

14th International Conference on Environmental Degradation of Materials in Nuclear Power Systems

**Virginia Beach, Virginia. USA
August 23-27, 2009**



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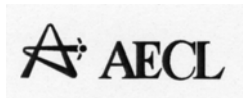


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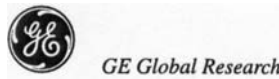
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14th International Conference on Environmental Degradation of Materials in Nuclear Power Systems

“Nuclear Power—Transitioning to the Next Generation”

August 23-27, 2009 • Virginia Beach, VA • Hilton Virginia Beach Oceanfront

UPDATED: AUGUST 18, 2009

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Conference Officials

Take a peek at who is planning the sessions for this successful conference.

5

Conference Information

Find out important information about meeting registration, the conference proceedings and the social events that are scheduled.

6-7

Conference Schedule

Take a look at the listing of sessions by day.

8-17

Technical Sessions by Day

A comprehensive list of the technical papers/presentations for the conference.

GENERAL CHAIR:

Dr. Todd Allen,
University of Wisconsin, Madison

TECHNICAL PROGRAM CHAIR:

Dr. Jeremy T. Busby,
Oak Ridge National Laboratory

ASSISTANT TECHNICAL PROGRAM CHAIR:

Dr. Gabriel Ilevbare,
Electric Power Research Institute

TECHNICAL PROGRAM COMMITTEE:

Todd Allen *(University of Wisconsin/ATR National Scientific User Facility)*

Koji Arioka *(Institute of Nuclear Safety System, Inc)*

Peter Andresen *(GE Global Research Center)*

Steve Bruemmer *(Pacific Northwest National Laboratory)*

Jeremy Busby *(Oak Ridge National Lab)*

Gene Carpenter *(U.S. Nuclear Regulatory Commission)*

Paul Doherty *(University of Waterloo)*

Pål Efsing *(Vattenfall)*

Ulla Ehrnsten *(VTT Industrial Systems)*

Steve Fyfitch *(AREVA)*

Barry Gordon *(Structural Integrity Associates, Inc)*

Ron Horn *(GE-Hitachi)*

Il Soon Hwang *(Seoul National University)*

Gabriel Ilevbare *(EPRI)*

Rich Jacko *(Westinghouse Electric Corp.)*

Christer Jansson *(Vattenfall Power Consultant AB)*

Anders Jenssen *(Studsvik)*

Renate Kilian *(AREVA)*

Hong Pyo Kim *(KAERI)*

Peter King *(Babcock & Wilcox Canada)*

Bill Mills *(Bechtel Marine Propulsion Corporation)*

Dave Morton *(Bechtel Marine Propulsion Corporation)*

Larry Nelson *(GE Global Research Center)*

Hans-Peter Seifert *(PSI)*

Robert Tapping *(AECL Chalk River Nuclear Labs)*

Francois Vaillant *(Electricite de France)*

Gary Was *(University of Michigan)*

TK Yeh *(National Tsing Hua University)*

Toshio Yonezawa *(Tohoku University)*

The economic success and safety performance of water-cooled reactors critically depend on material performance. The 14th Conference on Environmental Degradation continues a vital technical discussion on the science that explains and solves material performance questions for water-cooled reactors. The conference will be of interest to utility engineers, reactor vendor engineers, plant architect engineers, and consultants involved in design, construction, and operation of water reactors, as well as to researchers concerned with the fundamental nature of materials degradation. The conference draws experts from around the world to participate in these critical discussions.

The conference will focus on advanced energy systems, boiling water reactors, crack growth, extended operation, flow-assisted corrosion, irradiation-assisted stress corrosion cracking, irradiation effects, low alloy steels, water chemistry, operational experience, pressurized water reactors, waste, and zirconium alloys. A plenary session featuring industry leaders will open the conference, highlighting the importance and challenges in operating and manning light water reactors through current and extended lifetimes. Following these plenary talks, teams of senior and junior researchers in key technical areas will present a series of overview talks. A special evening session on Life Beyond 60 will also take place. As always, the exchange of technical information is paired with the ability for colleagues from around the world to share each other's company in a world-class conference.

Conference Registration

Registration is required for all attendees and presenters. Badges are required for admission to all events.

- The **Full Conference Registration Fee** includes admission to all technical sessions, a copy of the published abstract book (proceedings available on CD-ROM will be sent after the conference), one ticket to the welcome reception, and one ticket to the dinner cruise.
- The **Daily Conference Registration Fee** includes admission to all technical sessions and a copy of the proceedings (CD-ROM).
- The **Student Registration Fee** includes admission to all technical sessions and a copy of the proceedings (CD-ROM). If you plan on attending any of the social functions, tickets must be purchased in addition to the registration fee. A full-time student i.d. is required to register at the student rate.

NOTE: Additional tickets can be purchased at the ANS registration desk for the welcome reception and the dinner cruise.

Registration Hours

The ANS registration desk and message desk will be located in the Peacock Foyer of the Hilton Virginia Beach Oceanfront Hotel. You may register, purchase tickets for events, or pick up your registration packet during the following hours:

SUNDAY, AUGUST 23, 2009
3:00 PM – 7:00 PM
MONDAY, AUGUST 24, 2009
7:00 AM – 5:00 PM
TUESDAY, AUGUST 25, 2009
7:00 AM – 5:00 PM
WEDNESDAY, AUGUST 26, 2009
7:00 AM – 5:00 PM
THURSDAY, AUGUST 27, 2009
7:00 AM – 3:00 PM

Accommodations/Hotel Information

Technical sessions and conference activities are scheduled at the Hilton Virginia Beach Oceanfront Hotel. The hotel towers 21 stories above the Virginia Beach resort district and offers panoramic views that rank among the very best on the mid-Atlantic coast. Recognized as one of the premier hotels on the Virginia Beach Oceanfront, it offers the most luxurious accommodations and superior first-class service.

Conference Proceedings

This year's conference proceedings is available on CD-ROM and will be sent after the conference. A copy of the published abstract book will be available at the conference. Each full, daily and student conference registrant will receive a copy of the proceedings as part of the registration fees. Additional copies of the proceedings may be purchased at the conference registration desk for \$110.00; additional copies of the printed abstract book may be purchased for \$85.00. To purchase copies following the conference, you may contact the ANS Accounting Department at 708-579-8210 (phone); 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. Payment information must accompany all orders.

Speaker Registration and Preparation Room

All speakers are required to register for the conference in advance and to submit a registration fee. A Speakers' Preparation Room, located in the Avamere Room of the Hilton Virginia Beach Oceanfront Hotel, will be in operation for the duration of the conference to serve the needs of speakers and moderators.

SOCIAL FUNCTIONS

Welcome Reception

SUNDAY, AUGUST 23, 2009 • 6:00 PM – 8:00 PM
Location: Peacock Ballroom A

Each full conference registrant will receive a ticket for the welcome reception. Additional tickets may be purchased on-site at the ANS registration desk for \$65.00.

Dinner Cruise on the Spirit of Norfolk

WEDNESDAY, AUGUST 26, 2009 • 6:15 PM – 10:30 PM
Buses will depart promptly at 6:15 PM from Neptune Park, located to the North side of the front of the Hilton Hotel.

Get ready for the time of your life. Step aboard the Spirit of Norfolk and enjoy an exciting evening of vibrant fun out on the water. This engaging cruise on the Elizabeth River will be a festive celebration. Your excursion covers the Elizabeth River waterfront with spectacular skyline views of the mighty ships of the Navy's Atlantic Fleet. No trip to Norfolk is complete without a view from the deck of this festive ship. You will dine in a magical setting enhanced by dazzling city sights and harbor lights.

Each full conference registrant will receive a ticket for the dinner cruise. Additional tickets may be purchased on-site at the ANS registration desk for \$85.00.

