

# PVP 2012

2012 Pressure Vessels & Piping Conference

*New Horizons in Global Pressure  
Vessel and Piping Technology*



July 15–19, 2012

Sheraton Centre Toronto Hotel  
Toronto, Ontario, Canada



## Welcome to PVP 2012

Welcome to Toronto, Ontario, Canada for the 2012 ASME Pressure Vessels & Piping Conference. The PVP Conference is known to be the outstanding international technical forum for participants to further their knowledge-base through exposure to diverse engineering topics and dissemination of cutting-edge technology related to pressure vessel and piping technologies for the power and process industries. We look forward to fruitful technical exchanges between participants from Europe, Africa, the Middle East, Asia, the Americas and the Oceania Islands. Our Conference continues to shape the technology in the pressure vessel industry on a truly global basis.

The ASME Pressure Vessels & Piping Division is sponsoring this Conference. The ASME Nondestructive Evaluation (NDE) Engineering Division is also participating. This year, the Conference Technical Program contains over 600 technical papers, and presentations organized into more than 150 technical and panel discussion sessions, two tutorials, two special tutorials, and our outstanding Student Paper Competition. The NDE and Software Demonstration forums are also organized as part of our technical program.

Technical papers presented in this Conference are separated into tracks, according to their technical areas, and published in the Conference proceedings in the form of a CD-ROM.

A key component of every PVP Conference is the opportunity to socialize and make new friends—our Conference in Toronto offers several great possibilities. **A Day in Niagara** is our Monday tour event featuring an up-close look at the falls from the Maid of the Mist tour boat and lunch at a restaurant overlooking the falls. Monday evening we all meet at the **Conference-Wide Reception** that will be held in the Dominion Ballroom. The **City Tour of Toronto**, on Tuesday, includes a guided tour of Casa Loma—a 98-room castle residence—and an additional stop at the **Distillery District** for lunch and shopping. Wednesday's social highlight celebrates the international cultures represented at the Conference with an evening at the **Atlantis Pavilion**. The venue is perched on stilts over Lake Ontario and features fantastic views of the Toronto skyline. International dining and fun entertainment make this an event not to be missed.

### PVP 2012 Program Layout

	<b>Sunday July 15, 2012</b>	<b>Monday July 16, 2012</b>	<b>Tuesday July 17, 2012</b>	<b>Wednesday July 18, 2012</b>	<b>Thursday July 19, 2012</b>
<b>7:30 am 8:15 am</b>	Arrival Registration Opens <b>(8:00 pm – 6:00 pm)</b>	Authors' Breakfast/Briefing Registration Open <b>(7:30 am – 4:00 pm)</b>	Authors' Breakfast/Briefing Registration Open <b>(7:30 am – 4:00 pm)</b>	Authors' Breakfast/Briefing Registration Open <b>(7:30 am – noon)</b>	Authors' Breakfast/Briefing Registration Open <b>(7:30 am – 3:00 pm)</b>
<b>8:30 am 10:15 am</b>	Microwave NDE Techniques <b>(9:00 am – 11:30 am)</b>	<b>Block 1.1</b> Technical Sessions NDE Demo	<b>Block 2.1</b> Technical Sessions Software Demo	<b>Block 3.1</b> Technical Sessions	<b>Block 4.1</b> Technical Sessions
<b>10:30 am 12:15 pm</b>	Open	<b>Block 1.2</b> Plenary Session NDE Demo	<b>Block 2.2</b> Technical Sessions Software Demo	<b>Block 3.2</b> Technical Sessions	<b>Block 4.2</b> Technical Sessions
<b>12:15 pm 1:45 pm</b>	Special Tutorial: Process & Benefits of ASME Pressure Technology Codes & Standards Development <b>(1:00 pm – 3:30 pm)</b>	Lunch Technical Committee Meetings	Lunch Technical Committee Meetings	Honors & Awards Luncheon <b>(12:30 pm – 2:15 pm)</b>	Lunch
<b>2:00 pm 3:45 pm</b>	Open	<b>Block 1.3</b> Technical Sessions NDE Demo	<b>Block 2.3</b> Technical Sessions Software Demo	<b>Block 3.3</b> Open	<b>Block 4.3</b> Technical Sessions
<b>4:00 pm 5:45 pm</b>	Special Tutorial: Effective Networking <b>(4:00 pm – 6:00 pm)</b>	<b>Block 1.4</b> Technical Sessions NDE Demo	<b>Block 2.4</b> Technical Sessions Software Demo	<b>Block 3.4</b> Open	<b>Block 4.4</b> Technical Sessions Conference Evaluation
<b>Evening</b>	Open	Conference-Wide Reception <b>(6:15 pm – 8:00 pm)</b>	Open	Conference Social Event <b>(6:00 pm – 10:30 pm)</b>	Open

**The American Society of Mechanical Engineers  
Pressure Vessels & Piping Division**

**PVP2012 Conference Committees**



Michael E. Nitzel

Conference Chair & Technical Program Chair

**PVP Technical Program Representatives**

Codes & Standards	Bostjan Bezensek
Computer Technology & Bolted Joints	Reza Adibiasl
Design & Analysis	San Iyer
Fluid-Structure Interaction	Hirofumi Iyama
High-Pressure Technology	Edward A. Rodriguez/ Jan Keltjens
Materials & Fabrication	Chris Truman
Operations, Applications & Components	Garry G. Young/ Yasumasa Shoji
Seismic Engineering	Tomoyo Taniguchi
Student Paper Competition	Luc Geraets
ASME NDE Division	William T. Springer
NDE Demonstration Forum	Carl E. Jaske
Software Demonstration Forum	James F. Cory, Jr.

**Student Paper Competition Session Developers**

Codes & Standards	Koji Takahashi
Computer Technology & Bolted Joints	Reza Adibiasl
Design & Analysis	Yasumasa Shoji
Fluid-Structure Interaction	Pierre Mertiny
High-Pressure Technology	Jong Chull Jo
Materials & Fabrication	Mahesh Aggarwal
Operations, Applications & Components	Bilal Dogan
Seismic Engineering	Yasumasa Shoji
	Cheryl O'Brien/ Tomoyo Taniguchi
ASME NDE Division	William T. Springer
PVP Senate	Luc Geraets

**PVP Division Executive Committee (2011–2012)**

Ronald S. Hafner	Chair
Michael E. Nitzel	Vice Chair and Secretary
Michael E. Nitzel	Professional Development Chair
Daniel T. Peters	Programs Chair
Marina Ruggles-Wrenn	Communications Chair
Doug Scarth	Honors and Awards Chair

**PVP Senate of Past Division Chairs**

Young W. Kwon, Historian (2011–12)	2010–11
Luc H. Geraets, President (2011–12)	2009–10
Artin A. Dermenjian	2008–09
James F. Cory, Jr.,	2007–08
Judith A. Todd	2006–07
M. K. Au-Yang	2005–06
Ismail T. Kisisel	2004–05
William J. Bees	2003–04
Howard H. Chung	2002–03
Joseph Sinnappan	2001–02
A. G. (Jack) Ware	2000–01
Robert F. Sammataro*	1999–00
Thou-Han Liu	1998–99
William E. Short, II	1997–98
Richard C. Gwaltney	1996–97
Shoei-Sheng Chen*	1995–96
Greg L. Hollinger	1994–95
Carl E. Jaske	1993–94
Rudy J. Scavuzzo	1992–93
Sam Y. Zamrik	1991–92
G. E. O. (Otto) Widera	1990–91
Robert H. Mallett	1989–90
Robert W. Swindeman	1988–89
Alexander H. C. Marr	1987–88
Jeffrey T. Fong	1986–87
Don B. Van Fossen	1985–86
James R. Farr	1984–85
Charles F. Nash	1983–84
Donald S. Griffin	1982–83
Richard H. Gallagher*	1981–82
L. Eugene Hulbert	1980–81
Robert E. Nickell	1979–80
Roger F. Reedy	1978–79
David H. C. Pai	1977–78
Pedro V. Marcal	1976–77
Harold H. Waite	1975–76
Robert L. Cloud	1974–75
Charles V. Moore	1973–74
Irvin Berman*	1972–73
Danos Kallas*	1971–72
Robert J. Cepluch*	1970–71
Charles F. Larson	1969–70
Gunther P. Eschenbrenner	1968–69
Vito Salerno*	1967–68
Dana Young*	1966–67

\*Deceased

**PVP Division Technical Committee Chairs**

Codes & Standards	Kunio Hasegawa
Computer Technology & Bolted Joints	Hakim A. Bouzid

Design & Analysis  
 Fluid-Structure Interaction  
 High-Pressure Technology  
 Materials & Fabrication  
 Operations, Applications & Components  
 Seismic Engineering

William J. Koves  
 Jong Chull Jo  
 Jan Keltjens  
 Doug Scarth  
 Stephen J. Hensel  
 Spyros Karamanos

**PVP Division Administrative Committee Chairs**

Membership Development Pierre Mertiny  
 Publicity & PVPD Newsletter Editor Marina Ruggles-Wrenn  
 International Coordination Maher Y.A. Younan

**ASME Journal of Pressure Vessel Technology**

Editor G. E. O. (Otto) Widera

**ASME President**

Victoria A. Rockwell 2011–2012  
 Marc W. Goldsmith  
 (President Elect) 2012–2013

**ASME Staff**

Executive Director Thomas Loughlin  
 Programs Manager Melissa Torres

**OPENING CEREMONY and PLENARY SESSION**  
**New Horizons in Global Pressure Vessel and Piping Technology**

The Conference opens on Monday, July 16, at 10:30 am, in the Dominion Ballroom. Representatives of the American Society of Mechanical Engineers will welcome the attendees. The first presentation will be delivered by Mr. Mark Elliott, Senior Vice-President and Chief Nuclear Engineer for Ontario Power Generation. The second presentation will be delivered by Mr. Terry Jamieson, Vice-President of the Technical Support Branch at the Canadian Nuclear Safety Commission.

**Plenary Speaker**



**W. M. (Mark) Elliott, P.Eng.**

Ontario Power Generation

**Nuclear Refurbishment at Ontario Power Generation**

In 2016, Ontario Power Generation (OPG) will begin executing the mid-life Refurbishment of the Darlington Nuclear Plant. Darlington is a 4-reactor complex east of Toronto that began operation in 1991–1993. Its CANDU Reactor design has 480 Fuel Channels at its core. These Fuel Channels and other reactor components must be replaced at the 30 year mark to allow another 30 years of operation. Replacing these major reactor components is the biggest task but the plant as a whole will be updated. And this work will all be done while keeping at least two reactors in full operation. This will be a large multi-year project that's already been extensively planned with more detailed preparations now underway.

Mr. Elliott will discuss the key factors in the path to success for the Refurbishment Project. Activities to define and fix the scope early included an Environmental Assessment, an Integrated Safety Review against modern Codes & Standards and a Component Condition Assessment. A full reactor mock up is being built to test the innovations in tooling and extensive plant inspections and walk downs are being done to minimize surprises. The work will be done using the Engineer, Procure, Construct (EPC) contracting model with the vendors fully engaged in the planning phase. OPG is also benchmarking the best practices of other Utilities currently doing nuclear refurbishment projects.

These and other sound Project Management techniques will be used by OPG to ensure success in this challenging phase of the CANDU Reactor life cycle.

**W. M. (Mark) Elliott, P.Eng.** is Senior Vice President, Nuclear Engineering, and Chief Nuclear Engineer for Ontario Power Generation (OPG). Mr. Elliott has held this position since December, 2010.

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Prior to assuming this position, Mr. Elliott was Senior Vice President for the Pickering A Nuclear Station responsible for the operation of the two Pickering A units and the Safe Storage of the remaining two units.

Mr. Elliott has held various positions with OPG and its predecessor Ontario Hydro, including Senior Vice President, Inspection and Maintenance Services; Director, Station Engineering for Pickering B, Director; Training at Pickering; Director, Operations and Maintenance Support at Pickering; Authorized Shift Supervisor at both Pickering B and Darlington stations; and Unit Pair Manager for Units 1 & 2 at Darlington.

Mr. Elliott graduated from McMaster University in Engineering Physics (1978) and has been a Professional Engineer in the Province of Ontario since 1981.

### Plenary Speaker



**Terry Jamieson, MASc, P.Eng.**

Canadian Nuclear Safety Commission

### The Importance of Participation of Regulators at International Activities

The Canadian Nuclear Safety Commission (CNSC) regulates the use of nuclear energy and materials to protect the health, safety, and security of Canadians and the environment in Canada. The CNSC is committed to providing regulatory instruments that achieve clarity of its requirements and are aligned with the best international practices. Regulatory decisions are made based on staff recommendations derived from state-of-the-art information in science and technology acquired, in part, by staff participation at various international activities. This participation contributes to enhancing the staff's knowledge and to maintaining a high overall level of competence, to staying abreast of the latest developments in the science and engineering, to achieving mutual understanding among regulatory bodies and technical support organizations, and to building the organization's reputation as one of the world's best nuclear regulators. The knowledge acquired is used to develop and enhance our regulatory framework and, jointly with the industry, to continuously improve national standards in all technical areas of the nuclear industry and, subsequently, to ensure that existing nuclear facilities continue to operate safely and that new builds will be even safer. Moreover, the CNSC strategic R&D program takes into account various international research projects at which staff participates in order to maximize the benefits of the scientific outcome. Through its long and steady participation at scientific and technical events in the international nuclear arena sponsored by, but not limited to, the IAEA and OECD-NEA, we are recognized by our peers as an important contributor to the development and promotion of nuclear safety regulations. Since CNSC

participation is very broad, covering many topics, this presentation will focus only on those international activities which pertain to the Pressure Vessels & Piping Conference. Such activities are encompassing, just to count a few, the development and harmonization of the codes and standards for pressure retaining components, the seismic qualification of Structures, Systems and Components (SSCs), fracture mechanics, periodic in-service inspections, aging management and material degradation. This presentation will also highlight how the recent lessons learned from the Fukushima accident have been integrated within these activities.

**Mr. Terry Jamieson, MASc, P.Eng.**, is the Vice-President of the Technical Support Branch at the Canadian Nuclear Safety Commission. In this position he directs a staff of over 300 engineers and scientists.

He has over 31 years of experience in the Canadian nuclear safety and environmental industries, and has held technical and management positions in the areas of radiation protection, environmental protection, nuclear security and safeguards, and safety assessment. He holds a designation as a Consulting Engineer (PEO), specializing in radiological engineering.

Mr. Jamieson began his career as a nuclear design engineer at Ontario Hydro in 1981. More recently, from 1989 to 2007, he worked at Science Applications International Corporation, where he rose to the position of Chief Operating Officer and Vice-President for Canada. He joined the CNSC in 2007.

He has authored many technical publications and was a recipient of an American Nuclear Society Best Paper Award in 1996. The Canadian Nuclear Society awarded him the J.S. Hewitt Team Achievement Award in 2000 for the creative conceptualization and innovative application of a thermal neutron-activation-based system for detecting non-metallic land mines. In 2010, he was made a Fellow of the Engineering Institute of Canada.

### HONORS and AWARDS LUNCHEON

The ASME PVP Division Honors and Awards Luncheon, during which all Division and selected ASME Society awards are presented, will be held on Wednesday, July 18, at 12:30 pm, in the Osgoode Ballroom, on the Lower Concourse. The top PVP Division award, the ASME S. Y. Zamrik PVP Medal, will be presented to Dr. M. K. Au-Yang.

### ASME S. Y. Zamrik PVP Medal Recipient

**M. K. Au-Yang, Ph.D., P.E.**



Consultant

Dr. M. K. Au-Yang is one of the most internationally renowned engineers in the field of flow induced vibrations and is this year's recipient of the ASME

S. Y. Zamrik Pressure Vessels & Piping Medal. Following the completion of his formal education in both mechanical engineering and physics at UC Berkley in the late 1960's, M. K. found his way across country to Lynchburg, VA, where he spent the vast majority of his professional career with various divisions of the Babcock & Wilcox Company and Framatome Technologies advancing the state of the art in flow induced vibrations. During an esteemed career that spanned a period in excess of 43 years, M. K. also served as the PVPD Fluid-Structures Interaction Technical Committee Chair, the Honors & Awards Committee Chair, and the PVP Division Chair. Dr. Au-Yang also served two separate multi-year terms as an Associate Editor of the ASME Journal of Pressure Vessel Technology.

Through M. K.'s contributions, the nuclear power industry has benefited directly from his publications and direct leadership on numerous international panels and committees, including his work on U. S. Nuclear Regulatory Guidelines pertaining to equipment vibrations. With his unique technical expertise, Dr. Au-Yang published more than 50 technical papers, authored the text entitled, "Flow-Induced Vibration for Power and Process Plant Components" (ASME Press), received two U.S. patents, and also edited/co-edited 26 ASME publications. In addition, Dr. Au-Yang also conducted several tutorials and short courses on his expert areas at a PVPD Conference and for the ASME Continuous Education Institute. Dr. Au-Yang also contributed significantly to various ASME Codes dealing with flow-induced vibration analysis and with heat exchanger testing. During his extensive service to the PVP Division, M. K. exemplified and demonstrated his devotion toward the Division. Dr. Au-Yang is known throughout our PVP family as always providing leadership with integrity.

