kim (*Korea Atomic Energy Research Institute*),
Hee Joon Lee (*Kookmin University*)
- 17331 **Hot Channel Analysis of a 333 MWth High Power Density Civil Marine Core Using 3D Neutronic/Thermal-Hydraulic Coupling of Hybrid Monte Carlo MONK with Sub-Channel Analysis COBRA-EN Code**
Syed Bahauddin Alam, Rodrigo G. G. de Oliveira, Eugene Shwageraus, Geoffrey T. Parks (*University of Cambridge*)

Track 8: SNF and HLW Management 3:20 pm - 5:00 pm / Take (The Westin Miyako Kyoto)Chair: Martin G. Plys (*Fauske & Associates, LLC*)Co-Chair: Hiroshi Suzuki (*Mitsubishi Research Institute, Inc.*)

- 17650 **Safe Transport and Storage of Spent Fuel for 40 Years in Japan**
Kyosuke Fujisawa (*Transnuclear, Ltd.*)
- 17675 **Conceptual Study of Dry Storage Method for Spent Fuel Assemblies Based on Honeycomb Concrete Overpack (COP): Phase 1**
Yoshio Hida (*WATS Co., Ltd.*), Shigeki Hayashi, Yoshiaki Katsuyama (*Kanden Plant Corporation*),
Hirohide Hashimoto (*IHI Construction Materials Co., Ltd.*), Takashi Murata (*Murata Engineering Co., Ltd.*)
- 17109 **Sizing of the Overpacks Containing High-Level Radioactive Waste Packages from French Nuclear Facilities**
Claudia Codau, Roméo Fernandes (*EDF*)
- 17434 **Study of Shielding Analysis Methods for Casks of Spent Fuel and Radioactive Waste**
Ai Saito (*Transnuclear, Ltd.*)

Track 2: HTR PRA 3:20 pm - 5:00 pm / Ran (The Westin Miyako Kyoto)Chair: Jie Wang (*Tsinghua University*)Co-Chair: Nozomu Fujimoto (*Kyushu University*)

- 17078 **Probabilistic Risk Assessment Method Development for High Temperature Gas-Cooled Reactors (1) Project Overviews**
Hiroyuki Sato, Akemi Nishida, Hirofumi Ohashi (*Japan Atomic Energy Agency*),
Ken Muramatsu, Hitoshi Muta (*Tokyo City University*),
Tatsuya Itoi, Tsuyoshi Takada, Takenori Hida (*The University of Tokyo*),
Masayuki Tanabe, Tsuyoshi Yamamoto, Hidemitsu Shimada, Takao Ikeda (*JGC Corporation*)
- 17687 **Probabilistic Risk Assessment Method Development for High Temperature Gas-Cooled Reactors (2) Development of Accident Sequence Analysis Methodology**
Kosuke Matsuda, Ken Muramatsu, Hitoshi Muta (*Tokyo City University*),
Hiroyuki Sato, Akemi Nishida, Hirofumi Ohashi (*Japan Atomic Energy Agency*),
Tatsuya Itoi, Tsuyoshi Takada, Takenori Hida, Masayuki Tanabe (*The University of Tokyo*),
Tsuyoshi Yamamoto, Hidemitsu Shimada, Takao Ikeda (*JGC Corporation*)
- 17060 **Probabilistic Risk Assessment Method Development for High Temperature Gas-Cooled Reactors (3) Development Plan of Seismic Fragility Analysis Method**
Tatsuya Itoi (*The University of Tokyo*), Akemi Nishida (*Japan Atomic Energy Agency*),
Tsuyoshi Takada, Takenori Hida (*The University of Tokyo*), Ken Muramatsu (*Tokyo City University*),
Hiroyuki Sato (*Japan Atomic Energy Agency*)
- 17089 **Probabilistic Risk Assessment Method Development for High Temperature Gas-Cooled Reactors (4) Use of Operational and Maintenance Experiences with the High Temperature Engineering Test Reactor**
Atsushi Shimizu, Hiroyuki Sato, Shigeaki Nakagawa, Hirofumi Ohashi (*Japan Atomic Energy Agency*)
- 17079 **Probabilistic Risk Assessment Method Development for High Temperature Gas-Cooled Reactors (5) Accident Progression Analysis**
Yuki Honda, Hiroyuki Sato, Hirofumi Ohashi (*Japan Atomic Energy Agency*)

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Track 4: Plant Assessment

3:20 pm - 5:00 pm / Kiku (The Westin Miyako Kyoto)

Chair: Takashi Shoji (*Chubu Electric Power Co. Inc.*)**Co-Chair:** Kosei Taguchi (*Toshiba Corporation*)

- 17508 **Seawater Intrusion Event Consequence Assessment for RPV and Core Internals, Hamaoka NPS Unit5**
Tomiyasu Imai, Kouhei Kurono, Yuta Niwa, Takanori Nagura (*Chubu Electric Power Co. Inc.*)
- 17274 **Study of the Reduction Method of the Helium Gas Leakage from Bolted Gasket Flanged Connection for HTGRs**
Shimpei Hamamoto, Shoji Takada (*Japan Atomic Energy Agency*)
- 17220 **Completion of Solidification and Stabilization for Pu Nitrate Solution to Reduce Potential Risks at Tokai Reprocessing Plant**
Yasunobu Mukai, Hideo Nakamichi, Daisuke Kobayashi, Kazuaki Nishimura, Sakae Fujisaku, Hideki Tanaka, Hidemi Isomae, Hironobu Nakamura, Tsutomu Kurita (*Japan Atomic Energy Agency*), Masayoshi Iida, Kazuma Tajiri (*E&E Techno Service Co., Ltd.*)
- 17320 **Current Status and Future Plan of INSS's Analysis of Overseas Trouble Information**
Takashi Akazawa (*Institute of Nuclear Safety System, Inc.*), Masaru Okumoto (*former Institute of Nuclear Safety System member*)

Track 6: Application and Verification of Reactor Physics

3:20 pm - 5:00 pm / Shirakawa (The Westin Miyako Kyoto)

Chair: Kenichi Tada (*Japan Atomic Energy Agency*)**Co-Chair:** Tatjana Jevremovic (*IAEA*)

- 17457 **Representativity Studies of ZEPHYR Fast/Thermal Coupled Cores for SFR-Like Reactivity Effects during Core Meltdown**
Patrick Blaise (*CEA*), Marat Margulis (*CEA/Ben-Gurion University of the Negev*), Laurent Buiron, Gérald Pruhlière, Bruno Fontaine (*CEA*), Erez Gilad (*Ben-Gurion University of the Negev*)
- 17467 **Spectral Adaptation to Emphasize the 10 eV to 10 keV Energy Domain for ZEPHYR, a Future Multipurpose ZPR for CEA**
Paul Ros, Patrick Blaise, Pierre Leconte (*CEA*)
- 17594 **Application of Bias Factor Method Using Random Sampling Technique for Prediction Accuracy Improvement of Critical Eigenvalue of BWR**
Motohiro Ito, Tomohiro Endo, Akio Yamamoto (*Nagoya University*), Yusuke Kuroda, Takashi Yoshii (*TEPCO SYSTEMS CORPORATION*)
- 17298 **Verification of Mixed Stochastic/Deterministic Approach for Fast and Thermal Reactor Analysis**
Nicolas E. Stauff, Changho Lee, Paul K. Romano, Taek K. Kim (*Argonne National Laboratory*)
- 17228 **Application of Hybrid Resonance Self-Shielding Treatment Based on Integration of Equivalence Theory and Ultra-Fine-Group Calculation**
Hiroki Koike, Kazuya Yamaji, Kazuki Kirimura, Shinya Kosaka (*Mitsubishi Heavy Industries, Ltd.*)

Track 5: PSA/PRA

5:10 pm - 6:50 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Hans-Josef Allelein (*RWTH Aachen University*)**Co-Chair:** Akira Nakamura (*Institute of Nuclear Safety System, Inc.*)

- 17151 **Study of Accident Sequences Using Refined Plant Damage States in Level 2 PSA**
Takeshi Takahashi, Naoki Hirokawa, Daisuke Taniguchi (*Hitachi-GE Nuclear Energy Ltd.*)
- 17401 **Development of Dynamic Probabilistic Risk Assessment Model for PWR Using Simplified Plant Simulation Method**
Shohei Otsuki, Tomohiro Endo, Akio Yamamoto (*Nagoya University*)
- 17760 **Analysis on Key Issue of Source Term Behavior Based on Seismic Level 2 PRA Evaluation by Application of Up-To-Date Knowledge and Methodology**
K. Nakamura (*Central Research Institute of Electric Power Industry*), Y. Yamane (*Advancesoft*), K. Murata (*Trust Tech*), T. Kanai, A. Ui, H. Endo (*Central Research Institute of Electric Power Industry*)

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Track 3: GFR and ITER

5:10 pm - 6:50 pm / Hiei (The Westin Miyako Kyoto)

Chair: Yoshitaka Chikazawa (*Japan Atomic Energy Agency*)**Co-Chair:** Kazuhiro Kamei (*Toshiba Corporation*)

17496 **Advanced I&C Technologies:
Design, Qualification, Fabrication, Installation and Testing of an I&C SIL4 Hardwired Technology**
Maria Teresa Dominguez Bautista (*Empresarios Agrupados*)

17550 **Development of Manufacturing Technologies for the ITER Toroidal Field Coil
- Welding and Machining Processes -**