CONFERENCE SCHEDULE

DATE AND TIME	FUNCTION	LOCATION
SUNDAY, AUGUST 23, 2009		
3:00 PM – 7:00 PM	Meeting Registration	Peacock Foyer
6:00 PM – 8:00 PM	Welcome Reception	Peacock Ballroom A
MONDAY, AUGUST 24, 2009		
7:00 AM – 8:30 AM	Continental Breakfast	Peacock Foyer
7:00 AM – 5:00 PM	Meeting Registration	Peacock Foyer
8:00 AM – 12:00 PM	Opening Plenary Session	Peacock Salon A & B
9:30 AM	Refreshment Break	Peacock Foyer
1:30 PM – 6:00 PM	Technical Sessions • <i>PWR—I: Corrosion and SCC of Nickel Base Alloys</i> • <i>PWR—II: Corrosion and SCC of Nickel Base Alloys</i> • <i>Ni-Base Welds—I: Alloy 52/152</i> • <i>Ni-Base Welds—II: Alloy 82/182</i> • <i>Irradiation Effects—I: Microstructure and Hardening</i> • <i>Irradiation Effects—II: Dimensional Changes</i>	Peacock Salon A Peacock Salon A Peacock Salon B Peacock Salon B Peacock Salon C Peacock Salon C
3:30 PM	Refreshment Break	Peacock Foyer
TUESDAY, AUGUST 25, 2009		
7:00 AM – 9:00 AM	Continental Breakfast	Peacock Foyer
7:00 AM – 5:00 PM	Meeting Registration	Peacock Foyer
8:00 AM – 12:00 PM	Technical Sessions • <i>Crack Initiation and Deformation in Stainless Steels</i> • <i>Cracking and Inhomogenous Structures in Stainless Steel</i> • <i>Ni-Base Welds—III</i> • <i>Waste—I</i> • <i>Irradiation Effects—III</i> • <i>Low Alloy Steels and Flow Accelerated Corrosion</i>	Peacock Salon A Peacock Salon A Peacock Salon B Peacock Salon B Peacock Salon C Peacock Salon C
9:30 AM	Refreshment Break	Peacock Foyer
6:00 PM – 9:00 PM	Special Session: “Life Beyond 60 Years”	Peacock Salon A & B
7:00 PM – 8:00 PM	Evening Refreshments	Peacock Foyer

DATE AND TIME	FUNCTION	LOCATION
WEDNESDAY, AUGUST 26, 2009		
7:00 AM – 9:00 AM	Continental Breakfast	Peacock Foyer
7:00 AM – 5:00 PM	Meeting Registration	Peacock Foyer
8:00 AM – 12:00 PM	Technical Sessions • <i>PWR—III: Environmental Effects</i> • <i>PWR—IV: Deformation Effects on Stainless Steel in Primary Water</i> • <i>Extended Operations</i> • <i>Crack Initiation and Deformation Structures in Ni-Base Alloys</i> • <i>Zirconium Alloys—I: Corrosion</i> • <i>Zirconium Alloys—II: Hydrogen Effects</i>	Peacock Salon A Peacock Salon A Peacock Salon B Peacock Salon B Peacock Salon C Peacock Salon C
9:30 AM	Refreshment Break	Peacock Foyer
1:30 PM – 6:00 PM	Technical Sessions • <i>PWR—V: Weldments</i> • <i>PWR—VI: PWSCC</i> • <i>Operational Experience—I: Service Experience</i> • <i>Operational Experience—II: Methodologies and Policies</i> • <i>IASCC—I</i> • <i>IASCC—II</i>	Peacock Salon A Peacock Salon A Peacock Salon B Peacock Salon B Peacock Salon C Peacock Salon C
3:30 PM	Refreshment Break	Peacock Foyer
6:15 PM – 10:30 PM	Dinner Cruise on the Spirit of Norfolk <i>Buses will depart promptly at 6:15 PM from Neptune Park, located to the North side of the front of the Hilton Hotel.</i>	
THURSDAY, AUGUST 27, 2009		
7:00 AM – 9:00 AM	Continental Breakfast	Peacock Foyer
7:00 AM – 3:00 PM	Meeting Registration	Peacock Foyer
8:00 AM – 12:00 PM	Technical Sessions • <i>Crack Growth—I: Experimental Observations</i> • <i>Crack Growth—II: Fundamentals</i> • <i>BWR—I: Corrosion and SCC</i> • <i>BWR—II: SCC</i> • <i>IASCC—III</i> • <i>Water Chemistry—I: Mitigation Strategies</i>	Peacock Salon A Peacock Salon A Peacock Salon B Peacock Salon B Peacock Salon C Peacock Salon C
9:30 AM	Refreshment Break	Peacock Foyer
12:00 PM – 2:00 PM	Committee Meeting Luncheon	Courtney Terrace
1:30 PM – 6:00 PM	Technical Sessions • <i>Advanced Energy Systems—I: Stress Corrosion Cracking</i> • <i>Advanced Energy Systems—II: Oxidation</i> • <i>BWR—III: SCC</i> • <i>BWR—IV: Weldments</i> • <i>Water Chemistry—II: Species Control</i> • <i>Water Chemistry—III: Deleterious Effects</i>	Peacock Salon A Peacock Salon A Peacock Salon B Peacock Salon B Peacock Salon C Peacock Salon C
3:00 PM	Refreshment Break	Peacock Foyer

TECHNICAL SESSIONS

MONDAY, AUGUST 24, 2009 • 8:00 A.M.

Opening Plenary

Peacock Salon A & B

SPEAKERS:

- The Honorable Dale E. Klein (*Commissioner, U.S. Nuclear Regulatory Commission*)
- Alex Marion (*NEI*)

General Chairman's Special Session: Transitioning to the Next Generation of Nuclear Materials Professionals

Peacock Salon A & B

SPEAKERS:

- Peter Andresen (*GE Corporate Research*)
- Denise Paraventi (*Bettis*)
- Frank Garner (*PNNL*)
- Jeremy Busby (*ORNL*)
- Dave Guzonas (*AECL*)
- Elaine West (*University of Michigan*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

MONDAY, AUGUST 24, 2009 • 9:30 A.M.

Refreshment Break

Peacock Foyer

MONDAY, AUGUST 24, 2009 • 1:30 P.M.

PWR—I: Corrosion and SCC of Nickel Base Alloys

Chairs: Ed Richey (*Bechtel Marine Propulsion Corporation*), Francois Vaillant (*EdF*)

Peacock Salon A

1:30 p.m.

Predicting the SCC of Reactor Component Materials from First Principles—Micro-Nano Based Prediction, Roger Washburne Staehle (*Staeble Consulting*)

2:10 p.m.

The Effects of Reduced Sulfur Compounds in Chloride-Free Solutions on SG Tubing Alloys, William Zhang, Roger C. Newman (*Univ of Toronto*)

2:30 p.m.

Investigation of Intergranular Attack/Stress Corrosion Cracking of Sensitized Alloy 600 Tubing at Roll Transition Zone, John Jevic, Jeff Sarver (*Babcock & Wilcox Research Center*), Peter King, Jianguo Yu (*Babcock & Wilcox Canada*), Ken Sedman (*Bruce Nuclear Power Generating Station*)

2:50 p.m.

On the Stress Corrosion Cracking Behavior of Two Age-Hardenable Alloys in PWR Primary Environment, B. Ter-Ovanessian, J. M. Cloué (*AREVA NP*), J. Deleume (*AREVA CEZUS*), E. Andrieu (*CIRIMAT/CNRS/UPS/INPT*)

PWR—II: Corrosion and SCC of Nickel Base Alloys

Chairs: David Morton (*Bechtel Marine Propulsion Corporation*), Bob Tapping (*AECL*)

Peacock Salon A

3:15 p.m.

A Preliminary Hybrid Model of Nickel Alloy SCC Propagation in PWR Primary Water Environments, E. D. Eason (*Modeling & Computing Services*), R. Pathania (*EPRI*)

3:35 p.m.

The Effect of Sulfate Impurities on the Stress Corrosion Cracking of Nickel Alloys in High Temperature Primary Water, Martin König (*Studsvik Nuclear AB*), Karen Gott (*Swedish Radiation Safety Authority*), Pål Efsing (*Ringhals AB*)

3:55 p.m.

Mechanistic Studies of Stress Corrosion Cracking of Nickel-Base Alloys in High Temperature High Pressure PWR Environment, Fabien Léonard, Robert A. Cottis (*Univ of Manchester*), François J. Vaillant, Florence Carrette (*EDF*), Gabriel Ilevbare (*EPRI*)

4:15 p.m.