## **WORKSHOPS and TUTORIALS**

Tutorials and Workshops offer both the experienced and early career engineers excellent opportunities to refresh their knowledge and to venture into specific technical areas outside their expertise.

**Special Tutorial:** A special tutorial is a two-hour Conference session, held on Sunday afternoon. The session leader will make available the necessary presentation material.

**Technical Tutorials:** These tutorials are approximately four hours in length. Technical tutorials fill two consecutive Conference session blocks, and are integrated into the Conference session schedule. Admission to the tutorials and workshops is free for Conference Registrants. At each technical tutorial, attendees may purchase a copy of the Tutorial Notes; the charge is set as low as possible based on the cost of production. For 2012, the notes for the Technical Tutorials may be purchased for \$35.00 CAD each at the tutorial sessions. The Technical Tutorial notes will be available in either printed or electronic format.

Each attendee will receive a Certificate of Attendance, as proof that the attendee has participated in the two-hour Special Tutorial, or the four-hour Technical Tutorial.

PVP Division will not assign Continuing Education Units (CEUs) on these certificates. However, attendees may negotiate CEU credits with their respective licensing boards.

An outline of the tutorial sessions for the 2012 PVP Conference is presented below.

## **WORKSHOPS**

### **TECHNICAL WORKSHOP**

**Sunday, July 15, 9:00 am – 11:30 am**

*Civic Ballroom S., Second Floor*

**Microwave NDE Techniques for Rubber Expansion Joints and Hdpe Butt Fusions in Power Plants**

**Sponsored by ILD/Evisive, Inc.**

**Bob Stakenborghs, ILD/Evisive, Inc.**

This workshop will provide an overview on the theory and operation of microwave NDE for rubber expansion joints and HDPE pipe butt fusions. This NDE technique is currently in use on these materials in industries worldwide. The workshop will include equipment demonstrations for both applications.

### **SPECIAL TUTORIAL I**

**Sunday, July 15, 1:00 pm – 3:30 pm**

*Civic Ballroom S., Second Floor*

**Process and Benefits of ASME Pressure Technology Codes & Standards Development**

**Bills Bees, Consulting Engineer, Wadsworth, OH; and, Guido Karcher, Chair of the Board on Pressure Technology Codes & Standards, Little Egg Harbor, NJ**

Have you ever wondered how all of the Codes & Standards stuff that ASME produces happens? In addition to the advantages and benefits that ASME members gain from membership in the PVP Division and attendance and participation in the ASME Pressure Vessel and Piping Conference, ASME can also offer additional benefits to folks with these interests in the area of Codes & Standards development. In this workshop, we will:

- Explain the overall process used in development of ASME Codes & Standards, and specifically those in the area of Pressure Technology Codes & Standards;
- Describe the consensus process used in the Codes & Standards development process and the ANSI approval process;
- Explore the benefits to participants in ASME Codes & Standards development activities;
- Discuss the various types of participation in the Codes & Standards Committees, qualifications, and the expectations of the participants;
- Explore the relationship between ASME Pressure Vessels & Piping Division and ASME Codes & Standards;
- Explain the overall structure of the Committee Structure under the Board on Pressure Technology Codes & Standards and their areas of

### **Coffee Breaks and Refreshments**

Coffee and refreshments are available throughout the week in the Civic Foyer (Second Floor). This hub of activity features the coffee breaks, guest activity information area, and registration. Note that the NDE and Software forum booths will be located in both the Civic Foyer (Second Floor) and the Essex Foyer (Mezzanine Level).

responsibilities; and

- Discuss some of the emerging areas in Pressure Technology and the ones currently seeking participants.

One of ASME's most valuable assets is our relationships with the volunteer members who serve on our Codes & Standards committees. It is ASME's policy to afford all persons with direct and material interest, without regard to country of citizenship or residency, the opportunity to participate in the ASME Codes & Standards development process. Membership on a committee normally represents you as an individual, rather than as a representative of your employer or another organization.

The last part of the session will be an open question and answer session to discuss any questions you may have. So come and ask the experts about another way to get involved with ASME.

## **SPECIAL TUTORIAL II**

**Sunday, July 15, 4:00 pm – 6:00 pm**

*Civic Ballroom S., Second Floor*

### **Effective Networking**

**Donna Messer, President, ConnectUsCanada, Oakville, Ontario, Canada**

For more than two decades, Donna has been a renowned expert on, and promoter of, the often overlooked, true currency of business—personal relationships—how to forge, nurture, and leverage them to enable those who properly cultivate these relationships to put them to mutual benefit.

A dynamic, highly sought-after speaker, Donna has spoken throughout North America, the Caribbean, Mexico, Europe, and Iceland on a host of topics dealing with the art of networking and the ties that bind. She has spoken before Federal, Provincial, Municipal and State governments, even serving as an advisor to the Prime Minister's Office (PMO) on issues relating to women in business.

A noted author and journalist, Donna's more than 4,000 articles have graced the pages of numerous newspapers and magazines. She has authored five books, including the Canadian best seller, *Effective Networking Strategies*. Join us for this very interesting and informative session.

## **TECHNICAL TUTORIALS**

**Monday, July 16, 2:00 pm – 5:45 pm**

*Civic Ballroom S., Second Floor*

### **Use of CFD in Design**

**Sean McGuffie, Mike Porter, and Tommy Hirst, Porter McGuffie, Inc., Lawrence, KS**

This tutorial will provide the design engineer with an understanding behind the fundamental concepts related to successfully performing CFD analyses, and how they can be incorporated into design processes. The tutorial will begin with an overview of the CFD process, including:

- A general outline of the Navier-Stokes equations and their solution;
- The selection of proper computational domains;
- Basic requirements for computational grids;
- Selection of proper boundary conditions; and
- Turbulence models required for basic solutions.

These preliminary concepts will then be reinforced through the solution of a "simple" CFD model. During the solution of the problem the concepts of establishing solution monitors and using them to monitor convergence will be discussed.

Next, more advanced topics/physics models that can be incorporated into CFD analyses will be discussed. These will include:

- The incorporation of the energy equation for thermodynamics analyses, including radiation models;
- The use of multi-component flows, including—
  - Multi-species
  - Volume of fluid
  - Eulerian methods
  - Lagrangian methods, and
  - Reacting flows
- Non-approximate transient methods such as DES and LES.

Industrial examples will be shown to demonstrate the advanced topics.

**Tuesday, July 17, 8:30 am – 12:15 pm**

*Civic Ballroom S., Second Floor*

### **Practical Piping Vibration**

**Charles Becht IV, Becht Engineering Company, Inc., Liberty Corner, NJ**

This tutorial provides an overview of a wide variety of causes of piping vibration from the point of view of an engineer that must identify the cause of vibration, determine if vibration is excessive, and correct the problem if it is. It provides a background on fundamental causes of piping vibration and how to identify source of vibration, rules of thumb and simplified methods for evaluating vibration severity, and methods of treatment. A wide variety of causes of vibration are covered in order to enable the participant to properly evaluate the variety of piping vibration problems that can occur in piping systems. The causes of vibration, where possible, are discussed with respect to very basic energy and momentum principles that enable the participant to understand what is happening within and to the piping system. Screening and simple vibration limits are provided.

## **NDE and SOFTWARE FORUMS**

### **NDE Demonstration Forum**

**Monday, July 16, 8:00 am – 5:00 pm**

*Civic Foyer, Second Floor, and Essex Foyer, Mezzanine Level*

The NDE Demonstration Forum will be held on Monday, July 16th. NDE Vendors will present and discuss their capabilities, equipment, and services in the Civic Foyer, Second Floor, and Essex Foyer, Mezzanine Level. For additional information, please contact Dr. Carl E. Jaske, Det Norske Veritas (USA), Inc., at Carl.Jaske@dnv.com.

### **Software Demonstration Forum**

**Tuesday, July 17, 8:00 am – 5:00 pm**

*Civic Foyer, Second Floor, and Essex Foyer, Mezzanine Level*

The Software Demonstration Forum will be held on Tuesday, July 17th. Software Vendors will present and discuss their capabilities, equipment, and services in the Civic Foyer, Second Floor, and Essex Foyer, Mezzanine Level. For additional information, please contact James F. Cory, Jr., UGS, Inc., at james.cory@siemens.com.

## SOCIAL PROGRAMS and TOURS

### Conference-Wide Reception—Dominion Ballroom, Second Floor Monday, July 16, 6:15 pm – 8:00 pm

All who registered are invited to attend the Reception. Meet with your colleagues, many of whom you have not seen for a while. Join with the registrants and guests for a relaxing evening.

**No charge for registered Conference participants and guests.**

### A Day in Niagara

#### Monday, July 16, 8:30 am – 3:30 pm

A trip to Southern Ontario would not be complete without a visit to this most beautiful of the world's wonders! The Niagara region boasts some of the world's most beautiful scenery.

In the Niagara area, a detailed tour will begin, outlining the historical, cultural, and geographical highlights of the region. Board the Maid of the Mist and experience the majesty of the Falls close up. Lunch will be provided in a restaurant overlooking the Falls—a wonderful way to relax. Afterwards, browse through the gift shops or simply just enjoy the view.

The return to Toronto may, if time permits, be routed through Niagara-on-the-Lake. Niagara-on-the-Lake is one of the oldest settlements in Ontario, famous for the War of 1812 between Canada and the United States. The town has been beautifully restored to depict its heritage. En route, the tour follows the Niagara River, passes the Whirlpool Rapids, as well as the historic sites of the Brock Monument and Laura Secord House.

**Tickets: \$98 CAD per Person/\$69 Children 12 and younger**

### Toronto City Tour with Stop at Casa Loma and the Distillery

#### Tuesday, July 19, 9:00 am – 3:00 pm

On the way to Casa Loma this "get acquainted" tour includes views of such famous attractions as Nathan Phillips Square, Old and New City Halls, Queen's Park, the four city block shopping complex Eaton Centre, the Victorian splendor of Cabbagetown, Allan Gardens, Queen's Park, Royal Ontario Museum and the trendy Yorkville area. Next, visit one of the most popular tourist attractions in Toronto—Casa Loma. Sir Henry Pellatt built this castle between 1911 and 1914, with every painstaking attempt to replicate the homes of European royalty. The childhood dream of his took three years and \$3.5 million to complete. The 98-room creation includes gold plated bathroom fixtures, a pipe organ larger than those in many cathedrals, underground tunnels, and secret passageways.

On the way to the last stop, you will pass the Annex, Chinatown, Art Gallery of Ontario, Roy Thomson Hall, Rogers Centre and St. Lawrence Market and Hall. Your last stop will be in Toronto's Distillery District. Once the largest distillery in the world, it was founded in 1832 by William Gooderham and James Worts. The Distillery District now includes 44 heritage buildings housing boutiques, galleries, art studios, cafes, bistros, and other retail shops. This is also an often-used venue where movies like Chicago, The Recruit, Cinderella Man, and many more of your favorite movies were filmed. Enjoy lunch on your own at one of the restaurants or cafes that The Distillery District has to offer.

**Tickets: \$52 CAD per person/\$45 Children 12 and under**

## Badge Required for all Events

Please wear your badge for admission to all Conference activities. Your badge also provides a helpful introduction to other Conference attendees.

## CONFERENCE SPECIAL EVENT

### Evening at Atlantis Pavilion

#### Wednesday, July 18, 6:00 pm – 10:30 pm, Dinner & Drinks Served

Wednesday's social highlight celebrates the international cultures represented at the Conference with an evening at one of Toronto's surprise gems—the Atlantis Pavilion. The venue is perched on 50-ft stilts over Lake Ontario and the 30-ft floor to ceiling windows provide fantastic views of the Toronto skyline. The evening will begin with a reception—either in the Mezzanine area or, if weather permits, up on the rooftop at Atlantis. The reception will be followed by dinner with an international flair. Following dinner, a demonstration of international dance styles reflecting the nature of the Conference will be presented by a professional dance troupe. A DJ will then provide music for the dancing enjoyment of the attendees. This fun evening of international dining and fun entertainment make this an event not to be missed.

Busses will depart the hotel at 6:00 pm.

**Tickets: \$115 CAD per Person/\$60 Children 12 and under**

## CONFERENCE INFORMATION

### Technical Sessions and Programs

All technical sessions will be held on either the second floor or the mezzanine level of the Sheraton Centre Toronto Hotel. Each room will be equipped with an LCD projector that can be connected to a personal computer for electronic presentations (e.g., Microsoft PowerPoint). Please note that ASME will not provide personal computers, 35-mm slide projectors, VCRs, or overhead projectors. Personal computers are the responsibility of the session developer, or presenter. It is strongly recommended that authors provide their materials to the session developer at the Authors' Breakfast, so that all the papers in a session can be loaded onto a single computer. Authors are recommended to have their presentations on a flash (pen) drive, in the event that compatibility problems occur between their computers and the LCD.

The location of the session rooms is shown in the Hotel Floor Plan of this program.

### Rudy Scavuzzo Student Paper Symposium and 20th Annual Student Paper Competition

#### Mon., July 16th, 2:00 pm – 5:45 pm

#### Tues., July 17th, 8:30 am – 12:15 pm

*Student Paper Competition Sessions: Windsor West room*

*Student Paper Symposium Sessions: Windsor East room*

The 2012 Rudy Scavuzzo Student Paper Symposium & Competition is sponsored by the PVPD Senate. Luc H. Geraets, PVPD Senate President, and Young W. Kwon, PVPD Senate Vice-President will conduct the ses-



sions, together with the Student Symposium and Competition representatives from each PVP Technical Committee. The Senate Review Committee will identify the outstanding finalist undergraduate and graduate student papers in two categories: the BS/MS level, and the Ph.D. level. Finalist papers will be judged on written technical content (70%) and presentation effectiveness (30%). A \$1,000 award will be made to each of the presenting Student Competition Finalist authors during the Honors Luncheon. In addition, in each category (BS/MS and Ph.D.), \$1000 will be awarded to the presenting author of the Outstanding Student Paper; \$800 will be awarded to the presenting author of the First Runner-Up Student Paper, and \$500 will be awarded to the presenting author of the Second Runner-Up Student Paper. Students must attend the Conference, and must present their papers to be eligible for an award. The winners will be announced at the Honors and Awards Luncheon, on Wednesday, July 18th.

### Technical Committee Meetings

#### Monday & Tuesday, July 16th & 17th, 12:15 pm – 1:45 pm

The Pressure Vessels & Piping Division Technical Committees will meet during the noon break on Monday, July 16th, and Tuesday, July 17th. Visitors are encouraged to attend and take an active part in PVP Committee activities. All committee meetings, schedules, and rooms are listed on Page 12.

### Honors & Awards Luncheon

#### Wednesday, July 18th, 12:30 pm – 2:15 pm

*Osgoode Ballroom, Lower Concourse*

The Division Honors & Awards Luncheon, honoring all Division Award Recipients and the 2012 ASME S. Y. Zamrik PVP Medalist, Dr. M. K. Au-Wang, will be held on Wednesday, July 18th, from 12:30 pm, until approximately 2:15 pm, in the Osgoode Ballroom, Lower Concourse. One ticket is included in the Full Conference registration fee. Additional tickets may be purchased at the Conference Registration desk.

### Authors' Breakfast/Briefing

#### Monday through Thursday, July 16th – 19th, 7:30 am – 8:15 am

*Dominion Ballroom, Second Floor*

All Authors, Panelists, Session Developers, Chairs, and Vice-Chairs are requested to attend a breakfast briefing in the Dominion Ballroom, Second Floor, on Monday through Thursday, at 7:30 am, on the morning of their sessions. Session protocol will be discussed, and the participants will have the opportunity to become better acquainted with one another before their scheduled sessions. Authors are encouraged to place all the presentations for their session on a single computer at the Authors' Breakfast.

### Registration Hours

*Civic Foyer, Second Floor*

Located in the Civic Foyer on the second floor, the ASME registration desk will be open during the following hours, to provide advance registrants with their materials, to process on site registrations, and to provide additional Conference information:

Sunday, July 15	3:00 pm – 6:00 pm
Monday, July 16	7:30 am – 4:00 pm
Tuesday, July 17	7:30 am – 4:00 pm
Wednesday, July 18	7:30 am – Noon
Thursday, July 19	7:30 am – 3:00 pm

### On-Site Registration Fees

For those *not* registered in advance, the On-Site Registration Fees are as follows (all fees are USD):

	Full Registration*	One Day Registration**
ASME Member	\$600	\$450
Author/Panelist	\$600	\$450
Session Chair	\$600	\$450
Session Vice Chair	\$600	\$450
Coop. Soc. Member***	\$600	\$450
Non-Member	\$660	\$550
ASME Life Member, Retired, Participating †	\$600	\$450
ASME Life Member Retired, Non-Participating ††	\$150	—
Student Author ‡	\$200	—
Student Member (Non-Author) ††	\$75	—
Student Non-Member (Non-Author) ††	\$75	—
Guest/Spouse	N/C	N/C

\* Full Registration fees include a coupon for the Conference Proceedings CD containing all the published technical papers. Full Registration also includes a ticket for the Honors Luncheon.