Katsusuke Shimizu, Naoki Sawa, Mikio Wakabayashi, Masahiko Inoue, Takashi Miyake, Takashi Kagawa, Daisuke Hara, Takeru Okamoto (*Mitsubishi Heavy Industries, Ltd.*), Shinji Ando, Kunihiro Matsui, Masataka Nakahira, Norikiyo Koizumi (*National Institutes for Quantum and Radiological Science and Technology*)

Track 7: Multi-Phase Flow Thermal Hydraulics III

5:10 pm - 6:50 pm / Atago (The Westin Miyako Kyoto)

Chair: Ge Wu (*Nuclear Power Institute of China*)**Co-Chair:** Daisuke Yamauchi (*Tokyo Electric Power Company Holdings, Inc.*)

17593 **Void Fraction and Interfacial Velocity Distributions of Gas-Liquid Two-Phase Flow Just behind an Obstacle Simply Simulating the Spacer Shape Measured by Wire-Mesh Sensors**

K. Takase, T. Sakka (*Nagaoka University of Technology*)

17686 **CFD Simulation and Validation of Turbulent Mixing in a Rod Bundle with Vaned Spacer Grids Based on LDV Test**

Xi Chen, Songwei Li, Zhongchun Li, Sijia Du, Yu Zhang, Haunhuan Peng (*Nuclear Power Institute of China*)

17189 **Influence of Rod-Pitch on Void Fraction Distribution in an Unheated 5 × 5 Rod Bundle under High Pressure and Low Flow Rate Conditions**

Kenichi Katono, Kiyoshi Fujimoto (*Hitachi, Ltd.*), Goro Aoyama, Yuma Nagasawa (*Hitachi-GE Nuclear Energy Ltd.*), Takuji Nagayoshi (*Hitachi, Ltd.*), Takahiro Arai (*Central Research Institute of Electric Power Industry*)

Track 7: System Analysis Code Simulations

5:10 pm - 6:50 pm / Take (The Westin Miyako Kyoto)

Chair: Kazuaki Kito (*Hitachi Ltd.*)**Co-Chair:** Jiyun Zhao (*City University of Hong Kong*)

17167 **Spray Cooling Performance during Spent Fuel Pool Accident with MAAP Code**

Kenichi Kanda, Satoshi Nishimura, Masaaki Satake, Kazuma Abe, Masahiro Furuya, Yoshihisa Nishi (*Central Research Institute of Electric Power Industry*)

17484 **Construction of the PWR Analysis Model with MAAP5.01
- Parametric Survey of TMLB' and ADCB' Sequences -**

Yoshihisa Nishi, Satoshi Nishimura, Masaaki Satake (*Central Research Institute of Electric Power Industry*), Toshihiko Miyamoto, Yuusuke Katakami (*Shikoku Electric Power Co., Inc.*), Hiroyuki Sakamoto, Kenta Kobayashi, Tomohiro Kodaira (*Hokkaido Electric Power Co., Inc.*)

17604 **The Ultimate Response Guideline Simulation and Analysis by Using RELAP5/SNAP for Lungmen ABWR Nuclear Power Plant under Fukushima-Like Condition**

Jong-Rong Wang, Wen-Shu Huang, Shao-Wen Chen, Chunkuan Shih, Yuh-Ming Ferng (*National Tsing Hua University*), Show-Chyuan Chiang, Tzu-Yao Yu (*Taiwan Power Company*)

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Track 2: HTR Design

5:10 pm - 6:50 pm / Ran (The Westin Miyako Kyoto)

Chair: Charles W. Forsberg (*Massachusetts Institute of Technology*)**Co-Chair:** Hiroyuki Sato (*Japan Atomic Energy Agency*)**17567 Nuclear Combined Cycle Gas Turbines for Variable Electricity and Heat Using Firebrick Heat Storage and Low-Carbon Fuels**Charles Forsberg (*Massachusetts Institute of Technology*), Per F. Peterson (*University of California*), Patrick McDaniel (*University of New Mexico*), Hitesh Bindra (*Kansas State University*)**17542 Opportunities for International Collaboration on Modular High Temperature Reactors**Matt Richards, Chris Hamilton (*Ultra Safe Nuclear Corporation*), Donald Hoffman (*EXCEL Services Corporation*), Kazuhiko Kunitomi (*Japan Atomic Energy Agency*), Min-Hwan Kim (*Korea Atomic Energy Research Institute*), Michael A. Fütterer (*European Commission*), Grzegorz Wrochna (*National Centre for Nuclear Research*)**17662 Study on Thermodynamic Cycle of High Temperature Gas-Cooled Reactor**Xinhe Qu, Xiaoyong Yang, Jie Wang (*Tsinghua University*)**17630 Mitsubishi Small Module High Temperature Gas-Cooled Reactor "MHR" Conceptual Design - A Comparison Analysis between a Steam Turbine Cycle and a Gas Turbine Cycle -**Sunao Oyama, Hiroki Tsukamoto, Kazumasa Suyama, Takuya Kono (*Mitsubishi Heavy Industries, Ltd.*)**17241 Cost Performance Design for High Temperature Helium Heat Transport Piping of GTHTTR300C and HTTR-GT/H₂ Plants**Yasunobu Nomoto, Shoichi Horii, Junya Sumita, Hiroyuki Sato, Xing L. Yan (*Japan Atomic Energy Agency*)**Track 4: Operation Supporting System**

5:10 pm - 6:50 pm / Kiku (The Westin Miyako Kyoto)

Chair: Hironobu Nakamura (*Japan Atomic Energy Agency*)**Co-Chair:** Richard F. Wright (*Westinghouse Electric Company LLC*)**17142 A Full Scope Nuclear Power Plant Simulator for Multiple Reactor Types with Virtual Control Panels**Hisanori Yonezawa, Hiroki Ueda, Takahisa Kato (*Toshiba Corporation Energy Systems & Solutions Company*)**17382 Development of Emergency Response Training Program for On-Site Commanders (1)**Masaru Hikono, Yuko Matsui, Masaki Kanayama (*Institute of Nuclear Safety System, Inc.*)**17437 Development of Emergency Response Training Program for On-Site Commanders (2) - Extraction of Non-Technical Skills -**Yuko Matsui, Masaru Hikono (*Institute of Nuclear Safety System, Inc.*), Mari Iwasaki, Miduho Morita (*Inter Quest*)**17691 Development of the Decision Make Supporting System on Incident Management**Mizuki Kasamatsu, Satoshi Hanada, Eisuke Noda (*Mitsubishi Heavy Industries, Ltd.*)**17697 CRDM Motion Analysis Using Machine Learning Technique**Takuya Nishimura, Hiroyuki Nakayama, Mayumi Saitoh, Seiji Yaguchi (*Mitsubishi Heavy Industries, Ltd.*)**Track 9: Accident Tolerant Fuel Materials**

5:10 pm - 6:50 pm / Shirakawa (The Westin Miyako Kyoto)

Chair: Tomoyuki Uwaba (*Japan Atomic Energy Agency*)**Co-Chair:** Mirco Grosse (*Karlsruhe Institute of Technology*)**17722 Surface Modification Technology of Fuel Cladding, Fresh Green to Mitigate Corrosion and Hydrogen-Pickup in High-Temperature Steam Environment**Masahiro Furuya (*Central Research Institute of Electric Power Industry*)**17319 Finite Element Simulation for Microstructural Evolution in U-Mo/Al Dispersion Fuel**Yeon Soo Kim (*Argonne National Laboratory*), G.Y. Jeong (*Ulsan National Institute of Science and Technology*), L.M. Jamison, W. Mohamed (*Argonne National Laboratory*), D.-S. Sohn (*Ulsan National Institute of Science and Technology*)**17599 Development of FeCrAl-ODS Steel Claddings for Accident Tolerant Fuel of Light Water Reactors**Shigeharu Ukai, Naoko Oono (*Hokkaido University*), Kan Sakamoto, Tadahiko Torimaru (*Nippon Nuclear Fuel Development Co., Ltd.*), Takeji Kaito (*Japan Atomic Energy Agency*), Akihiko Kimura (*Kyoto University*), Shigenari Hayashi (*Tokyo Institute of Technology*)**17796 Fuel Performance of Multi-Layered Zirconium Based Accident Tolerant Fuel Cladding**Malik Wagih, Yifeng Che, Koroush Shirvan (*Massachusetts Institute of Technology*)**17681 High-Temperature Oxidation Behavior of Advanced Fuel Cladding SiC under Various Oxygen Partial Pressures**Aikebaier Yusufu, Souichirou Yamaguchi, Takuma Shirahama, Hiroyuki Murakami, Masayoshi Uno (*University of Fukui*)**Technical Sessions:**Thursday
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Track 8: Fukushima Daiichi NPP - Characterization and Waste Treatment -

10:20 am - 12:00 pm / Mizuho 1 & 2 (The Westin Miyako Kyoto)

Chair: Takeshi Tsukada (*Central Research Institute of Electric Power Industry*)**Co-Chair:** Christine Georges (*CEA*)