Stress Corrosion Crack Growth Rate in Rolled Alloy 600 Exposed to Primary PWR Environment, Thierry Couvant, François Vaillant (*EDF R&D*), Emmanuel Lemaire (*EDF/UNIE*)

4:35 p.m.

Fatigue Crack Growth Rate Behavior of Alloy 690 in Air and Water, W. J. Mills (*Bechtel Marine Propulsion Corp*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

Ni-Base Welds—I: Alloy 52/152

Chairs: George Young (*Bechtel Marine Propulsion Corporation*), Hannu Hanninen (*Helsinki University of Technology*)

Peacock Salon B

1:30 p.m.

Physical Metallurgy, Weldability, and In-Service Performance of Nickel-Chromium Alloys Used in Nuclear Power Systems, George A. Young, Thomas E. Capobianco, Lisa L. D'Amore, Robert A. Etien, Karl D. Schmidt, Douglas G. Baldrey, Reza Najafabadi, James Vollmer, Micah J. Hackett, Julie D. Tucker (*Lockheed Martin Corp.*)

2:10 p.m.

Characterization of Defects in Alloy 152, 52 and 52M Welds, S. M. Bruemmer, M. B. Toloczko, M. J. Olsza, R. Seffens (*PNNL*), P. Efsing (*Ringhals AB*)

2:30 p.m.

EAC Crack Initiation in Nickel-Based Dissimilar Metal Welds Using Doped Steam Test, Hannu Hänninen (*Helsinki Univ of Technology*), Aki Toivonen (*VTT*), Tapio Saukkonen (*Helsinki Univ of Technology*), Wade Karlsen (*VTT*), Iikka Virkkunen, Anssi Brederholm, (*Helsinki Univ of Technology*), Pertti Aaltonen, Ulla Ehrnström (*VTT*)

Ni-Base Welds—II: Alloy 82/182

Chairs: Larry Nelson (*General Electric*), Christer Jansson (*Vattenfall*)

Peacock Salon B

2:55 p.m.

SCC Mitigation of Ni Alloys and Weld Metals by Optimizing Dissolved H₂, Peter L. Andresen (*GE Global Research*), Rick Reid (*EPRI*), John Wilson (*Exelon*)

3:15 p.m.

Influence of Sulphate on the Crack Growth Rates of Nickel Base Weld Metals Alloy 82 and 182 under Simulated BWR Off-Chemistry Environment, B. Devrient, R. Kilian (*AREVA NP GmbH*), M. Wieda (*RWE Power AG*), E. Nowak (*E.ON Kernkraft GmbH*)

3:35 p.m.

SCC of Controlled Chemistry Alloy 182 and 82 Weld Metals in BWR Water, Peter L. Andresen (*GE Global Research*)

3:55 p.m.

Microstructural Characterization of Primary Water Stress-Corrosion Cracks in Alloy 182 Welds from PWR Components and Laboratory Tests, L. E. Thomas, M. J. Olszta, B. R. Johnson, S. M. Brummer (*PNNL*)

4:15 p.m.

IGSCC Initiation from Weld Defects in Alloy 600/82, Dolores Gómez-Briceño, Jesús Lapeña, M^a Sol García, Lucas Castro, Francisco Perosanz (*CIEMAT*), Kawaljit Ahluwalia (*EPRI*), John Hickling (*Independent Technical Consultant*)

4:35 p.m.

Effect of Low Temperature Thermal Treatment on SCC Growth Rates in Alloy 82, D. J. Paraventi, B. M. Capell, S. R. Claves (*Bechtel Marine Propulsion Corp*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

Irradiation Effects—I: Microstructure and Hardening

Chairs: Todd Allen (*Univ of Wisconsin/ATR National Scientific User Facility*), Frank Garner (*DSL Extreme*)

Peacock Salon C

1:30 p.m.

Fracture Toughness of Irradiated Stainless Steel in Nuclear Power Systems, Stephen Fyfe, Hongqing Xu (*AREVA NP*), Anne Demma, Robert Carter (*EPRI*), Ron Gamble (*Sartrex Corp*), Peter Scott (*Les Vergers*)

2:10 p.m.

Grain Boundary Chromium Depletion in Austenitic Alloys, Youfa Yin, Roy G. Faulkner (*Loughborough Univ*), Paul Moreton, Ian Armson (*Rolls-Royce*)

2:30 p.m.

Microstructure and Grain Boundary Chemistry Evolution in Austenitic Stainless Steels Irradiated in the BOR-60 Reactor up to 120 DPA, Alexandra-Évelyne Renault (*CEA*), Cédric Pokor (*EDF*), Jérôme Garnier, Joël Malaplate (*CEA*)

2:50 p.m.

Dose Dependence of Radiation Hardening in Austenitic Stainless Steel at PWR-Relevant Temperatures, Yong Yang (*Univ of Wisconsin, Madison*), Yiren Chen (*ANL*), Todd R. Allen (*Univ of Wisconsin, Madison*), Omesh K. Chopra (*ANL*)

Irradiation Effects—II: Dimensional Changes

Chairs: Steve Fyfe (*Areva*), Julie Tucker (*Bechtel Marine Propulsion Corporation*)

Peacock Salon C

3:15 p.m.

Swelling-Induced Distortion of Thick AISI 304 Stainless Steel Components Having Gradients in Temperature and DPA Rate Comparable to PWR Conditions, F. A. Garner (*Radiation Effects Consulting*), I. I. Balachov (*SRI International*), P. D. Panetta (*Luna Innovations Inc.*), Y. Isobe (*Nuclear Fuel Industries*)

3:55 p.m.

Irradiation Creep and Irradiation Stress Relaxation of 316 and 304L Stainless Steel, John Paul Foster (*Westinghouse*), Torill Karlsen (*OECD Halden Reactor Project*)

4:15 p.m.

Impact of Ni-59 (N, alpha) and (N, P) Reactions on DPA Rate, Heating Rate, Gas Generation and Stress Relaxation in LWR and CANDU Reactors, F. A. Garner (*Radiation Effects Consulting*), L. R. Greenwood, E. R. Gilbert (*PNNL*), M. Griffiths (*AECL*)

4:35 p.m.

The Effect of Prior Cold-Work on the Deformation Behavior of Neutron Irradiated AISI 304 Austenitic Stainless Steel, Wade Karlsen (*VTT Technical Research Center of Finland*), Steven Van Dyck (*TCH, SCK-CEN*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

MONDAY, AUGUST 24, 2009 • 3:30 P.M.

Refreshment Break

Peacock Foyer

TECHNICAL SESSIONS

TUESDAY, AUGUST 25, 2009 • 8:00 A.M.

Crack Initiation and Deformation in Stainless Steels

Chairs: Gary Was (*Univ of Michigan*), Gabriel Ilevbare (*EPRI*)

Peacock Salon A

8:00 a.m.

A Review and Assessment of Cold-Work Influence on SCC of Austenitic Stainless Steels in Light Water Reactor Environment, Y. S. Garud

(*Consultant*), G. O. Ilevbare (*EPRI*)

8:40 a.m.

Effects of Surface Treatments on Microstructure, Hardness and Residual Stress in Type 316L Stainless Steel, Junya Kaneda, Hiroaki Tamako

(*Hitachi-GE Nuclear Energy*), Ryo Ishibashi, Hisamitsu Hato (*Hitachi. Ltd.*),

Masahiko Miyagawa, Norimichi Yamashita (*TEPCO*)

Cracking and Inhomogenous Structures in Stainless Steel

Chair: Koji Arioka (*Inst of Nuclear Safety Systems*)

Peacock Salon A

9:05 a.m.

Deformation Localisation and EAC in Inhomogeneous Microstructures of Austenitic Stainless Steels, Ulla Ehrnstrén (*VTT*), Tapio Saukkonen (*Helsinki Univ of Technology*), Wade Karlsen (*VTT*), Hannu Hänninen (*Helsinki Univ of Technology*)

9:45 a.m.

Characteristic of Grain Boundary Having SCC Susceptibility for Low Carbon Austenitic Stainless Steel in High Temperature Water, Yohei Sakakibara, Keiji Kubushiro, Guen Nakayama (*IHI Corp*)

10:05 a.m.

