

Official Program

WRFPM 2014

**2014 Water Reactor Fuel Performance Meeting/
Top Fuel / LWR Fuel Performance Meeting**

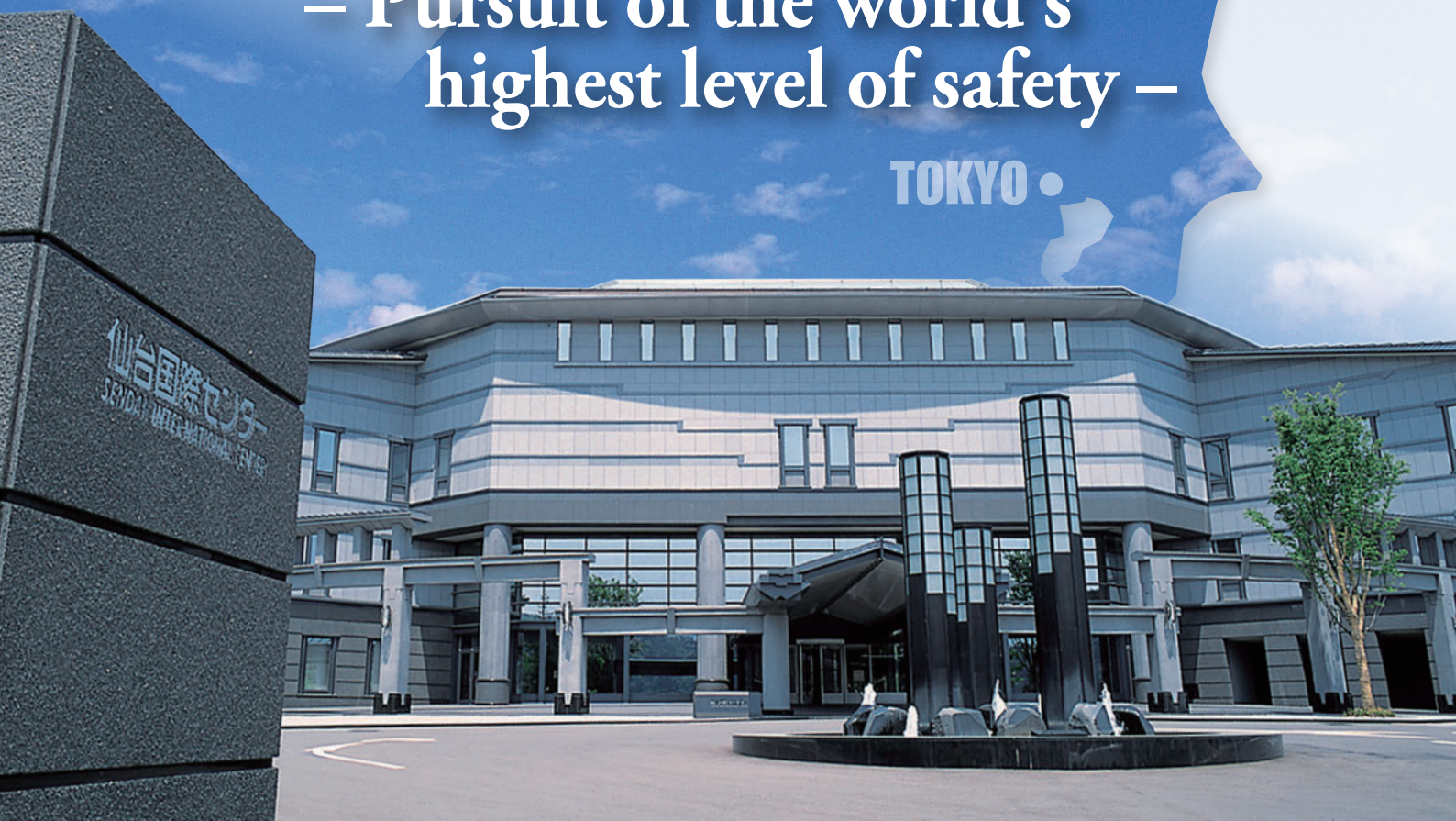
**14-17 September 2014,
Sendai, Japan**

Sendai International Center

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Suresh YAGNIK

EPRI

Shinsuke YAMANAKA

Osaka University

Jinzhao ZHANG

Tractebel Engineering / GDF SUEZ

1 Convention Venue

Registration	SENDAI INTERNATIONAL CENTER	2F Lobby (In front of Tachibana)	Sep.15-Sep.17
	Hotel Metropolitan Sendai	21F Lobby	Sep.14
Oral(Main Room)	SENDAI INTERNATIONAL CENTER	2F Tachibana	Sep.15-Sep.17
Oral(Sub Room)		2F Hagi	Sep.15-Sep.17
Poster Session		2F Sakura Hall2	Sep.16
Lunch		2F Sakura Hall1	Sep.15-Sep.17
Welcome Party	Hotel Metropolitan Sendai	21F Ginga	Sep.14
Meeting Dinner		4F Chiyo	Sep.16

Address of Hotel Metropolitan Sendai
1-1-1, Chuo, Aoba-ku, Sendai-shi, 980-8477 Japan
TEL 022-268-2525

Address of Sendai International Center
Aobayama, Aoba-ku, Sendai, Miyagi 980-0856 Japan
TEL: 022-265-2211

2 Convention Date

September 14(Sun.)-17(Wed.)

3 Registration

Date		Registration Location
Sep.14(Sun.)	17:00-20:00	Hotel Metropolitan Sendai
Sep.15(Mon.)	8:00-18:00	SENDAI INTERNATIONAL CENTER
Sep.16(Tue.)	8:00-18:00	SENDAI INTERNATIONAL CENTER
Sep.17(Wed.)	8:00-15:30	SENDAI INTERNATIONAL CENTER

4 Name Badge

Delegates are required to wear their badge at all times during Convention. This also serves as entry identification to Welcome Party, Sessions, Lunch, Meeting Dinner.