\*\* One Day Registration fees include a coupon for the Conference Proceedings CD and admission to technical sessions for one-day.

\*\*\* To qualify for discounted registration fees, you must be a member of ASME, or one of the cooperating societies listed below. Please fill in your society affiliation and membership number on the registration form.

† Life Member, Retired, Participating Members are defined as Life Members who are Retired, but who are participating in the Conference as an Author, a Co-Author, a Presenter, a Panelist, a Session/Symposium Developer, a Session/Symposium Co-Developer, a Session/Symposium Chair, a Session/Symposium Vice-Chair, etc. Registration under this category includes a CD-ROM of the Conference Proceedings and one (1) ticket for the Honors Luncheon.

†† Life Member, Retired, Non-Participating Members are defined as Life Members who are Retired, but who are not participating in the Conference as an Author, a Co-Author, a Presenter, a Panelist, a Session/Symposium Developer, a Session/Symposium Co-Developer, a Session/Symposium Chair, a Session/Symposium Vice-Chair, etc. Full Registration under this category includes a CD-ROM of Conference Proceedings and one (1) ticket for the Honors Luncheon.

‡ Student Author Full Registration Fees include a CD-ROM of the Conference Proceedings and one (1) ticket for the Honors Luncheon.

†† Student Non-Author Full Registration Fees include a CD-ROM of the Conference Proceedings, only.

### Cooperating Societies

If you are a member of one of the following "Cooperating Societies," you may register at the ASME member rate: Albanian Society of Mechanical Engineers; Centro Argentino de Ingenieros (Argentina); Institution of Engineers, Australia; Bahrain Society of Engineers; Institution of

Engineers, Bangladesh; National Academy of Sciences of Belarus; Belgian Society of Mechanical and Environmental Engineering (formerly Société Belge Des Mécaniciens); Associação Brasileira de Ciências Mecânicas (Brazil); Canadian Society for Mechanical Engineering; Canadian Nuclear Society; Chinese Mechanical Engineering Society (People's Republic); Chinese Institute of Engineers; Chinese Society of Mechanical Engineers (Taiwan, ROC); Chinese Nuclear Society; Asociación Colombiana de Ingenieros, Mecánicos, Electricistas, Electrónicos y Afines (Colombia); Colegio de Ingenieros Tecnólogos (Costa Rica); Asociación Costarricense de Ingenieros en Mantenimiento (Costa Rica); Cyprus Mechanical Engineering Association; Czech Mechanical Engineering Society; Ingeniørforening i Danmark, Dansk Maskinteknisk selskab (Society of Danish Engineers: Society for Mechanical Engineering); Colegio de Ingenieros Mecánicos del Ecuador; Egyptian Society of Mechanical Engineers; Ethiopian Society of Mechanical Engineers; Association Française de Mécanique (France) (formerly Groupe de Concertation en Mécanique); Société des Ingénieurs et Scientifiques de France; Georgia Academy of Engineering Sciences; Verein Deutscher Ingenieure (Germany); Ghana Institution of Engineers; Hellenic Society of Mechanical and Electrical Engineers (Greece); Hong Kong Institution of Engineers; Scientific Society of Mechanical Engineers (Hungary); Institution of Mechanical Engineers, India; Institution of Engineers, India; Indonesian Institute of Engineers; Iranian Society of Mechanical Engineers; Institution of Engineers of Ireland; Association of Engineers and Architects in Israel; Society of Mechanical Engineers in Israel; Associazione Nazionale Di Meccanica (Italy); Associazione Italiana di Tecnologia Meccanica (Italy); Unione Italiana Di Termofluidodinamica (Italy); Japan Society of Mechanical Engineers; Atomic Energy Society of Japan; Korean Society of Mechanical Engineers; Korean Nuclear Society; Kuwait Society of Engineers; Asociación Mexicana De Ingenieros Mexicanos y Electricistas (Mexico); Sociedad Mexicana de Ingeniería Mecánica (Mexico); Koninklijk Instituut van Ingenieurs (Netherlands); Institution of Professional Engineers, New Zealand; Norwegian Society of Chartered Engineers; Philippine Society of Mechanical Engineers; Polish Society of Mechanical Engineers & Technicians; Ordem Dos Engenheiros (Portugal); Romanian Society of Mechanical Engineers; Russian Academy of Sciences (formerly the USSR Academy of Sciences); Nuclear Society of Russia; Union of Mechanical and Electrical Engineers and Technicians of Serbia; Institution of Engineers, Singapore; Slovak Mechanical Engineering Society; Association of Mechanical Engineers and Technicians of Slovenia; South African Institution of Mechanical Engineers; Federacion de Asociaciones de Ingenieros Industriales de Espana (Spain); Svenska Mekanisters Riksförening (Sweden); Association of Professional Engineers of Trinidad & Tobago; Turkish Chamber of Mechanical Engineers; Academy of Sciences of Ukraine; Institution of Mechanical Engineers (U.K.); Institute of Energy (U.K.) (formerly Institute of Fuel); Colegio de Ingenieros de Venezuela; International Institute of Acoustics and Vibration.

### **Conference Publications**

*Dufferin Room, Second Floor, Near Registration Desk*

Papers presented at the ASME PVP 2012 Conference are published on a CD available at the Conference. Information on paper titles and authors are included in the final program. All attendees registered for the entire

Conference (i.e., Full Registration) will receive a coupon redeemable for one CD containing all the technical papers presented in the Conference.

Bound volumes of the Conference Proceedings may be ordered at the Conference, for post-conference shipping, subject to there being sufficient demand for the respective volumes. A list of volumes is available in the Conference publication room, which features a variety of ASME publications.

### **Ship Your Conference Proceedings**

You can ship your ASME Publications to your home or office right from the Conference. Bring your books to the shipping booth in the Publication Sales room, and they will be packaged and shipped for you. Inquire at the Publication Sales room for location and fees.

### **Disabled Registrants**

Whenever possible, arrangements can be made for disabled registrants, if advance notice is given. Please indicate any special needs on the registration form, or contact Melissa Torres at [TorresM@asme.org](mailto:TorresM@asme.org) with your request.

### **Tax Deductibility**

Expenses of attending professional meetings have been held to be tax deductible as ordinary business expenses for U.S. citizens. Please check changes in the tax code for the current level of deduction, as this is subject to change.

### **Guest/Family Programs**

Guests and family members of registrants are welcome at the Guest Programs that include: A Day in Niagara, (Monday), the Conference Wide Reception at the Sheraton Centre Toronto Hotel (Monday evening), the Toronto City Tour with Stop at Casa Loma and the Distillery (Tuesday), the Conference Social Event, Evening at Atlantis Pavilion (Wednesday evening), and for a daily (i.e., Monday–Thursday) Breakfast in the Churchill Room, Second Floor. Badges are required for admission to all events.

A guest program activities packet is also included. Please indicate how many guests you will be bringing on your registration form, so that the necessary accommodations can be arranged.

Please note that the tours and Wednesday Evening Social event have an associated fee for participants, as is shown on the registration form, and in this booklet. Early registration is strongly recommended for the events that require fees, as they are available only on a first-come, first-served basis.

### **Professional Development Hours Now Available**

Professional Development Hours are now available for your attendance at the PVP Conference. Simply stop by the registration desk and fill out a certificate request form with the sessions that you have attended. The certificates can then be picked up on Thursday at the registration desk.

### **Publishing Conference Papers in the ASME Journal of Pressure Vessels Technology**

Technical papers presented at the ASME PVP 2012 Conference are published in the form of the ASME Conference Proceedings on a CD. Publication of papers in these proceedings does not preclude authors from publishing their papers in ASME archival journals, such as the ASME

Journal of Pressure Vessel Technology (i.e., the *Journal*), which is the technical voice of the Pressure Vessels & Piping Division.

Authors are encouraged to submit their papers to the Journal. The Journal is edited by Dr. G. E. O. Widera, and manuscripts should be submitted to the address below. Manuscripts should be prepared according to the Journal guidelines, which can be found at the ASME web site at: <http://journaltool.asme.org/Content/index.cfm>.

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## PVP 2012 COMMITTEE MEETINGS

Date/Time	Meeting	Room	Responsible Person
<b>Sunday, July 15, 2012</b>			
8:30 am – 1:30 pm	PVPD Executive Committee	Pinnacle	R. S. Hafner
1:00 pm – 5:00 pm	Subgroup High Pressure Vessels Committee (BPV VIII)	Conference H	D.T. Peters
1:30 pm – 2:30 pm	PVP Senate	Pinnacle	L. H. Geraets
<b>Monday, July 16, 2012</b>			
8:30 am – 10:15 pm	PVPD International Coordination Committee	Pinnacle	M. A. Younan
12:15 pm – 1:45 pm	PVPD Codes & Standards Technical Committee	York	K. Hasegawa
12:15 pm – 1:45 pm	PVPD Design & Analysis Technical Committee	Conference H	W. Koves
12:15 pm – 1:45 pm	PVPD Fluid-Structure Interaction Technical Committee	Gingersnap	J.-C. Jo
12:15 pm – 1:45 pm	PVPD Operations, Applications & Components Technical Committee	Goldrush	S. J. Hensel
<b>Tuesday, July 17, 2012</b>			
8:30 am – 10:15 am	ASME NDE Executive Committee	Goldrush	W. T. Springer
10:30 am – 12:15 pm	PVPD Communications Committee	Gingersnap	M. B. Ruggles-Wrenn
12:15 pm – 1:45 pm	PVPD Computer Technology & Bolted Joints Technical Committee	York	H. A. Bouzid
12:15 pm – 1:45 pm	PVPD High Pressure Technology Technical Committee	Conference H	J. Keltjens
12:15 pm – 1:45 pm	PVPD Materials & Fabrication Technical Committee	Civic BR S.	D. A. Scarth
12:15 pm – 1:45 pm	PVPD Seismic Engineering Technical Committee	Gingersnap	S. Karamanos
2:00 pm – 3:45 pm	PVPD Professional Development	Conference H	M. E. Nitzel
4:00 pm – 5:45 pm	PVPD Honors & Awards Committee	Civic BR S.	D. A. Scarth
4:00 pm – 5:45 pm	PVP2013/2014 Program Committee	Gingersnap	M. E. Nitzel
<b>Wednesday, July 18, 2012</b>			
8:30 am – 5:45 pm	Subgroup High Pressure Vessels Committee (BPV VIII)	Conference H	D.T. Peters
10:30 am – 12:15 pm	JPVT Editors	York	G.E.O. Widera
<b>Thursday, July 19, 2012</b>			
8:30 am – 12:15 pm	PVPD Executive Committee	Gingersnap	M. E. Nitzel
12:30 pm – 3:45 pm	PVPD General Committee	Civic BR S.	M. E. Nitzel
4:00 pm – 5:45 pm	PVPD Conference Evaluation	Civic BR S.	D.T. Peters

Pinnacle room is on the 43rd Floor.

## PUBLICATIONS

Papers presented at the 2012 PVP Conference will be published in bound volumes, to be purchased at the Conference for post-conference shipping, subject to sufficient demand from the authors. The list of volumes is presented below. Other books of interest, Codes & Standards, Transactions, Journals, and free literature regarding ASME publications will be available at the Conference.

During the Conference, all publications will be sold at the ASME member price. Prepaid orders will be taken for publications that are not available at the Conference. All fully-paid Conference registrants will receive a CD-ROM containing the papers presented at PVP2012. A complete set of the volumes covering the 2012 PVP Conference publications may be purchased as a package at a 10% discount. ASME accepts payment in cash (\$US), checks (\$US), travelers' checks (\$US), VISA, MasterCard, American Express, Diners Club, and Discover (all credit card charges in \$US). Technical papers and bound volumes may be ordered after the Conference by contacting the ASME Order Department, 22 Law Drive, P.O. Box 2300, Fairfield, NJ 07007-2300 or by calling 1-800-THE-ASME. Payment by check or credit card (VISA, MasterCard, American Express, Diners Club, and Discover) must accompany your order. California, Georgia, Illinois, and Texas purchasers must add the appropriate sales tax or furnish a tax exemption certificate. Non-US checks are not accepted.

You may also ship your Conference publications home, or to your office, right from the Publication Sales. A shipping booth will be set up for your convenience, so you do not have to carry your books home.

The Publication Sales area, located in the Dufferin Room, Second Floor, near the Registration Desk, will be open during the following hours:

Sunday, July 15	3:00 pm – 6:00 pm
Monday, July 16	8:00 am – 4:00 pm
Tuesday, July 17	8:00 am – 4:00 pm
Wednesday, July 18	8:00 am – Noon
Thursday, July 19	8:00 am – 3:00 pm

<b>Volume Title and Volume Editor(s)</b>	<b>Volumes</b>	<b>No. of Papers</b>	<b>Conference Price</b>
<b>Codes &amp; Standards—2012</b> edited by B. Bezensek and K. Hasegawa (Topics include Structural Integrity of Pressure Components; Ratcheting and Fatigue Issues; Environmental Fatigue Issues; Interaction and Flaw Modeling for Multiple Flaws; ASME Section XI; Recent Developments in ASME, Japanese, Chinese, European Codes & Standards; High Temperature; Integrity Issues for Buried Pipes; Repair, Replacement and Mitigation for Fitness-for-Service Rules; Probabilistic and Risk Based Assessment; Combination of Multiple Loads; HDPE Pipe and Related Issues; Integrity of Cast Stainless Steel Pipes; Section III for Elevated Temperature Service; Modern FE Methods)	97	97	\$ 55
<b>Computer Technology &amp; Bolted Joints—2012</b> edited by R. Adibi-Asl and H. Bouzid (Topics include Design and Analysis of Bolted Flange Joints; Design and Analysis of Pressure Sealed Joints; Leak Tightness and Fugitive Emissions; Assembly of Bolted Joints; Threaded Fasteners; Elevated Temperature Behavior of Bolted Joints; Computational Applications in Fatigue, Fracture, and Damage Mechanics; New and Emerging Methods of Analysis and Applications; Computational Model Verification and Experimental Qualification; Probabilistic Analysis Tools for Design and Fitness-for-Service Assessments of Components; Computational Models for Limit Load and Elastic-Plastic FEA)	39	39	\$ 35
<b>Design &amp; Analysis—2012</b> edited by S. Iyer (Topics include Pressure Vessels, Heat Exchangers and Components; Design & Analysis of Piping & Piping Components; Fatigue, Fracture & Damage Analysis; Inelastic, Nonlinear Analysis and Limit Load Analysis; Stress Classification and Design by Analysis Methodologies; Composite Materials and Structures; Thermal Stresses in Vessels, Piping and Components; Fitness for Service Evaluations and Post Construction Issues; Piping and Equipment Dynamics & Dynamic Response Analysis; Design and Analysis of Bolted Joints; Emerging Design Technologies Associated with Small Modular Reactors; Probabilistic Methods; CFD, Buckling and Special Topics)	116	116	\$ 65
<b>High-Pressure Technology, Fluid-Structure Interaction, Non-Destructive Evaluation, And Student Paper Symposium &amp; Competition—2012</b> edited by J. Keltjens, E. Rodriguez, H. Iyama, W. Springer, L. Geraets and Y. Kwon (Topics include Design, Analysis, Operation and Maintenance of High-Pressure Components and Systems; Structural Response to Highly Dynamic (Impulsive) Events; The Dave Kendall Memorial Session; Advancements in High-Pressure Technology; Codes and Standards; Thermal-Hydraulic Phenomena and Interaction with Vessels, Piping, and Components; 16th International Symposium on Emerging Technologies; Structures under Extreme Loading Conditions; Fluid-Structure Interaction Issues in Aeronautical Engineering; NDE Engineering; and student papers)	96	96	\$ 58

Volume Title and Volume Editor(s)	Volumes	No. of Papers	Conference Price
<b>Materials &amp; Fabrication—2012</b> edited by C. Truman and D. Scarth (Topics include David Lidbury Memorial Symposium on Fracture Mechanics, Failure Assessment, and International Programs in Structural Integrity; Materials for Hydrogen Service; Welding Residual Stress and Distortion Simulation and Measurement; European Programs in Structural Integrity—In Memoriam of David Lidbury; Fitness for Service and Failure Assessment; Materials and Technologies for Nuclear Power Plants; Wall Thinning Caused by Flow Accelerated Corrosion; Mechanistic Modeling of Materials; Integrity Issues in SCC and Corrosion Fatigue; Pipeline Integrity; Small-scale and Miniature Mechanical Testing; Leak-Before-Break; Plastic Pipe; Fatigue and Fracture of Welds and Heat Affected Zones; Creep and Creep-Fatigue Interaction; Composite Systems for Pressure Vessels and Piping; Advanced Materials for Pressure Applications)		146	\$ 35
<b>Operations, Applications &amp; Components—2012</b> edited by S. Hensel, Y. Shoji and G. Young (Topics include Safety, Reliability and Risk Assessment; Qualification and Testing; Monitoring, Diagnostics and Inspection; Toxic Substances: Storage and Transportation; Valves and Pumps; Operations and Maintenance of Pressure Vessels, Heat Exchangers and Structures; Aging Management and Life Extension)		41	\$ 35
<b>Seismic Engineering—2012</b> edited by T. Taniguchi (Topics include Structural Dynamics - Linear and Nonlinear; Seismic Analysis and Design of Piping Systems; Appropriate Criteria and Methods for the Seismic Design of Piping; Seismic Issues for New Reactor Licensing Activities; Seismic Isolation and Energy Absorption Systems; Base Isolation and Vibration Control Systems; Seismic Evaluation of Systems, Structures, and Components; Seismic Response and Design of Storage Tanks, Piping and Other Components; Seismic Response Mitigation, Optimization and Damping Systems)		29	\$ 30



# Call for Papers

## 2013 ASME PVP Conference

July 14–18, 2013

Paris, France

### The International Scene of Pressure Vessels & Piping

The ASME 2013 PVP Conference promises to be the outstanding international technical forum for participants to further their knowledge-base by being exposed to diverse topics, and exchange opinions and ideas both from industry and academia in a variety of topics related to Pressure Vessel and Piping technologies for the Power and Process Industries. PVP is looking forward to fruitful technical exchanges with participants from Europe, Africa, the Middle East, Asia, the Americas, and the Oceania Islands.