3-D Characterization of SCC in Cold Worked Stainless Steels, Sergio Lozano-Perez, David Saxey (*Univ of Oxford*), Takumi Terachi, Takuyo Yamada (*Inst of Nuclear Safety System*), Lionel Cervera-Gontard (*Danish Technical University*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

Ni-Base Welds—III

Chairs: Denise Paraventi (*BAPL*), Dolores Gomez-Briceno (*CIEMAT*)

Peacock Salon B

8:00 a.m.

The Effects of Deaerated Water on the Toughness of Nickel-Based Alloys, Edward Richey, George A. Young, Robert A. Etien (*KAPL/Lockheed Martin*)

8:20 a.m.

Dynamic Strain Aging of Ni Base Weld Metals in Comparison to Alloy 600 and 690, M. Ivanchenko, Y. Yagodzinskyy, H. Hänninen (*Helsinki Univ of Technology*), U. Ehrnstrén (*VTT Technical Research Centre of Finland*)

8:40 a.m.

Corrosion Fatigue Behavior of Dissimilar Metal Weldments in High Temperature Water Environments, J. Y. Huang, R. F. Liu, M. C. Young, S. L. Jeng, J. S. Huang, R. C. Kuo, (*INER*), J. C. Wang (*TPC*)

9:00 a.m.

Residual Stress Measurement and Finite Element Mapping on a Narrow Gap Dissimilar Metal Weld, X. Ficquet (*Vegter Ltd*), S. Courtin (*AREVA*), C. Ohms

(*JRC*), D. Neov (*Inst for Nuclear Research and Nuclear Energy*), P. Gilles, P. Joly (*AREVA*)

9:20 a.m.

Welding Residual Stress for Dissimilar Metal Welds with Alloy 52 Inlays and Corresponding Flaw Evaluation, Frederick W. Brust Jr., Do-Jun Shim,

Gery Wilkowski (*Engineering Mechanics Corp of Columbus*), Tao Zhang (*Emc2*),

Edmund Sullivan, Al Csontos, David Rudland (*NRC*)

Waste—I

Chair: Tiangan Lian (*EPRI*)

Peacock B

9:45 a.m.

Evaluation of Austenitic Stainless Steel Dry Storage Cask Stress Corrosion Cracking Susceptibility, Mekonen Bayssie, Darrell Dunn, Aladar Csontos

(*NRC*), Leonardo Caseres, Todd Mintz (*Southwest Research Inst*)

10:25 a.m.

Corrosion Resistance of Alloy 22 in Chloride and Silicate Solutions,

Ricardo M. Carranza, Mauricio Rincón Ortíz, Martin A. Rodríguez (*CAC-*

CNEA), Raul B. Rebak (*GE Global Research*)

10:45 a.m.

Corrosion of Radioactive Waste Drum Materials and Migration of

Corroded Products in Presence of Various Thiobacillus Strains, F. I. Chou,

M. Y. Wang, H. P. Chung (*Natl Tsing Hua Univ*), H. W. Wen (*Natl Chung Hsing Univ*)

11:05 a.m.

TIMODAZ: Lining Stability under Thermal Load, Jaroslav Pacovský

(*Czech Technical Univ in Prague*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

Irradiation Effects—III

Chairs: Jeremy Busby (*ORNL*), Micah Hackett (*Bechtel Marine Propulsion Corporation*)

Peacock Salon C

8:00 a.m.

A New Deformation Mode Observed in Austenitic Low-Nickel Stainless Steels Irradiated to High Neutron Exposure at 310-432°C, M. N. Gusev,

D. A. Toktogulova, O. P. Maksimkin (*Inst of Nuclear Physics*), F. A. Garner

(*Radiation Effects Consulting*)

8:20 a.m.

Influence of Surface Peening on the Weldability of Neutron-Irradiated Stainless Steel, Masato Koshiishi (*Nippon Nuclear Fuel Development Co*), Tomomi Nakamura (*Hitachi Works*), Kyoichi Asano (*TEPCO*)

Low Alloy Steels and Flow Accelerated Corrosion

Chairs: Peter King (*Babcock & Wilcox*), Hans-Peter Seifert (*Paul Scherrer Inst*)

Peacock Salon C

8:45 a.m.

SCC Retardation and Propagation Behavior in Dissimilar Weldment of Alloy 182 and Low Alloy Steel, Tatsuya Kubo, Mikiro Itow, Norihiko Tanaka, Toshiyuki Saito (*Toshiba Corp*)

9:25 a.m.

The Effect of Material Variability on Low Cycle Fatigue Resistance of Low Alloy Steels in a 310°C Deoxygenated Water, Hun Jang, Jong -Dae Hong (*KAIST*), Jae Gon Lee (*Korea Hydro and Nuclear Power Co.*), Changheui Jang (*KAIST*)

9:45 a.m.

Influence of Dynamic Strain Ageing on the Crack Growth Rates and Crack Tip Plasticity of Low-Alloy Steels in Oxygenated High-Temperature Water, B. Devrient, A. Roth (*AREVA NP GmbH*), K. Küster (*Vattenfall Europe*), M. Widera (*RWE Power AG*), U. Ilg (*EnBW Kernkraftwerke AG*)

10:05 a.m.

Issues and Advances in the Assessment of Flow Accelerated Corrosion, Y. S. Garud (*Consultant*)

10:45 a.m.

Evaluation of Wall Thinning Rate Due to Flow Accelerated Corrosion with the Coupled Models of Electrochemical Analysis and Double Oxide Layer Analysis, Shunsuke Uchida, Masanori Naito, Yasushi Uehara, Hidetoshi Okada (*Inst of Applied Energy*), Seiichi Koshizuka (*Univ of Tokyo*), Derek H. Lister (*Univ of New Brunswick*)

11:05 a.m.

Effects of Alloy Composition of Carbon Steel on the Flow Accelerated Corrosion and Oxide Film Properties in Neutral Water Condition, Tomonori Satoh, Hirokazu Ugachi, Takashi Tsukada, Shunsuke Uchida (*JAEA*)

11:25 a.m.

FAC Mitigation Technology in BWR, Young-Jin Kim (*GE Global Research Center*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

TUESDAY, AUGUST 25, 2009 • 9:30 A.M.

Refreshment Break

Peacock Foyer

TUESDAY, AUGUST 25, 2009 • 6:00 P.M.

Special Session on Life Beyond 60 Years

Peacock Salon A & B

6:00 p.m.

PANELISTS:

- Jeremy Busby (*ORNL*)
- C. E. Carpenter (*NRC*)
- Changheui Jang (*KAIST*)
- Karen Gott (*Swedish Radiation Safety Authority*)
- U.S. Industry

TUESDAY, AUGUST 25, 2009 • 7:00 P.M.

Evening Refreshments

Peacock Foyer

WEDNESDAY, AUGUST 26, 2009 • 8:00 A.M.

PWR—III: Environmental Effects

Chairs: Bogdan Alexandreanu (*ANL*), David Tice (*Serco Assurance*)

Peacock Salon A

8:00 a.m.

Effect of Flow Rate on the Environmentally Enhanced Fatigue Crack Propagation of Austenitic Stainless Steels in a Simulated PWR Primary Coolant Environment, Norman Platts, David Richard Tice, John W. Stairmand (*Serco Ltd*)

8:20 a.m.

Effect of Intergranular Oxygen Penetration on the SCC Initiation Behaviour of Ni-Based Structural Alloys, B. Ter-Ovanesian, J. M. Cloué (*AREVA NP*), J. Deleume (*AREVA*), E. Andrieu (*CIRIMAT*)

8:40 a.m.

Prediction of Stress Corrosion Initiation Time of Alloy 600 PWR Components, Claude Benhamou (*AREVA NP*), Claude Amzallag (*EDF SEPTEN*)

9:00 a.m.

Effects of Dissolved Hydrogen on the Electronic Properties of the Oxide Film on Alloy 600 in High Temperature Water, Qunjia Peng, Yoichi Takeda, Jiro Kuniya, Tetsuo Shoji (*Tohoku Univ*)

9:20 a.m.