5 Welcome Party

Date : September 14 Sunday

Time : 18:00-20:00

Venue : Room 'Ginga' on 21F at Hotel Metropolitan Sendai

6 Meeting Dinner

Date : September 16 Tuesday

Time : 19:00-21:00

Venue : Room 'Chiyo' on 4F at Hotel Metropolitan Sendai

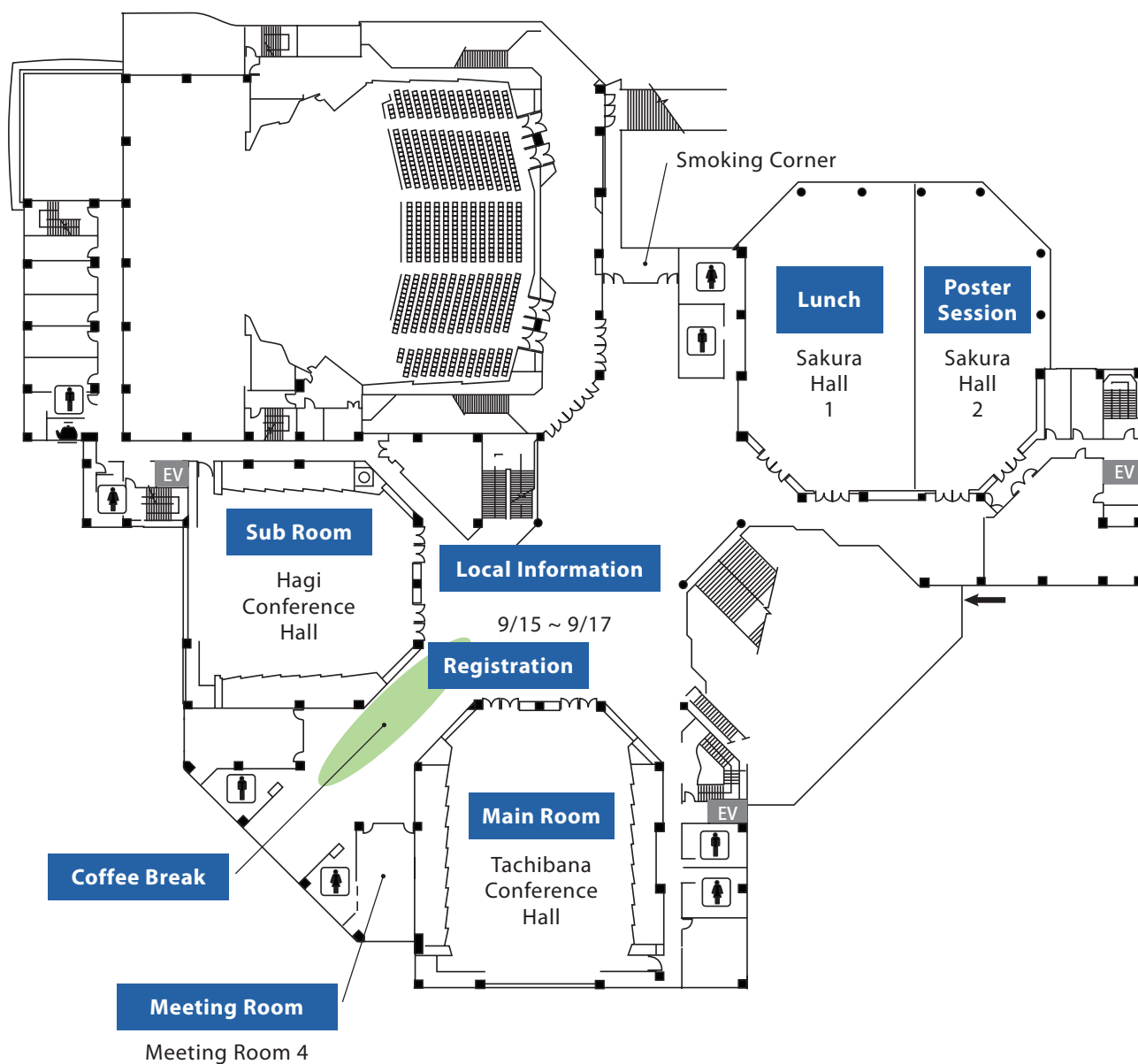
* 18:00~18:45 Shuttle bus available from International Center to Hotel Metropolitan Sendai

7 Lunch

Date		Lunch Location
Sep.15(Mon.)	11:50-13:20	2F Sakura Hall1
Sep.16(Tue.)	11:50-13:20	2F Sakura Hall1
Sep.17(Wed.)	12:10-13:40	2F Sakura Hall1

Floor Map

2F



* Note:

Welcome Party (9/14) and Meeting Dinner (9/16) will be held at Hotel Metropolitan Sendai.

Program of WRFPM2014

Sept.15(Mon.)			Sept.16(Tue.)			Sept.17(Wed.)		
	Main	Sub		Main	Sub		Main	Sub
8:30 - 8:40	Opening		8:30 - 10:10	Special Session	Track-2(2)	8:30 - 10:10	Track-3(4)	Track-1(2)
8:40 - 9:50	Plenary I-1							
9:50 - 10:20	Coffee Break		10:10 - 10:30	Coffee Break		10:10 - 10:30	Coffee Break	
10:20 - 11:50	Plenary I-2		10:30 - 11:50	Track-3(1)	Track-1(1)	10:30 - 12:10	Track-2(3)	Track-5(1)
11:50 - 13:20	Lunch		11:50 - 13:20	Lunch		12:10 - 13:40	Lunch	
13:20 - 15:20	Plenary II		13:20 - 14:40	Track-3(2)	Track-4(1)	13:40 - 15:00	Track-2(4)	Track-5(2)
			14:40 - 15:00	Coffee Break		15:00 - 15:20	Coffee Break	
15:20 - 15:50	Coffee Break		15:00 - 16:00	Track-3(3)	Track-4(2)	15:20 - 16:20	Track-2(5)	Track-1(3)
15:50 - 18:10	Special Session	Track-2(1)	16:00 - 18:00	Poster Session		16:20 - 17:40	Track-5(3)	
						17:50 - 18:00	Closing	

Special Session	Core melt and relocation in severe accidents
Track-1	Fuel performance, reliability and operational experience
Track-2	Advances and innovation in nuclear fuel technology
Track-3	Transient and accidents related issues
Track-4	Fuel cycle, interim storage and transportation
Track-5	Science and fundamental aspects

Note:

- Welcome Party will be held at 18:00-20:00 on Sept. 14 (Sun.) in Room 'Ginga' on 21F at Hotel Metropolitan Sendai.
- Meeting Dinner will be held at 19:00-21:00 on Sept. 16 (Tue.) in Room 'Chiyo' on 4F at Hotel Metropolitan Sendai.

MONDAY SEPTEMBER 15, 2014, MAIN ROOM

Opening (8:30 – 8:40)

Welcome Address

Hideo Ishibashi (Chair of Organizing Committee)

Introduction of Next Meeting

(ENS)

Plenary Session I (8:40 – 11:50)

Chair: Prof. Shinsuke Yamanaka and Dr. Manuel Quecedo

Invited-1 The Future of Nuclear Power – after Fukushima (Preliminary)

Rosa Yang (EPRI)

Invited-2 Continuous Improvement of Nuclear Safety and Safety Research Strategy

Naoto Sekimura (University of Tokyo)

Invited-3 Activities towards the Decommissioning of Fukushima-Daiichi

Shigemitsu Suzuki (Fukushima Daiichi Decontamination & Decommissioning Engineering Company)

Invited-4 Research and Development for the Decommissioning of the Fukushima Daiichi Nuclear Power Station

Hirofumi Kenda (International Research Institute for Nuclear Decommissioning)

Invited-5 Lessons Learned from the Fukushima Dai-ichi Accident and Responses in NRA Regulatory Requirements

Toyoshi Fuketa (NRA)

Plenary Session II (13:20 – 15:20)

Chair: Prof. Shuichi Iwata and Mr. Sadaaki Abeta

Invited-6 Perspectives on Nuclear Industry and Nuclear Fuel in France and Europe

Nicolas Waeckel (EDF)

Invited-7 Perspectives on BWR Fuel in the US

Russell Stachowski (GNF-A)

Invited-8 Progress on Nuclear Fuel in China

Xin Chang (CNFC)

Invited-9 Implementation of the IAEA Action Plan on Nuclear Safety and Fuel Engineering Activities

Victor Inozemtsev (Fuel Engineering Team Leader), **Alexander Bychkov** (Deputy Director General, Director of Nuclear Energy Department), **Juan Carlos Lentijo** (Director of NFC and Waste Technology Division), **Pal Vincze** (Head of Nuclear Power Engineering Section), **Gustavo Caruso** (Special Coordinator of NS Action Team)

Special Session I (15:50 – 18:10)

Chair: Dr. Fumihisa Nagase and Dr. J.P. von Dorsselaere

Invited-10 Overview of the European R&D on Severe Accidents in the SARNET Network

Jean-Pierre Van Dorsselaere (IRSN), **Ari Auvinen** (VTT Technical Research Centre), **David Beraha** (GRS), **Patrick Chatelard** (IRSN), **Christophe Journeau** (CEA), **Ivo Kljenak** (JSI), **Alex Miasoedov** (KIT), **Sandro Paci** (University of Pisa), **Roland Zeyen** (JRC/IET)