The ASME Pressure Vessels & Piping Division is the primary sponsor of the PVP 2013 Conference, with additional participation by the ASME Nondestructive Examination (NDE) Division. More than 175 paper and panel sessions are planned, as well as workshops, tutorials, NDE and Software Demonstration Forums, and the ASME PVP Student Paper Competition & Symposium.

The initial **CALL FOR PAPERS** provides guidance for planning the dates for submitting abstracts for the 2013 PVP Conference based upon the Technical Committee topics listed below. Specific Calls for Papers will be available from the Technical Committees at the ASME 2013 PVP Conference web site which will be open and available in the summer of 2012.

**TECHNICAL COMMITTEE TOPICS:** (1) Codes & Standards; (2) Computer Technology & Bolted Joints; (3) Design & Analysis; (4) Fluid- Structure Interaction; (5) High Pressure Technology; (6) Materials & Fabrication; (7) Operations, Applications, & Components; (8) Seismic Engineering; (9) Non-Destructive Examination; and (10) the Student Paper Competition and Symposium.

**SCHEDULE:** Abstracts are due by **November 11, 2012**. Authors will be notified of abstract acceptance by **December 5, 2012**. Draft papers are due by **February 13, 2013**. Paper peer review comments will be returned by **March 12, 2013**. A Copyright Agreement Form for each paper and the final manuscripts in the standard ASME format for publication must be received by **April 9, 2013**. All accepted papers will be published via CD-ROM.

**CONFERENCE INFORMATION:** The Paris Marriott Rive Gauche is one of Europe's finest conference hotels and is conveniently located near the Paris Metro, providing attendees with easy transportation to many of the city's major tourist attractions. Come join your colleagues and visit such notable attractions such as the Eiffel Tower, Jardins du Luxembourg, the Panthéon, Arc de Triomphe, École Militaire, and a host of other breath taking attractions.

#### PVP Conference Co-Chair

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## SESSION TITLES BY SESSION BLOCK

Sessions are arranged in Session Blocks in the format X.YZ, where: X indicates the Day, Y indicates the Session Block, and Z indicates the Conference Session Room. Conference Session Rooms are as follows: A = Dominion or Osgoode Ballroom; B = Elgin; C = Wentworth; D = Kenora; E = Huron; F = Kent; G = Conference F; H = Conference G; I = Simcoe; J = Windsor W.; K = Windsor E.; L = Conference B; M = Conference C; N = Not Used; O = Not Used; P = City Hall; Q = Civic Ballroom N.; R = Essex Ballroom; S = Civic Ballroom S.; T = Civic and Essex Foyers. The parenthetical designations are the Technical Committee session references.

The Technical Committee acronyms used are shown below:

- CS = Codes & Standards
- CT = Computer Technology & Bolted Joints
- DA = Design & Analysis
- FSI = Fluid-Structure Interaction
- HPT = High Pressure Technology
- MF = Materials \* Fabrication
- NDE = ASME Nondestructive Evaluation Division
- OAC = Operations, Applications, and Components
- SE = Seismic Engineering
- SPC = Rudy Scavuzzo Student Paper Symposium & Student Paper Competition
- TW = Technical Tutorials and Workshops

All sessions are sponsored by the indicated Technical Committee unless specifically noted in the daily listing of individual sessions beginning on page 20.

### Sunday, July 15, 2012

**Block 0.1: Sunday July 15, 2012 (9:00 am – 11:30 am)**

0.1S (TW-1) SPECIAL TUTORIAL I: MICROWAVE NDE TECHNIQUES FOR RUBBER EXPANSION JOINTS AND HDPE BUTT FUSIONS IN POWER PLANTS

**Block 0.2: Sunday July 15, 2012 (1:00 pm – 3:30 pm)**

0.2S (TW-2) SPECIAL TUTORIAL I: PROCESS AND BENEFITS OF ASME PRESSURE TECHNOLOGY CODES & STANDARDS DEVELOPMENT

**Block 0.3: Sunday July 15, 2012 (4:00 p.m. – 6:00 p.m.)**

0.3S (TW-3) SPECIAL TUTORIAL II: EFFECTIVE NETWORKING

### Monday, July 16, 2012

**Block 1.1: Monday, July 16, 2012 (8:30 am – 10:15 pm)**

1.1B (CS-3-1) RATCHETING AND FATIGUE ISSUES  
 1.1C (SE-1-1) INTERIM REPORTS ON DAMAGE OF MECHANICAL FACILITIES  
 1.1D (CS-2-1) STRUCTURAL INTEGRITY OF PRESSURE COMPONENTS—I  
 1.1E (OAC-1-1) SAFETY, RELIABILITY, AND RISK ASSESSMENT  
 1.1F (FSI-8-1) DR. S. S. CHEN MEMORIAL SESSION  
 1.1G (CT-12-1) ELASTIC-PLASTIC ANALYSIS USING IMPLICIT AND EXPLICIT FEA

1.1H (DA-5-1) STRESS CLASSIFICATION & DESIGN BY ANALYSIS METHODOLOGIES  
 1.1I (DA-15-1) PROBABILISTIC METHODS IN DESIGN AND ANALYSIS  
 1.1J (HP-4-1) ADVANCEMENTS IN HIGH PRESSURE TECHNOLOGY  
 1.1L (MF-4-1) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—I  
 1.1M (MF-6-1) FITNESS FOR SERVICE AND FAILURE ASSESSMENT—I  
 1.1P (CS-5-1) INTERACTION AND FLAW MODELING FOR MULTIPLE FLAWS  
 1.1Q (DA-1-1) DESIGN AND ANALYSIS OF PRESSURE VESSELS AND COMPONENTS  
 1.1R (MF-5-1) EUROPEAN PROGRAMS IN STRUCTURAL INTEGRITY—I  
 1.1T (MF-15-1) NDE DEMONSTRATION FORUM I

**Block 1.2: Monday, July 16, 2012 (10:30 am – 12:15 pm)**

1.2A (TW-4) OPENING CEREMONY AND PLENARY LECTURES  
 1.2T (MF-15-2) NDE DEMONSTRATION FORUM II

**Block 1.3: Monday, July 16, 2012 (2:00 pm – 3:45 pm)**

1.3B (NDE-3-1) RECENT DEVELOPMENTS IN NDE TECHNOLOGY I  
 1.3C (SE-15-1) SEISMIC RESPONSE MITIGATION, OPTIMIZATION AND DAMPING SYSTEMS  
 1.3D (CS-2-2) STRUCTURAL INTEGRITY OF PRESSURE COMPONENTS—II  
 1.3E (OAC-2-1) MODELING AND INSPECTION QUALIFICATION  
 1.3F (FSI-1-1) THERMAL-HYDRAULIC PHENOMENA AND INTERACTIONS I  
 1.3G (CT-1-1) DESIGN AND ANALYSIS OF BOLTED JOINTS  
 1.3H (DA-6-1) COMPOSITE MATERIALS AND STRUCTURES  
 1.3I (DA-4-1) LIMIT LOAD ANALYSIS  
 1.3J (SPC-1-1) 20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—I  
 1.3K (SPC-2-1) STUDENT PAPER SYMPOSIUM—I  
 1.3L (MF-4-2) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—II  
 1.3M (MF-6-3) FITNESS FOR SERVICE AND FAILURE ASSESSMENT—II  
 1.3P (CS-10-1) RECENT ACTIVITIES OF JAPANESE FITNESS-FOR-SERVICE CODES  
 1.3Q (DA-3-1) INTEGRITY OF REACTOR VESSEL  
 1.3R (MF-18-1) ANALYSIS OF FATIGUE, FRACTURE AND HYDROGEN EMBITTERMENT OF WELDS—I  
 1.3S (TW-5) USE OF CFD IN DESIGN—PART I  
 1.3T (MF-15-3) NDE DEMONSTRATION FORUM III



**Block 1.4: Monday, July 16, 2012 (4:00 pm – 5:45 pm)**

- 1.4B (HP-1-1) DESIGN, ANALYSIS, OPERATION, AND MAINTENANCE OF HIGH-PRESSURE EQUIPMENT
- 1.4C (SE-4-1) SEISMIC ANALYSIS AND DESIGN OF PIPING SYSTEMS
- 1.4D (CS-4-1) ENVIRONMENTAL FATIGUE ISSUES
- 1.4E (OAC-3-1) MONITORING, DIAGNOSTICS AND INSPECTION
- 1.4F (FSI-1-2) THERMAL-HYDRAULIC PHENOMENA AND INTERACTIONS II
- 1.4G (CT-2-1) DESIGN AND ANALYSIS OF PRESSURE SEALED JOINTS
- 1.4H (DA-6-2) COMPOSITE MATERIALS AND STRUCTURES
- 1.4I (DA-4-2) SHAKEDOWN AND RATCHETING ANALYSIS
- 1.4J (SPC-1-2) 20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—2
- 1.4K (SPC-2-2) STUDENT PAPER SYMPOSIUM—2
- 1.4L (MF-4-3) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—III
- 1.4M (MF-6-4) FITNESS FOR SERVICE AND FAILURE ASSESSMENT—III
- 1.4P (CS-10-2) ADVANCED ANALYSIS METHODS AND APPLICATIONS ON RESIDUAL STRESS AND CRACK PROPAGATION
- 1.4Q (DA-3-2) FATIGUE EVALUATION
- 1.4R (MF-5-2) EUROPEAN PROGRAMS IN STRUCTURAL INTEGRITY—II
- 1.4S (TW-6) USE OF CFD IN DESIGN—PART II
- 1.4T (MF-15-4) NDE DEMONSTRATION FORUM IV

**Tuesday, July 17, 2012****Block 2.1: Tuesday, July 17, 2012 (8:30 am – 10: 15 am)**

- 2.1B (HP-3-1) THE DAVE KENDALL MEMORIAL SESSION
- 2.1C (SE-7-1) SEISMIC ISOLATION AND ENERGY ABSORPTION SYSTEMS
- 2.1D (CS-9-1) RECENT DEVELOPMENTS IN ASME CODES AND STANDARDS
- 2.1E (OAC-4-1) TOXIC SUBSTANCES: THERMAL EVALUATION—I
- 2.1F (FSI-3-1) DYNAMIC EXCITATION OF TUBES AND TUBE BUNDLES
- 2.1G (CT-3-1) LEAK TIGHTNESS AND FUGITIVE EMISSIONS
- 2.1H (DA-2-1) DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—I
- 2.1I (DA-14-1) SMALL MODULAR REACTORS & TOPICS IN BUCKLING
- 2.1J (SPC-1-3) 20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—3
- 2.1K (SPC-2-3) STUDENT PAPER SYMPOSIUM—3
- 2.1L (MF-31-1) INFRASTRUCTURE ASSESSMENT FOR AGING AND EMERGING ENERGY TECHNOLOGIES—I
- 2.1M (MF-19-1) CREEP DEFORMATION AND LIFTING
- 2.1P (CS-15-1) INTEGRITY ISSUES FOR BURIED PIPE

- 2.1Q (DA-12-1) BOLTED JOINT DESIGN—EXTREME LOADING CONDITIONS
- 2.1R (MF-18-2) ANALYSIS OF FATIGUE, FRACTURE AND HYDROGEN EMBRITTLMENT OF WELDS—II
- 2.1S (TW-7) PRACTICAL PIPING VIBRATION PART I
- 2.1T (CT-14-1) SOFTWARE DEMONSTRATION FORUM I

**Block 2.2: Tuesday, July 17, 2012 (10:30 am – 12:15 pm)**

- 2.2B (NDE-3-2) RECENT DEVELOPMENTS IN NDE TECHNOLOGY II
- 2.2C (MF-4-4) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—IV
- 2.2D (CS-18-1) PROBABILISTIC AND RISK BASED ASSESSMENT FOR CODES AND STANDARDS
- 2.2E (OAC-4-2) TOXIC SUBSTANCES: THERMAL EVALUATION—II
- 2.2F (FSI-3-2) FLUID STRUCTURE INTERACTION AND PLANT COMPONENTS
- 2.2G (CT-4-1) ASSEMBLY AND TIGHTENING OF BOLTED JOINTS
- 2.2H (DA-2-2) DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—II
- 2.2I (DA-4-3) NONLINEAR ANALYSIS
- 2.2J (SPC-1-4) 20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—4
- 2.2K (SPC-2-4) STUDENT PAPER SYMPOSIUM—4
- 2.2L (MF-32-1) PANEL SESSION: INFRASTRUCTURE ASSESSMENT FOR AGING AND EMERGING ENERGY TECHNOLOGIES—II
- 2.2M (MF-19-2) CREEP BEHAVIOR OF WELDMENTS
- 2.2P (CS-15-2) INSPECTION OF BURIED PIPE
- 2.2Q (DA-12-2) BOLTED JOINT DESIGN—PRACTICAL CONSIDERATIONS
- 2.2R (MF-5-3) EUROPEAN PROGRAMS IN STRUCTURAL INTEGRITY—III
- 2.2S (TW-8) PRACTICAL PIPING VIBRATION PART II
- 2.2T (CT-14-2) SOFTWARE DEMONSTRATION FORUM II

**Block 2.3: Tuesday, July 17, 2012 (2:00 pm – 3:45 pm)**

- 2.3B (NDE-3-3) RECENT DEVELOPMENTS IN NDE TECHNOLOGY III
- 2.3C (SE-6-1) SEISMIC ISSUES FOR NEW REACTOR LICENSING ACTIVITIES
- 2.3D (CS-8-1) ASME CODE SECTION XI ACTIVITIES—I
- 2.3E (OAC-4-3) TOXIC SUBSTANCES: STRUCTURAL EVALUATION—I
- 2.3F (FSI-3-3) FLUID STRUCTURE INTERACTION AND WAVE PROPAGATION
- 2.3G (CT-5-1) THREADED FASTENERS
- 2.3H (DA-2-3) DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—III
- 2.3I (DA-8-1) THERMAL STRESSES—I
- 2.3K (MF-3-1) MATERIALS FOR HYDROGEN SERVICE
- 2.3L (MF-4-6) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—VI
- 2.3M (MF-19-3) CREEP CRACK INITIATION AND GROWTH
- 2.3P (CS-24-1) USE OF MODERN FE METHODS FOR CODE ASSESSMENT—I
- 2.3Q (DA-3-3) CREEP AND CORROSION

- 2.3R (MF-2-1) THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—I  
 2.3T (CT-14-3) SOFTWARE DEMONSTRATION FORUM III

**Block 2.4: Tuesday, July 17, 2012 (4:00 pm – 5:45 pm)**

- 2.4B (HP-8-1) CODES AND STANDARDS IN HIGH-PRESSURE TECHNOLOGY  
 2.4C (SE-9-1) BASE ISOLATION AND VIBRATION CONTROL SYSTEMS  
 2.4D (CS-8-2) ASME CODE SECTION XI ACTIVITIES—II  
 2.4E (OAC-4-5) TOXIC SUBSTANCES: STRUCTURAL EVALUATION—II  
 2.4F (FSI-3-4) SHOCK WAVE PROPAGATION  
 2.4G (CT-6-1) ELEVATED TEMPERATURE BEHAVIOR OF BOLTED JOINTS  
 2.4H (DA-2-4) DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—IV  
 2.4I (DA-8-2) THERMAL STRESSES—II  
 2.4K (MF-12-1) PIPELINE INTEGRITY—I  
 2.4L (MF-4-7) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—VII  
 2.4M (MF-19-4) CREEP-FATIGUE INTERACTION  
 2.4P (CS-24-2) USE OF MODERN FE METHODS FOR CODE ASSESSMENT—II  
 2.4Q (DA-1-2) DESIGN AND ANALYSIS OF HEAT EXCHANGERS AND COMPONENTS  
 2.4R (MF-2-2) THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—II  
 2.4T (CT-14-4) SOFTWARE DEMONSTRATION FORUM IV