Stress Corrosion Cracking Response of 304 Stainless Steel in Aerated and Deaerated Water, W. J. Mills (*Bechtel Marine Propulsion Corp*)

TECHNICAL SESSIONS

PWR—IV: Deformation Effects on Stainless Steel in Primary Water

Chairs: Gabriel Ilevbare (EPRI), Brent Capell (BAPL)

Peacock Salon A

9:45 a.m.

Influence of Cold Working Methods on Stress Corrosion Crack Growth Rates of Austenitic Stainless Steel in PWR Primary Water Conditions, D. R. Tice, S. Nouraei, J. W. Stairmand (*Serco Technical and Assurance Services*)

10:25 a.m.

Stress Corrosion Cracking Propagation of Cold-Worked Austenitic Stainless Steels in PWR Environment, François Vaillant (*EDF R&D*), Laure Tribouilloy-Buissé (*EDF DPN*), Thierry Couvant (*EDF R&D*)

10:45 a.m.

Development of Understanding of the Interaction Between Localized Deformation and SCC of Austenitic Stainless Steels Exposed to Primary PWR Environment, T. Couvant, L. Legras, A. Herbelin (*EDF R&D*), A. Musienko (*ENSMP*), G. Ilevbare (EPRI), D. Delafosse (*ENSM-SE*), G. Cailletaud (*ENSMP*), J. Hickling (*CMC*)

11:05 a.m.

SCC Behaviour of Austenitic Stainless Steels in High Temperature Water: Effect of Cold Work, Water Chemistry and Type of Materials, D. Gómez-Briceño, Ma Sol García, Jesús Lapeña (*CIEMAT*)

11:25 a.m.

Effects of Loading Mode and Water Chemistry on Stress Corrosion Cracking of 316L Stainless Steel in Simulated PWR Environments, Zhanpeng Lu, Tetsuo Shoji, Seiya Yamazaki (*Tohoku Univ*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

Extended Operations

Chairs: Jeremy Busby (ORNL), Gene Carpenter (NRC)

Peacock Salon B

8:00 a.m.

Materials Issues and Research for Extended Reactor Service, Jeremy T. Busby (ORNL)

8:40 a.m.

Modeling and Simulation of Aging Effects in Irradiated PWR Reactor Internals Components, Glenn A. Gardner (*Dominion Generation*), Anne Demma (EPRI), Frank J. Marx (*Westinghouse*), Tamas Liskai (AREVA NP), Joe Rashid (*Anatech*)

9:00 a.m.

Reactor Pressure Vessel Issues and Plans in the Light-Water Reactor Sustainability Program, Randy K. Nanstad (ORNL), G. Robert Odette (*Univ of California, Santa Barbara*)

Crack Initiation and Deformation Structures in Ni-Base Alloys

Chairs: Steve Bruemmer (PNNL), Thierry Couvant (EDF)

Peacock Salon B

9:25 a.m.

Unusual Cold Work and Strain Rate Effects on SCC, Peter L. Andresen (*GE Global Research*)

10:05 a.m.

Effect of Deformation and Orientation on SCC of Alloy 690, Peter L. Andresen, Martin M. Morra (*GE Global Research*), Al Ahluwalia (EPRI), John Wilson (*Exelon*)

10:25 a.m.

Long Range Ordering of Alloy 690, F. Delabrouille, D. Renaud, F. Vaillant, J. Massoud (*EDF R&D*)

10:45 a.m.

Formation of Crack Embryos Prior to Crack Growth in High Temperature Water, Koji Arioka (*Inst of Nuclear Safety System*), Tomoki Miyamoto (*Kobe Material Testing Laboratory Co, LTD*), Takuyo Yamada, Takumi Terachi (*Inst of Nuclear Safety System*)

11:05 a.m.

SCC Initiation Testing of Nickel-Based Alloys in High Temperature Water, Robert A. Etien, Edward Richey, David S. Morton, Julie Eager (*Bechtel Marine Propulsion Corp*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

Zirconium Alloys—I: Corrosion

Chair: Jeremy Busby (ORNL)

Peacock Salon C

8:00 a.m.

Review on Electrochemical Corrosion of Zirconium Alloys in High Temperature Water, Raul B. Rebak (*GE Global Research*), Yang-Pi Lin (*GE Energy*), Young-Jin Kim (*GE Global Research*)

8:40 a.m.

The Atomic Scale Structure and Chemistry of the Zircaloy-4 Metal-Oxide Interface, Daniel Hudson, Na Ni, Sergio Lozano-Perez, David Saxey (*Univ of Oxford*), Colin English (*National Nuclear Laboratory*), George D.W. Smith, John Sykes, Chris Grovenor (*Univ of Oxford*)

9:00 a.m.

The Effect of Residual Stress on Growth of Oxide Scale on Zirconium Alloys, E. Polatidis, P. G. Frankel, M. Preuss (*Univ of Manchester*)

Zirconium Alloys—II: Hydrogen Effects

Chairs: Arthur Motta (*Penn State Univ*), Raul Rebak (*General Electric*)

Peacock Salon C

9:25 a.m.

Corrosion and Hydriding Performance of Alloy M5® In U.S. Reactors, M. T. Machut, G. L. Garner, J. P. Mardon, P. B. Hoffmann (AREVA NP)

10:05 a.m.

Influence of Zirconium Hydrides on Zircaloy-4 Corrosion in PWR Conditions, Caroline Bisor-Melloul, Marc Tupin, Philippe Bossis (CEA/DEN), Jacques Chêne (CNRS-CEA/DEN), François Jomard (CNRS UMR)

10:25 a.m.

Crack Growth Rate and Hydride Cracking with Temperature in Delayed Hydride Cracking of Zirconium Alloys, Young S. Kim (KAERI)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

WEDNESDAY, AUGUST 26, 2009 • 9:30 A.M.

Refreshment Break

Peacock Foyer

WEDNESDAY, AUGUST 26, 2009 • 1:30 P.M.

PWR—V: Weldments

Chairs: Denise Paraventi (BAPL), Micah Hackett (Bechtel Marine Propulsion Corporation)

Peacock Salon A

1:30 p.m.

The Effect of Strain-Hardening on PWSCC of Nickel-Base Alloys 600 and Alloy 690, Tetsuo Shoji, Zhanpeng Lu, Seiya Yamazaki (Tohoku Univ)

2:10 p.m.

The Stress Corrosion Cracking Behavior of Alloys 690 and 152 Weld in a PWR Environment, B. Alexandreanu, Y. Chen, Y. Yang, W. J. Shack (ANL)

2:30 p.m.

An Analytical Evaluation of the Efficacy of the Full Structural Weld Overlay as a Stress Improving Mitigation to Prevent Primary Water Stress Corrosion Cracking in Pressurized Water Reactor Primary Cooling Piping, L. F. Fredette, Paul M. Scott (BMI), F. W. Brust (Engineering Mechanics Corp of Columbus), A. Csontos (NRC)

2:50 p.m.

LTCP of Alloy 182/152 Tested in PWR Primary Water, Emmanuel Herms, Olivier Raquet (CEA), Ian De Curières, Pierre Joly (AREVA NP)

PWR—VI: PWSCC

Chair: Darrell Dunn (NRC)

Peacock Salon A

3:15 p.m.

Impact of Welding Residual Stress Uncertainties on PWSCC Growth Modeling, David L. Rudland, Aladar Csontos (NRC), Frederick Brust, Tao Zhang (Engineering Mechanics Corporation of Columbus)

3:35 p.m.

An Analytical Evaluation of the Efficacy of the Mechanical Stress Improvement Process in Pressurized Water Reactor Primary Cooling Piping, L. F. Fredette, Paul M. Scott (BMI), F. W. Brust (Engineering Mechanics Corp of Columbus), A. Csontos (NRC)

3:55 p.m.

PWSCC in the Steam Generator Drain Nozzle of a PWR, Seong Sik Hwang, Yun Soo Lim, Jangyul Park, Dong Jin Kim, Sung Woo Kim, Man Kyo Jung, Joung Soo Kim, Hong Pyo Kim (KAERI)

4:15 p.m.