Invited-11 Efforts for the Implementation of Severe Accident Mitigation Measures

H. Y. Kim, K. S. Ha, J. H. Song (Korea Atomic Energy Research Institute)

100122 Corium Formation from Reactor Components and How Its Properties Affect Later Stages of a Severe Nuclear Accident.

D. Bottomley, V.V. Rondinella, D. Papaioannou, S. Bremier, Ph. Pöml, D. Manara, J. Somers and P. Lajarge (European Commission-JRC-Institute for Transuranium Elements (ITU))

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- 100033 An R&D Project on Debris Bed Reflooding During Severe Accident**
Florian Fichot, Georges Repetto, Nourdine Chikhi (IRSN), Michel Quintard (Université de Toulouse/ CNRS; IMFT)
- 100079 Experimental Study on Control Blade Degradation and Its Modeling**
M. Kurata, H. Shibata (Japan Atomic Energy Agency), K. Sakamoto (Nippon Nuclear Fuel Development, Co., Ltd.), T. Toh (Nippon Steel & Sumitomo Metal, Corporation)
- 100078 Thermodynamic Evaluation on Chemical Reaction between Degraded Nuclear Fuel and B₄C Control Rod in Severe Accident of LWR**
Noriko Shirasu, Masaki Kurata (Japan Atomic Energy Agency), Toru Ogawa (Nagaoka University of Technology)
- 100156 Research Program for the Evaluation of Fission Product Release and Transport Behavior Focusing on FP Chemistry**
Isamu Sato, Shuhei Miwa, Kosuke Tanaka, Kuniyoshi Nakajima, Takashi Hirose, Maho Iwasaki, Takashi Onishi, Masahiko Osaka, Toshihide Taka, Masaki Amaya, Fumihisa Nagase, Masaki Kurata (Japan Atomic Energy Agency)

MONDAY SEPTEMBER 15, 2014, SUB ROOM

Track-2(1) (15:50 – 18:10)

Chair: Mr. Sumit Ray and Dr. Mutsumi Hirai

- 100021 The Role of Pore Formation on Sintering UO₂-Gd₂O₃ Fuel**
Michelangelo Durazzo, Adonis Marcelo Saliba-Silva, Elita Urano de Carvalho (Nuclear and Energy Research Institute), Humberto Gracher Riella (Santa Catarina Federal University)
- 100008 A Study of the Influence of Al₂O₃-SiO₂ on the Large Grain TVS-2M UO₂ Pellet Performance**
Pan Jiaye (CJNF), Pei Haiqing (CJNF)
- 100046 Evaluation of Practicability of Aluminosilicate Additive Fuel -Influence of Aluminosilicate for Reprocessing and Corrosion of Pellet-**
Junji Matsunaga, Shinji Kashibe (Nippon Nuclear Fuel Development Co., Ltd.), Mika Kinoshita, Shinji. Ishimoto (Global Nuclear Fuel-Japan, Co., Ltd.), Kenichi Harada (Chubu Electric Power Co., Inc.)
- 100138 Fabrication and Properties of Carbon Network Reinforced Composite Fuel**
Malik Adeel Umer, Qusai Mahmoud Mistarihi, Joon Hui Kim, Soon Hyung Hong, Ho Jin Ryu (Korea Advanced Institute of Science and Technology)
- 100025 MOX Fuel Fabrication Technology in J-MOX**
Shuichi Osaka, Ryouichi Yoshida, Yukiko Yamazaki, Hiroyuki Ikeda (JNFL)
- 100069 Fuel Performance Research on Thorium based Nuclear Fuel**
Ding Yang, Zhou Qin, Jia Hongyi (Shanghai Nuclear Engineering Research and Design Institute)
- 100099 Ceria-Thoria Materials Testing and Pellet Manufacturing in Preparation for Plutonia-Thoria LWR Fuel Production**
Saleem S. Drera, Julian F. Kelly, Øystein Asphjell, Klara Insulander Björk (Thor Energy AS), Matylda Sobieska, Barbara Oberländer (IFE)

TUESDAY SEPTEMBER 16, 2014, MAIN ROOM

Special Session II (8:30 – 10:10)

Chair: Dr. David Bottomley and Dr. Masaki Kurata

- 100055 Accident Analysis of TEPCO's Fukushima Daiichi Nuclear Power Plant with the SAMPSON Severe Accident Code**
(1) Improvement of Debris Relocation Model
Hiroaki Suzuki, Hideo Mizouchi, Yoshihiro Morita, Masanori Naitoh (The Institute of Applied Energy)
- 100051 Accident Analysis of TEPCO's Fukushima Daiichi Nuclear Power Plant with the SAMPSON Severe Accident Code**
(2) Unit 1 Analysis with Improved Debris Relocation Model
Hideo Mizouchi, Hiroaki Suzuki, Masanori Naitoh (The Institute of Applied Energy)
- 100151 Characterization of Fuel Debris Properties for Decommissioning of Fukushima Daiichi Nuclear Power Stations**
Tadahiro Washiya, Kimihiko Yano (Japan Atomic Energy Agency/International Research Institute for Nuclear Decommissioning), *Hirotomo Ikeuchi* (Japan Atomic Energy Agency), *Naoya Kaji, Masahide Takano, Kyoichi Morimoto* (Japan Atomic Energy Agency/International Research Institute for Nuclear Decommissioning)
- 100137 Criticality Control Technique Development for Fukushima Daiichi Fuel Debris**
Yamato Hayashi (International Research Institute for Nuclear Decommissioning/ Toshiba Corporation), *Makoto Nakano* (International Research Institute for Nuclear Decommissioning/ Mitsubishi Heavy Industry, Ltd.), *Akiyuki Tsuchiya* (International Research Institute for Nuclear Decommissioning/ Hitachi-GE Nuclear Energy, Ltd.), *Katsuyoshi Oyama* (International Research Institute for Nuclear Decommissioning/ Tokyo Electric Power Company)
- 100090 Evaluation of Water Condition Change for Long Term Integrity of Fuel Assemblies in Fukushima Daiichi NPPs Common Pool**
Maki Hiramoto, Shigeaki Tanaka, Kazuo Kakiuchi (International Research Institute for Nuclear Decommissioning/Toshiba Corporation), *Susumu Otomo, Yuki Yamamura* (Nuclear Fuel Industries, Ltd.), *Masaki Aomi* (Global Nuclear Fuel - Japan Co.), *Masashi Ichikawa, Yoshinori Etoh* (Nippon Nuclear Fuel Development Co., Ltd.)

Track-3(1) (10:30 – 11:50)

Chair: Dr. Fumihisa Nagase and Dr. Nicolas Waeckel

- 100145 An Investigation into Fuel Pulverization with Specific Reference to High Burn-up LOCA**
Suresh Yagnik (Electric Power Research Institute), *James Turnbull* (Independent Consultant), *Jean Noiro* (CEA Cadarache), *Clive Walker* (Institute for Transuranium Elements), *Lars Hallstadius* (Westinghouse), *N. Waeckel* (EDF Septen), *P. Blanpain* (AREVA NP)
- 100117 Fuel Fragmentation Data Review and Separate Effects Testing**
Ken. H. Yueh (Electric Power Research Institute), *N. Snis* (Studsvik Nuclear AB), *D. Mitchell* (Westinghouse Electric Company), *C. Munoz-Reja* (ENUSA Industrias Avanzadas)
- 100026 Predictions of Fuel Dispersal During a LOCA**
Patrick Raynaud, Ian Porter (United States Nuclear Regulatory Commission)
- 100034 Ballooning and Rupture Behavior of Zircaloy-4 Cladding under Transient-Heating Conditions**
Takafumi Narukawa, Masaki Amaya (Japan Atomic Energy Agency)

Track-3(2) (13:20 – 14:40)

Chair: Dr. Nicolas Waeckel and Dr. Fumihisa Nagase

- 100086 Current Studies at JAEA on Fuel Behaviors under Accident Conditions**
Masaki Amaya, Fumihisa Nagase, Tomoyuki Sugiyama, Yutaka Udagawa, Takafumi Narukawa, Akihiko Sawada (Japan Atomic Energy Agency)

