



2007 LWR FUEL PERFORMANCE MEETING/TOP FUEL

“Zero by 2010”

September 30 – October 3, 2007

San Francisco, CA • Grand Hyatt Hotel

Cosponsored by: ANS, ENS, AESJ and KNS

OFFICIAL PROGRAM

CONTRIBUTING ORGANIZATIONS

The organizations listed below have made an outstanding contribution to the success of the
2007 LWR FUEL PERFORMANCE MEETING/TOP FUEL
and to the enjoyment of the attendees and their guests through generous sponsorship.

SUNDAY, SEPTEMBER 30, 2007

Westinghouse Electric Company

Sponsor of the Opening Reception

MONDAY, OCTOBER 1, 2007

Global Nuclear Fuel (GNF)

Sponsor of the Monday Luncheon

2007 LWR FUEL PERFORMANCE MEETING/TOP FUEL

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Find Wednesday’s meeting highlights and a comprehensive listing of Wednesday’s technical sessions.

Welcome

to the

2007 LWR Fuel Perform

September 30–October 3, 2007

San Francisco, CA

Grand Hyatt Hotel

MEETING OFFICIALS



GENERAL CO-CHAIR:
Amir Shahkarami,
Exelon Generation
Company, LLC–USA



GENERAL CO-CHAIR:
Si-Hwan Kim,
KAERI–Korea



**TECHNICAL PROGRAM
CO-CHAIR:**
Roger Reynolds,
AREVA NP–USA



**TECHNICAL PROGRAM
CO-CHAIR:**
Myung Seung Yang,
KAERI–Korea

The technical scope of the meeting includes all aspects of nuclear fuel from fuel rod to core design as well as performance experience in commercial and test reactors. The meeting excludes front end and back end fuel issues, however, it covers all front and/or back issues that impact fuel designs and performance.

2007 LWR Fuel Performance/Top Fuel

Steering Committee

Samim Anghaie (Univ of Florida-USA)
James Malone (Exelon-USA)
James Tulenko (Univ of Florida-USA)

Technical Program Committee

Samim Anghaie (Univ of Florida-USA)	Mujid Kazimi (MIT-USA)
Carl E. Beyer (PNNL-USA)	Motoyashu Kinoshita (CRIEPI-Japan)
Dirk Blavius (AREVA NP-USA)	Hideya Kitamura (TEPCO-Japan)
Robert Brown (GNF-USA)	Phil MacDonald (Consultant-USA)
Michel Debes (EDF-France)	James Malone (Exelon-USA)
Scott Ferguson (WCNOC-USA)	Ralph Meyer (NRC-USA)
Robert Freeman (AREVA NP-USA)	David Mitchel (Westinghouse-USA)
Toyoshi Fuketa (JAEA-Japan)	Pierre Mollard (AREVA NP-France)
Garry Garner (AREVA NP-USA)	Kari Ranta-Puska (TVO-Finland)
Jose E. Gutierrez (ENUSA-Spain)	Javier G. Riverola (ENUSA-Spain)
Didier Haas (ITU, Karlsruhe-Germany)	Dong Seong Sohn (KAERI-Korea)
Lars Hallstadius (Westinghouse Atom AB-Sweden)	James Tulenko (Univ of Florida-USA)
Hiroshi Hayashi (NUPEC-Japan)	Peter Urban (AREVA NP-Germany)
Nadine Hollasky (AVN-Belgium)	Nicolas Waeckel (EDF-France)
Kenichi Ito (Global Nuclear Fuel-Japan)	John Willse (AREVA NP-USA)
Yong Hwan Jeong (KAERI-Korea)	Jinzhao Zhang (Tractebel Engineering-Belgium)
Zeses E. Karoutas (Westinghouse-USA)	

ance Meeting/Top Fuel

MEETING SCHEDULE

Sunday, September 30, 2007

6:00 p.m. – 8:00 p.m. Opening Reception

Monday, October 1, 2007

8:00 a.m. – 10:15 a.m. Opening Plenary: “Zero by 2010”
10:15 a.m. – 10:30 a.m. Coffee Break
10:30 a.m. – 12:00 p.m. Operating Experience, Fuel Reliability: BWR Fuel Performance
12:00 p.m. – 1:15 p.m. Meeting Luncheon
1:15 p.m. – 2:30 p.m. Operating Experience, Fuel Reliability: PWR Fuel Performance
2:30 p.m. – 3:45 p.m. Fuel Failure Mechanism and Analysis
3:45 p.m. – 4:45 p.m. Poster Session / Coffee Break
4:45 p.m. – 6:00 p.m. Influence of Water Chemistry on Fuel

Tuesday, October 2, 2007

8:00 a.m. – 10:00 a.m. Fuel Assembly Design and Cladding
10:00 a.m. – 10:15 a.m. Coffee Break
10:15 a.m. – 12:15 p.m. Fuel Fabrication, Methods and Models
12:15 p.m. – 1:30 p.m. Meeting Luncheon
1:30 p.m. – 3:00 p.m. Fuel Rods and Structural Components
3:00 p.m. – 4:00 p.m. Poster Session / Coffee Break
4:00 p.m. – 5:45 p.m. High Burn-up Fuel