A PWSCC Mechanism Based on Ordering Reaction in Ni-Base Alloys, SungSoo Kim, Jeong Soo Kim, Seong Sik Hwang, Hong Pyo Kim (KAERI)

4:35 p.m.

Effect of a High Li Chemistry on Alloy 600 PWSCC Susceptibility, Thierry Couvant, François Vaillant (EDF R&D), Odile de Bouvier, Damien Déforge (EDF CEIDRE)

4:55 p.m.

Environmental Mitigation of PWSCC Initiation —Low DH Chemistry for PWR Primary System, Daisuke A. Kutagawa, Nobuaki Nagata, Koji Dozaki, Hideki Takiguchi (JAPC), Kjell Norring, Anders Jenssen, Anders Molander (Studsvik Nuclear AB)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

Operational Experience—I: Service Experience

Chair: Steve Fyfe (AREVA)

Peacock Salon B

1:30 p.m.

Barrel Bolt Cracking in a German PWR, R. Kilian, G. Maußner (AREVA NP GmbH), G. König (EnBW Kernkraft GmbH)

1:50 p.m.

Build-Up of Deposits in Steam Generators: A Safety Issue, M. Le Calvar (IRSN), A. Vergnault (AREVA NP), H. Bodineau, F. Balestreri, T. Sollier (IRSN)

Operational Experience—II: Methodologies and Policies

Chairs: Bob Carter (EPRI), Renate Killian (AREVA)

Peacock Salon B

2:15 p.m.

Coordinated U.S. PWR Reactor Vessel Surveillance Plan: A Summary, Ryan Hosler, J. Brian Hall (AREVA NP), Jack Spanner (EPRI), Stephen Byrne (Westinghouse)

2:35 p.m.

Improving Regulatory Practices Through the OECD-NEA Stress Corrosion Cracking and Cable Ageing Project (SCAP), Akihiro Yamamoto, Alejandro Huerta (OECD Nuclear Energy Agency), Karen Gott (Swedish Radiation Safety Authority), Bengt Lydell (Sigma-Phase, Inc.)

TECHNICAL SESSIONS

2:55 p.m.

Corrosion Experience with Aged Components in Russian NPPs, G. Saji (*NSC*), B. T. Timofeev (*CRISM 'Prometey'*), V. A. Yurmanov (*ENES/Nikiyet*)

3:15 p.m.

Service Experience with Alloy 600 and Associated Welds in Operating PWRs, Including Repair Activities and Regulatory and Code Actions, Warren H. Bamford, Nathan A. Palm (*Westinghouse*)

3:35 p.m.

Leak-Before-Break Evaluation of Full Structural Weld Overlays, Do-Jun Shim (*Engineering Mechanics Corp of Columbus*), Frederick Brust (*Emc2*), Gery Wilkowski, Elizabeth Kurth (*Engineering Mechanics Corp of Columbus*), Aladar Csontos, David Rudland, Edmund Sullivan (*NRC*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

IASCC—I

Chairs: Gary Was (*Univ of Michigan*), Karen Gott (*Swedish Radiation Safety Authority*)

Peacock Salon C

1:30 p.m.

Criteria for Initiation of Irradiation-Assisted Stress Corrosion Cracking in Stainless Steels in PWR Systems, Stephen Fyfe, Hongqing Xu (*AREVA NP*), Peter Scott (*Les Vergers*), Lionel Fournier (*AREVA NP*), Anne Demma (*EPRI*)

2:10 p.m.

Crack Growth Rate Testing of Fast Reactor Irradiated Type 304L and 316 SS in BWR and PWR Environments, Anders Jenssen, Johan Stjärnsäter (*Studsvik Nuclear AB*), Raj Pathania (*EPRI*)

2:30 p.m.

Influence of Microstructure on IASCC Growth Behavior of Neutron Irradiated Type 304 Austenitic Stainless Steels in Simulated BWR Condition, Yoshiyuki Kaji, Yukio Miwa, Akira Shibata, Junichi Nakano, Takashi Tsukada (*JAEA*), Kenichi Takakura, Kiyotomo Nakata (*Japan Nuclear Energy Safety Organization*)

2:50 p.m.

Crack Growth Behavior of Neutron Irradiated L-Grade Austenitic Stainless Steels in Simulated BWR Conditions, Kenichi Takakura, Kiyotomo Nakata (*Japan Nuclear Energy Safety Organization*), Shigeaki Tanaka (*Toshiba Corp*), Tomomi Nakamura (*Hitachi-GE*), Kazuhiro Chatani (*Nippon Nuclear Fuel Development Co., Ltd.*), Yoshiyuki Kaji (*JAEA*)

IASCC—II

Chairs: Jeremy Busby (*ORNL*), Ulla Ehrnsten (*VTT*)

Peacock Salon C

3:15 p.m.

IASCC Properties of Cold Worked 316 Stainless Steel in PWR Primary Water, Kenichi Takakura, Kiyotomo Nakata (*Japan Nuclear Energy Safety Organization*), Koji Fujimoto, Kimihisa Sakima, Noboru Kubo (*Mitsubishi Heavy Industries, Ltd.*)

3:35 p.m.

Crack Growth Rates and Fracture Toughness of Neutron Irradiated Grain-Boundary-Engineered Austenitic Stainless Steels, Y. Chen, O. K. Chopra (*ANL*), Y. Yang (*Univ of Wisconsin, Madison*), W. J. Shack (*ANL*), Appajosula S. Rao (*NRC*)

3:55 p.m.

Crack Growth Rate and Fracture Toughness of Austenitic Stainless Steels in a PWR Primary Water Environment, J. K. McKinley, E. W. Deemer, R. J. Jacko, R. G. Lott (*Westinghouse*)

4:15 p.m.

An Atom Probe Tomography Study of Proton-Irradiated Austenitic Stainless Steels, Z. Jiao, G. S. Was (*Univ of Michigan*), P. Chou (*EPRI*)

4:35 p.m.

Characterization of IASCC Crack Tip in Highly Irradiated Stainless Steels, Koji Fukuya, Horimasa Nishioka, Katsuhiko Fujii (*Inst of Nuclear Safety System*), Yuji Kitsunai (*Nippon Nuclear Fuel Development*)

4:55 p.m.

The Investigation of the Damages of Irradiated 316L Stainless Steel Used for the Hafnium Plate Type of Control Rods in BWR Plants, S. Ooki, A. Miyazaki, H. Tezuka, M. Taguchi, S. Suzuki (*TEPCO*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

WEDNESDAY, AUGUST 26, 2009 • 3:00 P.M.

Refreshment Break

Peacock Foyer

THURSDAY, AUGUST 27, 2009 • 8:00 A.M.

Crack Growth—I: Experimental Observations

Chairs: Peter Andresen (*General Electric*), Qunjia Peng (*Tohoku Univ*)

Peacock Salon A

8:00 a.m.

Crack Growth Behavior of Welded and Cast Stainless Steels in Hydrogenated and Oxygenated High-Temperature Water, Takuyo Yamada, Takumi Terachi, Tomoki Miyamoto, Koji Arioka (*Inst of Nuclear Safety System, Inc.*)

8:40 a.m.

Crack Growth Response of Alloy 690 in Simulated PWR Primary Water, M. B. Toloczko, S. M. Bruemmer (*PNNL*)

9:00 a.m.

Crack Growth Response of Alloy 152 and 52 Weld Metals in Simulated PWR Primary Water, M. B. Toloczko, S. M. Bruemmer (*PNNL*)

9:20 a.m.

Effect of Grain Size on Stress Corrosion Cracking of Low Carbon Austenitic Stainless Steel in High Temperature Water, Kenji Kako, Yuichi Miyahara, Taku Arai, Masami Mayuzumi (*CRIEPI*)

Crack Growth—II: Fundamentals

Chairs: Peter Andresen (*General Electric*), Zhanpeng Lu (*Tohoku Univ*)

Peacock Salon A

9:45 a.m.

The Electrochemistry of Stress Corrosion Cracking, Digby D. Macdonald (*Penn State*)

10:25 a.m.

Stress Corrosion Crack Growth Rate Testing of Novel Specimens: Yield Strength Gradient and Composite Arrest, Julie B. Eager, David S. Morton, John V. Mullen, Edward Richey (*KAPL*)

10:45 a.m.