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- 100040 The Failure Behavior of the Cladding with Outer Surface Pre-crack in Biaxial Stress Test**
Takashi Shinozaki, Takeshi Mihara, Yutaka Udagawa, Tomoyuki Sugiyama, Masaki Amaya (Japan Atomic Energy Agency)
- 100097 Synthesis and Interpretation of Fuel Cladding Temperature Evolution under Reactivity Initiated Accident in NSRR Reactor**
Vincent Georgenthum, Nicolas Tregoures (IRSN), *Yutaka Udagawa* (JAEA)
- 100066 Reevaluation of Fuel Enthalpy in NSRR Test for High Burnup Fuels**
Yutaka Udagawa, Tomoyuki Sugiyama, Masaki Amaya (Japan Atomic Energy Agency)

Track-3(3) (15:00 – 16:00)

Chair: Dr. Jinzhao Zhang and Mr. Kenji Takano

- 100056 An Experimental and Finite Element Modeling Study of Cladding Strain and Localized Stresses under Simulated Iodine-Induced Stress Corrosion Cracking**
Per Magnusson (Studsvik NuclearAB), *David Le Boulch* (Commissariat à l'énergie atomique et aux énergies alternatives), *Anders Puranen* (Studsvik NuclearAB), *Daniel Jädnäs, Gunnar Lysell* (Studsvik NuclearAB)
- 100158 AREVA's PCI Methodologies for PWR Enhanced Plant Maneuverability**
Vincent Bessiron, Nicolas Jamet, Céline Gressier (AREVA NP), *Klaus-Dieter Schuh* (AREVA GmbH), *Agnès Sautereau* (AREVA NP), *Tobias Paul* (AREVA GmbH), *Christian Royere* (AREVA NP)
- 100140 Halden Fuel and Material Experiments Beyond Operational and Safety Limits**
Boris Volkov, Wolfgang Wiesenack, M. McGrath, T. Tverberg (Halden Reactor Project)

TUESDAY SEPTEMBER 16, 2014, SUB ROOM

Track-2(2) (8:30 – 10:10)

Chair: Dr. Ghatu Subhash and Dr. Kan Sakamoto

- 100019 Evolution of Westinghouse Fuel Cladding**
J. Romero (Westinghouse Electric Company), *L. Hallstadius* (Westinghouse Electric Sweden), *M. Owaki* (Nuclear Fuel Industries), *G. Pan* (Westinghouse Electric Company), *K. Kataoka, K. Kakiuchi* (Nuclear Fuel Industries), *R.J. Comstock, J. Partezana, A. Mueller* (Westinghouse Electric Company), *M. Dahlbäck* (Westinghouse Electric Sweden), *A. Garde, A. Atwood* (Westinghouse Electric Company), *M. Åslund* (Westinghouse Electric Sweden)
- 100153 Irradiation Behavior of J-Alloy™ at High Burnup**
Aya Yoshino (Mitsubishi Nuclear Fuel Co., Ltd.), *Shinji Ono* (Nuclear Fuel Industries, Ltd.), *Toshiya Kido* (Nuclear Development Corporation.), *Hiroaki Onooka* (The Kansai Electric Power Co., Inc.)
- 100076 High Temperature Properties of J-Alloy™**
Masahito Katayama (Nuclear Fuel Industries, Ltd.), *Aya Yoshino* (Mitsubishi Nuclear Fuel Co., Ltd.), *Hiroaki Onooka* (The Kansai Electric Power Co., Inc.)
- 100080 A Study on New Zirconium Alloys with Improved Corrosion Resistance**
Qifeng Zeng, Lei Chen, Junqiang Lu, Jiazheng Liu (Shanghai Nuclear Engineering Research & Design Institute)
- 100113 Environmental Effects on Advanced Cladding Materials under Normal and Accident Scenarios**
Kurt A Terrani, Bruce A. Pint (Oak Ridge National Laboratory), *Young-Jin Kim* (General Electric Global Research Center), *Lance L. Snead* (Oak Ridge National Laboratory)

Track-1(1) (10:30 – 11:50)

Chair: Dr. JinZhao Zhang and Mr. Hideyuki Teshima

- 100073 Criteria for Removal of Defective Fuel Rod from Fuel Assembly under Repair without Cladding Rupture**
V.V.Likhanskii, I.A.Evdokimov, T.N.Aliev, V.G.Zborovskii, A.A.Sorokin, K.E.Ulibishev, L.A.Maslova, A.Yu.Burtsev, I.O.Gorushin, A.P.Ponomarev (SRC RF TRINITI), E.A.Zvir, V.S.Polenok (JSC "SSC RIAR"), A.V.Ugrumov, A.A.Shishkin (JSC "TVEL")
- 100082 Design, Fabrication, and Modeling of a Two-Phase Thermosyphon Experimental Facility for Fuels and Materials Irradiation**
Joel McDuffee, Juan Carbajo, David Felde (Oak Ridge National Laboratory)
- 100095 Gamma Emission Tomography for Determining Pin-wise Percent Fission Gas Release in Fuel Assemblies at the Halden Boiling Water Reactor**
Scott Holcombe (Institute for Energy Technology – OECD Halden Reactor Project), Staffan Jacobsson Svärd (Uppsala University, Division of Applied Nuclear Physics), Lars Hallstadius (Westinghouse Electric Sweden AB)
- 100053 Comparison of Fuel Performance Codes Using Stainless Steel as Cladding Material**
Claudia Giovedi, Antonio Teixeira e Silva, Alfredo Abe, Daniel Souza Gomes (IPEN/CNEN-SP), Marco Cherubini (NINE), (UNIP), Francesco D'Auria (UNIP)

Track-4(1) (13:20 – 14:40)

Chair: Prof. Nobuaki Sato and Mr. Vaclav Mecir

- 100024 Analysis of the Structural Integrity of the Fuel Rod Cladding Based on Ring Compression Tests**
Ana Muñoz, Cristina Muñoz-Reja, Manuel Quecedo (ENUSA)
- 100126 The Analysis of Kuosheng NPP Dry-Storage System by Using TRACE/FRAPCON/FRAPTRAN**
Wan-Yun Li (National Tsing Hua University), Jong-Rong Wang (National Tsing Hua University/ Institute of Nuclear Energy Research), Hao-Tzu Lin (Institute of Nuclear Energy Research), Shao-Wen Chen, Chunkuan Shih (National Tsing Hua University)
- 100134 Sulfurization Treatment of Uranium and Zirconium Oxides by the Use of Carbon Disulfide**
Nobuaki Sato, Yuhei Fukuda, Akira Kirishima (Tohoku University), Takayuki Sasaki (Kyoto University)
- 100161 Cool-down Induced Hydride Reorientation of Hydrogen-Charged Zirconium Alloy Cladding Tubes**
Kyu-Tae Kim, Hyun-Jin Cha, Ju-Jin Won (Dongguk University)

Track-4(2) (15:00 – 16:00)

Chair: Mr. Shinji Ono and Prof. Nobuaki Sato

- 100057 Structural Integrity of Irradiated Fuel Rod Cladding under Axial Loads from Hypothetical Transportation Accident**
Jorge Muñoz, Alberto Cerracín, Cristina Muñoz-Reja, Manuel Quecedo (ENUSA)
- 100110 Hydrides Reorientation: From Experimental Investigation to Modeling**
Stéphane Valance, Johannes Bertsch (Paul Scherrer Institut)
- 100160 The Effect of Terminal Heat-up and Cool-down Temperatures on Hydride Reorientations in Zirconium Alloy Cladding Tubes**
Kyu-Tae Kim, Myeong-Su Kim, Ju-Jin Won, Hyun-Jin Cha (Dongguk University)