**Wednesday, July 18, 2012**

**Block 3.1: Wednesday, July 18, 2012 (8:30 am – 10:15 am)**

- 3.1B (HP-2-1) STRUCTURAL RESPONSE OF VESSELS TO EXPLOSIVE EVENTS—I  
 3.1C (SE-10-1) SEISMIC EVALUATION OF SYSTEMS, STRUCTURES, & COMPONENTS I  
 3.1D (CS-21-1) HDPE PIPE AND RELATED ISSUES IN CODES AND STANDARDS  
 3.1E (OAC-4-4) TOXIC SUBSTANCES: MISCELLANEOUS TOPICS  
 3.1F (FSI-4-1) STRUCTURES UNDER EXTREME LOADING CONDITIONS  
 3.1G (CT-7-1) COMPUTATIONAL APPLICATIONS IN FATIGUE, FRACTURE, AND DAMAGE MECHANICS  
 3.1H (DA-11-1) PIPING AND EQUIPMENT DYNAMICS—I  
 3.1K (MF-14-1) LEAK-BEFORE-BREAK—I  
 3.1L (MF-4-8) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—VIII  
 3.1M (MF-10-1) MECHANISTIC MODELING OF MATERIALS—I  
 3.1P (CS-20-1) COMBINATION OF MULTIPLE LOADS FOR WALL THINNING

- 3.1Q (DA-3-4) PIPING INTEGRITY I  
 3.1R (MF-2-3) THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—III

**Block 3.2: Wednesday, July 18, 2012 (10:30 am – 12:15 pm)**

- 3.2B (HP-2-2) STRUCTURAL RESPONSE OF VESSELS TO EXPLOSIVE EVENTS—II  
 3.2C (SE-13-1) SEISMIC RESPONSE AND DESIGN OF STORAGE TANKS, PIPING AND OTHER COMPONENTS  
 3.2D (CS-22-1) INTEGRITY EVALUATIONS OF CAST STAINLESS STEEL PIPE  
 3.2E (OAC-5-1) OAC-5.1: VALVES AND PUMPS  
 3.2F (NDE-4-1) CORROSION INSPECTION ISSUES  
 3.2G (CT-8-1) NEW AND EMERGING METHODS OF ANALYSIS AND APPLICATIONS  
 3.2H (DA-11-2) PIPING AND EQUIPMENT DYNAMICS—II  
 3.2I (DA-8-3) THERMAL STRESSES—III  
 3.2K (MF-12-2) PIPELINE INTEGRITY—II  
 3.2L (MF-4-9) WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—IX  
 3.2M (MF-10-2) MECHANISTIC MODELING OF MATERIALS—II  
 3.2P (CS-20-2) COMBINATION OF MULTIPLE LOADS FOR CRACK EVALUATIONS  
 3.2R (MF-2-4) THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—IV

**Thursday, July 19, 2012**

**Block 4.1: Thursday, July 19, 2012 (8:30 am – 10:15 pm)**

- 4.1B (NDE-4-2) PLANT INSPECTION ISSUES  
 4.1C (SE-3-1) STRUCTURAL DYNAMICS—LINEAR AND NONLINEAR  
 4.1D (CS-13-1) RECENT DEVELOPMENTS IN EUROPEAN CODES AND STANDARDS  
 4.1E (OAC-6-1) FAILURE, REPAIR, AND FITNESS-FOR-SERVICE  
 4.1F (FSI-6-1) FSI ISSUES IN AERONAUTICAL ENGINEERING & SLOSHING TOPICS  
 4.1G (CT-9-1) COMPUTATIONAL MODEL VERIFICATION AND EXPERIMENTAL QUALIFICATION  
 4.1H (DA-9-1) FITNESS FOR SERVICE—I  
 4.1I (DA-16-1) CFD, BUCKLING & SPECIAL TOPICS IN DESIGN & ANALYSIS  
 4.1J (DA-12-3) PANEL SESSION: INTERNATIONAL PROGRESS IN BOLTED JOINT INTEGRITY—I  
 4.1K (MF-14-2) LEAK-BEFORE-BREAK—II  
 4.1L (MF-7-1) MATERIALS AND TECHNOLOGIES FOR NUCLEAR POWER PLANTS  
 4.1M (MF-26-1) ADVANCED MATERIALS FOR PRESSURE APPLICATIONS  
 4.1P (CS-12-1) INTEGRITY MANAGEMENT  
 4.1Q (DA-3-5) PIPING INTEGRITY II

4.1R (MF-2-5) THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—V

**Block 4.2: Thursday, July 19, 2012 (10:30 am – 12:15 pm)**

4.2B (HP-2-3) STRUCTURAL RESPONSE OF PIPING SYSTEMS TO GASEOUS DETONATIONS—I  
4.2C (SE-5-1) FORUM ON APPROPRIATE CRITERIA AND METHODS FOR THE SEISMIC DESIGN OF PIPING SYSTEMS  
4.2D (CS-14-1) HIGH TEMPERATURE CODES AND STANDARDS  
4.2E (OAC-6-2) PLANT DESIGN AND OPERATIONS  
4.2G (CT-10-1) PROBABILISTIC ASSESSMENT OF COMPONENT/STRUCTURAL INTEGRITY  
4.2H (DA-9-2) FITNESS FOR SERVICE—II  
4.2J (DA-12-4) PANEL SESSION: INTERNATIONAL PROGRESS IN BOLTED JOINT INTEGRITY—II  
4.2L (MF-9-1) WALL THINNING CAUSED BY FLOW ACCELERATED CORROSION  
4.2M (MF-13-1) SMALL-SCALE AND MINIATURE MECHANICAL TESTING  
4.2P (CS-12-2) ENGINEERING FAILURE ANALYSIS  
4.2Q (DA-3-6) EVALUATION OF FRACTURE TOUGHNESS

4.2R (MF-2-6) THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—VI

**Block 4.3: Thursday, July 19, 2012 (2:00 pm – 3:45 pm)**

4.3D (CS-23-1) SECTION III CODES AND STANDARDS ACTIVITIES FOR ELEVATED TEMPERATURE SERVICE  
4.3E (OAC-8-1) AGING MANAGEMENT AND LICENSE RENEWAL—I  
4.3H (DA-9-3) FITNESS FOR SERVICE—III  
4.3L (MF-16-1) PLASTIC PIPE  
4.3P (CS-12-3) EXTREME PRESSURE EQUIPMENT  
4.3Q (DA-3-7) CASE STUDIES  
4.3R (MF-25-1) COMPOSITE PRESSURE VESSELS

**Block 4.4: Thursday, July 19, 2012 (4:00 pm – 5:45 pm)**

4.4D (CS-17-1) REPAIR, REPLACEMENT, AND MITIGATION FOR FITNESS-FOR-SERVICE RULES  
4.4E (OAC-8-2) AGING MANAGEMENT AND LICENSE RENEWAL II  
4.4L (MF-11-1) INTEGRITY ISSUES IN SCC AND CORROSION FATIGUE  
4.4P (CS-12-4) STRUCTURAL INTEGRITY  
4.4R (MF-25-2) COMPOSITE PIPING SYSTEMS

## DAILY SESSION LISTING

Sessions are arranged in Session Blocks in the format X.YZ, where: X indicates the Day, Y indicates the Session Block, and Z indicates the Conference Session Room. Conference Session Rooms are as follows: A = Dominion or Osgoode Ballroom; B = Elgin; C = Wentworth; D = Kenora; E = Huron; F = Kent; G = Conference F; H = Conference G; I = Simcoe; J = Windsor W.; K = Windsor E.; L = Conference B; M = Conference C; N = Not Used; O = Not Used; P = City Hall; Q = Civic Ballroom N.; R = Essex Ballroom; S = Civic Ballroom S.; T = Civic and Essex Foyers. The parenthetical designations are the Technical Committee session references.

The Technical Committee acronyms used are shown below:

- CS = Codes & Standards
- CT = Computer Technology & Bolted Joints
- DA = Design & Analysis
- FSI = Fluid-Structure Interaction
- HPT = High Pressure Technology
- MF = Materials \* Fabrication
- NDE = ASME Nondestructive Evaluation Division
- OAC = Operations, Applications, and Components
- SE = Seismic Engineering
- SPC = Rudy Scavuzzo Student Paper Symposium & Student Paper Competition
- TW = Technical Tutorials and Workshops

Note: Unless specifically listed in the individual sessions below, all sessions are sponsored by the indicated Technical Committee.

### SUNDAY, JULY 15

#### Block 0.1: Sunday July 15 (9:00 am – 11:30 am)

##### SESSION 0.1S (TW-1)

*Sunday July 15, 9:00 am – 11:30 am, 2nd Floor, Civic Ballroom South*

##### **MICROWAVE NDE TECHNIQUES FOR RUBBER EXPANSION JOINTS AND HDPE BUTT FUSIONS IN POWER PLANTS**

**Sponsored by ILD/Evisive, Inc.**

Presented by: R. Stakenborghs, ILD/Evisive, Inc., Baton Rouge, LA, USA

#### Block 0.2: Sunday July 15 (1:00 pm – 3:30 pm)

##### SESSION 0.2S (TW-2)

*Sunday July 15, 1:00 pm – 3:30 pm, 2nd Floor, Civic Ballroom South*

##### **SPECIAL TUTORIAL I: PROCESS AND BENEFITS OF ASME PRESSURE TECHNOLOGY CODES & STANDARDS DEVELOPMENT**

**Sponsored by the PVP Division Conference Committee**

Presented by: W. Bees, Consulting Engineer, Wadsworth, OH USA; G. Karcher, Chair of the Board on Pressure Technology Codes and Standards, Little Egg Harbor, NJ, USA

#### Block 0.3: Sunday July 15 (4:00 pm – 6:00 pm)

##### SESSION 0.3S (TW-3)

*Sunday July 15, 4:00 pm – 6:00 pm, 2nd Floor, Civic Ballroom South*

##### **SPECIAL TUTORIAL II: EFFECTIVE NETWORKING**

**Sponsored by the ASME Ontario, Canada, Section and the PVP Division Conference Committee**

Presented by: D. Messer, ConnectUsCanada, Oakville, ON, Canada

### MONDAY, JULY 16

#### Block 1.1: Monday, July 16 (8:30 am – 10:15 pm)

##### SESSION 1.1B (CS-3-1)

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Elgin*

##### **RATCHETING AND FATIGUE ISSUES**

**Sponsored by the Codes & Standards and Computer Technology & Bolted Joints Technical Committees**

Developed by: R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada; W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada

Chair: H. Chen, University of Strathclyde, Glasgow, United Kingdom

Co-Chair: R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

##### **PVP2012-78485: SHAKEDOWN AND RATCHETING ASSESSMENT OF A TUBEPLATE USING THE LINEAR MATCHING METHOD**

H. Reece-Barkell, Frazer-Nash Consultancy, Plymouth, Devon, United Kingdom; M. Stevens, Frazer-Nash Consultancy, Bristol, United Kingdom; D. Tipping, EDF Energy Nuclear Generation Ltd., Gloucester, United Kingdom; J. Sole, Cambridge University, Cambridge, United Kingdom

##### **PVP2012-78513: RELIEF VALVE STRESS AND FATIGUE ASSESSMENT USING NON-LINEAR ANALYSIS AND CFD**

D. Griffin, J. Kelly, G. Bowie, D. Hunt, A. Fletcher, G. Reed, Assystem UK, Sunderland, Tyne and Wear, United Kingdom; P. Hugill, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

##### **PVP2012-78516: RATCHET BOUNDARY EVALUATION AND COMPARISON WITH RATCHETTING EXPERIMENTS INVOLVING STRAIN HARDENING MATERIAL MODELS**

H. Indermohan, W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada

##### **PVP2012-78660: SHAKEDOWN AT THERMAL DISCONTINUITIES INVOLVING THERMAL MEMBRANE AND THERMAL BENDING STRESS**

W. Reinhardt, A. Asadkarami, Candu Energy Inc., Mississauga, ON, Canada

### **SESSION 1.1C (SE-1-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Wentworth*

#### **INTERIM REPORTS ON DAMAGE OF MECHANICAL FACILITIES**

Developed by: S. Fujita, Tokyo Denki University, Tokyo, Japan; T. Taniguchi, Tottori University, Tottori, Japan; O. Furuya, Tokyo City University, Tokyo, Japan

Chair: S. A. Karamanos, University of Thessaly, Volos, Greece

Co-Chair: C.-S. Tsai, Feng Chia University, Taichung, Taiwan

#### **PVP2012-78894: OVERVIEW OF THE 2011 OFF THE PACIFIC COAST OF TOHOKU EARTHQUAKE (Presentation Only)**

T. Taniguchi, Tottori University, Tottori, Japan

#### **PVP2012-78895: DAMAGES ON MECHANICAL FACILITIES (Presentation Only)**

O. Furuya, Tokyo City University, Tokyo, Japan

#### **PVP2012-78896: DAMAGES ON TRANSPORTATION FACILITIES (Presentation Only)**

T. Kamada, Tokyo University of Agriculture & Technology, Tokyo, Japan

### **SESSION 1.1D (CS-2-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Kenora*

#### **STRUCTURAL INTEGRITY OF PRESSURE COMPONENTS—I**

Developed by: B. S. Antaal, AMEC, Calgary, AB, Canada

Chair: B. Shitolé, AMEC, Calgary, AB, Canada

Co-Chair: B. S. Antaal, AMEC, Calgary, AB, Canada

#### **PVP2012-78021: DEVELOPMENT OF LOAD MULTIPLIERS (Z-FACTORS) IN ELASTIC-PLASTIC FRACTURE MECHANICS EVALUATION IN RULES ON FITNESS-FOR-SERVICE FOR NUCLEAR POWER PLANTS**

S. Asada, Mitsubishi Heavy Industries, Ltd., Kobe, Japan; M. Itatani, Toshiba Corporation, Yokohama, Japan; N. Miura, Central Research Institute of Electric Power Industry, Yokosuka, Japan; H. Machida, TEPCO Systems Corporation, Tokyo, Japan

#### **PVP2012-78734: A FRACTURE MECHANICS EVALUATION OF BWR VESSEL WATER LEVEL INSTRUMENTATION NOZZLE FOR P-T CURVE ASSESSMENT INCLUDING IRRADIATION EFFECTS**

H. Mehta, L. J. Tilly, GE Hitachi Nuclear Energy, San Jose, CA, USA; D. A. Sampson, GE Hitachi Nuclear Energy, Wilmington, NC, USA

#### **PVP2012-78735: A J ESTIMATION SCHEME FOR LINEAR HARDENING BEHAVIOR (Presentation Only)**

P. Gilles, AREVA NP SAS, Paris La Défense, France

### **SESSION 1.1E (OAC-1-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Huron*

#### **SAFETY, RELIABILITY AND RISK ASSESSMENT**

#### **Sponsored by the Operations, Applications & Components and Materials & Fabrication Technical Committees**

Developed by: S. Harris, N. Gupta, Savannah River National Laboratory, Aiken, SC, USA

Chair: C.-C. Huang, Institute of Nuclear Energy Research, Taoyuan County, Taiwan

Co-Chair: N. Gupta, Savannah River National Laboratory, Aiken, SC, USA

#### **PVP2012-78438: STYLE—COMPARISON OF ENGINEERING ASSESSMENT METHODS**

D. Lauerova, Nuclear Research Institute Rez, Rez, Czech Republic, J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

#### **PVP2012-78677: APPLICATION OF RISK EVALUATION IN INCREASING THE OPERATING PRESSURE OF ETHERIFICATION REACTORS**

X. Ma, Jiangsu Province Special Equipment Safety Supervision Inspection Institute, Nanjing, Jiangsu, China

#### **PVP2012-78248: THE ADHESION FAILURE MODE IN STAINLESS STEEL TRIM SPRING OPERATED PRESSURE RELIEF VALVES**

J. Bukowski, Villanova University, Pocono Pines, PA, USA; R. Gross, Savannah River Nuclear Solutions, Aiken, SC, USA; W. Goble, exida, LLC, Sellersville, PA, USA

#### **PVP2012-78223: USING A PROBABILISTIC APPROACH FOR THE INTEGRITY ASSESSMENT OF THE FRENCH PWR PRESSURIZER**

E. Ardillon, E. Dautrême, EDF-R&D, Chatou, France; E. Meister, C. Catherine, EDF-DPI/SEPTEN, Villeurbanne, France

### **SESSION 1.1F (FSI-8-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Kent*

#### **DR. S. S. CHEN MEMORIAL SESSION**

Developed by: M.K. Au-Yang, Independent Consultant, Lynchburg, VA, USA

Chair: Y. W. Kwon, Naval Postgraduate School, Monterey, CA, USA

Co-Chair: M.K. Au-Yang, Independent Consultant, Lynchburg, VA, USA

#### **PVP2012-78888: S.S. CHEN MEMORIAL SESSION INTRODUCTION (Presentation Only)**

S. Zamrik, Penn State University, University Park, USA

#### **PVP2012-78889: FLOW-INDUCED VIBRATION IN TWO-PHASE FLOWS: SOME PUZZLING PHENOMENA AND INTERESTING FINDINGS (Presentation Only)**