Wednesday, October 3, 2007

8:00 a.m. – 10:00 a.m. Fuel Behavior during Design Basis Accidents (RIA and LOCA)
10:00 a.m. – 11:00 a.m. Poster Session / Coffee Break
11:00 a.m. – 12:30 p.m. Fuel Behavior during Off-normal Transient
12:30 p.m. – 1:45 p.m. Meeting Luncheon
1:45 p.m. – 3:15 p.m. Neutronics, Thermal and Mechanical Methodologies
3:15 p.m. – 4:45 p.m. Fuel Cycle, Spent Fuel Storage and Transportation

Accommodations and Hotel Information

The Grand Hyatt San Francisco will be the location for the 2007 LWR Fuel Performance Meeting/Top Fuel, where all meeting activities and technical sessions will take place. Treat yourself to the premier choice among Union Square hotels - Grand Hyatt San Francisco. Pampering amenities and welcoming staff await you at this gracious hotel, while all the city's delights beckon from just outside the doors. Enjoy unequalled access to world-class shopping, Chinatown, museums, the theater and the many famous sights of this vibrant metropolis, all just minutes away.

Local Attractions and Activities

The hilly streets of San Francisco provide some gorgeous glimpses of the sparkling bay and its famous bridges. The city's steepness makes for some beautiful panoramic views. You can observe a diverse mix of neighborhoods, bohemian history, provocative art, innovative architecture and restorative parks.

Some popular attractions include:

- Alcatraz Island
- Aquarium of the Bay
- Asian Art Museum
- Cable Car Museum
- California Palace of the Legion of Honor
- Coit Tower
- The Exploratorium
- Fisherman's Wharf
- Ghiradelli Square
- Golden Gate Bridge
- Haas-Lilienthal House
- Lombard Street
- Mission Dolores
- Octagon House
- Pier 39
- San Francisco Maritime National Historical Park
- San Francisco Museum of Modern Art (MOMA)
- Yerba Buena Center for the Arts/ Yerba Buena Gardens

Meeting Registration

Registration is required for all attendees and presenters. Badges are required for admission to all events. The Full Meeting Registration fee includes one (1) copy of the CD of the Meeting Proceedings and one (1) ticket each to the Opening Reception and the Monday, Tuesday and Wednesday Luncheons.

NOTE:

Additional tickets can be purchased at the ANS Registration Desk for the Sunday Opening Reception and the Monday, Tuesday, and Wednesday meeting luncheons.

Registration Hours:

The Meeting Registration Desk and Message Center will be located in the Ballroom Foyer East of the Grand Hyatt San Francisco Hotel. You may register, purchase tickets for events, or pick up your registration packet during the following hours:

SUNDAY, SEPTEMBER 30, 2007
3:00 P.M. – 7:00 P.M.

MONDAY, OCTOBER 1, 2007
7:00 A.M. – 5:00 P.M.

TUESDAY, OCTOBER 2, 2007
7:00 A.M. – 5:00 P.M.

WEDNESDAY, OCTOBER 3, 2007
7:00 A.M. – 2:00 P.M.

Speakers' Preview Room

A Speakers' Preview Room, Merced A of the Grand Hyatt San Francisco Hotel, will be available during the following hours:

SUNDAY, SEPTEMBER 30, 2007
3:00 P.M. – 7:00 P.M.

MONDAY, OCTOBER 1, 2007
7:00 A.M. – 4:00 P.M.

TUESDAY, OCTOBER 2, 2007
7:00 A.M. – 4:00 P.M.

WEDNESDAY, OCTOBER 3, 2007
7:00 A.M. – 12:00 P.M.

Audio/visual equipment will be set up; so, that speakers may preview their presentation material.

Meetings Proceedings

The meeting proceedings is available on CD-ROM. Copies of the Meeting Proceedings will be available on-site. Each full meeting registrant will receive a copy of the proceedings as part of the full meeting registration fee. Additional copies may be purchased at the meeting registration desk for \$50.00. (This special rate is available at the meeting only.) To purchase copies following the meeting, you may contact the ANS Accounting Department at 708-579-8210 (telephone); 708-579-8314 (fax); accounting@ans.org (email); or submit your request in writing to: American Nuclear Society, 97781 Eagle Way, Chicago, IL 60678-9770. Copies of the proceedings are available for \$150.00 after the meeting. Payment information must accompany all orders.

Special Events

Opening Reception

SUNDAY, SEPTEMBER 30, 2007

6:00 p.m. – 8:00 p.m.

Location: Ballroom West

The meeting will start with a welcome reception. One ticket to the Opening Reception is included with the full meeting registration.

Additional tickets can be purchased at the ANS Registration Desk for \$65.00 each.

Monday Luncheon

MONDAY, OCTOBER 1, 2007

12:00 p.m. – 1:15 p.m.

Location: Ballroom West

FEATURED LUNCHEON SPEAKER:

Jack Fuller, CEO, Global Nuclear Fuel, LLC

One ticket to the Monday Luncheon is included with the full meeting registration.

Additional tickets can be purchased at the ANS Registration Desk for \$50.00 each.

Tuesday Luncheon

TUESDAY, OCTOBER 2, 2007

12:15 p.m. – 1:30 p.m.

Location: Ballroom West

One ticket to the Tuesday Luncheon is included with the full meeting registration.

Additional tickets can be purchased at the ANS Registration Desk for \$50.00 each.

Wednesday Luncheon

WEDNESDAY, OCTOBER 3, 2007

12:30 p.m. – 1:45 p.m.

Location: Ballroom West

One ticket to the Wednesday Luncheon is included with the full meeting registration.