- 17153 **Radioactive Waste Water Treatment for Fukushima Daiichi Nuclear Power Station**
Hiroko Abe, Shunsuke Susa, Naoki Tajima, Hisao Oomura, Shuji Seki, Seiji Yamamoto, Teruki Fukumatsu, Akira Ikeda, Norihiko Tanaka (*International Research Institute for Nuclear Decommissioning / Toshiba Corporation*), Keiji Ishikawa (*Tokyo Electric Power Company Holdings, Inc.*)
- 17795 **Purification of Accumulated Waste Water and Groundwater in Fukushima Dai-ichi Nuclear Power Station**
Yusuke Kitamoto, Takashi Nishi, Takashi Asano, Kenji Noshita, Shunsuke Miyake (*Hitachi-GE Nuclear Energy Ltd.*), Yuko Kani, Toshimasa Ohashi, Yutaka Sangu (*Hitachi, Ltd.*), Ken Yamaguchi, Kei Kobayashi, Yuichi Kurosaki, Keiji Ishikawa (*Tokyo Electric Power Company Holdings, Inc.*)
- 17077 **Characterization of Carbonate Slurry Generated from Multiple Radio-Nuclides Removal System in Fukushima Daiichi Nuclear Power Station**
Yuhei Fukuda, Yoichi Arai, Hiroshi Hinai (*International Research Institute for Nuclear Decommissioning / Japan Atomic Energy Agency*), Masashi Ichikawa, Ryota Takahashi, Fumio Hirayama (*Nippon Nuclear Fuel Development Co., Ltd.*), Masamichi Obata, Masaki Akagi, Teruki Fukumatsu (*International Research Institute for Nuclear Decommissioning / Toshiba Corporation*), Atsuhiko Shibata, Kazunori Nomura (*International Research Institute for Nuclear Decommissioning / Japan Atomic Energy Agency*)
- 17618 **Heat Treatment of Phosphate-Modified Cementitious Matrices for Safe Storage of Secondary Radioactive Aqueous Wastes in Fukushima Daiichi Nuclear Power Plant**
Keita Irisawa, Takumi Taniguchi, Masahiro Namiki (*Japan Atomic Energy Agency*), Ines Garcia-Lodeiro (*The University of Sheffield*), Takeshi Osugi, Tetsuro Sakakibara, Osamu Nakazawa, Yoshihiro Meguro (*Japan Atomic Energy Agency*), Hajime Kinoshita (*The University of Sheffield*)
- 17444 **Demonstration of Laser Processing Technique Combined with Water Jet Technique for Retrieval of Fuel Debris at Fukushima Daiichi Nuclear Power Station**
Toshihide Hanari (*Japan Atomic Energy Agency*), Toshihiko Takebe (*Japan Atomic Energy Agency / Sugino Machine*), Tomonori Yamada, Hiroyuki Daido (*Japan Atomic Energy Agency*), Ippei Ishizuka, Shinya Ohmori, Koichi Kurosawa (*Hitachi-GE Nuclear Energy Ltd.*), Go Sasaki, Masahiro Nakada, Hideaki Sakai (*Sugino Machine*)

Track 5: Safety Analysis Code Development 10:20 am - 12:20 pm / Cosmos Hall (The Westin Miyako Kyoto)**Chair:** Yoshihisa Nishi (*Central Research Institute of Electric Power Industry*)**Co-Chair:** Thierry Albiol (*Institute for Radiological Protection and Nuclear Safety*)

- 17677 **New MHI Safety Analysis Code Package for DBA (1) Overview of New MHI DBA Code Package**
Ryo Fukuda, Seiji Arita (*Mitsubishi Heavy Industries, Ltd.*)
- 17591 **New MHI Safety Analysis Code Package for DBA (2) Core Design Code, GalaxyCosmo-S**
Kazuya Yamaji, Hiroki Koike, Kazuki Kirimura, Shinya Kosaka (*Mitsubishi Heavy Industries, Ltd.*)
- 17613 **New MHI Safety Analysis Code Package for DBA (3) Thermal Hydraulic Design Code - MIDAC -**
Naohiro Takeda, Tadakatsu Yodo (*Mitsubishi Heavy Industries, Ltd.*)
- 17602 **New MHI Safety Analysis Code Package for DBA (4) Three-Dimensional Coupled Code SPARKLE-2 for PWR Non-LOCA**
Hikaru Sakamoto, Manabu Maruyama, Junto Ogawa (*Mitsubishi Heavy Industries, Ltd.*)
- 17596 **New MHI Safety Analysis Code Package for DBA (5) LOCA Analysis Code - MCOBRA/RELAP5-GOTHIC -**
Tetsuya Teramae, Hideki Miwa, Michiaki Okamoto, Takafumi Noda (*Mitsubishi Heavy Industries, Ltd.*)
- 17615 **New MHI Safety Analysis Code Package for DBA (6) Updated Mitsubishi PWR Fuel Rod Design Code, FINE4**
Nozomu Murakami, Teruhisa Yamamoto, Hideyuki Teshima (*Mitsubishi Nuclear Fuel Co., Ltd.*)

Track 3: LFR Design and R&D

10:20 am - 12:00 pm / Hiei (The Westin Miyako Kyoto)

Chair: Toru Obara (*Tokyo Institute of Technology*)**Co-Chair:** Kazuhiro Kamei (*Toshiba Corporation*)

- 17264 **Experimental and Numerical Study of the MYRRHA Control Rod System Dynamics**
G. Kennedy, D. Lamberts (*SCK•CEN*), M. Profir, V. Moreau (*Centre for advanced Studies, Research and Development in Sardinia*), K. Van Tichelen (*SCK•CEN*)
- 17211 **Component Qualification in Lead Bismuth Eutectic for Remote Handling in MYRRHA**
B. Caers, K. Van Tichelen, P. Schuurmans (*SCK•CEN*)
- 17470 **Westinghouse Demonstration Lead Fast Reactor in the Context of the U.S. DOE Advanced Demonstration and Test Reactor Options Study**
P. Ferroni, F. Franceschini, C. Stansbury, A. Harkness (*Westinghouse Electric Company LLC*), G. Grasso (*Italian National Agency for New Technologies, Energy and Sustainable Economic Development*)
- 17713 **Sensitivity and Uncertainty Studies for a Lead Cooled Fast Reactor Core**
Péter German, Máté Szieberth, Ádám Aranyosy (*Budapest University of Technology and Economics*)
- 17641 **System Level Thermal-Hydraulic Assessment of a Natural Circulating LFR**
Koroush Shirvan (*Massachusetts Institute of Technology*), Ji-Hyun Kim (*Ulsan National Institute of Science and Technology*), Il-Soon Hwang (*Seoul National University*), Ronald Ballinger (*Massachusetts Institute of Technology*)

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Track 7: Reactor Thermal Hydraulics

10:20 am - 12:00 pm / Atago (The Westin Miyako Kyoto)

Chair: Min Lee (*National Tsing Hua University*)**Co-Chair:** Hiroyuki Sato (*Japan Atomic Energy Agency*)

- 17115 **Numerical Study of the Underexpanded Nitrogen Jets Submerged into Liquid Sodium in the Frame of Sodium-Cooled Fast Reactor (SFRS)**
F. Chen (*CEA/ French Air Force Academy*), A. Allou (*CEA*), J. D. Parisse (*French Air Force Academy*)
- 17127 **Development of New PCV Cooling System for Severe Accidents**
Naoyuki Ishida, Naohisa Watahiki, Hideaki Hosoi (*Hitachi, Ltd.*),
Yasunori Nagata, Yukiko Kushima, Kouji Andou (*Hitachi-GE Nuclear Energy Ltd.*)
- 17156 **Suppression Methods of Flow-Induced Acoustic Resonance in Piping Systems**
Shiro Takahashi, Akinori Tamura (*Hitachi, Ltd.*), Toshitaka Goto, Shunichi Sato (*Mitsubishi Hitachi Power Systems, Ltd.*)
- 17300 **Flow Visualization in a Simplified Helically Coiled Steam Generator Geometry**
Saya Lee, Marilyn Delgado, Samuel J. Lee, Yassin A. Hassan (*Texas A&M University*)
- 17505 **Development of Temperature Profile Sensor at High Temporal and Spatial Resolution**
Hiroki Takiguchi, Masahiro Furuya, Takahiro Arai (*Central Research Institute of Electric Power Industry*)

Track 1: Computational Technique for Design and Simulations

10:20 am - 12:00 pm / Take (The Westin Miyako Kyoto)

Chair: Masafumi Utsumi (*Mitsubishi Heavy Industries, Ltd.*)**Co-Chair:** Takehiro Kusunoki (*The Japan Atomic Power Company*)

- 17268 **COPERNIC, a New Tool Based on Simplified Calculation Methods for Innovative LWRs Conceptual Design Studies**
Franck Morin, Guy-Marie Gautier, Oceane Bizeau, Stephane Cathalau, Elisabetta Stratta, Michel Belliard (*CEA*)
- 17173 **Improvements on Computerized Procedure System of Advanced Power Reactor 1400MWe**
Nokyu Seong, Yeonsub Jung, Chanho Sung, Sungkon Kang (*Korea Hydro & Nuclear Power Central Research Institute*)
- 17348 **Effective Use of Engineering Reactor Simulator for Education of Nuclear Safety**
Akio Yamamoto, Tomohiro Endo (*Nagoya University*)
- 17712 **Development of the Distributed Simulation System for Nuclear Power Plant Simulator for Operator Training**
Yujiro Tani, Tomohiro Komine (*Mitsubishi Heavy Industries, Ltd.*)
- 17261 **Simulation of Operational Transients for AP1000™ Plant Primary and BOP Systems**
Yoshio Kawano, Kenya Takiwaki, Naoyuki Takado, Yukitaka Yamazaki, Kenji Arai (*Toshiba Corporation*)