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WEDNESDAY SEPTEMBER 17, 2014, MAIN ROOM

Track-3(4) (8:30 – 10:10)

Chair: Dr. Ken Yueh and Dr. Masaki Amaya

- 100007 Hydrogen Absorption/Desorption Behavior through Oxide Layer of Fuel Claddings under Accidental Conditions**
K. Sakamoto (Nippon Nuclear Fuel Development, Co., Ltd.), *H. Shibata* (Japan Atomic Energy Agency), *K. Une, A. Ouchi* (Nippon Nuclear Fuel Development, Co., Ltd.), *M. Aomi* (Global Nuclear Fuel Japan Co., Ltd.), *M. Kurata* (Japan Atomic Energy Agency)
- 100064 Oxidation Behavior of Zircaloy Cladding under Nitrogen-Containing Atmosphere**
Akihiko Sawada, Masaki Amaya (Japan Atomic Energy Agency)
- 100105 High Temperature Behaviour of E110G and E110 Fuel Claddings in Various Mixtures of Steam and Air**
Erzsébet Perez-Feró, Tamás Novotny, Márta Horváth, Mihály Kunstár, Nóra Vér, Zoltán Hózer (Hungarian Academy of Sciences)
- 100018 Modelling of Cladding Oxidation by Air Under Severe Accident Conditions with the MAAP 4 Code**
Emilie Beuzet, Caroline Baumgarten (Electricité de France Research and Development), *Martin Steinbrück* (Karlsruher Institut für Technologie)
- 100148 Assessment of the Breakaway Performance of ZIRLO® and Optimized ZIRLO™ High Performance Claddings for Realistic Small Break LOCA Transients**
Robert J Comstock, Andrew J Mueller, Javier Romero, David Mitchell (Westinghouse Electric Company)

Track-2(3) (10:30 – 12:10)

Chair: Dr. Jon Carmack and Dr. Masaki Kurata

- Invited12 Critical Issues, Development, and Performance Properties of Nuclear Grade FeCrAl Cladding**
Lance Snead (ORNL)
- 100143 Metrics for the Evaluation of Light Water Reactor Accident Tolerant Fuel**
Shannon M. Bragg-Sitton (Idaho National Laboratory)
- 100131 Progress on the Westinghouse Accident Tolerant Fuel Program**
Sumit Ray, Ed Lahoda, Peng Xu, Steve Johnson, Frank Boylan, Jason Mazzocchi, Lars Hallstadius (Westinghouse Electric Company LLC)
- 100087 Silicon Carbide Materials for LWR Application; Current Status and Issues**
Tatsuya Hinoki (Kyoto University)
- 100089 Research and Development of Innovative Technologies for Nuclear Reactor Core Material with Enhanced Safety**
Yoshiyuki Kawaharada, Fumihisa Kano, Yumiko Tsuchiya, Kazuo Kakiuchi, Kazunari Okonogi, Shinichi Higuchi (Toshiba Corporation), *Tatsuya Hinoki* (Kyoto University), *Naoyuki Hashimoto, Somei Ohnuki* (Hokkaido University)

Track-2(4) (13:40 – 15:00)

Chair: Dr. Lance Snead and Prof. Tatsuya Hinoki

- 100075 Enhancing Fuel Resistance to Severe Loss of Coolant Accidents with Molybdenum-alloy Fuel Cladding**
Bo Cheng, Peter Chou (Electric Power Research Institute), *Young-Jin Kim* (GE Global Research Center)
- 100144 Molybdenum Alloys for Accident Tolerant Fuel Cladding: High Temperature Corrosion and Oxidation Behavior**
Young-Jin Kim (GE Global research Center), *Bo Cheng, Peter Chou* (Electric Power Research Institute)

- 100011 Scoping Analyses of FCM Fuel with FeCrAl Cladding for Design-Basis Accidents**
Ji-Han Chun, Sung-Won Lim, Bub-Dong Chung, Won-Jae Lee (Korea Atomic Energy Research Institute)
- 100054 Oxidation Behavior and Mechanical Property of Cr-Coated Zirconium Cladding Prepared by 3D Laser Coating**
Hyun-Gil Kim, Il-Hyun Kim, Yang-Il Jung, Dong-Jun Park, Jung-Hwan Park, Jeong-Yong Park, Yang-Hyun Koo (Korea Atomic Energy Research Institute)

Track-2(5) (15:20 – 16:20)

Chair: Dr. Bo Cheng and Dr. Isamu Sato

- 100116 Modeling Alternative Clad Behavior for Accident Tolerant Systems**
Theodore M. Besmann, Yukinori Yamamoto, Kinga A. Unocic (Oak Ridge National Laboratory)
- 100009 Estimation of Irradiation-induced Material Damage Measure of FCM Fuel in LWR Core**
Kyung-Hoon Lee, Chungchan Lee, Sang-Yoon Park, Jin-Young Cho, Jonghwa Chang, Won Jae Lee (Korea Atomic Energy Research Institute)
- 100050 Accident Tolerant and Neutronically Favorable LWR Cladding**
Jack Galloway, Cetin Unal (Los Alamos National Laboratory)

Track-5(3) (16:20 – 17:40)

Chair: Dr. Takanari Ogata and Mr. Nobuhiko Ikatsu

- 100154 CARACAS: An Industrial Model for the Description of Fission Gas Behavior in LWR-UO₂ Fuel**
Gérald Jomard, Christine Struzik, Antoine Bouloure (CEA), Pierre Mailhé (AREVA NP), Vincent Auret (EDF SEPTEN), Rodrigue Largenton (EDF R&D)
- 100032 CYRANO3: The EDF Fuel Performance Code - Global Overview and Recent Developments on Fission Gas Modelling**
Rodrigue Largenton, Gilles Thouvenin (EDF R&D)
- 100059 New Release of Fuel Performance Codes, FRAPCON-3.5 and FRAPTRAN-1.5**
Ken Geelhood, Walter Luscher (Pacific Northwest National Laboratory)
- 100061 Discrete Modeling of Early-Life Thermal Fracture in Ceramic Nuclear Fuel**
Benjamin Spencer, Hai Huang (Idaho National Laboratory), John Dolbow (Duke University), Jason Hales (Idaho National Laboratory)

Closing (17:50 – 18:00)

Closing

Kazuo Minato (President, Division of Nuclear Fuel, AESJ)

WEDNESDAY SEPTEMBER 17, 2014, SUB ROOM

Track-1(2) (8:30 – 10:10)

Chair: Dr. David Schrire and Dr. Kunio Ito

- 100045 Third SCIP Modeling Workshop: Beneficial Impact of Slow Power Ramp on PCI Performance**
V.I. Arimescu (AREVA Inc.), I. Vallejo (CIEMAT), J. Karlsson (Studsvik Nuclear AB), G. Zhou (WEC), G. Grandi (Studsvik Scandpower), P. Raynaud (US NRC), Y. Yun (PSI), N. Doncel (ENUSA), J. Sercombe (CEA), M. Pytel (EPRI), M.Dostal (UJV, Rez), R. Dunavant (GNF-US), JS. Yoo (KEPCO NF)
- 100142 Evaluation of Fuel Integrity for Seawater Intrusion Event at Hamaoka 5**
Y.Sago (Japan Chubu Electric Power Co., Inc.), K.Ito, S.Okuda (Global Nuclear Fuel-Japan Co., Ltd.), Y.Etoh (Nippon Nuclear Fuel Development Co., Ltd.)