Additional tickets can be purchased at the ANS Registration Desk for \$50.00 each.



Coit Tower

Technical Sessions: Monday

MONDAY, OCTOBER 1, 2007 • 8:00 A.M. – 10:15 A.M.

Opening Plenary: Zero by 2010

Session Chairs: Roger Reynolds (AREVA NP-USA), Myung Seung Yang (KAERI-Korea)

Ballroom East

SPEAKERS:

- Amir Shahkarami (Exelon-USA)
- Si-Hwan Kim (KAERI-Korea)
- Kevin Donovan (INPO-USA)
- Nicolas Waeckel (EDF-France)
- Kurt Edsinger (EPRI-USA)
- Kazuhiro Suzuki (TEPCO-Japan)

MONDAY, OCTOBER 1, 2007 • 10:30 A.M. – 12:00 P.M.

Operating Experience, Fuel Reliability: BWR Fuel Performance

Session Chairs: James Malone (Exelon-USA), Jack Fuller (GNF-USA)

Ballroom East

10:30 a.m.

GNF2 Operating Experience, John Schardt (GE Energy, Nuclear-USA)

10:50 a.m.

Westinghouse BWR Fuel Reliability—Recent Experience and Analyses, Kristina Ryttersson, Sture Helmersson, Jonathan Wright, Lars Hallstadius (Westinghouse-Sweden AB)

11:10 a.m.

Dimensional Behavior of Fuel Channels—Recent Experience and Consequences, Dirk Blavius, Claus-Jürgen Muench, Norman L. Garner (AREVA NP-USA)

11:30 a.m.

Channel Bow in Boiling Water Reactors—Hot Cell Examination Results and Correlation to Measured Bow, S.T. Mahmood, Y.-P. Lin, M.A. Dubecky (GNF-USA), K. Edsinger, E.V. Mader (EPRI-USA)

MONDAY, OCTOBER 1, 2007 • 1:15 P.M. – 2:30 P.M.

Operating Experience, Fuel Reliability: PWR Fuel Performance

Session Chair: Scott Ferguson (WCNOC-USA)

Ballroom East

1:15 p.m.

Modern Fuel Cladding in Demanding Operation—ZIRLO in Full Life High Lithium PWR Coolant, Kenneth Kargol (Pacific Gas & Electric Company-USA), Jim Stevens (TXU Power-USA), John Bosma, Jayashri Iyer, Gunnar Wikmark (Westinghouse-USA)

1:35 p.m.

Performance of Alloy M5™ Cladding and Structure, G.L. Garner (AREVA NP-USA), B.A. Hilton (INL-USA), E. Mader (EPRI-USA)

1:55 p.m.

In-reactor Verification of Advanced Nuclear Fuel, PLUS7™, for KSNPs, Young Ki Jang, Jae Ik Kim, Kyu Tae Kim, Chong Chul Lee, Chan Oh Park (KNFC-Korea)

MONDAY, OCTOBER 1, 2007 • 2:30 P.M. – 3:45 P.M.

Fuel Failure Mechanism and Analysis

Session Chair: Nicolas Waeckel (EDF-France)

Ballroom East

2:30 p.m.

Studies of Hydrogen Assisted Failures Initiating at the Cladding Outer Surface of High Burnup Fuel Using a Modified Ring Tensile Technique, A.-M. Alvarez-Holston, G. Lysell, V. Grigoriev (Studsvik Nuclear-Sweden)

2:50 p.m.

Experimental Study on the Influence of the Supporting Condition and Rod Motion on the Fuel Fretting Damage, Hyung-Kyu Kim, Young-Ho Lee (KAERI-Korea)

3:10 p.m.

A Model for Predicting Coolant Activity Behaviour for Fuel-Failure Monitoring Analysis, B.J. Lewis, A. El-Jaby, J. Higgs, W.T. Thompson (RMC-Canada), F.C. Iglesias, R. Laidler, J. Armstrong, R. Stone, R. Oduntan, M. Ip (Bruce Power-Canada)

MONDAY, OCTOBER 1, 2007 • 3:45 P.M. – 4:45 P.M.

Operating Experience, Fuel Reliability: BWR Fuel Performance-Poster Session

Farallon Room

Fuel Performance Experience, Analysis and Modeling: Deformations, Fission Gas Release and Pellet-Clad Interaction, G. Zhou (Westinghouse-Sweden), A.R. Massih (Quantum Technologies-Sweden), L. Hallstadius (Westinghouse-Sweden), D. Schrire (Vattenfall Bränsle-Sweden), S. Helmersson (Westinghouse-Sweden), R. Källströmd (Studsvik Nuclear-Sweden), G. Wikmark (Westinghouse-USA), C. Hellwig (PSI-Switzerland)

XEDOR—Reduced Order Stress Model for Online Maneuvering of Boiling Water Reactors, Yousef M. Farawila (Consultant-USA), Michel R. Billaux (AREVA NP-USA)

Burn-up Increase and Power Up-rate—Operation History of KKL, G. Ledergerber, W. Kaufmann, A. Ritter, D. Greiner, Y. Parmar, R. Jacot-Guillarmod, J. Krouthén (Kernkraftwerk Leibstadt AG-Switzerland)