Track 9: Stainless Steel and Concrete

10:20 am - 12:20 pm / Ran (The Westin Miyako Kyoto)

Chair: Shohei Kawano (*Toshiba Corporation*)**Co-Chair:** Eing Yee Yeoh (*State Power Investment Corporation Research Institute*)

- 17210 **Evaluation of the Stability and Precipitation Behavior of G Phase in Dual-Phase Stainless Steels by Thermodynamic Calculations**
Toshiaki Horiuchi (*Hokkaido University of Science*), Satoshi Minamoto (*National Institute for Materials Science*),
Shota Ito (*Hokkaido University of Science*)
- 17588 **New Stress Distribution Scaling Method to Predict Fracture Toughness Temperature Dependency**
Toshiyuki Meshii, Kenichi Ishihara, Hiroki Nakano (*University of Fukui*)
- 17690 **Improvement of Alloy 52 Filler Metal for Weldability**
Yasushi Nishijima, Yusuke Sano, Kenji Kawasaki, Masahiko Toyoda, Seiji Asada (*Mitsubishi Heavy Industries, Ltd.*),
Teiichiro Saito, Norihito Ogawa, Tetsuya Sango (*Nippon Welding Rod Co., Ltd.*)
- 17120 **Metallurgical Investigations on Creep Rupture Mechanisms of Dissimilar Welded Joints between Gr.91 and 304SS**
Takuya Yamashita, Yuji Nagae (*Japan Atomic Energy Agency*), Koichi Kikuchi (*Mitsubishi FBR Systems Inc.*),
Kenji Yamamoto (*Mitsubishi Heavy Industries, Ltd.*)
- 17699 **Discussion on the Standardization of Concrete Composite for Radiation Shielding Design I - Concept of Standard Concrete for Radiation Shielding -**
Ken-ichi Kimura (*Fujita Corporation*), Tomohiro Ogata (*Mitsubishi Heavy Industries, Ltd.*),
Mikihiro Nakata (*MHI Nuclear Systems And Solution Engineering Co., Ltd.*), Nobuhiro Shigyo (*Kyushu University*),
Yoshihiro Hirao (*National Maritime Research Institute*), Yukio Sakamoto (*ATOX Co.,Ltd*)
- 17663 **Discussion on the Standardization of Concrete Composition for Radiation Shielding Design II - Evaluation of the Effect of the Composition Variance on the Shielding Property -**
Tomohiro Ogata (*Mitsubishi Heavy Industries, Ltd.*), Ken-ichi Kimura (*Fujita Corporation*),
Mikihiro Nakata (*MHI Nuclear Systems And Solution Engineering Co., Ltd.*),
Koichi Okuno (*Hazama Ando Corporation*), Tomoyuki Ishikawa (*ITOCHU Techno-Solutions Corporation*)

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Track 6: Nuclear Data

10:20 am - 12:20 pm / Kiku (The Westin Miyako Kyoto)

Chair: Takeshi Mitsuyasu (*Hitachi, Ltd.*)**Co-Chair:** Frédéric Damian (*CEA*)**17035 Development of an Automatic Nuclear Data Validation System VACANCE**Kenichi Tada, Kenya Suyama (*Japan Atomic Energy Agency*)**17203 Nuclear Data Propagation with Burnup: Impact on SFR Reactivity Coefficients**Laurent Buiron, Danièle Plisson-Rieunier (*CEA*)**17455 Interpretation of the SNEAK-12A/B Experimental Programs on Severe Core Accidents in LMFBRs – Some Feedback on Nuclear Data Re-Assimilation for the Prediction of Reactivity Changes**Marat Margulis (*Ben-Gurion University of the Negev / CEA*), Patric Blaise, Gérald Rimpault (*CEA*), Erez Gilad (*Ben-Gurion University of the Negev*)**17469 A Revision of Sensitivity Analysis for Small Reactivity Effects in ZPRs**Paul Ros, Patrick Blaise, Pierre Leconte, Adrien Gruel (*CEA*)**17377 Uncertainty Quantification of Activation Due to Cross Section Data in Neutron Shielding Calculation**Kimihiro Yokoi, Tomohiro Endo, Akio Yamamoto (*Nagoya University*), Ryoji Mizuno, Yoshio Kimura (*Chuden-CTI*)**17473 Sensitivity and Uncertainty Analysis in Nuclear Data with SCALE 6.2 Code Application to LWRs Assemblies**A. Labarile, C. Mesado, R. Miró, T. Barrachina, G. Verdú (*Universitat Politècnica de València*)**Track 5: Safety Analysis II**

1:20 pm - 3:00 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Mike Kuznetsov (*Karlsruhe Institute of Technology*)**Co-Chair:** Ryo Fukuda (*Mitsubishi Heavy Industries, Ltd.*)**17158 Dose Evaluation in the BWR Reactor Building with MAAP-DOSE**Kazuma Abe, Kenichi Kanda, Satoshi Nishimura, Masahiro Furuya, Yoshihisa Nishi (*Central Research Institute of Electric Power Industry*)**17250 Safe Shutdown Analysis for Submerged Equipment inside Containment**Dong Soo Song, Seung Chan Lee, Duk Joo Yoon, Sang Jun Ha (*Korea Hydro & Nuclear Power Co., Ltd.*)**17292 Safety Analyses for Preventing Core Damage by ATWS in Kashiwazaki-Kariwa 6, 7**Shoichi Suehiro, Masanori Takeuchi, Akinori Hayakawa, Satoshi Mizuno, Yoshihiro Oyama (*Tokyo Electric Power Company Holdings, Inc.*)**17293 Safety Analyses for Preventing PCV Damage by FCI in Kashiwazaki-Kariwa 6,7**Akinori Hayakawa, Shoichi Suehiro, Satoshi Mizuno, Yoshihiro Oyama (*Tokyo Electric Power Company Holdings, Inc.*)**17339 Assessment of Location-Specific LOCA**Daichi Shiota, Yuki Ishiwatari (*Hitachi-GE Nuclear Energy Ltd.*), Jonathan Li, Dennis Henneke (*GE Hitachi Nuclear Energy*)**Track 3: MSR Design and R&D**

1:20 pm - 3:00 pm / Hiei (The Westin Miyako Kyoto)

Chair: Kazuhiro Kamei (*Toshiba Corporation*)**Co-Chair:** Paolo Ferroni (*Westinghouse Electric Company LLC*)**17107 Feasibility of Using (Li, Na, K)F-UF₄-TRUF₃ Fuels for the U-Pu Fast-Spectrum Molten-Salt Reactors**Yasuo Hirose (*Retired*)**17260 Feasibility Studies of a Breed and Burn Molten Salt Reactor**Alisha Kasam, Eugene Shwageraus (*University of Cambridge*)**17219 A Starting Procedure for the MSFR: Approach to Criticality and Incident Analysis**D. Heuer, A. Laureau, E. Merle-Lucotte, M. Allibert, D. Gerardin (*Université Grenoble Alpes*)**17539 Seismic Probabilistic Safety Assessment of the 10MWt Solid Fuel Molten Salt Test Reactor at the Power Operating Condition**Qun Yang, Xiaowei Jiao, Zhaozhong He, Kun Chen (*Chinese Academy of Sciences*)**Technical Sessions:**Friday
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Track 7: Code Verification and Validation

1:20 pm - 3:00 pm / Atago (The Westin Miyako Kyoto)

Chair: Angel Aleksandrov Papukchiev (*Gesellschaft für Anlagen- und Reaktorsicherheit gGmbH*)**Co-Chair:** Susumu Yamashita (*Japan Atomic Energy Agency*)

- 17289 **Verification of CTF/PARCSv3.2 Coupled Code in a Turbine Trip Scenario**
A. Abarca, P. Hidalgo, R. Miró, G. Verdú (*Universitat Politècnica de València*), A. Sekhri (*Kernkraftwerk Leibstadt AG*)
- 17507 **Validation of MAAP Code for the Analysis of Liquid Waste Boiling Accident in the Reprocessing Plant**
Daisuke Fujiwara, Tatsuya Hayasaki, Ryuta Akimoto, Ryunosuke Yamaguchi (*TEPCO SYSTEMS CORPORATION*), Takashi Kodama, Takahiro Ishio, Satoshi Segawa, Mirai Kuramata (*Japan Nuclear Fuel Limited*)
- 17409 **Validation and Applicability of Reactor Core Modeling in a Plant Dynamics Code during Station Blackout**
T. Mori, H. Ohira, M. Sotsu, Y. Fukano (*Japan Atomic Energy Agency*)

Track 8: Decommissioning Planning of Nuclear Facilities

1:20 pm - 3:00 pm / Take (The Westin Miyako Kyoto)

Chair: Satoshi Yanagihara (*University of Fukui*)**Co-Chair:** David L. Perkins (*Electric Power Research Institute*)