M. Pettigrew, École Polytechnique, Montreal, Canada

#### **PVP2012-78890: MY WORKS ON CROSS-FLOW INDUCED VIBRATION OF TUBE ARRAYS WITH DR. CHEN (Presentation Only)**

T. Nakamura, Osaka Sangyo University, Osaka, Japan

#### **PVP2012-78891: MODAL COUPLING IN FLUID ELASTIC INSTABILITY OF A MULTI-SUPPORTED TUBES IN CROSS FLOW (Presentation Only)**

R. D. Blevins, Goodrich Aerostructures, San Diego, USA

#### **PVP2012-78893: S.S. CHEN, A PERSONAL PERSPECTIVE OF AN EXCEPTIONAL ENGINEER (Presentation Only)**

F. Moody, Consulting Engineer, Turlock, CA, USA

### **SESSION 1.1G (CT-12-1)**

*Monday, July 16, 8:30 am – 10:15 pm, Mezzanine, Conference F*

#### **ELASTIC-PLASTIC ANALYSIS USING IMPLICIT AND EXPLICIT FEA**

Developed by: W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada; R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

Chair: D. Metzger, Candu Energy Inc., Mississauga, ON, Canada

Co-Chair: W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78558: ESTIMATING LOWER BOUND LIMIT LOADS NO ITERATIONS/MODULUS ADJUSTMENT**

H. Simha, R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

**PVP2012-78566: EXAMINING COMPUTATIONAL TECHNIQUES TO SIMULATE THE EFFECTS OF EXTERNAL CHEMICAL EXPLOSIONS USING EXPLICIT FINITE ELEMENT ANALYSIS**

P. E. Pruetter, D. Dewees, R. G. Brown, The Equity Engineering Group, Inc., Shaker Heights, OH, USA

**PVP2012-78819: FINITE ELEMENT MESH REFINEMENT STUDY FOR IAEA PUNCTURE DROP TEST (Presentation Only)**

U. Zencker, M. Weber, F. Wille, BAM Federal Institute for Materials Research and Testing, Berlin, Berlin, Germany

**PVP2012-78659: SIMULATION OF NOTCH TIP STRESS/STRAIN RESPONSE OF ZIRCONIUM PRESSURE TUBE MATERIAL**

W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada; S. Ranganath, xgen engineering, San Jose, CA, USA; P. Doddihal, Kinectrics Inc., Toronto, ON, Canada

**SESSION 1.1H (DA-5-1)**

*Monday, July 16, 8:30 am – 10:15 pm, Mezzanine, Conference G*

**STRESS CLASSIFICATION & DESIGN BY ANALYSIS METHODOLOGIES**

Developed by: I. Fanous, Candu Energy Inc., Mississauga, ON, Canada; M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Chair: S. Iyer, AMEC NSS Ltd., Toronto, ON, Canada

Co-Chair: W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78362: DETERMINATION OF MINIMUM VESSEL WALL THICKNESS UNDER DESIGN CONDITION LOADINGS**

S. Ratcliffe, Atkins Defence, Bristol, England, United Kingdom

**PVP2012-78521: SIMPLIFIED STRESS LINEARIZATION METHOD, MAINTAINING ACCURACY**

A. Strzelczyk, M. Stojakovic, Ontario Power Generation, Pickering, ON, Canada

**PVP2012-78755: EVALUATING THE AFFECT OF NOZZLE WELD STIFFNESS WHEN USING SHELL FINITE ELEMENT MODELS FOR ASME CODE EVALUATIONS**

B. Dunlap, Bechtel, Richland, WA, USA; H. Ziada, URS, Richland, WA, USA; J. Julyk, Bechtel, Richland, WA, USA

**PVP2012-78840: STRESS ANALYSIS OF THE BIPARTITE OVERLAPPING EXPANSION JOINTS OF THE CONTAINMENT PENETRATION—ANGRA 2**

R. Suanno, J. E. Maneschy, M. Francioni, Eletrobrás Eletronuclear, Rio de Janeiro, Brazil

**SESSION 1.1I (DA-15-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Simcoe*

**PROBABILISTIC METHODS IN DESIGN AND ANALYSIS**

Developed by: D. Vlaicu, Ontario Power Generation, Pickering, ON, Canada; M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Chair: D. Vlaicu, Ontario Power Generation, Pickering, ON, Canada

Co-Chair: I. Fanous, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78233: DESIGN CURVE CONSTRUCTION BASED ON TOLERANCE LIMIT CONCEPT**

Z. Wei, Tenneco, Grass Lake, MI, USA; B. Dogan, ETD Consultant, Charlotte, NC, USA; L. Luo, B. Lin, D. Konson, Tenneco, Grass Lake, MI, USA

**PVP2012-78475: RELIABILITY-BASED FATIGUE DESIGN FOR PIPING USING SPECTRUM CHARACTERISTICS**

S. Sakai, J. Maeda, The University of Tokyo, Tokyo, Japan; M. Takanashi, IHI Corporation, Yokohama, Kanagawa, Japan; S. Izumi, The University of Tokyo, Tokyo, Japan

**PVP2012-78646: PROBABILISTIC PARAMETER SENSITIVITY STUDY ON DESIGN FATIGUE CURVE FOR CARBON AND LOW ALLOY STEELS**

M. Takanashi, IHI Corporation, Yokohama, Kanagawa, Japan; J. Maeda, S. Sakai, The University of Tokyo, Tokyo, Japan

**PVP2012-78199: HELICAL COIL STEAM GENERATOR TUBES SUBJECTED TO EXTERNAL PRESSURE: PROBABILISTIC METHOD (Presentation Only)**

D. K. Williams, Sharoden Engineering Consultants, P.A., Charlotte, NC, USA; M. A. Martin, Fluor Enterprises, Inc., Greenville, SC, USA

**SESSION 1.1J (HP-4-1)**

*Monday, July 16, 8:30 am – 10:15 pm, Mezzanine, Windsor West*

**ADVANCEMENTS IN HIGH PRESSURE TECHNOLOGY**

Developed by: J. Keltjens, SABIC, Geleen, Netherlands

Chair: R. Wink, Uhde High Pressure Technologies, GmbH, Hagen, Germany

Co-Chair: J. Keltjens, SABIC, Geleen, Netherlands

**PVP2012-78472: ADVANCES IN HYPERCOMPRESSOR VALVE AND VALVE SPRING DESIGN**

R. Bagagli, C. Maggi, L. Tognarelli, A. Capanni, GE Oil & Gas Nuovo Pignone, Florence, Italy

**PVP2012-78509: NEW MANUFACTURING CYCLE TO IMPROVE THE LIFE OF PACKING CUPS**

C. Maggi, L. Tognarelli, A. Capanni, GE Oil & Gas Nuovo Pignone, Florence, Italy; J. Wojnar, Warsaw Institute of Aviation, Warsaw, Poland

**PVP2012-78150: AN OVERVIEW OF RISK MANAGEMENT PLANNING FOR HOT-ISOSTATIC PRESSURE TREATMENT OF HIGH-LEVEL WASTE CALCINE FOR THE IDAHO CLEANUP PROJECT**

B. Preussner, V. J. Balls, J. A. Nenni, CH2M-WG Idaho, LLC, Idaho Falls, ID, USA

**PVP2012-78025: MATHEMATICAL MODELING ON FRACTURE PROPAGATION CONTROL**

E. Burlutskiy, A\*STAR Institute of High Performance Computing, Singapore, Singapore

**SESSION 1.1L (MF-4-1)**

*Monday, July 16, 8:30 am – 10:15 pm, Mezzanine, Conference B*

**WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—I**

Developed by: D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA; B. Brust, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Chair: D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA

Co-Chair: E. Kurth, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

**PVP2012-78055: A STUDY OF THE EFFECT OF HARDENING MODEL IN THE PREDICTION OF WELDING RESIDUAL STRESS**

M. Joosten, TWI Ltd., Cambridge, United Kingdom; M. Gallegillo, NNB GenCo, London, United Kingdom

**PVP2012-78528: EFFECT OF AGEING ON RESIDUAL STRESSES IN WELDED STAINLESS STEEL CYLINDERS**

S. C. Do, D. Smith, University of Bristol, Bristol, United Kingdom; M. Smith, EdF Energy Nuclear Generation Ltd., Gloucester, United Kingdom

**PVP2012-78599: MATERIAL HARDENING MODELLING BASED ON KEY DEFORMATION CONDITIONS DURING WELDING**

J. G. Mullins, J. Gunnars, Inspecta Technology AB, Stockholm, Sweden

**PVP2012-78615: HIGH-TEMPERATURE SOFTENING OF AUSTENITIC STAINLESS STEEL FOR WELD RESIDUAL STRESS MODELING**

D. Qiao, Tsinghua University, Beijing, China; W. Zhang, Z. Feng, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**SESSION 1.1M (MF-6-1)**

*Monday, July 16, 8:30 am – 10:15 pm, Mezzanine, Conference C*

**FITNESS FOR SERVICE AND FAILURE ASSESSMENT—I**

Developed by: M. Cohn, Intertek, Sunnyvale, CA, USA; C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; B. Wiersma, Savannah River Nuclear Solutions, Aiken, SC, USA

Chair: M. Cohn, Intertek APTECH, Sunnyvale, CA, USA

Co-Chair: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA

**PVP2012-78113: THE EFFECT OF OVALITY AND THICKNESS VARIATIONS ON STRESS ANALYSIS OF TUBE BEND UNDER INTERNAL PRESSURE**

Y. Chen, SNC-Lavalin Nuclear Inc., Oakville, ON, Canada; J. Parker, Electric Power Research Institute, Charlotte, NC, USA

**PVP2012-78127: THE INFLUENCE OF LONG-RANGE RESIDUAL STRESS ON PLASTIC COLLAPSE AND LOCAL YIELDING OF INTERNALLY PRESSURIZED PIPES**

G. Wu, D. Smith, M. Pavier, University of Bristol, Bristol, United Kingdom

**PVP2012-78476: FIRST ESTIMATE PLASTIC COLLAPSE SOLUTIONS FOR FLAT AND TORI-SPHERICAL ENDED PRESSURE VESSELS SUBJECTED TO EXTENSIVE CORROSION WALL THINNING**

C. Madew, M. Wilkes, R. Charles, I. Symington, Serco Energy, Warrington, Cheshire, United Kingdom

**PVP2012-78546: THE BI-AXIAL STRESS EFFECTS ON LIMIT LOADS OF STRUCTURES CONTAINING SURFACE-BREAKING FLAWS AND THE INFLUENCES ON STRUCTURAL INTEGRITY ASSESSMENTS**

L. Wei, I. Hadley, TWI Ltd., Cambridge, United Kingdom

**SESSION 1.1P (CS-5-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, City Hall*

**INTERACTION AND FLAW MODELLING FOR MULTIPLE FLAWS**

**Sponsored by the Codes & Standards and Materials & Fabrication Technical Committees**

Developed by: K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom; B. Bezensek, Hunting Energy Service UK Ltd., Scotland, United Kingdom

Chair: J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

Co-Chair: F. Iwamatsu, Hitachi, Ltd., Hitachi, Ibaraki, Japan

**PVP2012-78132: INTERACTION EFFECT EVALUATION OF PLURAL SURFACE CRACKS IN DUCTILE FRACTURE PROCESS**

K. Suga, Tokyo University of Science, Noda, Chiba, Japan; K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; R. Senda, M. Kikuchi, Tokyo University of Science, Noda, Chiba, Japan

**PVP2012-78208: INTERACTION EFFECT EVALUATION OF MULTIPLE THROUGH CRACKS IN DUCTILE FRACTURE PROCESS**

K. Suga, Tokyo University of Science, Noda, Chiba, Japan; K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; Y. Arai, M. Kikuchi, Tokyo University of Science, Noda, Chiba, Japan

**PVP2012-78264: SIMULATION OF STRESS CORROSION CRACKING IN ICM HOUSING OF NUCLEAR POWER PLANT**

M. Kikuchi, Tokyo University of Science, Noda, Chiba, Japan; Y. Wada, Tokyo University of Science, Suwa, Nagano, Japan; K. Suga, Tokyo University of Science, Noda, Chiba, Japan; F. Iwamatsu, Hitachi, Ltd., Hitachi, Ibaraki, Japan; Y. Shintaku, Tokyo University of Science, Noda, Chiba, Japan

**PVP2012-78688: COMPARISON OF EXPERIMENT AND CALCULATION ON FATIGUE CRACK GROWTH FOR TRANSFORMED SURFACE FLAW**

K. Hasegawa, Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan; K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; K. Saito, Hitachi GE, Hitachi-shi, Japan

**SESSION 1.1Q (DA-1-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Civic Ballroom North*

**DESIGN AND ANALYSIS OF PRESSURE VESSELS AND COMPONENTS**

Developed by: T. Seipp, Becht Engineering, Calgary, AB, Canada; J. Taagepera, Chevron ETC, Richmond, CA, USA

Chair: C. Rodery, BP plc, Webster, TX, USA

Co-Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA

**PVP2012-78119: SUPPLEMENTAL STRESS AND FRACTURE ANALYSES OF PRESSURIZED WATER REACTOR PRESSURE VESSEL NOZZLES**

G. Stevens, US Nuclear Regulatory Commission, Washington, DC, USA; S. Yin, Oak Ridge National Laboratory, Oak Ridge, TN, USA; M. Walter, Structural Integrity Associates, Inc., Centennial, CO, USA; D. Sommerville, Structural Integrity Associates, Mukilteo, WA, USA; N. Palm, C. Heinecke, Westinghouse Electric Company, Cranberry Township, PA, USA

**PVP2012-78390: CLOSED-FORM SOLUTIONS FOR CODE CASE 2286 ALLOWABLE COMPRESSIVE STRESSES ANALOGOUS TO VACUUM CHART METHOD**

H. Baid, D. LaBounty, A. Chatterjee, A&H Technical Services, Mission

Viejo, CA, USA

**PVP2012-78587: EFFECT OF STRAIN RATE, THICKNESS, WELDING ON THE J-R CURVE FOR POLYETHYLENE PIPE MATERIALS**

T. El-Bagory, Majmaah University, Kingdom of Saudi Arabia, Majmaah, Saudi Arabia; M. Y. A. Younan, American University in Cairo, Cairo, Egypt; H. Sallam, Jazan University, Jazan, Saudi Arabia; L. Latif, Helwan University, Cairo, Egypt

**PVP2012-78128: FATIGUE ANALYSIS OF FEED SPOOL BOLTING OF COKE DRUM**

M. S. Panwala, S. Jaiswal, Larsen & Toubro Limited, Surat, India

**SESSION 1.1R (MF-5-1)**

*Monday, July 16, 8:30 am – 10:15 pm, Mezzanine, Essex Ballroom*

**EUROPEAN PROGRAMMES IN STRUCTURAL INTEGRITY—I**

Developed by: E. Keim, AREVA NP GmbH, Erlangen, Germany; D. Moinereau, EDF R&D, Moret-sur-Loing, France

Chair: T. Nicak, AREVA NP GmbH, Erlangen, Germany

Co-Chair: P. James, Serco TCS, Warrington, Cheshire, United Kingdom

**PVP2012-78045 STYLE PROJECT: LARGE SCALE EXPERIMENT ON A CLADDED FERRITIC PIPE (Presentation Only)**

D. Moinereau, P. Le Delliou, C. Sonnefraud, Q. Roirand, EDF R&D, Moret-sur-Loing, France; E. Keim, T. Nicak, AREVA NP GmbH, Erlangen, Germany

**PVP2012-78139: MECHANICAL CHARACTERIZATION AND LARGE TEST DESIGN OF A DISSIMILAR METALS WELDING WITH A NARROW GAP INCONEL WELD: EXPERIMENTAL AND NUMERICAL ANALYSIS ON SPECIMENS.**

M. Bourgeois, CEA, Gif-sur-Yvette, France; S. Chapuliot, AREVA, Paris La Défense, France; S. Marie, O. Ancelet, CEA, Gif-sur-Yvette, France

**PVP2012-78286: STYLE: TRANSFERABILITY OF FRACTURE MATERIAL PROPERTIES UPDATED EXPERIMENTAL AND ANALYTICAL RESULTS**

T. Nicak, E. Keim, Herbert Schendzielorz, Gottfried Meier, AREVA NP GmbH, Erlangen, Germany; D. Moinereau, P. Le Delliou, EDF R&D, Moret-sur-Loing, France

**PVP2012-78518: ANALYSIS OF DUCTILE CRACK GROWTH IN PIPE TEST IN STYLE PROJECT**

S. Yin, P. Williams, H. Klasky, R. Bass, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**PVP2012-78035: EFFECT OF PRE-STRAIN ON MECHANICAL PROPERTIES OF PRESSURE VESSEL GRADES ASSESSMENT OF STRESS RELIEVING/POST WELD HEAT TREATMENTS EFFICIENCY TO REGENERATE PROPERTIES.**