Operating Experience, Fuel Reliability: PWR Fuel Performance-Poster Session

Farallon Room

Irradiation Test of Advanced PWR Fuel in Fuel Test Loop at HANARO, Yong Sik Yang, Je Geon Bang, Je Geon Park, Kun Woo Song, Su Ki Park, Chul Gyo Seo (KAERI-Korea)

CHF Performance of Hybrid Mixing Vane Grid for Nuclear Fuel Bundle, Chang-Hwan Shin, Yeon-Jun Choo, Sang-Ki Moon, Se-Young Chun, Tae-Hyun Chun (KAERI-Korea)

Fuel Failure Mechanism and Analysis-Poster Session

Farallon Room

ORNL Capability to Conduct Post Irradiation Examination of Full-Length Commercial Nuclear Fuel Rods, Donald J. Spellman (ORNL-USA)

WWER Expert System for Fuel Failure Analysis Using Data on Primary Coolant Activity, V.V. Likhanskii, I.A. Evdokimov, A.A. Sorokin, A.G. Khromov, V.D. Kanukova, O.V. Apollonova (SRC RF TRINITI-Russia), A.V. Ugryumov (JSC TVEL-Russia)

The Necessity of a New Type Test Rig for the Development of an Evaluation Method in Grid Fretting Problems, Young-Ho Lee, Hyung-Kyu Kim (KAERI-Korea)

Progress in the Research Programs to Elucidate Axial Cracking Fuel Failure at High Burnup, Keizo Ogata, Masaki Aomi, Toshikazu Baba, Katsuichiro Kamimura (JNES-Japan), Yoshinori Etoh (NFD-Japan), Kunio Ito (GNF-Japan), Toshiya Kido (NDC-Japan), Hideyuki Teshima (MHI-Japan)

Fuel Rods and Structural Components-Poster Session

Farallon Room

Investigation of Increased Hydriding of Guide Tubes in Ringhals 2 During Cycle Start-up, Håkan Pettersson, Bernt Bengtson, Tell Andersson (Vattenfall-Sweden), Hans-Juergen Sell, Petra-Britt Hoffmann (AREVA NP GmbH-Germany), Friedrich Garzarolli (Consultant-Germany)

Technical Sessions: Monday/Tuesday

Corrosion and Hydrogen Pick-up Behaviors of Cladding and Structural Components in BWR High Burnup 9X9 Lead Use Assemblies, Toshiyasu Miyashita, Nobuo Nakae, Keizo Ogata, Toshikazu Baba, Katsuichiro Kamimura (*JNES-Japan*), Toshio Matsumoto (*GNF-Japan*), Kazuo Kakiuchi (*NFI-Japan*)

Influence of Water Chemistry on Fuel-Poster Session

Farallon Room

Integrated Electronic Microscopy Method to Characterize BWR Crud Deposits, Mike G. Pop, Brian Lockamon (*AREVA NP-USA*), James M. Howe, Vladimir P. Oleshko (*Univ of Virginia-USA*)

Phase Identifications in Crud from Commercial Boiling Water Reactors at the Idaho National Laboratory by Transmission Electron Microscopy, Dawn E. Janney, Douglas L. Porter (*INL-USA*), Joshua L. Peterson (*Univ of Texas at Austin-USA*)

MONDAY, OCTOBER 1, 2007 • 4:45 P.M. – 6:00 P.M.

Influence of Water Chemistry on Fuel

Session Chairs: John Willse (*AREVA NP-USA*), Motoyashu Kinoshita (*CRIEPI-Japan*)

Ballroom East

4:45 p.m.

Electrochemical Potential (ECP) of Clean Heated Fuel Cladding Material and Structural SS under BWR Operating Conditions, Mike G. Pop, Merl Bell (*AREVA NP-USA*), Renate Kilian, Thomas Dorsch, Mueller Christian (*AREVA NP GmbH-Germany*)

5:05 p.m.

Water Chemistry Influence on AOA Phase 3 of the Spanish Experiment at Studsvik, N. Doncel (*ENUSA Industrias Avanzadas-Spain*), J. Chen (*Studsvik Nuclear AB-Sweden*), J. Deshon (*EPRI-USA*)

5:25 p.m.

AREVA NP Fuel Condition Index for Boiling Water Reactors, Mike G. Pop, Merl Bell, Brian Lockamon (*AREVA NP-USA*)

TUESDAY, OCTOBER 2, 2007 • 8:00 A.M. – 10:00 A.M.

Fuel Assembly Design and Cladding

Session Chairs: Lars Hallstadius (*Westinghouse Atom AB-Sweden*), John Schardt (*GE-Energy, Nuclear-USA*)

Ballroom East

8:00 a.m.

Safety and Economics of High Power Density PWR with Novel Annular Fuel, J. Beccherle, P. Hejzlar, M.S. Kazimi (*MIT-USA*)

8:20 a.m.

High Mechanical Performance of AREVA Upgraded Fuel Assemblies for PWR in USA, Dennis Gottuso (*AREVA NP-USA*), Jean-Noel Canat, Pierre Mollard (*AREVA NP-France*)

8:40 a.m.

Upgraded Fuel Assemblies for BWRs, N.L. Garner (*AREVA NP-USA*), T. Rentmeister, H.-J. Lippert (*AREVA NP GmbH-Germany*), P. Mollard (*AREVA NP-France*)

9:00 a.m.

AREVA Cr₂O₃-Doped Fuel Development for BWRs, C. Delafoy (*AREVA NP-France*), P. Dewes (*AREVA NP GmbH-Germany*), T. Miles (*AREVA NP-USA*)

9:20 a.m.