- 17509 **Decommissioning of the Pressurized Water Reactor**
Hajime Ito, Koichi Kamahori, Yasuhiro Sugahara, Kazuhiro Fukuda (*The Kansai Electric Power Co., Inc.*)
- 17682 **Efforts to Perform Safe and Efficient Decommissioning for Tsuruga Power Station Unit 1**
Shiro Saito, Toyoaki Yamauchi (*The Japan Atomic Power Company*), Colin R. Austin (*EnegeySolutions, Inc.*)
- 17694 **Current Status of Decommissioning Activities at Ningyo-Toge Environmental Engineering Center**
Yuu Ishimori (*Japan Atomic Energy Agency*)
- 17354 **Markerless Tracking in Nuclear Power Plants: A Line Segment-Based Approach**
Hirotake Ishii, Taro Kimura, Hiroki Tokumaru, Hiroshi Shimoda (*Kyoto University*), Yuya Koda (*Japan Atomic Energy Agency*)
- 17611 **Decommissioning Engineering Support System Based on an Intelligent 3D Model Database**
Hiroshi Seki, Atsuko Enomoto (*Hitachi, Ltd.*), Mitsutaka Imamura, Takashi Kitahara (*Hitachi-GE Nuclear Energy Ltd.*)

Track 9: Maintenance and Related Materials

1:20 pm - 3:00 pm / Ran (The Westin Miyako Kyoto)

Chair: Kunihiro Ito (*Nuclear Development Corporation*)**Co-Chair:** Pascal Aubry (*CEA*)

- 17172 **Influence of Nitrogen on the Oxidation Behavior of Zircaloy-4 – Results of In-Situ Neutron Radiography Investigations**
M. Grosse, S. Pulvermacher, M. Steinbrueck (*Karlsruhe Institute of Technology*), B. Schillinger (*Technische Universität München*)
- 17273 **Effect of Addition of Sodium Tungstate and Zinc / Sodium Molybdate Mixed Phosphate on Corrosion of Carbon Steel under Diluted Artificial Seawater Environment**
Tetsuji Kaneko, Mikiro Itow, Norihiko Tanaka, Yoshiyuki Kawaharada (*International Research Institute for Nuclear Decommissioning / Toshiba Corporation*), Kazumi Fujii, Shinichi Ishioka (*International Research Institute for Nuclear Decommissioning / Hitachi-GE Nuclear Energy Ltd.*), Yutaka Yokoyama, Ryuji Umehara (*International Research Institute for Nuclear Decommissioning / Mitsubishi Heavy Industries, Ltd.*), Chiaki Kato, Tomonori Sato, Fumiyoshi Ueno (*International Research Institute for Nuclear Decommissioning / Japan Atomic Energy Agency*), Yuichi Fukaya, Katsuhiko Kumagai (*Tokyo Electric Power Company Holdings, Inc.*)
- 17430 **Long-Term Progress Prediction for the Carbon Steel Corrosion in Diluted Artificial Seawater with and without Zinc / Sodium Carbonate Mixed Phosphate**
Kazumi Fujii, Shinichi Ishioka, Masaru Iwanami (*International Research Institute for Nuclear Decommissioning / Hitachi-GE Nuclear Energy Ltd.*), Tetsuji Kaneko, Norihiko Tanaka, Yoshiyuki Kawaharada (*International Research Institute for Nuclear Decommissioning / Toshiba Corporation*), Yutaka Yokoyama, Ryuji Umehara (*International Research Institute for Nuclear Decommissioning / Mitsubishi Heavy Industries, Ltd.*), Chiaki Kato, Fumiyoshi Ueno (*International Research Institute for Nuclear Decommissioning / Japan Atomic Energy Agency*), Yuichi Fukaya, Katsuhiko Kumagai (*Tokyo Electric Power Company Holdings, Inc.*)
- 17440 **Effect of Addition of Corrosion Inhibitors on Corrosion Behavior of Piping Material in Flowing Diluted Seawater**
Ryuji Umehara, Yutaka Yokoyama (*International Research Institute for Nuclear Decommissioning / Mitsubishi Heavy Industries, Ltd.*), Tetsuji Kaneko, Norihiko Tanaka, Yoshiyuki Kawaharada (*International Research Institute for Nuclear Decommissioning / Toshiba Corporation*), Kazumi Fujii, Shinichi Ishioka (*International Research Institute for Nuclear Decommissioning / Hitachi-GE Nuclear Energy Ltd.*), Chiaki Kato, Tomonori Sato, Fumiyoshi Ueno (*International Research Institute for Nuclear Decommissioning / Japan Atomic Energy Agency*), Yuichi Fukaya, Katsuhiko Kumagai (*Tokyo Electric Power Company Holdings, Inc.*)
- 17182 **Maintenance for Pre-Stressed Concrete Containment Vessel of Tsuruga Unit 2**
Tomohiro Nishizawa, Kyouichi Chuda, Yuichiro Morishita (*The Japan Atomic Power Company*), Akira Shimizu (*Obayashi Corporation*)

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Track 6: Methods for Neutronics

1:20 pm - 3:00 pm / Kiku (The Westin Miyako Kyoto)

Chair: Kazumi Ikeda (*Mitsubishi FBR Systems, Inc.*)

Co-Chair: Tatjana Jevremovic (*IAEA*)

17295 Transient Coupled Neutronics-Thermalhydraulics Study of ULOF Accidents in Sodium Fast Reactors Using Spatial Kinetics: Comparison of the TFM Monte Carlo and S_N Approaches

A. Laureau (*CEA*), Y. Lederer (*Nuclear Research Center Negev*), A. Krakovich (*Soreq Nuclear Research Center*), L. Buiron, B. Fontaine (*CEA*)

17065 Development of Analysis Code PORCAS-F for Dynamic Behavior of Re-Critical Fuel Debris

Rei Kimura, Yutaka Takeuchi, Yamato Hayashi (*Toshiba Corporation / International Research Institute for Nuclear Decommissioning*), Hiromi Maruyama, Satoshi Takeo (*Hitachi-GE Nuclear Energy Ltd. / International Research Institute for Nuclear Decommissioning*)

17317 The Eigenvalue Problem:

Alpha, Lambda and Gamma Modes and Its Applications

A. Carreño, A. Vidal-Ferrández, D. Ginestar, G. Verdú (*Universitat Politècnica de València*)

Track 5: Evaluation of Fukushima Daiichi Accident

3:20 pm - 5:00 pm / Cosmos Hall (The Westin Miyako Kyoto)

Chair: Kazuya Yamaji (*Mitsubishi Heavy Industries, Ltd.*)

Co-Chair: Dongsoo Song (*Korea Hydro & Nuclear Power Co., Ltd.*)

17100 Sensitivity Study of Accident Scenarios on MCCI for Fukushima Daiichi Unit-1 by MELCOR

Takumi Noju, Akifumi Yamaji, Kiyoshi Matsumoto (*Waseda University*), Xin Li (*Japan Atomic Energy Agency*)

17265 Fukushima Daiichi Unit 3 Explosion and a Metal Water Reaction Accident

Takashi Tsuruda (*Akita Prefectural University*)

17357 Numerical Simulations of Cesium Distribution of Fukushima-Daiichi Nuclear Power Plant Accident and Its Uncertainty Caused by Computational Mesh

Akira Nakamura, Takayoshi Kusunoki (*Institute of Nuclear Safety System, Inc.*)

Track 3: Thermal Hydraulics in MSR

3:20 pm - 5:00 pm / Hiei (The Westin Miyako Kyoto)

Chair: Yasuo Hirose (*Retired*)

Co-Chair: Elsa Merle (*Université Grenoble Alpes*)

17511 Key Parameter Uncertainty and Sensitivity Analysis in the Nitrate Natural Circulation Loop

Xiaowei Jiao (*Chinese Academy of Sciences / University of Chinese Academy of Sciences*), Kai Wang, Shiwei Shao, Chuangxiaong Cai, Qun Yang, Zhaozhong He, Kun Chen (*Chinese Academy of Sciences*)

17581 Preliminary Model Validation for Integral Stability Behavior in Molten Salt Natural Circulation

Chuanxiong Cai, Zhaozhong He, Kun Chen (*Chinese Academy of Sciences*)

17647 Numerical Study on Heat Transfer Characteristics of Liquid-Fueled Molten Salt Using OpenFOAM

Yeong Shin Jeong, In Cheol Bang (*Ulsan National Institute of Science and Technology*)

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Track 7: CFD Analysis

3:20 pm - 5:00 pm / Atago (The Westin Miyako Kyoto)

Chair: Yoshio Kawano (*Toshiba Corporation*)**Co-Chair:** Syed Bahauddin Alam (*University of Cambridge*)

- 17716 **Steady-State Thermal-Hydraulics Analysis of a TMSR-SF1 Reactor Concept Design Using CFD Method**
Linsen Li, Kai Xie, Feng Shen (*State Power Investment Corporation Research Institute*),
Qiming Li, Naxiu Wang (*Chinese Academy of Sciences*)
- 17318 **Single Phase Analytical Models for Terry Turbine Nozzle**
Haihua Zhao, Hongbin Zhang, Ling Zou, James O'Brien (*Idaho National Laboratory*)
- 17336 **The CFD Calculation of a Stratification Break-Up Test of Light Gas in a Closed Vessel**
Yazhe Lu, Yu Zhang, Xu Ran (*Nuclear Power Institute of China*)
- 17032 **Simulation of Rod Induced Vibrations in a Flow Channel Using Coupled ANSYS CFX - MOR Approach**
Angel Papukchiev (*Gesellschaft für Anlagen- und Reaktorsicherheit gGmbH*),
J. Einzinger (*ANSYS Germany GmbH*)

Track 8: Dismantling and Decontamination Technologies

3:20 pm - 5:00 pm / Take (The Westin Miyako Kyoto)