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100162 The HWC Fuel Surveillance of a BWR-6 NPP in Taiwan

Wan-June Chiu, Shih-Chung Cheng, Yaw-Hwa Shiu (Institute of Nuclear Energy Research)

100102 Hydrogen Uptake of BWR Fuel Rods: Power History Effects at Long Irradiation Times

K.L. Nissen (AREVA GmbH), V.I. Arimescu (AREVA Inc.), W. Goll (AREVA GmbH), G. Ledergerber (Kernkraftwerk Leibstadt), C. Hellwig (Axpo Power AG)

100164 Protecting Areva ATRIUM™ BWR Fuel from Debris Fretting Failure

Steven E. Cole, Norman L. Garner (AREVA Inc.), Hans-Joachim Lippert, Rüdiger Graebert (AREVA GmbH), Pierre Mollard (AREVA NP), Gregory C. Hahn (Duke Energy)

Track-5(1) (10:30 – 12:10)

Chair: Prof. Kyu-Tae Kim and Prof. Hiroaki Abe

100030 Electrochemical Corrosion of Zircalloys Under Irradiation and Different Water Chemistry Conditions

Young-Jin Kim (GE Global Research Center), Aylin Kucuk (Electric Power Research Institute), Timothy Jurewicz (GE Global Research Center), Erik Mader, Bo Cheng (Electric Power Research Institute), John Katsoudas, Daniel Olive Jeff Terry (Illinois Institute of Technology)

100074 Electrochemical Characterization of Oxide Film on Zirconium Alloy in High Temperature Water

Kiyoko Takeda (Nippon Steel & Sumitomo Metal Corporation)

100157 Effects of Additive Elements and Precipitate Behavior in Oxide Films on Hydrogen Pick-up of Zirconium Alloys

Katsuhito Takahashi, Tomio Iwasaki, Masahisa Inagaki (Hitachi Ltd.)

100048 The Threshold Stress-Intensity Factor, K_{IH} , for Delayed Hydride Cracking (DHC) in Zircaloy-4 Fuel Cladding – an IAEA Coordinated Research Project (CRP)

C. Coleman (AECL), V. Inozemtsev (IAEA), V. Markelov (VNIINM), M. Roth (RATEN), A-M. Alvarez-Holston (Studsvik Nuclear AB), L. Ramanathan (Instituto de Pesquisas Energéticas e Nucleares), Z. He (AECL), J.K. Chakravartty (Department of Atomic Energy), V. Makarevicius (Lithuanian Energy Institute), L. Ali (Pakistan Institute of Nuclear Science and Technology)

100091 Radiation Damage Accumulation and Dissolution of Second Phase Particles in Zircaloy-2 by Means of Ion Accelerator

Takeshi Sonoda, Takashi Sawabe, Shoichi Kitajima (Central Research Institute of Electric Power Industry), Norito Ishikawa (Japan Atomic Energy Agency)

Track-5(2) (13:40 – 15:00)

Chair: Prof. Kwangheon Park and Dr. Takeshi Sonoda

100016 X-Ray Fluorescence and Absorption Analysis of Krypton in Irradiated Nuclear Fuel

Claude Degueldre, Cyprian Mieszczyński, Camelia Borca, Daniel Grolimund, Matthias Martin, Johannes Bertsch (Paul Scherrer Institut)

100043 Microbeam X-ray Diffraction to Study Radiation Damage in Irradiated Uranium Dioxide Nuclear Fuel

Goutam Kuri, Matthias Martin, Johannes Bertsch (Paul Scherrer Institute), Guido Ledergerber (Kernkraftwerk Leibstadt)

100130 The Isotopic Composition of Fission Gas Release from MOX and High Burnup UO_2 Fuel to Check the Fission Yield Database

Francette Lemoine, Olivier Serot, Pierre Leconte, David Bernard (CEA)

100165 Development of an Advanced Method for Expansion Due to Compression Testing

H. Abe, T. Abe, S. Kishita, S. Kano, Y. Satoh, Y. Matsukawa (Tohoku University)

Track-1(3) (15:20 – 16:40)

Chair: Dr. Suresh Yagnik and Mr. Hideyuki Teshima

- 100124 Experimental Study of Vibration and Fretting-Wear of Fuel Rods in Fa-K Fuel Assembly**
Victor Makarov, Andrey Afanasiev, Ivan Matvienko, Yuri Egorov (OKB HYDROPPRESS)
- 100152 Fretting Wear Evaluation on Mitsubishi ZDP-1 Fuel Assembly Designed Against GTRF Issue**
Yusuke Yasuno, Norihiro Kitashiba (Mitsubishi Nuclear Fuel Co., Ltd.)
- 100155 Post-Irradiation Examination of a Bowed PWR Fuel Rod with Contact**
David Schrire, Bertil Josefsson (Vattenfall Nuclear Fuel AB), Johan Larsson, Ronnie Apelqvist (Ringhals AB), Pia Tejlund, Francesco Corleoni (Studsvik Nuclear AB)
- 100136 Core and Fuel Feasibility Study for Improved Flexibility on the Belgian Nuclear Power Plants**
Femke Flachet (Electrabel), Jinzhao Zhang, Ruben Van Parys, Daniel Vantroyen, Christophe Schneidesch (Tractebel Engineering)

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TUESDAY SEPTEMBER 16, 2014, SAKURA HALL 2

16:00-18:00

Poster Session T1

- 100004 Equipment and Methods for Examinations of Fuel Rods in the MIR Reactor Storage Pool**
A.V. Burukin, A.I. Dolgov, A.L. Izhutov, P.A. Ilyin, S.V. Mikhailov, S.V. Romanovsky, V.A. Svistunov (JSC "SSC RIAR")
- 100022 Development of 3D Gap Element for Simulation of Asymmetric Fuel Behavior**
Hyochan Kim (Korea Atomic Energy Research Institute), Changhak Kang (KAIST), Yongsik Yang, Yanghyun Koo (Korea Atomic Energy Research Institute), Sunguk Lee, Dongyol Yang (KAIST)
- 100042 MCNP Evaluation of Top Node Control Rod Depletion below the Core in KKL**
Tâm Beran (Westinghouse Electric Sweden AB), Roger Bieli (Kernkraftwerk Leibstadt), Per Seltborg (Westinghouse Electric Sweden AB), Guido Ledergerber (Kernkraftwerk Leibstadt), Sten-Örjan Lindahl (Westinghouse Electric Sweden AB)
- 100062 The Influence of Fuel Assembly Characteristics on Reactor Safety**
Xu Liang-jian, Wang Yan-ping, Ren Chun-Ming (Nuclear Power Institute of China/ State Key Laboratory of Reactor System Design Technology)
- 100084 Design, Fabrication, and Testing of Gadolinium-Shielded Metal Fuel Samples in the Hydraulic Tube of the High Flux Isotope Reactor**
Joel L. McDuffee, Gary L. Bell, Ron J. Ellis, Randy W. Hobbs (Oak Ridge National Laboratory), Maria Okuniewski (Idaho National Laboratory), Lance L. Snead (Oak Ridge National Laboratory)
- 100103 Characterization of Nuclear Fuel Rods Operated at High Linear Heat Rates Using Nondestructive Gamma-Ray Spectroscopy**
Scott Holcombe (Institute for Energy Technology – OECD Halden Reactor Project), Staffan Jacobsson Svärd (Uppsala University), Knut Eitrheim (Institute for Energy Technology – OECD Halden Reactor Project), Lars Hallstadius (Westinghouse Electric Sweden AB)
- 100107 Experiments in Support to the Understanding of Fuel Cladding Behavior in Normal, Accidental and Storage Conditions at the CEA LECI Hotlab Facility**
Philippe Bossis, Christophe Poussard, Amel Petitrenaud, Pascal Yvon (CEA DEN)
- 100109 Evaluation of Missing Pellet Surface Geometry on Cladding Stress Distribution and Magnitude**
Nathan Capps (University of Tennessee), Robert Montgomery (Pacific Northwest National Laboratory), Dion Sunderland (Pacific Northwest National Laboratory/ ANATECH Corp), Benjamin Spencer (Idaho National Laboratory), Martin Pytel (Electric Power Research Institute), Brian D. Wirth (University of Tennessee)
- 100115 Indirect Evaluation of Pellet-Cladding Contact from Visual Analysis of Fuel Rod Elongation**
J. Klouzal, M. Dostál, J. Hejzlar (ÚJV Řež a.s.), D.Ernst (Temelín NPP, ČEZ a.s.)
- 100132 Turbine Trip with Bypass Failure Analysis of Kuosheng Nuclear Power Plant Using TRACE / FRAPCON / FRAPTRAN**
H.C.Chang, W.K.Lin, W.Y. Li, C. Shih (National Tsing-Hua University), J. R. Wang, H.T. Lin (Institute of Nuclear Energy Research)
- 100133 Effect of Integrated Boron Absorber Addition on Rod Internal Pressure of High Burnup Fuel**
Gwan Yoon Jeong (Ulsan National Institute of Science and Technology), Yong Sik Yang, Je Geun Bang (Korea Atomic Energy Research Institute), Dong Seong Sohn (Ulsan National Institute of Science and Technology)