Overviews on the Basic Thermal and Mechanical Properties of HANA™ Claddings, Jong-Hyuk Baek, Byoung-Kwon Choi (*KAERI-Korea*), Yong-Jun Oh (*Hanbat Univ-Korea*), Yong-Hwan Jeong (*KAERI-Korea*)

TUESDAY, OCTOBER 2, 2007 • 10:15 A.M. – 12:15 P.M.

Fuel Fabrication, Methods and Models

Session Chairs: Peter Urban (*AREVA NP-Germany*), Zeses E. Karoutas (*Westinghouse-USA*)

Ballroom East

10:15 a.m.

Design, Feasibility, and Testing of Instrumented Rod Bundles to Improve Heat Transfer Knowledge in PWR Fuel Assemblies, A. Bergeron (*CEA, Saclay-France*), T. Chataing (*CEA, Grenoble-France*), E. Décossin (*EDF-DRD-France*), J. Garnier (*CEA, Grenoble-France*), P. Péturaud (*EDF-DRD-France*), S.K. Yagnik (*EPRI-USA*)

10:35 a.m.

CFD Simulations of a Flow Mixing and Heat Transfer Enhancement in an Advanced LWR Nuclear Fuel Assembly, Wang-Kee In, Tae-Hyun Chun, Chang-Hwan Shin, Dong-Seok Oh (*KAERI-Korea*)

10:55 a.m.

Controlled Beta-quench Treatment of Fuel Channels, Andreas Moeckel, Ingo Cremer, Anton Kratzer (*AREVA NP GmbH-Germany*), Richard A. Perkins (*AREVA NP-USA*), Dirk Walter (*AREVA NP GmbH-Germany*)

11:15 a.m.

The Manufacture and Performance of Homogeneous-Microstructure SBR MOX Fuel, Matthew A. Barker, Keith Stephenson, Rebecca Weston (*Nexia Solutions Ltd-UK*)

11:35 a.m.

ARCADIA® - A New Generation of Coupled Neutronics / Core Thermal-Hydraulics Code System at AREVA NP, Florin Curca-Tivig, Stephan Merk, Andreas Pautz, Sébastien Thareau (*AREVA NP GmbH-Germany*)

TUESDAY, OCTOBER 2, 2007 • 1:30 P.M. – 3:00 P.M.

Fuel Rods and Structural Components

Session Chairs: Pierre Mollard (*AREVA NP-France*), Yong Hwan Jeong (*KAERI-Korea*)

Ballroom East

1:30 p.m.

In-Reactor Creep Behavior of Zircaloy-2, John Paul Foster (*Westinghouse-USA*), Margaret Ann McGrath (*OECD Halden Reactor Project-Norway*)

1:50 p.m.

Development of Modified MDA (M-MDA), PWR Fuel Cladding Tube for High Duty Operation in Future, Seiichi Watanabe (*MHI-Japan*), Toshiya Kido (*NDC-Japan*), Yasushi Arakawa (*Kansai-Japan*)

2:10 p.m.

The Effects of Cladding Chemical Composition on Corrosion Behavior of High Burnup BWR Fuel (Corrosion Properties of Low Iron and Low Silicon Content Cladding), Yasuyuki Otsuka, Moriyasu Abe (*TEPCO-Japan*), Kazuo Kakiuchi, Takuji Fukuda, Koichi Ohira, Noboru Itagaki (*NFI-Japan*)

2:30 p.m.

Fracture of Hydrided Zircaloy-4 Sheet under Through-Thickness Crack Growth Conditions, P.A. Raynaud, D.A. Koss, A.T. Motta (*Penn State Univ-USA*), K.S. Chan (*Southwest Research Institute-USA*)

TUESDAY, OCTOBER 2, 2007 • 3:00 P.M. – 4:00 P.M.

Fuel Assembly Design and Cladding-Poster Session

Farallon Room

Bi-Content Gadolinia as Burnable Absorber in PWR to Improve the Reactor Core Behaviour, S. Zheng (*AREVA NP-France*)

Thermal Behavior of Advanced UO₂ Fuel at High Burnup, E. Muller, T. Lambert, N. L'Hullier, K. Silberstein (*CEA-France*), C. Delafoy (*AREVA NP-France*), B. Therache (*EDF-France*)

Technical Sessions: Tuesday/Wednesday

Fuel Fabrication, Methods and Models-Poster Session

Farallon Room

3D Hydrodynamic Force Model for AREVA Fuel Assembly in EDF PWRs, S. Ekomie (EDF-SEPTEN-France), J. Bigot, Ph. Dolleans (AREVA NP-France), J. Vallory (CEA Cadarache-France)

Heat Transfer Coefficient Variations in Nuclear Fuel Rod Bundles, Michael E. Conner (Westinghouse-USA), Mary V. Holloway (United States Naval Academy-USA)

First Principles CANDU Fuel Model and Validation Experimentation, E.C. Corcoran, M.H. Kaye, F. Akbari, J.D. Higgs, B.J. Lewis, W.T. Thompson (Royal Military College-Canada), R.A. Verrall, Z. He, J.F. Mouris (AECL-Canada)

Experience and Outlook for Development of Vibropack Oxide Fuel Pins for Light Water Reactors, Yu.M. Golovtchenko, A.A. Mayorshin, O.V. Shishalov, S.P. Prokop'eva (FSUE SSC RF RIAR-Russia)