Chair: Hiroshi Rindo (*The Institute of Applied Energy*)**Co-Chair:** Noritake Sugitsue (*Japan Atomic Energy Agency*)

- 17684 **Confirmation of the Decontamination Ability Using the Dry Blasting Device**
Hirotaka Izuka, Yuuki Tshara (*KANDEN POWER-TECH, Corporation*),
Hajime Ito, Kazuhiro Fukuda, Yasuhiro Sugahara (*The Kansai Electric Power Co., Inc.*),
Yoji Kanamori (*ATOX Co.,Ltd*)
- 17587 **Development of Splitting Device in Axial Direction for Small Diameter Pipes**
Kazuhiro Tanabe (*Kanden Plant Corporation*)
- 17476 **Design of Test Methods for Remotely Operated Robots Utilized for Decommissioning Tasks**
Kuniaki Kawabata, Yuta Tanifuji, Fumiaki Mori, Norihito Shirasaki, Toshihide Hanari (*Japan Atomic Energy Agency*)
- 17453 **Technical Development of Repairing Method for Lower Section of PCV at Fukushima Daiichi NPS**
H. Masaki, Y. Hijioaka, T. Dekura (*Toshiba Corporation / International Research Institute for Nuclear Decommissioning*),
Y. Murakami, H. Imai, T. Wakui, S. Sawada, R. Yamashita (*Hazama Ando Corporation*),
Y. Morigaki, Y. Taniguchi, H. Kawabata (*IHI Corporation*), Y. Takeuchi, T. Tabara (*Kyokuto Sangyo Co., Ltd.*)

Track 9: SCC

3:20 pm - 5:00 pm / Ran (The Westin Miyako Kyoto)

Chair: Ken Kurosaki (*Osaka University*)**Co-Chair:** Koji Fujimoto (*Nuclear Development Corporation*)

- 17360 **The Role of Grain Boundary Cavities on SCC Initiation and Propagation in Alloy 690**
Takumi Terachi, Nobuo Totsuka, Takuyo Yamada, Tomoki Miyamoto, Koji Arioka (*Institute Nuclear Safety System, Inc.*)
- 17403 **Stress Corrosion Crack Growth Behavior of Strain Hardened Stainless Steels Evaluated by FRI Model Calculations**
Masato Koshiishi, Tsuneyuki Hashimoto (*Nippon Nuclear Fuel Development Co., Ltd.*),
Naoto Shigenaka (*Hitachi-GE Nuclear Energy Ltd.*), Shigeaki Tanaka (*Toshiba Corporation*)
- 17432 **Influence of Long-Term Thermal Aging on SCC Behavior of Stainless Steel Weld Metals and Cast Stainless Steels in High-Temperature Water**
Takuyo Yamada, Takumi Terachi, Tomoki Miyamoto, Koji Arioka (*Institute of Nuclear Safety System, Inc.*)
- 17175 **Grain Boundary Oxidation of Neutron Irradiated Stainless Steels in Simulated PWR Environment**
T. Fukumura, K. Fukuya, K. Fujii, T. Miura (*Institute of Nuclear Safety System, Inc.*),
Y. Kitsunai (*Nippon Nuclear Fuel Development Co., Ltd.*)
- 17350 **A Micro-Mechanical Study of Grain Boundary Fracture in Neutron-Irradiated Stainless Steels**
Terumitsu Miura, Katsuhiko Fujii, Koji Fukuya (*Institute of Nuclear Safety System, Inc.*)

Technical Sessions:Friday
April 28
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Track 6: Next Generation Reactor Physics

3:20 pm - 5:00 pm / Kiku (The Westin Miyako Kyoto)

Chair: Hiroki Koike (*Mitsubishi Heavy Industries, Ltd.*)

Co-Chair: Nicolas Stauff (*Argonne National Laboratory*)

17178 Model Verification and Validation Procedure for a Neutronics Design Methodology of Next Generation Fast Reactors

Kazuya Ohgama (*Japan Atomic Energy Agency*), Kazumi Ikeda (*Mitsubishi FBR Systems Inc.*),
Makoto Ishikawa (*Japan Atomic Energy Agency*), Taro Kan (*Mitsubishi Heavy Industries, Ltd.*),
Shuhei Maruyama, Kenji Yokoyama, Kazuteru Sugino, Yasunobu Nagaya, Shigeo Ohki (*Japan Atomic Energy Agency*)

17789 Discrepancy of Fast Reactor Neutron Flux Calculations Caused by Assembly Homogenization

Kazumi Ikeda, Masashi Ogura, Koki Hibi (*Mitsubishi FBR Systems Inc.*)

17696 Effect of Homogenization of Breeding Zone in Small Candle Burning Reactor with Melt and Refining Process

Van Khanh Hoang, Jun Nishiyama, Toru Obara (*Tokyo Institute of Technology*)