Fast Algorithm for Predicting Fatigue Crack Growth Rate, G. R. Engelhardt (*OLI Systems*), D. D. Macdonald (*Penn State*)

11:05 a.m.

Theoretical and Practical Results on the Effect of a Varying Stress Intensity Factor on Stress Corrosion Crack Growth Rates, Kjell Pettersson (*Matsafe AB*), Anders Jenssen (*Studsвик Nuclear AB*)

11:25 a.m.

Calculation of Crack Tip Stress Intensity Factors for Flaws in RPV Outlet Nozzle Butt Welds During Plant Cooldown, John E. Broussard III (*Dominion Engineering, Inc.*), Anne Demma (*EPRI*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

BWR—I: Corrosion and SCC

Chairs: Raj Pathania (*EPRI*), Roger Newman (*Univ of Toronto*)

Peacock Salon B

8:00 a.m.

Evaluation of Hydrothermally-Deposited Zirconium Oxide Coatings to Mitigate Intergranular Stress Corrosion Cracking in BWR Environments, P. H. Chou, R. Pathania (*EPRI*), M. B. Toloczko, S. M. Bruemmer (*PNNL*), S. N. Lvov, E. Chalkova, V. Balashov (*Penn State Univ*)

8:20 a.m.

A Novel Fouling Mitigation Method for Jet Pump Components in BWR, Young-Jin Kim (*GE Global Research Center*), Catherine P. Dulka (*GE-Hitachi Nuclear Energy*)

8:40 a.m.

An Investigation into the Electrochemical Behavior of Oxygen on TiO₂-Treated Type 304 Stainless Steels in High Temperature Pure Water, Tsung-Kuang Yeh, Yu-Jen Huang, Chuen-Horng Tsai (*Natl Tsing Hua Univ*)

9:00 a.m.

Crack Growth Rate Measurements of Alloy 600 in Simulated BWR Environment, Johan Stjärnsäter (*Studsвик Nuclear AB*), Christer Jansson (*Vattenfall Power Consultant AB*), Björn Forssgren (*Ringhals AB*), Bengt Bengtsson (*OKG AB*), Mats Molin (*Forsmarks Kraftgrupp AB*)

BWR—II: SCC

Chairs: Mychailo Toloczko (*PNNL*), Anders Jenssen (*Studsвик*)

Peacock Salon B

9:25 a.m.

Crack Growth Rates in Irradiated Stainless Steels in BWR Internals, R. Pathania, R. Carter (*EPRI*), R. Horn (*GE-Hitachi Nuclear Energy*), P. Andresen (*GE Global Research*)

9:45 a.m.

SCC Investigation of Pre-Irradiated Core Shroud Weld HAZ Specimens under Simulated BWR Environmental Conditions in a Research Reactor, H. Hoffmann (*VGB PowerTech*), F. Hüttner (*Vattenfall NE*), U. Ilg (*EnBW Kernkraft GmbH*), M. Widera (*RWE Power AG*), M. Ernestova, A. Hojna, J. Kysela, R. Vsolak (*NRI Rez plc*), P. Lukas (*Nuclear Physics Inc CAS*)

10:05 a.m.

Crack Initiation Precursors Originating from Surface Grinding, M. J. Olszta, L. E. Thomas, K. Asano (*PNNL*), S. Ooki (*TEPCO*), S. M. Bruemmer (*PNNL*)

10:25 a.m.

SCC Growth Verification Test Using Large-Diameter Pipe Made of Low-Carbon Stainless Steel in Simulated BWR Water Environment, Mikiro Itow, Rie Sumiya, Norihiko Tanaka (*Toshiba Corp*), Taiji Hirasawa (*CRIEPI*), Haruo Usui (*Japan Nuclear Energy Safety Organization*), Masami Ando (*Hitachi-GE Nuclear Energy, Ltd*), Kiyotomo Nakata (*Retired*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

IASCC—III

Chairs: Larry Nelson (*General Electric*), Yiren Chen (*ANL*)

Peacock Salon C

8:00 a.m.

Effect of Chemical Compositions on IGSCC Resistance for Strain Hardened Low Carbon Austenitic Stainless Steels in High Temperature Water, Toshio Yonezawa (*Tohoku Univ*), Hiroshi Kanasaki, Yasuhiro Sakaguchi, Masaki Taneike (*MHI*), Suguru Ooki, Hideshi Tezuka, Kenro Takamori, Shunichi Suzuki (*TEPCO*)

8:20 a.m.

Evaluation of Local Deformation at Low Strain Level of Austenitic Stainless Steel Irradiated by Proton, Takashi Tanno, Akira Hasegawa, Shuto Sasaki, Shuhei Nogami, Manabu Satou (*Tohoku Univ*)

8:40 a.m.

Cracking Behavior of Irradiated Heat-Affected Zone Specimens of Type 304 and 304L Stainless Steel Welds in High-Purity Water, Y. Chen, O. K. Chopra, W. J. Shack (*ANL*), Appajosula S. Rao (*NRC*)

TECHNICAL SESSIONS

Water Chemistry—I: Mitigation Strategies

Chairs: Ron Horn (*GE-Hitachi*), Inhyung Rhee (*Soonchunhyang Univ*)

Peacock Salon C

9:05 a.m.

Electrochemical Corrosion Potential (ECP) Reduction and Crack Mitigation Experiences With NobleChem™ and On-Line NobleChem™, S. Hettiarachchi, R. M. Horn (*GE-Hitachi Nuclear Energy*), P. L. Andresen, Y. J. Kim (*GE-Global Research Center*)

9:45 a.m.

Impact of Power Coastdown Operations on the Effectiveness of Hydrogen Water Chemistry in Boiling Water Reactors, Tsung-Kuang Yeh, Mei-Ya Wang (*Natl Tsing Hua Univ*), Charles F. Chu, Ching Chang (*Taiwan Power Company*)

10:05 a.m.

A New Concept Sensor for Determination of Oxygen and Hydrogen Peroxide Concentrations in Nuclear Reactor Coolant, Tomonori Satoh, Yukio Miwa, Takashi Tsukada, Shunsuke Uchida (*JAEA*)

10:25 a.m.

The influence of ZrO₂ Treatment on the Electrochemical Behavior of Hydrogen Peroxide on Type 304 Stainless Steels in High Temperature Water, T. K. Yeh, P. I. Wu, C. H. Tsai (*Natl Tsing Hua Univ*)

10:45 a.m.

Radiation Induced ‘Long Cell’ (Macrocell) Corrosion In PWRs and BWRs, Genn Saji (*Ex-Secretariat of NSC*)

NOTE:

This session will follow the preceding session, which will begin at 8:00 a.m.

THURSDAY, AUGUST 27, 2009 • 9:30 A.M.

Refreshment Break

Peacock Foyer

THURSDAY, AUGUST 27, 2009 • 1:30 P.M.

Advanced Energy Systems—I: Stress Corrosion Cracking

Chairs: Todd Allen (*Univ of Wisconsin/ATR National Scientific User Facility*), Zhijie Jiao (*Univ of Michigan*)

Peacock Salon A

1:30 p.m.

Intergranular Cracking Behavior of Irradiated Austenitic Alloys in Supercritical Water, G. S. Was, R. Zhou, E. A. West, Z. Jiao (*Univ of Michigan*)

2:10 p.m.

Influence of Taylor Factor on IASCC in SCW and Simulated BWR Environments, E. A. West, Z. Jiao, G. S. Was (*Univ of Michigan*)

2:30 p.m.

Stress Corrosion Cracking Behavior of Cast Stainless Steels, Sebastien Teyssyre (*INL*), Gary S. Was (*Univ of Michigan*), Jeremy T. Busby (*ORNL*)

Advanced Energy Systems—II: Oxidation

Chairs: Digby D. Macdonald (*Penn State*), Sebastien Teyssyre (*INL*)

Peacock Salon A

2:55 p.m.

Oxidation Performance in Supercritical Water, T. R. Allen, K. Sridharan, X. Ren, L. Tan, Y. Chen (*Univ of Wisconsin, Madison*), D. C. Foley, K. T. Hartwig, X. Zhang (*Texas A&M*)

3:35 p.m.