High Burn-up Fuel-Poster Session

Farallon Room

Fuel Safety Activities in Korea, Geun-Sun Auh, A.D. Shin, J.S. Lee, S.W. Woo, Y.H. Ryu (KINS-Korea), Jun-Hwan Kim, S.K. Kim, Y.H. Jeong (KAERI-Korea)

Early Fission-gas Behavior in Oxide Fuel: Escape vs Trapping, V. Cordoliani, D. Olander (Univ. of California-USA)

The Width of High Burnup Structure in LWR UO₂ Fuel, Yang-Hyun Koo, Byung-Ho Lee, Jae-Yong Oh, Dong-Seong Sohn (KAERI-Korea)

Irradiation Behaviour of the Large Grained UO₂ Fuel Pellet in the Transient Conditions, Yuji Kosaka (Nuclear Development Corporation-Japan), Seiichi Watanabe (Mitsubishi Heavy Industries-Japan), Yasushi Arakawa (Kansai Electric Power Co-Japan)

A New Fission Gas Release Model for Predicting Gas Release during Steady State and Slow Power Ramps and for Initializing Fast Transients, Ken J. Geelhood, Carl E. Beyer (PNNL-USA)

Clarification of Rim Structure Effects on Properties and Behaviour of LWR UO₂ Fuels and Gadolinia Doped Fuels, T. Sonoda, T. Kameyama, A. Sasahara, S. Kitajima, Y. Nauchi, M. Kinoshita (CRIEPI-Japan), V.V. Rondinella, T. Wiss, J.P. Hiernaut, D. Papaioannou, M. Sheindlin, D. Staicu (ITU-Germany)

Estimation of the Influence of Plutonium Agglomerates in MOX Fuel on the Pellet Temperature, G. Sauer, W. Besenböck (TÜV SÜD Industrie Service GmbH-Germany)

TUESDAY, OCTOBER 2, 2007 • 4:00 P.M. – 5:45 P.M.

High Burn-up Fuel

Session Chairs: Carl E. Beyer (PNNL-USA), Kari Ranta-Puska (TVO-Finland)

Ballroom East

4:00 p.m.

Thermal Diffusivity of Homogeneous SBR MOX Fuel with a Burn-up of 35 MWd/kgHM, D. Staicu, G. Pagliosa, D. Papaioannou, V.V. Rondinella, C. Cozzo, R. Konings, C.T. Walker (Institute for Transuranium Elements, JRC-Germany), M. Barker (Nexia Solutions-UK), R. Weston (British Nuclear Group Sellafield-UK)

4:20 p.m.

Final Assessment of MOX Fuel Performance Experiment with Japanese PWR Specification Fuel in the HBWR, Hajime Fujii, Hideyuki Teshima, Katsumasa Kanasugi (MHI-Japan), Yuji Kosaka (Nuclear Development Corporation-Japan), Yasushi Arakawa (Kansai Electric Power Co-Japan)

4:40 p.m.

Fission Gas Distribution and Behavior in the High Burn-up Structure, Ch. Hellwig, M.I. Horvath (PSI-Switzerland), P.R. Blair, R. Chawla (PSI, EPFL-Switzerland), D. Günther (ETH Zurich-Switzerland)

5:00 p.m.

Fuel Modelling at Extended Burnup: IAEA Coordinated Research Project FUMEX-II, J.C. Killeen (IAEA), J.A. Turnbull (Consultant-UK), E. Sartori (OECD/NEA-France)

WEDNESDAY, OCTOBER 3, 2007 • 8:00 A.M. – 10:00 A.M.

Fuel Behavior during Design Basis Accidents (RIA and LOCA)

Session Chairs: Javier Riverola (ENUSA-Spain), Samim Anghaie (Univ of Florida-USA)

Ballroom East

8:00 a.m.

The U. S. Nuclear Regulatory Commission's Strategy for Revising the RIA Acceptance Criteria, Paul M. Clifford (USNRC-USA)

8:20 a.m.

High Temperature Expansion Due to Compression Test for the Determination of a Cladding Material Failure Criterion under RIA Loading Conditions, M. Le Saux, C. Poussard, X. Averty, C. Sainte Catherine, S. Carassou (CEA Saclay-France), J. Besson (Centre des Matériaux, Mines Paris-France)

8:40 a.m.

JAEA Studies on High Burnup Fuel Behaviors during Reactivity-Initiated Accident and Loss-of-Coolant Accident, Toyoshi Fuketa, Tomoyuki Sugiyama, Fumihisa Nagase, Motoe Suzuki (JAEA-Japan)

9:00 a.m.

Behavior of Zr1%Nb Fuel Cladding under Accident Conditions, E. Perez-Feró, Z. Hózer, P. Windberg, I. Nagy, A. Vimi, N. Vér, L. Matus, M. Kunstar, T. Novotny, M. Horváth (AEKI-Hungary), Cs. Györi (JRC ITU-Germany)

9:20 a.m.

Overview of the M5® Alloy Behavior under RIA and LOCA Conditions, J.P. Mardon (AREVA NP-France), B. Dunn (AREVA NP-USA)

WEDNESDAY, OCTOBER 3, 2007 • 10:00 A.M. – 11:00 A.M.