Poster Session T2

- 100023 Estimation of Dimensional Stability for the Dual-Cooled Cladding Tubes**
Yang-Il Jung, Jeong-Yong Park, Hyun-Gil Kim, Dong-Jun Park, Jung-Hwan Park, Yang-Hyun Koo (Korea Atomic Energy Research Institute)

- 100039 The Influence of Ribbon Holes on Fuel Assembly Thermal Hydraulic Performance**
Songwei Li, Sijia Du, Hong Zhang, Yongjun Jiao, Fan Yang (Nuclear Power Institute of China)
- 100072 Porous SiC/SiC Composites Development for Industrial Application**
S.Maeta, T.Hinoki (Kyoto University)
- 100077 Fabrication of Uranium-based Nitride Alloy Powders and Pellets**
Jae Ho Yang, Dong-Joo Kim, Keon Sik Kim, Jong Hun Kim, Jang Soo Oh, Young Woo Rhee, Yang-Hyun Koo (Korea Atomic Energy Research Institute)
- 100092 Fabrication of UO₂ Fuel Pellet Containing Mo Metallic Channel**
Dong-Joo Kim, Young Woo Rhee, Jong Hun Kim, Keon Sik Kim, Jang Soo Oh, Jae Ho Yang, Yang-Hyun Koo (Korea Atomic Energy Research Institute)
- 100104 Reactor Physics Assessment of Alternate Cladding Materials**
Jeffrey J. Powers (Oak Ridge National Laboratory), Nathan M. George (Oak Ridge National Laboratory/University of Tennessee), Andrew Worrall, Kurt A. Terrani (Oak Ridge National Laboratory), G. Ivan Maldonado (Oak Ridge National Laboratory/University of Tennessee)
- 100108 Economic Feasibility of High-Throughput Processing of UO₂ Fuel by Spark Plasma Sintering**
James Tulenko, Ghatu Subhash, Daniel Permar, Andrew Cartas, Jitesh kuntawala (University of Florida)
- 100141 Experimental Investigations of Additives on Irradiation Performances of Oxide Fuel**
Boris Volkov, Terje Tverberg, M. McGrath (Halden Reactor Project)
- 100159 SiCr-SiC Composite Fuel Cladding for Light Water Reactors**
Christina A. Back (General Atomics), Edward Lahoda (Westinghouse Electric Company LLC), Robert W. Schleicher, Christian P. Deck, Hesham E. Khalifa, George M. Jacobsen, Josh G. Stone, Oscar Gutierrez (General Atomics)

Poster Session T3

- 100027 Core Coolability in Loss of Coolant Accident : The PERPROI Project**
G. Repetto, Ph. March, Ch. Marquié, N. Trégourès (Institut de Radioprotection et de Sureté Nucléaire, Cadarache), Nicolas Waeckel (EDF - Electricité de France), Marie-christine Baidetto (LaMCoS - Mechanics Laboratory Contact and Structures), Michel Gradeck (University of Lorraine)
- 100037 Analysis of PWR Cladding Transient Load under LOCA Quench Conditions**
Hsingtzu Wu, Yutaka Udagawa, Tomoyuki Sugiyama, Takafumi Narukawa, and Masaki Amaya (Japan Atomic Energy Agency)
- 100041 Analysis of Axial Fuel Relocation Based on Gamma Scan Data from OECD Halden Reactor Project LOCA Tests**
Vladimir Brankov (Paul Scherrer Institut), (École Polytechnique Fédérale de Lausanne), Grigori Khvostov, Konstantin Mikityuk (Paul Scherrer Institut), Andreas Pautz (Paul Scherrer Institut), (École Polytechnique Fédérale de Lausanne), Knut Eitrheim (Institut For Energiteknikk OECD Halden Reactor Project)
- 100068 The Influence of Hydrides on the Failure Behavior of the Hydrided Fuel Cladding Tube with outer Surface Pre-crack**
Takeshi Mihara, Yutaka Udagawa, Tomoyuki Sugiyama, Masaki Amaya (Japan Atomic Energy Agency)
- 100071 A New Research Program on Accidents in Spent Fuel Pools: The DENOPI Project**
H. Mutelle, I. Tamburini, Ch. Duriez, S. Tillard, N. Trégourès, G. Repetto (IRSN), A. Toutant (PROMES), M. Mermoux (LEPMI), V. Peres (EMSE), H. Buscail (LVEEM)
- 100094 The LORELEI Test Device for LOCA Experiments in the Jules Horowitz Reactor**
L. Ferry, D. Parrat, C. Gonnier, C. Blandin (CEA), Y. Weiss, A. Sasson (Rotem Industries LTD), & al
- 100149 Assessment of the Determination of Post Quench Ductile to Brittle Transition of ZIRLO® and Optimized ZIRLO™ High Performance Claddings**
Robert J. Comstock, Andrew J. Mueller, Guirong Pan, David Mitchell (Westinghouse Electric Company)

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Poster Session T5

- 100020 Fabrication of Powder from Ductile Uranium Alloys for Use as Nuclear Dispersion**
Michelangelo Durazzo, Ricardo Mendes Leal Neto, Claudio José da Rocha, Elita Fontenele Urano de Carvalho (Nuclear Fuel Center, Nuclear and Energy Research Institute), *Humberto Gracher Riella* (Santa Catarina Federal University)
- 100029 Crud Deposition Modeling on BWR Fuel Rods**
Aylin Kucuk, Bo Cheng (Electric Power Research Institute), *Gerald A. Potts, Bharat Shiralkar, Dave Morgan* (Finetech Inc.), *Garry Gose* (Computer Simulations and Analysis Inc.), *Kenny Epperson* (Finetech Inc.)
- 100049 Irradiation Damage Effect on Corrosion Rates of SiC in Hot Water**
Sosuke Kondo, Moonhee Lee, Tatsuya Hinoki (Kyoto University), *Yumiko Tsuchiya, Yoshiyuki Kawaharada, Fumihisa Kano* (Toshiba Corporation)
- 100060 Techniques Developed to Determine K_{IH} of Zircaloy- 4 Cladding Material**
Z. He, D. McDonald, J. Mouris, L. Fu (AECL)
- 100065 Deuterium Diffusion in Zr Oxide Layer Irradiated with Zr and O Ions**
Ikuji Takagi (Kyoto University), *Kan Sakamoto* (Nippon Nuclear Fuel Development, Co., Ltd.), *Hiroyuki Watanabe, Masayoshi Nishiyama* (Kyoto University), *Katumi Une* (Nippon Nuclear Fuel Development, Co., Ltd.)
- 100081 Determination of Diffusion Coefficients of Oxygen Atoms in ZrO_2 Using First-Principles Calculations**
Takashi Segi, Takanari Okuda (KOBELCO RESEARCH INSTITUTE, INC.)
- 100114 Finite Element Analysis of BWR Fuel Channel Buckling during a Seismic Event**
Mika Kinoshita, Yuji Iwamoto (Global Nuclear Fuel - Japan), *Kevin Ledford, Paul Cantonwine* (Global Nuclear Fuel - Americas)
- 100139 Distribution of Alloying Elements in Irradiated Zircaloy-2 by Atom Probe Tomography and Transmission Electron Microscopy**
Takashi Sawabe, Takeshi Sonoda, Shoichi Kitajima (Central Research Institute of Electric Power Industry)
- 100166 Characterization of Hydrogenation Behavior on Mo-Modified Zr-Nb Alloys as Nuclear Fuel Cladding Materials**
H.L. Yang, H. Abe (Tohoku University), *T. Kido* (Nuclear Development Corporation), *S. Shibukawa, Y. Satoh, Y. Matsukawa* (Tohoku University)

Information for Presenter

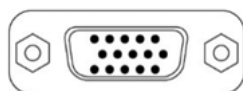
Oral Presentation

Duration of oral presentations are 20 minutes (including 5 minutes for discussion) for contributed talks.