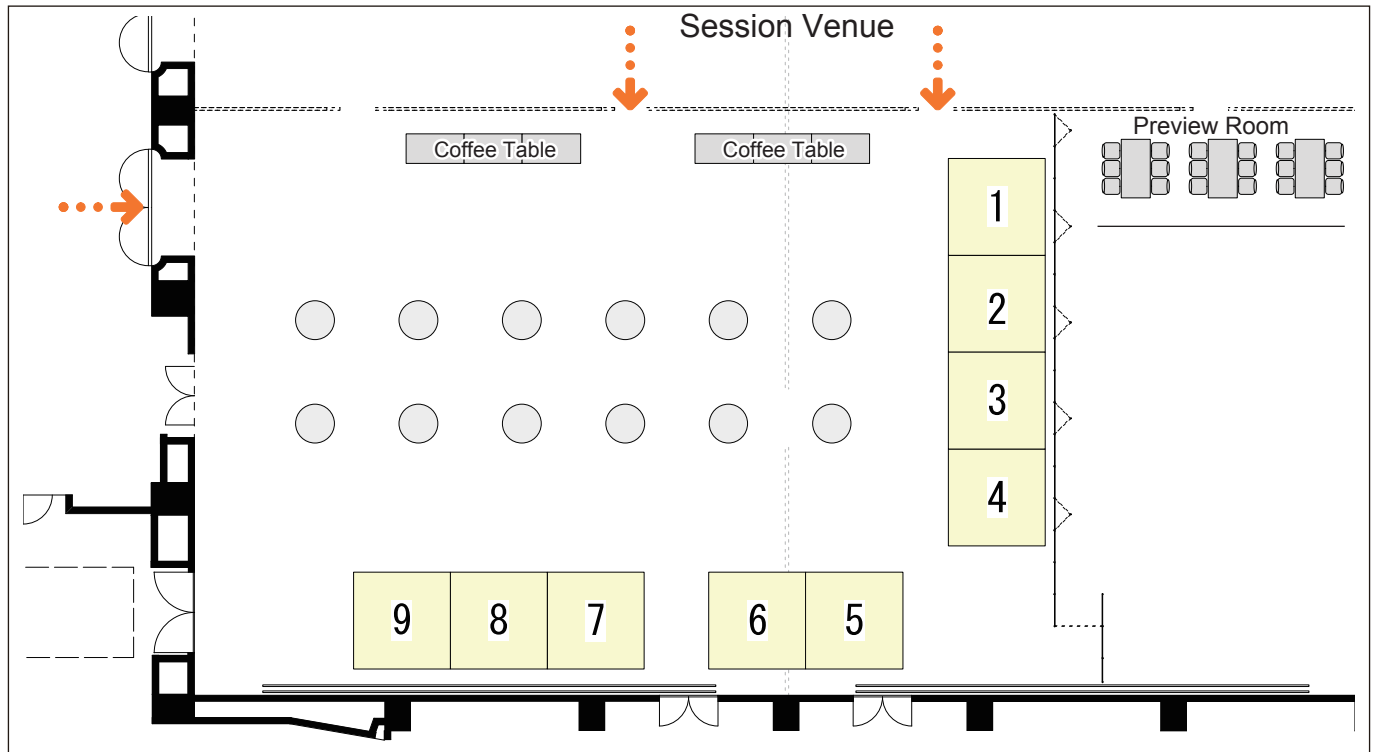
**Technical
Sessions:**

Friday
April 28

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Exhibition

Exhibition Area: Mizuho 3



EXHIBITION OPENING HOURS

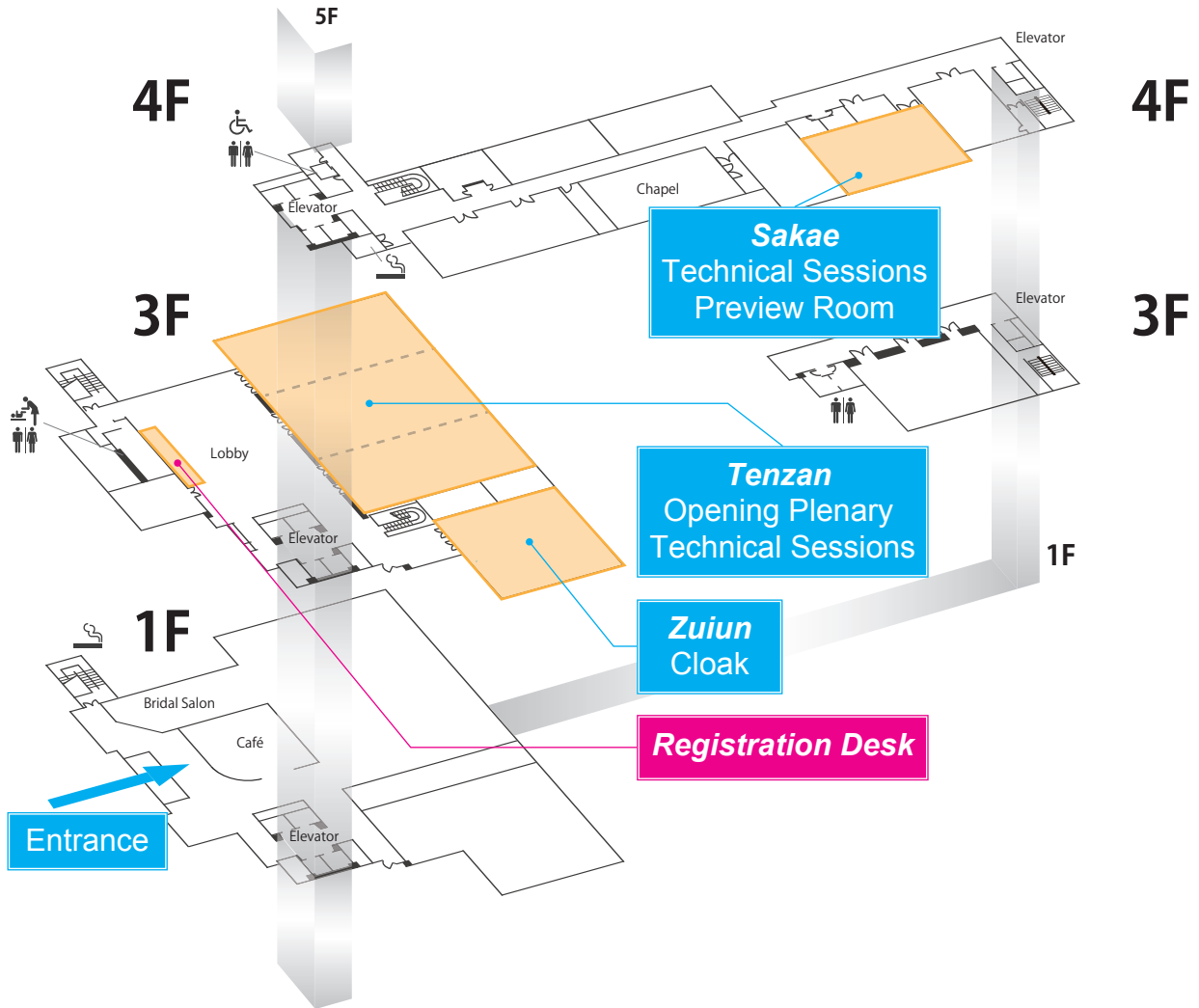
Wednesday, April 26	8:20 to 19:00
Thursday, April 27	8:20 to 19:00
Friday, April 28	8:20 to 12:00

LIST OF EXHIBITORS

1. TOA Valve Engineering Inc.
2. Kobelco Studsvik Co., Ltd.
3. Kanden Plant Corporation
4. Shin Nippon Air Technologies Co., Ltd.
5. Hitachi-GE Nuclear Energy, Ltd.
6. Nuclear Engineering, Ltd.
- 7-9. Mitsubishi Heavy Industries, Ltd.