Fuel Cycle, Spent Fuel Storage and Transportation-Poster Session

Farallon Room

Requirements of Cask-Storage and Cask-Transport Licensing According to IAEA 1996 Rules for On-Site Storage of Spent Fuel in Germany—From the Utility's Point of View, Paul Schmidt, Konrad Schmidt (EnKK-Germany), Heinz Geiser (GNS-Germany)

AREVA NP Next Generation Fresh UO₂ Fuel Assembly Shipping Cask: SCALE—CRISTAL Comparisons Lead to Safety Criticality Confidence, M. Doucet (AREVA NP-France), R. Montgomery, B. O'Donnell (AREVA NP-USA), M. Landrieu (AREVA NP-France)

Trans-Atlantic Fuel Fabrication: Security of Supply Program, Emilio I. Bobo Pérez (ENUSA-Spain), Manuel Novo Sanjurjo (CC.NN. Almaraz-Trillo-Spain), Bob Feagin (Westinghouse-USA), Scott Ferguson (WCNOC-USA), James Dwight (Westinghouse-USA), Roberto González Villegas (ENUSA-Spain)

Fuel Behavior during Design Basis Accidents (RIA and LOCA)-Poster Session

Farallon Room

Multi-pin Studies of the Effect of Changes in PWR Fuel Design on Clad Ballooning and Flow Blockage in a Large-break Loss-of Coolant Accident, J.R. Jones (British Energy-UK), M. Trowe (AMEC-UK)

A Model for Assessment of Failure of LWR Fuel during an RIA, Wenfeng Liu, Mujid S. Kazimi (MIT-USA)

FRAPTRAN Predictability of High Burnup Advanced Fuel Performance: Analysis of the CABRI CIP0-1 and CIP0-2 Experiments, M.T. del Barrio, L.E. Herranz (CIEMAT-Spain)

Technical Sessions: Wednesday

Neutronics, Thermal, Mechanical Methodologies-Poster Session

Farallon Room

HIDUTYDRV Code, A Fuel Product Margin Tool, Michael A. Krammen, Zeses E. Karoutas, Steven F. Grill, Balendra Sutharshan (*Westinghouse-USA*)

A3D Behavior Modeling for Design and Performance Analysis of LWR Fuels, A.C. Marino, G.L. Demarco, D.O. Brasnarof, P.C. Florido (*CNEA-Argentina*)

Prediction of Regions of Reduced Heat Transfer Downstream of Nuclear Fuel Spacer Grids, Bin Liu, Zeses Karoutas (*Westinghouse-USA*)

High Burnup Fuel Behavior Modeling, M. Jahingir, R. Rand, R. Stachowski, B. Miles (*GNF-USA*), K. Kusagaya (*GNF-Japan*)

Helium Production and Behavior in Nuclear Oxide Fuels during Irradiation in LWR, E. Federici, A. Courcelle (*CEA Cadarache-France*), P. Blanpain (*AREVA-NP-France*), H. Cognon (*EDF/SEPTEN-France*)

Direct Experimental Evaluation of the Grain Boundaries Gas Content in PWR Fuels: New Insight and Perspective of the ADAGIO Technique, Y. Pontillon, J. Noirot, L. Caillot, E. Muller (*Commissariat à l'Energie Atomique-France*)

WEDNESDAY, OCTOBER 3, 2007 • 11:00 A.M. – 12:30 P.M.

Fuel Behavior during Off-normal Transient

Session Chairs: Peter Urban (*AREVA NP-Germany*), Jinzhao Zhang (*Tractebel Engineering-Belgium*)

Ballroom East

11:00 a.m.

Multidimensional Modeling of a Ramp Test with the PWR Fuel Performance Code ALCYONE, G. Thouvenin, B. Michel, J. Sercombe, D. Plancq (*CEA-France*), P. Thevenin (*EDF-France*)

11:20 a.m.

The Mechanical Behavior of Pellet-Cladding with the Missing Chip under PCMI Loadings during Power Ramp, J.-S. Lee, J.S. Yoo, H.K. Kim (*KNFC-Korea*), D. Mitchell, Y. Aleshin (*Westinghouse-USA*)

11:40 a.m.

Computer Simulation of Non-congruent Melting of Non-stoichiometric Uranium Dioxide Fuel, M.J. Welland, W.T. Thompson, B.J. Lewis (*Royal Military College of Canada*)

12:00 p.m.

ATWS Analysis with an Advanced Boiling Curve Approach within COBRA 3-CP, A. Gensler, A. Knoll, K. Kühnel (*AREVA NP GmbH-Germany*)

WEDNESDAY, OCTOBER 3, 2007 • 1:45 P.M. – 3:15 P.M.

Neutronics, Thermal, Mechanical Methodologies

Session Chair: Nadine Hollasky (*AVN-Belgium*), Toyoshi Fuketa (*JAEA-Japan*)

Ballroom East

1:45 p.m.

Impact of Plant Noise on BWR Stability Analyses, J.G.M. Andersen, G. Pearson (*Global Nuclear Fuel-USA*), A.K. Chung, C.L. Heck, J. Vedovi (*GE Nuclear-USA*)

2:05 p.m.

Approach to Analyze Potentially Limiting Hot Low Power BWR Control Rod Drop Accident, Staffan Söderholtz (*Westinghouse-Sweden*), Eric Ramenblad (*Vattenfall Bränsle AB-Sweden*), Björn Schröder (*Forsmarks Kraftgrupp AB-Sweden*)

2:25 p.m.