Computers (Windows7 in English version/Power Point 2007-2013) are available for presenters at the meeting rooms. Our projectors will be equipped with standard D-SUB 15-pin cables. If your presentation data is created in Macintosh, please do bring your own computer and adapter.

In case you use your own computer, make sure to test your computer and its connection to the projector during the coffee break preceding the talk or the afternoon of the day before for those scheduled in the morning. This is mandatory as the schedule is tight and time has to be respected in order for listeners to move from one lecture hall to the other during parallel sessions.

Speakers are asked to check-in with the session presider in the conference room ten minutes before the session begins. The lecture halls are equipped with microphones and projectors.



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Poster Presentation

Poster boards will be located in Room 'SAKURA HALL 2' on the 2nd floor of International Conference Center. The size of each poster board will be 210 cm height × 120 cm width (maximum dimensions). A presenter should place his/her poster on the poster board of his/her presentation's categories(Track).

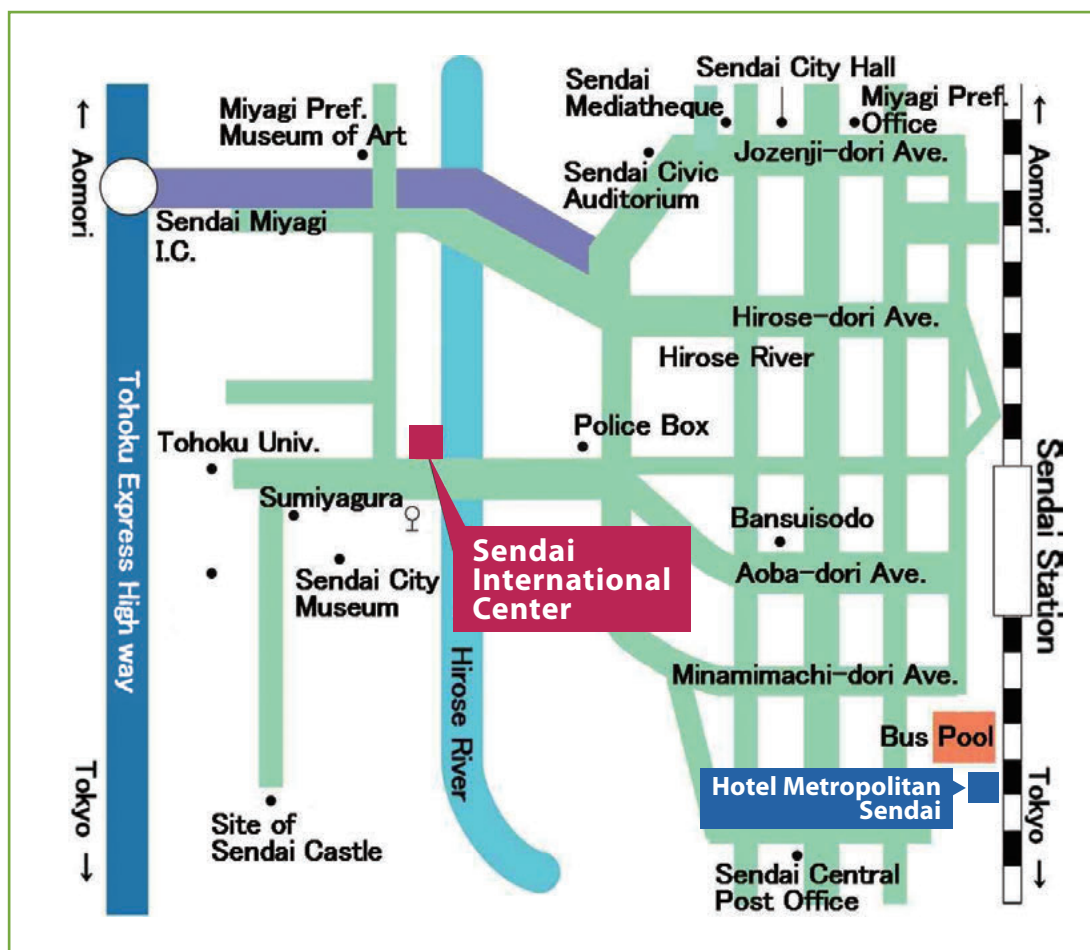
Pushpins are available at the poster reception desk.

Display of your poster should be conducted according to the following schedule.

	Poster Mounting:	Discussion time:	Poster Removal:
September 16:	13:00-15:00	16:00 -18:00	18:00-19:00

Access Map

Sendai International Center



Bus

10minutes from Sendai Station(bus stop No.9).
Take bus marked : "W8-3 青葉台" (AOBADAI) or "W8-2 宮教大" (MIYAKYODAI).
Get off at "博物館・国際センター前" (HAKUBUTSUKAN KOKUSAI CENTER MAE).
It is the 5th stop. The fare is 180 yen.

Walk

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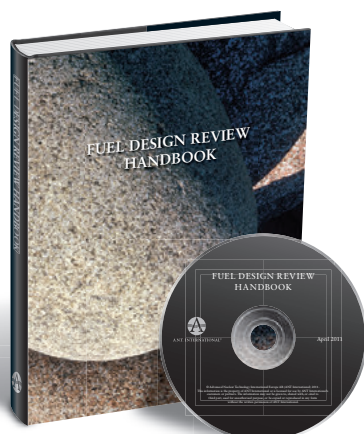
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Fuel Fabrication Process Handbook, Rev I

The Fuel Fabrication Process Handbook (FFPH) provides guidance for a cost effective audit which uses audit time on areas which are most likely to affect the performance of the PWR/VVER and BWR fuel. The FFPH focuses on a “Process Audit” procedure, the audit of the fabrication process parameters for making high quality fuel. The FFPH provides the “what, why and how” to look at in an audit. This is an updated and expanded version of the previous edition. The expansion constitutes two sections on Statistical Quality Control and Software Quality Assurance.



Fuel Design Review Handbook

This Handbook provides a guide for reviewing and auditing the Mechanical, T/H and Nuclear fuel design to assist in the assurance that it will perform its design functions adequately. The trend to more demanding performance parameters and the competitive reload fuel market have resulted in a design evolution that could outpace experience. This has produced a renewed need for design reviews and associated audits to assure reliable fuel performance and maximize plant availability.



Control Assembly Technology Report

This Report constitutes Volume III of the series of Fuel Material Technology Reports (FMTRs). The Report on Control Assembly Technology describes the designs, manufacturing, performance and issues related to BWR/PWR/VVER/CANDU Control Assemblies with Ag-In-Cd (AIC), B₄C, Hf absorber materials and stainless steel structural materials. The Report is authored by Mr. Alfred Strasser.



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