Floor Plan Hotel Fujita Fukui

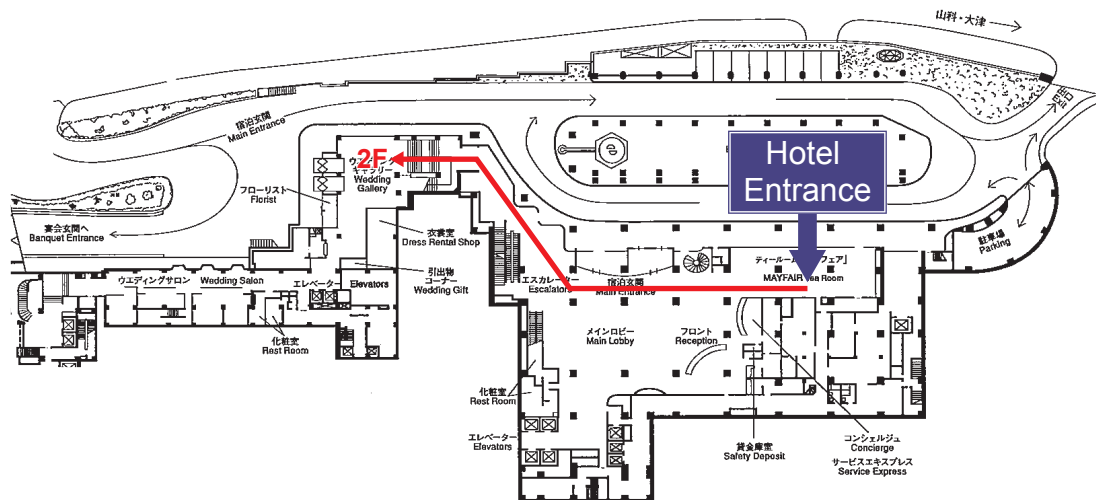
■ APRIL 24-25



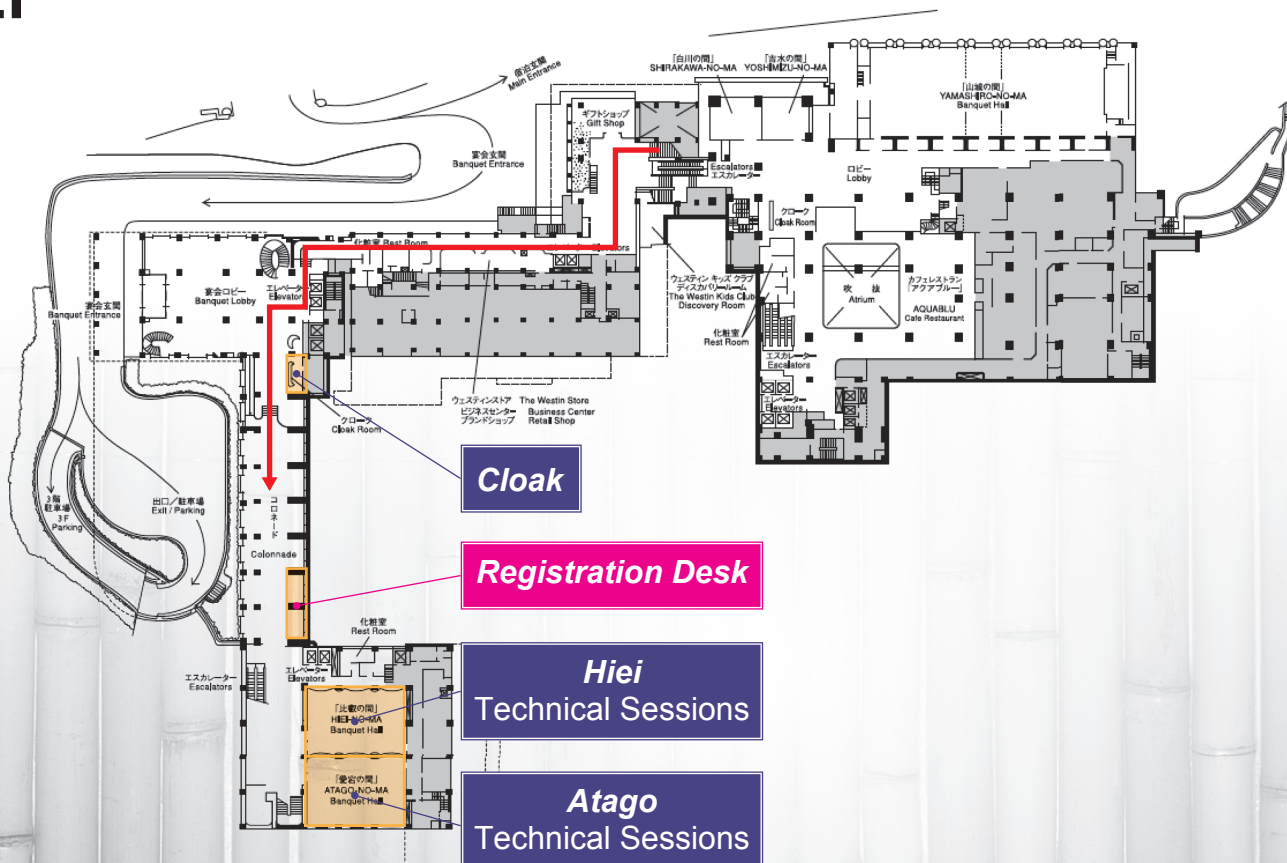
Floor Plan The Westin Miyako Kyoto

■ APRIL 25-28

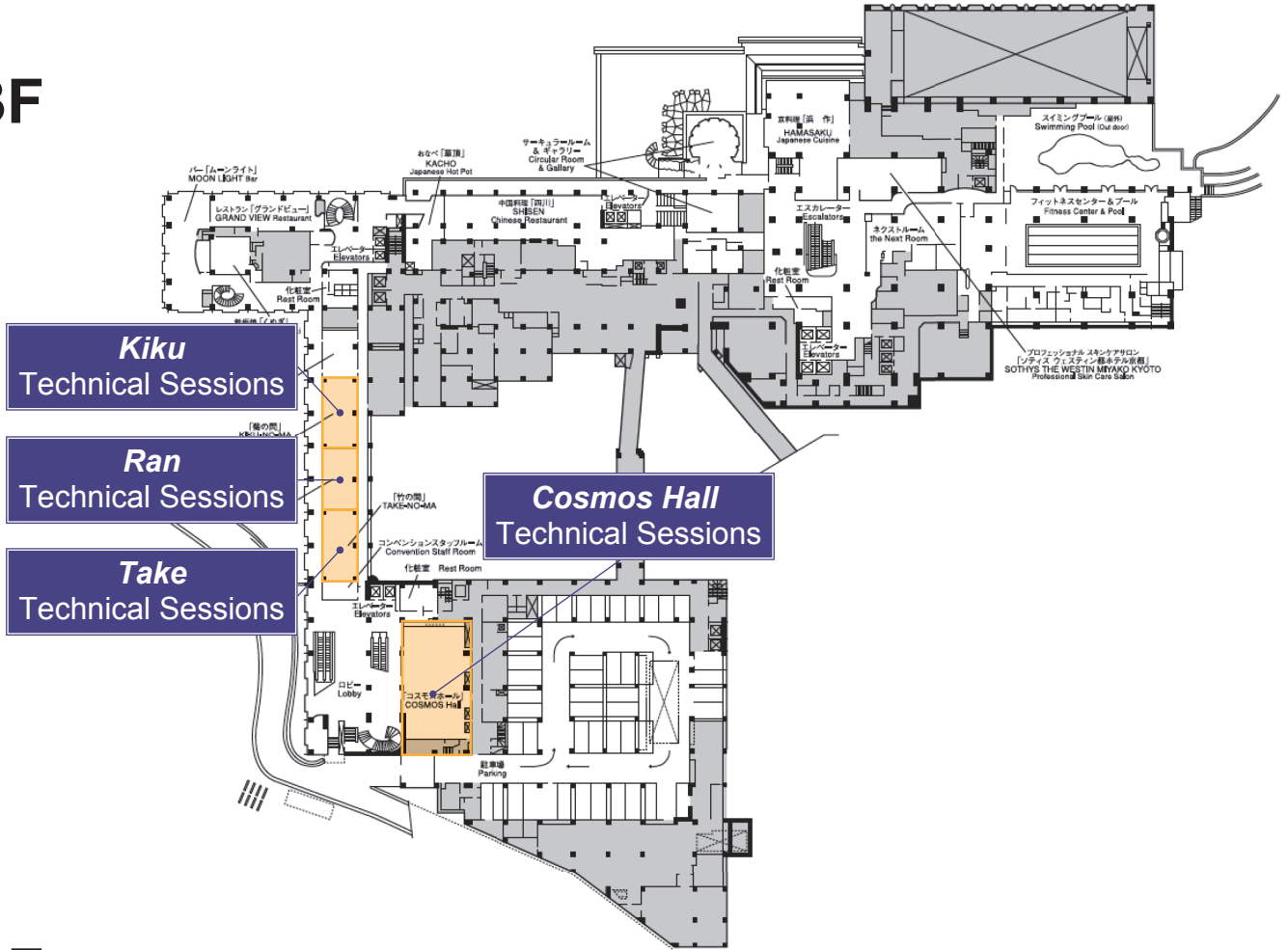
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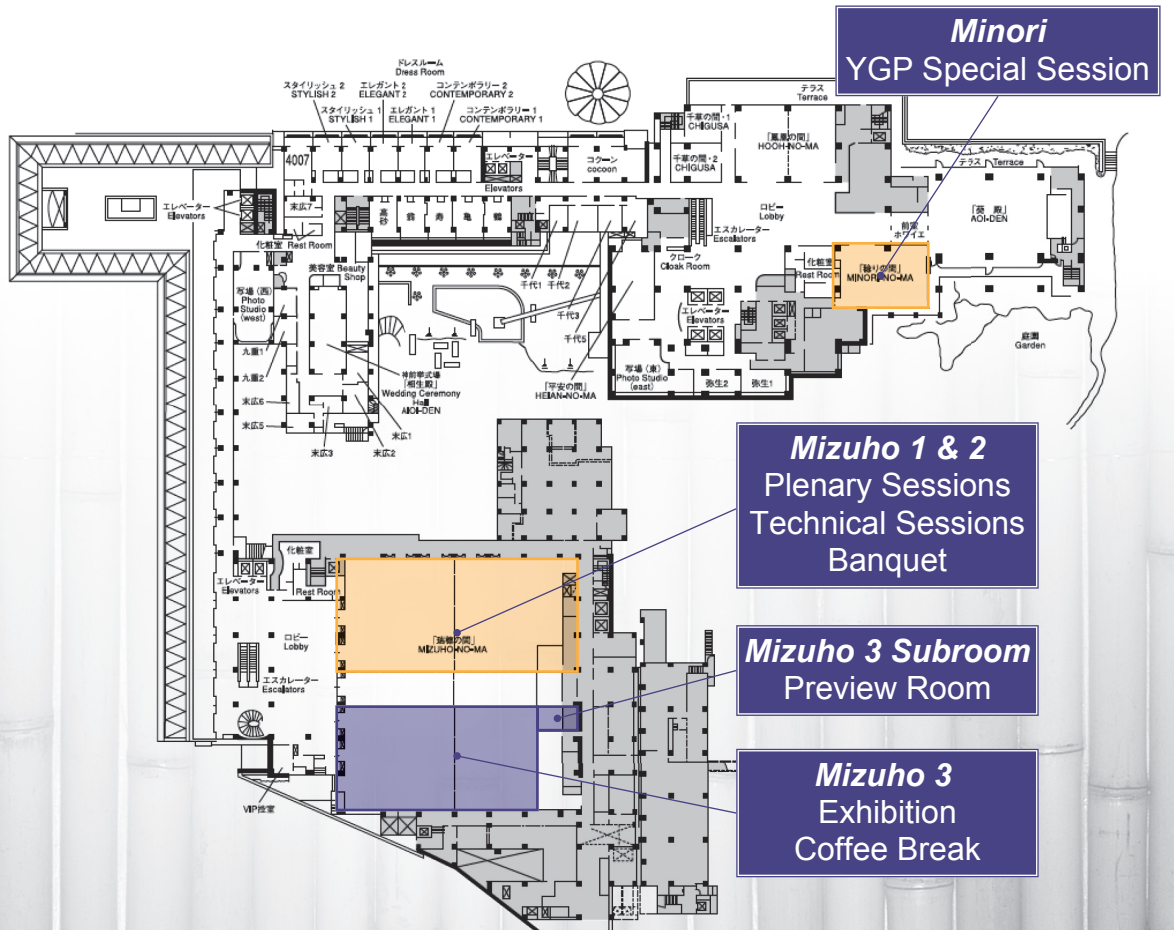
2F



3F



4F



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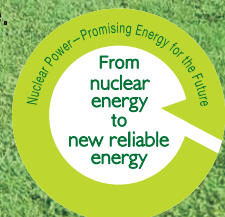
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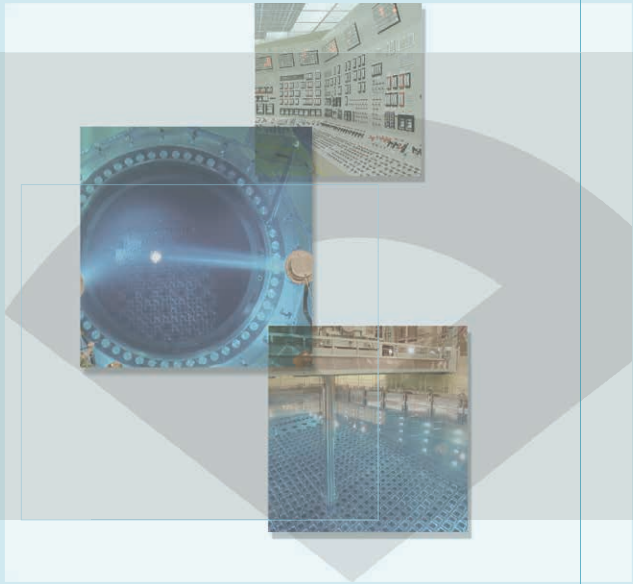
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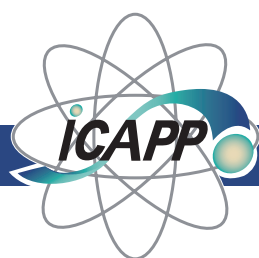
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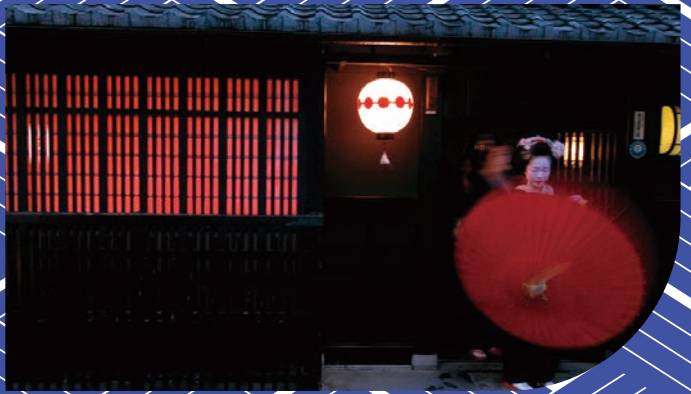


April 8-11, 2018

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