Non-Linear Dynamics Analysis of a PWR with Up-to-Date Fuel Design, Javier Riverola Gurruchaga (*ENUSA-Spain*)

2:45 p.m.

The COPERNIC3 Project: How AREVA is Successfully Developing an Advanced Global Fuel Rod Performance Code, Ch. Garnier (*AREVA NP-France*), F. Sontheimer (*AREVA NP GmbH-Germany*), P. Mailhé (*AREVA NP-France*), H. Landskron, D. Deuble (*AREVA NP GmbH-Germany*), V.I. Arimescu, M. Billaux (*AREVA NP-USA*)

WEDNESDAY, OCTOBER 3, 2007 • 3:15 P.M. – 4:45 P.M.

Fuel Cycle, Spent Fuel Storage and Transportation

Session Chair: Robert Freeman (*AREVA NP-USA*)

Ballroom East

3:15 p.m.

Study on Hydride Reorientation in Zry-2 Fuel Claddings during Interim Dry Storage, K. Sakamoto, H. Matsuoka (*GNF-Japan*), A. Takagi (*TEPCO-Japan*), S. Kashibe (*NFD-Japan*)

3:35 p.m.

Fabrication Characteristics of Large Grain DUPIC Fuel Using SIMFUEL, Geun IL Park, Jung Won Lee, Jae Won Lee, Myung Seung Yang, Kee Chan Song (*KAERI-Korea*)

3:55 p.m.

Threat of Hydride Re-orientation to Spent Fuel Integrity During Transportation Accidents: Myth or Reality?, Joe Rashid (*ANATECH-USA*), Albert Machiels (*EPRI-USA*)

4:15 p.m.

Evaluation of Hoop Creep Behaviors in Long-term Dry Storage Condition of Pre-hydrided and High Burn-up Nuclear Fuel Cladding, Sun-Ki Kim, J.G. Bang, D.H. Kim, Y.S. Yang (*KAERI-Korea*)

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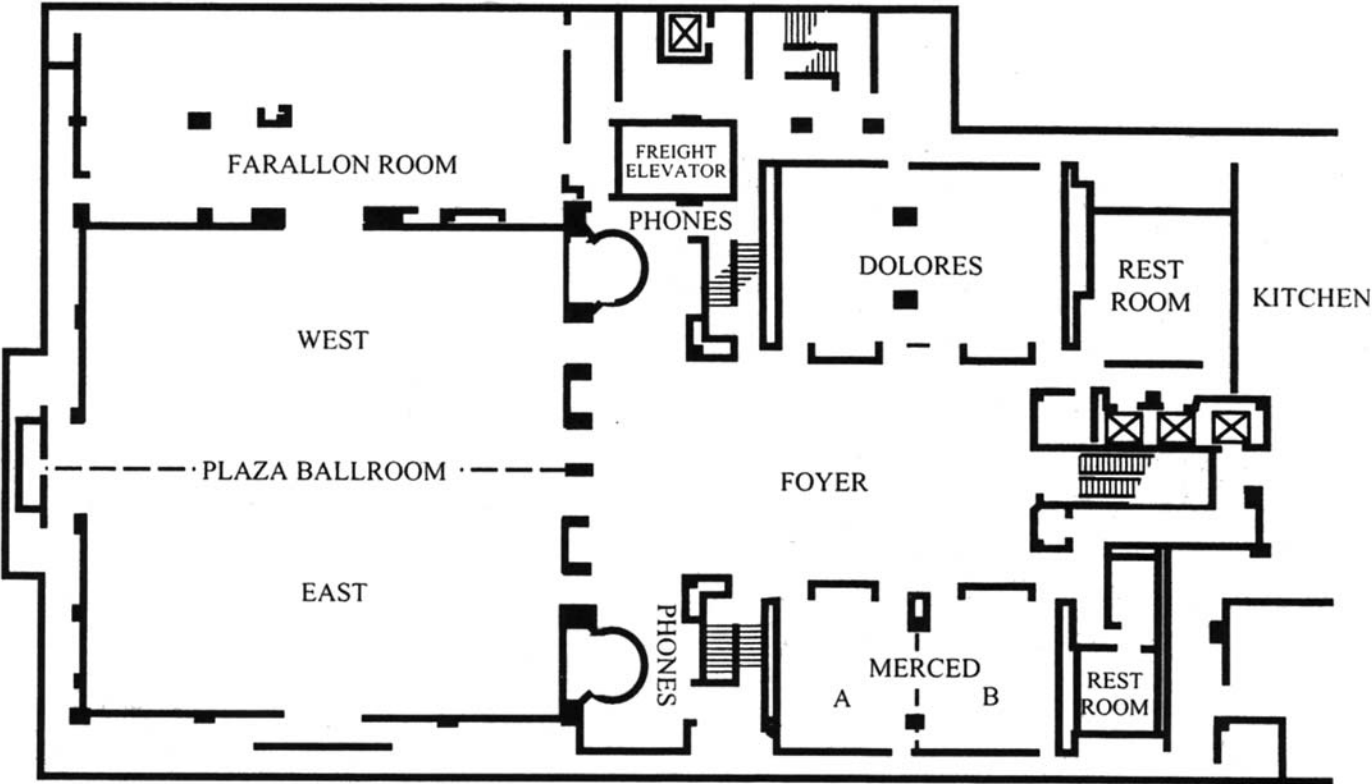
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