General Corrosion of Neutron Irradiated Candidate Alloys for Fuel Claddings of Supercritical Water-Cooled Reactor, S. Kasahara, J. Kaneda (*Hitachi, Ltd.*), Y. Tsuchiya (*PIC Toshiba Corp.*), S. Mimura (*Toshiba Corp.*), M. Narui, M. Yamazaki, T. T. Shikama (*Tohoku Univ*), H. Matsui (*Kyoto Univ*)

3:55 p.m.

The Oxidation Behavior of Candidate Materials for Advanced Energy Systems in Steam at Temperatures Between 650°C and 800°C, J. M. Sarver (*The Babcock & Wilcox Company*)

4:15 p.m.

Corrosion of Austenitic Stainless Steels in Supercritical Aqueous Solutions, Xueyong Guan (*Shell International Exploration & Production, Inc.*), Digby D. Macdonald (*Penn State*)

4:35 p.m.

Oxidation Mechanisms of Ferritic-Martensitic Alloys in Supercritical Water, Pantip Ampornrat, Yanbin Chen, Lu-Min Wang, Gary S. Was (*Univ of Michigan*)

4:55 p.m.

Comparison of the Oxide Structure Formed on 9CrODS Steel and NF616 in Supercritical Water, J. Bischoff, A. T. Motta (*Penn State*), X. Ren, T. R. Allen (*Univ of Wisconsin, Madison*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

BWR—III: SCC

Chair: Peter Chou (*EPRI*)

Peacock Salon B

1:30 p.m.

Corrosion Fatigue Behavior of Austenitic Stainless Steels under Simulated BWR/HWC and PWR Conditions, H. P. Seifert, S. Ritter, H. Leber (*Paul Scherrer Inst*)

1:50 p.m.

Results of Low Cycle Fatigue Experiments in German Boiling Water Reactor Environment, Rainer Gersinska, Leopold Weil (*Federal Office for Radiation Protection*), Karl-Heinz Herter, Xaver Schuler (*MPA Univ Stuttgart*)

2:10 p.m.

Effects of γ -Ray Irradiation upon SCC Initiation and Propagation under BWR Conditions, Yoichi Wada, Kazushige Ishida, Atsushi Watanabe, Masahiko Tachibana (*Hitachi, Ltd.*), Motohiro Aizawa, Motomasa Fuse (*Hitachi-GE Nuclear Energy, Ltd.*)

2:30 p.m.

High Resolution Electron Microscopy Study on the Thin Oxide Films Formed on Type 316L Stainless Steel Exposed under Simulated BWR Water Chemistry Conditions, J. Chen (*Studsvik Nuclear AB*), H. Bergqvist (*Royal Inst of Technology*), D. Jädnäs (*Studsvik Nuclear AB*), G. Granath (*Ringhals AB*)

2:50 p.m.

Passivation Characteristics of Stainless Steels Containing Silicon, Peter L. Andresen (*GE Global Research*), Peter H. Chou (*EPRI*), Michael L. Pollick, J. Lawrence Nelson, Raul B. Rebak (*GE Global Research*)

3:10 p.m.

Correlation Between Oxide Film and Stress Corrosion Cracking Susceptibility of Surface Cold Worked L-Grade Stainless Steels, Ryoji Obata, Masato Koshiishi (*Hitachi-GE Nuclear Energy*), Hideya Anzai (*Hitachi*), Katsuyuki Nakade, Suguru Ooki, Kenro Takamori, Shunichi Suzuki (*TEPCO*)

BWR—IV: Weldments

Peacock Salon B

3:35 p.m.

Quantifying the Effects of Straining-Hardening and Water Chemistry on Crack Growth Rates of 316L SS Welds in High Temperature Water, Zhanpeng Lu, Koji Negishi, Yuzutu Ito, Yoichi Takeda, Tetsuo Shoji (*Tohoku Univ*)

4:15 p.m.

Investigation of Grain Boundary and SCC Crack-Tip Characteristics at the Heat Affected Zone in L-Grade Stainless Steels, Yusaku Maruno (*Hitachi, Ltd.*), Junya Kaneda (*Hitachi, Ltd./Hitachi-GE Nuclear Energy, Ltd.*), Yuji Kitsunai (*Nippon Nuclear Fuel Development Co., LTD*), Ryoji Obata, Masato Koshiishi (*Hitachi-GE Nuclear Energy, Ltd.*), Haruo Usui, Masami Ando, Kiyotomo Nakata (*Japan Nuclear Energy Safety Organization*)

4:35 p.m.

Effect of Loading Direction on Crack Growth Behavior Near Fusion Line in Low Carbon Stainless Steel Weld Joints, Taku Arai, Kenji Kako, Keiji Watanabe, Yuichi Miyahara (*CRIEPI*)

4:55 p.m.

Effects of K and Anion Impurity Concentration on Crack Growth Kinetics Near Alloy 182/A533B Weld Overlay Boundaries in BWRs, Katsuhiko Kumagai (*TEPCO*), Martin Morra, Peter Andresen, Gregory Catlin, Lawrence Nelson (*GE Global Research*), Shunichi Suzuki, Yoshio Takagi (*TEPCO*), Ronald Horn (*GE-Hitachi Nuclear Energy*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

Water Chemistry—II: Species Control

Chairs: Samson Hettiarachchi (*General Electric*), T. K. Yeh (*National Taiwan University of Science and Technology*)

Peacock Salon C

1:30 p.m.

Modeling the Electrochemistry of BWR and PWR Primary Coolant Circuits, Digby Macdonald (*Penn State*), HanSang Kim (*KHNP*), Mirna Urquidí-Macdonald (*Penn State*)

1:50 p.m.

Selection of Water Chemistry for Successful Operation of Water-Cooled Fusion Machines, Andrei Y. Petrov, Jan B. Berry (*ORNL*), Otakar Jonas, Lee Machemer (*Jonas, Inc.*)

2:10 p.m.

Possible Alternatives to Sodium Phosphate for Non-Volatile pH Control in Steam Generators, Bryan Poulson, Vince Evans (*Rolls-Royce plc*), Geoff Bignold (*GJB Chemistry for Power Ltd*)

2:30 p.m.

Evaluation of the Effects of Oxide Film on Electrochemical Corrosion Potential of Stainless Steel in High Temperature Water, Shunsuke Uchida, Tomonori Satoh, Takashi Tsukada (*JAEA*), Takahiro Miyazawa (*Tohoku Univ/Aisin Seiki Co. Ltd.*), Yoshiyuki Satoh, Keizo Ishii (*Tohoku Univ*)

2:50 p.m.

Studies of Iron Redox States, Corrosion Potentials and Oxygen Reduction in a Simulated Feedwater Train, Stefan Forsberg, Peter Gillén (*Studsvik Nuclear AB*), Per-Olof Andersson (*Vattenfall Ringhals AB*), Jerzy A. Sawicki (*Interatomics*)

Water Chemistry—III: Deleterious Effects

Chairs: Young-Jin Kim (*General Electric*), Hong Pyo Kim (*KAERI*)

Peacock Salon C

3:15 p.m.

Effect of Ni/Fe Ratio and Ni Concentration on Crud Deposition Behavior on Heated Zircaloy-4 Surface in Simulated PWR Primary Water, Hirotaka Kawamura, Masahiro Furuya (*CRIEPI*)

3:35 p.m.

Characterization of PWR Crud Phases and Their Variation under Plant Operation by Transmission Electron Microscopy, H. Bergqvist (*Royal Inst of Technology*), J. Chen, D. Jädnäs (*Studsvik Nuclear AB*), B. Bengtsson (*Ringhals AB*)

3:55 p.m.

Oxide Investigation Formed on Alloy 600 in Leaded Aqueous Solutions, Dong-Jin Kim, Mi Ae Kim, Hyuk Chul Kwon, Seong Sik Hwang, Joung Soo Kim, Jun Hwa Hong, Hong Pyo Kim (*KAERI*)

NOTE:

This session will follow the preceding session, which will begin at 1:30 p.m.

THURSDAY, AUGUST 27, 2009 • 3:00 P.M.

Refreshment Break

Peacock Foyer

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