D. Héritier, S. Pillot, Industeel, ArcelorMittal, Le Creusot, France; C. Chauvy, Industeel, ArcelorMittal, Rive de Gier, France; P. Toussaint, Industeel Belgium, ArcelorMittal, Charleroi, Belgium; S. Corre, Industeel, ArcelorMittal, Le Creusot, France

**SESSION 1.1T (MF-15-1)**

*Monday, July 16, 8:30 am – 10:15 pm, 2nd Floor, Civic and Essex Foyers*

**NDE DEMONSTRATION FORUM I**

Sponsored by the PVP Senate, Materials & Fabrication Technical Committee, and the ASME NDE Division

Developed by: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; D. Rogers, Stress Engineering Services, Mason, OH, USA

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**Block 1.2: Monday, July 16 (10:30 am – 12:15 pm)**

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**SESSION 1.2A (TW-4)**

*Monday, July 16, 10:30 am – 12:15 pm, 2nd Floor, Dominion Ballroom*

**OPENING CEREMONY AND PLENARY LECTURES**

Developed by: M. Nitzel, M. E. Nitzel Engineering Services, Nampa, ID, USA

Chair: M. Nitzel, M. E. Nitzel Engineering Services, Nampa, ID, USA

**NUCLEAR REFURBISHMENT AT ONTARIO POWER GENERATION**

W. M. Elliott, Ontario Power Generation, Toronto, ON, Canada

**THE IMPORTANCE OF PARTICIPATION OF REGULATORS AT INTERNATIONAL ACTIVITIES**

T. Jamieson, Canadian Nuclear Safety Commission, Ottawa, ON, Canada

**SESSION 1.2T (MF-15-2)**

*Monday, July 16, 10:30 am – 12:15 pm, 2nd Floor, Civic and Essex Foyers*

**NDE DEMONSTRATION FORUM II**

Sponsored by the PVP Senate, Materials & Fabrication Technical Committee, and the ASME NDE Division

Developed by: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; D. Rogers, Stress Engineering Services, Mason, OH, USA

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**Block 1.3: Monday, July 16 (2:00 pm – 3:45 pm)**

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**SESSION 1.3B (NDE-3-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Elgin*

**RECENT DEVELOPMENTS IN NDE TECHNOLOGY I**

Sponsored by the ASME NDE Division and the PVP Operations, Applications & Components and Materials & Fabrication Technical Committees

Developed by: N. Tada, Okayama University, Okayama, Japan; N. Kobayashi, Toshiba Corporation, Yokohama, Japan; H. Seiichi, Tokyo Electric Power, Tokyo, Japan

Chair: N. Tada, Okayama University, Okayama, Japan

Co-Chair: N. Kobayashi, Toshiba Corporation, Yokohama, Japan

**PVP2012-78294: DETECTION OF A SURFACE FLAW USING DIFFERENTIAL SIGNALS OF MI SENSORS WITH THE RESIDUAL MAGNETIZATION METHOD**

N. Kasai, K. Miura, Yokohama National University, Yokohama, Kanagawa, Japan

**PVP2012-78425: NON-DESTRUCTIVE CRACK DETECTION BY NANOMETRIC CHANGE IN SURFACE PROFILE USING DIGITAL HOLOGRAPHIC MICROSCOPE**

N. Tada, M. Uchida, Y. Uenoyama, Okayama University, Okayama, Japan



**PVP2012-78429: BASIC CHARACTERISTICS OF EDDY CURRENT TESTING USING RESONANT COUPLING**

N. Kobayashi, S. Ueno, K. Nomura, M. Ochiai, Y. Kitajima, S. Maruyama, Toshiba Corporation, Yokohama, Japan

**PVP2012-78459: INTENSE X-RAY MEASUREMENT OF TRANSIENT HYDRAULIC PHENOMENA IN MOLTEN POOL DURING LASER WELDING PROCESS**

T. Yamada, Japan Atomic Energy Agency, Tsuruga, Fukui, Japan; T. Shobu, Japan Atomic Energy Agency, Sayo-gun, Hyogo, Japan; S. Yamashita, T. Ogawa, K. Sugihara, A. Nishimura, T. Muramatsu, Japan Atomic Energy Agency, Tsuruga, Fukui, Japan

**SESSION 1.3C (SE-15-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Wentworth*

**SEISMIC RESPONSE MITIGATION, OPTIMIZATION AND DAMPING SYSTEMS**

Developed by: T. Ito, Osaka Prefecture University, Sakai, Osaka Prefecture, Japan; K. Minagawa, Saitama Institute of Technology, Saitama, Japan

Chair: T. Clark, Idaho National Laboratory, Idaho Falls, ID, USA

Co-Chair: A. Sone, Kyoto Institute of Technology, Kyoto, Japan

**PVP2012-78029; STUDY ON THE SEISMIC RESPONSE OF HIGH-SPEED ROTATIONAL DISK-SHAFT SYSTEM**

T. Ito, M. Hatta, A. Shintani, C. Nakagawa, Osaka Prefecture University, Sakai, Osaka Prefecture, Japan

**PVP2012-78195: BASIC STUDY ON OPTIMAL DESIGN OF SYSTEM SUPPORTING STRUCTURES SUBJECTED TO RANDOM INPUTS USING THE PROBABILISTIC VIBRATION THEORY**

A. Shintani, T. Nagami, T. Ito, C. Nakagawa, Osaka Prefecture University, Sakai, Osaka Prefecture, Japan

**PVP2012-78400: VIBRATION CHARACTERISTICS OF A PERFORATED PLATE IMMersed IN LIQUID**

T. Ito, A. Shintani, C. Nakagawa, Osaka Prefecture University, Sakai, Osaka Prefecture, Japan

**SESSION 1.3D (CS-2-2)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Kenora*

**STRUCTURAL INTEGRITY OF PRESSURE COMPONENTS—II**

Developed by: B. S. Antaal, AMEC, Calgary, AB, Canada

Chair: B. Shitolé, AMEC, Calgary, AB, Canada

Co-Chair: B. S. Antaal, AMEC, Calgary, AB, Canada

**PVP2012-78692: AN ASME PIPING CODE-BASED STRESS ANALYSIS PROCEDURE AND A COMPARISON WITH THE ITALIAN CODE**

O. Grisolia, INAIL, Sector of Research, Certification and Testing, Rome, Italy

**PVP2012-78658: CONSIDERATIONS OF THE RESTRAINT INTRODUCED BY PIPING SUPPORT FRICTION IN A COMPREHENSIVE ASME B31.3 ANALYSIS**

B. S. Antaal, AMEC, Calgary, AB, Canada; D. K. Williams, Sharoden Engineering Consultants, P.A., Charlotte, NC, USA; Y. Hari, University of North Carolina at Charlotte, Charlotte, NC, USA

**PVP2012-78510: COMPARISON OF PTS GUIDES FOR REACTOR PRESSURE VESSEL INTEGRITY ASSESSMENT (Presentation Only)**

M. Brumovsky, Nuclear Research Institute Rez plc, Rez, Czech Republic

**SESSION 1.3E (OAC-2-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Huron*

**MODELING AND INSPECTION QUALIFICATION**

Developed by: G. Bezdikian, Georges Bezdikian Consulting Co., Le Vesinet, France; G. G. Young, Entergy Nuclear, Jackson, MS, USA

Chair: K.-S. Kang, IAEA, Vienna, Austria

Co-Chair: J.-P. Fontes, EDF R&D, Clamart, France

**PVP2012-78297: MATERIAL CHARACTERIZATION AND MODELING WITHIN SAFETY ANALYSIS OF PACKAGES FOR TRANSPORT OF RADIOACTIVE MATERIAL**

M. Neumann, V. Ballheimer, J. Sterthaus, S. Schubert, G. Eisenacher, F. Wille, BAM Federal Institute for Materials Research and Testing, Berlin, Germany

**PVP2012-78607 THE USE OF MODELING FOR NON DESTRUCTIVE INSPECTION QUALIFICATION (Presentation Only)**

F. Champigny, EDF, Saint-Denis, France

**PVP2012-78635: RISK-BASED INSPECTION AND NDE PERSONNEL QUALIFICATION (Presentation Only)**

D. Wang, Shell Projects and Technology, Houston, TX, USA

**PVP2012-78781: FIRE TESTING OF HIGH DENSITY POLYETHYLENE PIPING SYSTEMS**

D. Munson, Electric Power Research institute, Palo Alto, CO, USA; D. Decker, 3M, St. Paul, MN, USA

**SESSION 1.3F (FSI-1-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Kent*

**THERMAL-HYDRAULIC PHENOMENA AND INTERACTIONS I**

Developed by: A. Arastu, Bechtel Power Corporation, San Francisco, CA, USA; J. C. Jo, Korea Institute of Nuclear Safety, Daejeon, Korea (Republic)

Chair: S. Martin, Georgia Tech, South Dennis, MA, USA

Co-Chair: F. Moody, Consulting Engineer, Turlock, CA, USA

**PVP2012-78056: COMPARISON OF ANALYSIS METHODS FOR TRANSIENT FORCES**

B. J. Kim, GS Engineering & Construction, Seoul, Korea (Republic)

**PVP2012-78085: ACOUSTIC RESONANCE IN A RESERVOIR DOUBLE PIPE ORIFICE SYSTEM**

A. Tijsseling, Q. Hou, TU Eindhoven, Eindhoven, Netherlands; B. Svingen, Rainpower Technology AS, Trondheim, Norway; A. Bergant, Litostroj Power d.o.o., Ljubljana, Slovenia

**PVP2012-78867: NUMERICAL SIMULATIONS OF BUBBLE PUMPS**

S. W. Jo, S. A. Sherif, W. E. Lear, University of Florida, Gainesville, FL, USA

**SESSION 1.3G (CT-1-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Conference F*

**DESIGN AND ANALYSIS OF BOLTED JOINTS**

Developed by: H. Bouzid, Ecole de Technologie Superieure, Montreal, QC, Canada; T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

Chair: H. Bouzid, Ecole de Technologie Superieure, Montreal, QC, Canada

Co-Chair: T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

**PVP2012-78413: THE SEALING CHARACTERISTICS OF BOLTED FLANGED CONNECTIONS WITH METAL GASKETS**

K. Kondo, Shinko Plantech co., Ltd., Yokohama, Japan; T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan; K. Sato, Nippon Valqua Industries, Ltd., Gojo, Japan; T. Kikuchi, Idemitsu Kousan Co., Ltd., Chiba, Japan; S. Tsubaki, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

**PVP2012-78024: DEVELOPMENT OF TIGHTENING SPECIFICATION FOR POST YIELD ANGLE CONTROL TIGHTENING STRATEGY**

B. Housari, A. Alkelani, J. Yocum, BMW Manufacturing, Greer, SC, USA

**PVP2012-78420: FEM STRESS ANALYSIS AND THE SEALING PERFORMANCE EVALUATION IN BOLTED FLANGE CONNECTIONS WITH RING JOINT GASKET SUBJECTED TO INTERNAL PRESSURE: EFFECT OF SCATTER IN BOLT PRELOADS**

K. Kondo, Shinko Plantech Co., Ltd., Yokohama, Japan; S. Tsubaki, T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan; T. Kikuchi, Idemitsu Kousan Co., Ltd., Chiba, Japan; Y. Omiya, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

**PVP2012-78118: ON THE DEVELOPMENT OF A NEW BOLT SPACING FORMULA**

T.-D. Do, H. Bouzid, T.-M. Dao, Ecole de Technologie Superieure, Montreal, QC, Canada

**SESSION 1.3H (DA-6-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Conference G*

**COMPOSITE MATERIALS AND STRUCTURES**

Sponsored by the Design & Analysis and Materials & Fabrication Technical Committees

Developed by: P. Mertiny, University of Alberta, Edmonton, AB, Canada; M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA

Co-Chair: M. Chen, RWTH-Aachen, Aachen, Germany

Chair: P. Mertiny, University of Alberta, Edmonton, AB, Canada

**PVP2012-78644: INITIAL QUANTIFICATION OF THE EFFECT OF AMBIENT HUMIDITY ON THE STRENGTH OF NON-METALLIC REPAIRS OF PIPING AND PRESSURE VESSELS**

D. J. Gribble, R. H. Walker, Citadel Technologies, Tulsa, OK, USA; J. J. French, LeTourneau University, Longview, TX, USA

**PVP2012-78617: TRANSIENT HEAT CONDUCTION IN FUNCTIONALLY GRADED HOLLOW CYLINDERS AND SPHERES**

H. Akbarzadeh, Z. Chen, University of New Brunswick, Fredericton, NB, Canada

**PVP2012-78520: DEFLECTIONS OF COMPOSITE CYLINDERS CONSISTING OF FIBERS WITH VARIABLE VOLUME FRACTIONS**

M. H. Kargarnovin, M. Hashemi, Sharif University of Technology, Tehran, Iran

**SESSION 1.3I (DA-4-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Simcoe*

**LIMIT LOAD ANALYSIS**

Developed by: M. Y. A. Younan, American University in Cairo, Cairo, Egypt; D. Vlaicu, Ontario Power Generation, Pickering, ON, Canada

Chair: D. Mackenzie, University of Strathclyde, Glasgow, United Kingdom

Co-Chair: I. Fanous, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78111: USE OF LIMIT LOAD ANALYSIS FOR DESIGN OF PRESSURE VESSEL COVER**

R. Jain, The Babcock & Wilcox Co., Barberton, OH, USA

**PVP2012-78670 EFFECT OF VERTEX ANGLE ON ELASTIC PLASTIC STABILITY OF OPEN CONICAL SHELLS**

M. H. Kargarnovin, H. Shokrollahi, Sharif University of Technology, Tehran, Iran

**PVP2012-78679: LIMIT LOAD ANALYSIS OF TORISPHERICAL HEAD USED IN A GAS TURBINE CUMBUSTOR**

S. Nakhodchi, K.N Toosi University of Technology, Tehran, Iran; P. Rasouli, University of Isfahan, Isfahan, Iran

**SESSION 1.3J (SPC-1-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Windsor West*

**20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—1**

Developed by: P. Mertiny, University of Alberta, Edmonton, AB, Canada

Chair: P. Mertiny, University of Alberta, Edmonton, AB, Canada

Co-Chair: T. Taniguchi, Tottori University, Tottori, Japan

**PVP2012-78099: PREDICTION OF LOWER BOUND FRACTURE TOUGHNESS IN THE TRANSITION TEMPERATURE REGION BY T33-STRESS**

K. Lu, T. Meshii, University of Fukui, Fukui, Japan

**PVP2012-78320: DETERMINATION OF SHAKEDOWN BOUNDARY AND FITNESS-ASSESSMENT-DIAGRAMS OF CRACKED PIPE BENDS**

M. S. El-Saadany, M. Y. A. Younan, H. F. Abdalla, American University in Cairo, Cairo, Egypt

**PVP2012-78200: FATIGUE TEST FOR TWO-HOLES DIAGONALLY-PLACED PLATE AT ELEVATED TEMPERATURE**

K. Kinoshita, O. Watanabe, University of Tsukuba, Tsukuba, Ibaraki, Japan

**PVP2012-78384: THERMAL-CREEP INDUCED STRESS RELAXATION NEAR A NOTCH IN ZR-2.5NB**

S. Wan, M.R. Daymond, R.A. Holt, Queen's University, Kingston, ON, Canada

**SESSION 1.3K (SPC-2-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Windsor East*

**STUDENT PAPER SYMPOSIUM—1**

Developed by: K. Takahashi, Yokohama National University, Yokohama, Japan; R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

Chair: K. Takahashi, Yokohama National University, Yokohama

Co-Chair: R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

**PVP2012-78074: STUDY ON THE EFFECT OF AXIAL FLAW LENGTH ON LIMIT BENDING LOAD OF WALL THINNED STRAIGHT PIPES BY LARGE STRAIN FINITE ELEMENT ANALYSES**

Y. Ito, T. Meshii, University of Fukui, Fukui, Japan

**PVP2012-78209: IMPROVEMENT OF FATIGUE LIMIT BY SHOT PEENING FOR HIGH STRENGTH STEEL CONTAINING A CRACK-LIKE SURFACE DEFECT—INFLUENCE OF STRESS RATIO**

J. Yasuda, K. Takahashi, Yokohama National University, Yokohama, Japan  
**PVP2012-78765: RESEARCH AND DEVELOPMENT OF MULTIPLE TUNED MASS DAMPER FOR EXCAVATOR**  
S. Roppongi, Tokyo Denki University, Tokyo, Japan; S. Fujita, K. Minagawa, Saitama Institute of Technology, Saitama, Japan  
**PVP2012-78431: STUDY ON THE STRESS-STRAIN REDISTRIBUTION CAUSED BY INELASTIC DEFORMATION IN PERFORATED PLATE**  
S. Ikeda, M. Sato, N. Kasahara, The University of Tokyo, Tokyo, Japan

### **SESSION 1.3L (MF-4-2)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Conference B*

#### **WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—II**

Developed by: B. Brust, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA  
Chair: E. Kurth, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA  
Co-Chair: D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA

#### **PVP2012-78073: PREDICTING POST-WELD RESIDUAL STRESSES IN FERRITIC STEEL WELDMENTS**

C. Hamelin, O. Muransky, P. J. Bendeich, L. Edwards, Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW, Australia

#### **PVP2012-78299: DEVELOPMENT OF MATERIAL MODEL PARAMETERS SUITABLE FOR THE FINITE ELEMENT SIMULATION OF FERRITIC WELDS**

S. Bate, N. Shallcross, K. Stone, Serco, Warrington, Cheshire, United Kingdom; A. Mark, J. Francis, University of Manchester, Manchester, United Kingdom; C. Gill, Rolls-Royce plc, Derby, United Kingdom

#### **PVP2012-78556: RESIDUAL STRESS MEASUREMENT IN A FERRITIC BEAD ON PLATE BENCHMARK TEST SPECIMEN USING THE CONTOUR METHOD**

F. Hosseinzadeh, J. Bouchard, The Open University, Milton Keynes, United Kingdom

### **SESSION 1.3M (MF-6-3)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Conference C*

#### **FITNESS FOR SERVICE AND FAILURE ASSESSMENT—II**

Developed by: M. Cohn, Intertek, Sunnyvale, CA, USA; C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; B. Wiersma, Savannah River Nuclear Solutions, Aiken, SC, USA  
Chair: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA  
Co-Chair: M. Cohn, Intertek APTECH, Sunnyvale, CA, USA

#### **PVP2012-78003: ESTIMATED SIL LEVELS AND RISK COMPARISONS FOR RELIEF VALVES AS A FUNCTION OF TIME-IN-SERVICE**

E. Mitchell, Emory University, Aiken, SC, USA; R. Gross, Savannah River Nuclear Solutions, Aiken, SC, USA; S. Harris, Savannah River National Laboratory, Aiken, SC, USA

#### **PVP2012-78095: BENCH-KJ: BENCHMARK ON THE ANALYTICAL CALCULATION OF THE FRACTURE MECHANICS PARAMETERS KI AND J FOR CRACKED PIPING COMPONENTS**

S. Marie, CEA, Gif-sur-Yvette, France; C. Faidy, EDF, Villeurbanne, France

#### **PVP2012-78537: GRAIN BOUNDARY GRAPHITIZATION IN P1 (C-1/2MO) ALLOY PIPE**

C. McDonald, Structural Integrity Associates, Inc., Austin, TX, USA; J. Arnold, Structural Integrity Associates, Inc., Mystic, CT, USA; J. Henry, Structural Integrity Associates, Inc., Chattanooga, TN, USA  
**PVP2012-78591: COMPARISON OF ASME B31.1 SUSTAINED LOAD STRESSES TO CORRESPONDING TRESCA STRESSES**  
M. Cohn, Intertek APTECH, Sunnyvale, CA, USA

### **SESSION 1.3P (CS-10-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, City Hall*

#### **RECENT ACTIVITIES OF JAPANESE FITNESS-FOR-SERVICE CODES**

Developed by: K. Onizawa, Japan Atomic Energy Agency, Tokai-mura, Ibaraki-ken, Japan; Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan  
Chair: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

Co-Chair: H. Okada, Tokyo University of Science, Noda, Japan

#### **PVP2012-78026: RE-EVALUATION OF FATIGUE CRACK GROWTH CURVE FOR AUSTENITIC STAINLESS STEELS IN BWR ENVIRONMENT**

M. Itatani, T. Ogawa, T. Saito, C. Narazaki, Toshiba Corporation, Yokohama, Japan

#### **PVP2012-78316: DEVELOPMENT OF RBM STANDARD FOR PRESSURIZED EQUIPMENTS IN JAPAN**

S. Sakai, The University of Tokyo, Tokyo, Japan; T. Shibazaki, Chiyoda Advanced Solutions Corporation, Yokohama, Japan; H. Masatomo, H. Ishimaru, Sumitomo Chemical Engineering, Chiba, Japan; K. Sekine, Yokohama National University, Yokohama, Japan

#### **PVP2012-78109: DEVELOPMENT OF STRESS INTENSITY FACTORS FOR DEEP SURFACE CRACKS IN PLATES AND CYLINDERS**

Y. Li, H. Itoh, K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan; K. Osakabe, Mizuho Information & Research Institute, Inc., Tokyo, Japan; H. Okada, Tokyo University of Science, Noda, Japan

#### **PVP2012-78836: PROBABILISTIC STRUCTURAL INTEGRITY ANALYSIS OF REACTOR PRESSURE VESSELS DURING PTS EVENTS**

K. Onizawa, K. Masaki, J. Katsuyama, Japan Atomic Energy Agency, Tokai-mura, Ibaraki-ken, Japan

### **SESSION 1.3Q (DA-3-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Civic Ballroom North*

#### **INTEGRITY OF REACTOR VESSEL**

Developed by: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan; J.-M. Stephan, EDF R&D, Moret-sur-Loing, France

Chair: D. Moinereau, EDF R&D, Moret-sur-Loing, France

Co-Chair: S. Marie, CEA, Gif-sur-Yvette, France

#### **PVP2012-78038: CRACK TIP CONSTRAINT AND FRACTURE TOUGHNESS OF AN INNER-SURFACE CRACK UNDER THERMAL SHOCK**

T. Meshii, University of Fukui, Fukui, Japan

#### **PVP2012-78174: CLEAVAGE CRACK PROPAGATION AND ARREST IN A NUCLEAR PRESSURE VESSEL STEEL**

A. Bousquet, CEA and Ecole Centrale Paris, Gif-sur-Yvette, France; S.

Marie, CEA, Gif-sur-Yvette, France; P. Bompard, Ecole Centrale Paris, Châtenay-Malabry, France

**PVP2012-78224: STRUCTURAL INTEGRITY EVALUATION OF A REACTOR VESSEL OUTLET NOZZLE WELD INLAY**

N. L. Glunt, A. Udyawar, C. K. Ng, S. E. Marlette, Westinghouse Electric Company, Cranberry Township, PA, USA

**PVP2012-78855: USE OF THE FAILURE ASSESSMENT DIAGRAM (FAD) TO EVALUATE MARGINS IN THE ASME CODE FOR P-T CURVES**

W. Rongshan, L. Feng, C. Mingya, Suzhou Nuclear Power Research Institute, Suzhou, China; W. Haitao, East China University of Science and Technology, Shanghai, Shanghai, China

**SESSION 1.3R (MF-18-1)**

*Monday, July 16, 2:00 pm – 3:45 pm, Mezzanine, Essex Ballroom*

**ANALYSIS OF FATIGUE, FRACTURE AND HYDROGEN EMBRITTELMENT OF WELDS—I**

Developed by: M. Kerr, Office of Nuclear Regulatory Research, Washington, DC, USA; D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; P. Gilles, AREVA NP SAS, Paris La Défense, France; F. Hosseinzadeh, The Open University, Milton Keynes, United Kingdom

Chair: F. Hosseinzadeh, The Open University, Milton Keynes, United Kingdom

Co-Chair: P. Gilles, AREVA NP SAS, Paris La Défense, France

**PVP2012-78015: INFLUENCE OF THE INTERNAL, EXTERNAL WELD HEAT INPUT DIFFERENCES ON THE HAZ TOUGHNESS PROPERTIES OF THE LSAW X65 PIPES AND ITS RELATION TO THE PIPE WALL THICKNESS.**

S. Rasoulidanesh, A. Daghighi, A. Shamsi, Safa Rolling and Pipe Mill, Saveh, Markazi, Iran

**PVP2012-78353: DISSIMILAR METAL WELD PIPE FRACTURE TESTING EXPERIMENTAL PROCEDURES AND RESULTS**

A. Cox, R. Olson, B. Young, P. Scott, Battelle, Columbus, OH, USA; D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA

**PVP2012-78376: IMPLANT TEST MODELING FOR RISK OF COLD CRACKING ASSESSMENT DURING WELDING OPERATIONS**

V. Robin, F. Gommez, AREVA NP, Lyon, France; C. Primault, AREVA NP, Chalon-sur-Saône, France; J. Devaux, ESI France, LYON, France (Metro)

**PVP2012-78885: SIMULATION OF TRIAXIAL RESIDUAL STRESS MAPPING FOR A HOLLOW CYLINDER**

M. Olson, W. Wong, M. R. Hill, University of California, Davis, Davis, CA, USA

**SESSION 1.3S (TW-5)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Civic Ballroom South*

**USE OF CFD IN DESIGN—PART I**

Developed by: M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA

Chair: M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Presented by: S. McGuffie, M. Porter, and T. Hirst, Porter McGuffie, Inc., Lawrence, KS, USA

**SESSION 1.3T (MF-15-3)**

*Monday, July 16, 2:00 pm – 3:45 pm, 2nd Floor, Civic and Essex Foyers*

**NDE DEMONSTRATION FORUM III**

**Sponsored by the PVP Senate, Materials & Fabrication Technical Committee, and the ASME NDE Division**

Developed by: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; D. Rogers, Stress Engineering Services, Mason, OH, USA

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**Block 1.4: Monday, July 16 (4:00 pm – 5:45 pm)**

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**SESSION 1.4B (HP-1-1)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Elgin*

**DESIGN, ANALYSIS, OPERATION AND MAINTENANCE OF HIGH-PRESSURE EQUIPMENT**

Developed by: R. Dixon, Structural Integrity Associates, Huntersville, NC, USA

Chair: K. Subramanian, Stress Engineering Services, Metairie, LA, USA

Co-Chair: R. Dixon, Structural Integrity Associates, Huntersville, NC, USA

**PVP2012-78120: A NEW ANALYTICAL SOLUTION FOR OPTIMUM DESIGN OF SHRINK-FIT MULTI-LAYER COMPOUND CYLINDERS**

M. Sharifi, Sharif University of Technology, Tehran, Iran; M. R. Hematiyan, Shiraz University, Shiraz, Fars, Iran; R. Banan, University of Toronto, Toronto, ON, Canada

**PVP2012-78713: CALIBRATION TECHNOLOGY RESEARCH OF 160 MPA ULTRA HIGH PRESSURE SAFETY RELIEF VALVE**

C. Ye, X. Fang, Nanjing Boiler & Pressure Vessel Supervision and Inspection Institute, Nanjing, Jiangsu, China

**PVP2012-78825: ASSET MANAGEMENT, LIFE EXTENSION AND FITNESS FOR SERVICE IN THE HIGH PRESSURE INDUSTRY**

D. Peters, K. Haley, Structural Integrity Associates, Inc., Rootstown, OH, USA

**PVP2012-78834: ADVANCED NDE TECHNIQUES AND THEIR DEPLOYMENT ON HIGH PRESSURE EQUIPMENT**

J. P. Milligan, Structural Integrity Associates, Inc., Huntersville, NC, USA; D. Peters, Structural Integrity Associates, Inc., Rootstown, OH, USA; J. K. Van Velsor, Structural Integrity Associates, State College, PA, USA

**SESSION 1.4C (SE-4-1)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Wentworth*

**SEISMIC ANALYSIS AND DESIGN OF PIPING SYSTEMS**

Developed by: G. Slagis, G C Slagis Associates, Pleasant Hill, CA, USA

Chair: O. Furuya, Tokyo City University, Tokyo, Japan

Co-Chair: V. Matzen, University of North Carolina, Raleigh, NC, USA

**PVP2012-78203: ANALYTICAL STUDY ON SEISMIC RESPONSE OF PIPING UNDER MULTIPLE SUPPORT EXCITATION**

S. Kai, N. Kaneko, A. Otani, IHI Corporation, Yokohama, Kanagawa-Ken, Japan

**PVP2012-78346: PIPE ELBOWS UNDER STRONG CYCLIC LOADING**

G. E. Varelis, S. A. Karamanos, University of Thessaly, Volos, Greece; A. M. Gresnigt, Delft University of Technology, Delft, Netherlands

**PVP2012-78581: LBB UNDER BEYOND DESIGN BASIS SEISMIC LOADING**

T. Zhang, B. Brust, G. Wilkowski, H. Xu, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; A. Betervide, O. Mazzantini, Proyecto Atucha II, Buenos Aires, Argentina

**PVP2012-78820: SEISMIC CAPACITY OF THREADED, BRAZED AND GROOVED FIRE PROTECTION PIPE JOINTS**

B. Gutierrez, US Department of Energy, Aiken, SC, USA; G. Antaki, Becht Engineering, Aiken, SC, USA

**SESSION 1.4D (CS-4-1)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Kenora*

**ENVIRONMENTAL FATIGUE ISSUES**

**Sponsored by the Codes & Standards and Materials & Fabrication Technical Committees**

Developed by: H. Mehta, GE Hitachi Nuclear Energy, San Jose, CA, USA

Chair: H. Mehta, GE Hitachi Nuclear Energy, San Jose, CA, USA

Co-Chair: R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA

**PVP2012-78020: COMPARISON OF STRAIN RATE CALCULATION METHODS FOR ENVIRONMENTAL FATIGUE CORRECTION EVALUATION**

S. Asada, Mitsubishi Heavy Industries, Ltd., Kobe, Japan

**PVP2012-78088: ENVIRONMENTALLY ASSISTED FATIGUE ASSESSMENT CONSIDERING AN ALTERNATIVE METHOD TO THE ASME CODE CASE N-792**

S. Courtin, A. Lefrançois, J.-A. Le Duff, A. Le Pécheur, AREVA NP SAS, Paris La Défense, France

**PVP2012-78301: FATIGUE LIFE OF THE STRAIN HARDENED AUSTENITIC STAINLESS STEEL IN SIMULATED PWR PRIMARY WATER**

K. Tsutsumi, Mitsubishi Heavy Industries, Ltd., Takasago, Hyogo, Japan; N. Huin, EDF/Institut P, Université de Poitiers-Ensm, Moret-sur-Loing, France; T. Couvant, EDF R&D, Moret-sur-Loing, France; J. Mendez, G. Henaff, Institut P' Ensm, Futuroscope Chasseneuil, France; D. Chollet, EDF R&D, Moret-sur-Loing, France

**PVP2012-78340: ENVIRONMENTAL EFFECT ON FATIGUE OF 304L STAINLESS STEEL EXPOSED TO PWR PRIMARY WATER**

N. Huin, EDF/Institut P, Université de Poitiers-Ensm, Moret-sur-Loing, France; K. Tsutsumi, Mitsubishi Heavy Industries, Ltd., Takasago, Hyogo, Japan; L. Legras, T. Couvant, D. Loinsard, EDF R&D, Moret-Sur-Loing, France; J. Mendez, G. Henaff, Institut P' Ensm, Futuroscope Chasseneuil, France

**PVP2012-78721: FATIGUE PERFORMANCE OF STAINLESS STEEL IN NPP SERVICE CONDITIONS**

J. Solin, VTT Technical Research Centre of Finland, VTT, Finland; S. H. Reese, E.ON Kernkraft GmbH, Hannover, Germany; W. Maying, Fennovoima Oy, Helsinki, Finland

**SESSION 1.4E (OAC-3-1)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Huron*

**MONITORING, DIAGNOSTICS AND INSPECTION**

Developed by: M. Brumovsky, Nuclear Research Institute Rez plc, Rez, Czech Republic; I. Ezekoye, Westinghouse Electric Co., Cranberry Township, PA, USA

Chair: M. Brumovsky, Nuclear Research Institute Rez plc, Rez, Czech Republic

Co-Chair: I. Ezekoye, Westinghouse Electric Co., Cranberry Township, PA, USA

**PVP2012-78189: HYDROSTATIC PRESSURE TEST PASS/FAIL CRITERIA USED BY A REGULATORY AGENCY**

M. Edwards, California State Lands Commission, Long Beach, CA, USA

**PVP2012-78325: EXPERIMENTAL RESEARCH ON ON-LINE CORROSION MONITORING OF HIGH-TEMPERATURE PIPE**

Y. Ye, L. Xia, Zhe Jiang Provincial Special Equipment Inspection and Research Institute, Hangzhou, Zhejiang, China

**PVP2012-78515: CREEP STRAIN MONITORING USING OPTICAL TECHNIQUES**

A. Narayanan, Imperial College London, London, United Kingdom; A. Morris, E.ON New Build & Technology Limited, Nottingham, United Kingdom; C. M. Davies, J. P. Dear, Imperial College London, London, United Kingdom

**SESSION 1.4F (FSI-1-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Kent*

**THERMAL-HYDRAULIC PHENOMENA AND INTERACTIONS II**

Developed by: A. Arastu, Bechtel Power Corporation, San Francisco, CA, USA; J. C. Jo, Korea Institute of Nuclear Safety, Daejeon, Korea (Republic)

Chair: S. Martin, Georgia Tech, South Dennis, MA, USA

Co-Chair: F. Moody, Consulting Engineer, Turlock, CA, USA

**PVP2012-78159: HIGH-ACCURACY ANALYSIS METHODS OF FLUID AND STRUCTURE TEMPERATURE FLUCTUATIONS AT T-JUNCTION FOR THERMAL FATIGUE EVALUATION**

S. Qian, S. Kanamaru, JGC Corporation, Yokohama, Japan; N. Kasahara, The University of Tokyo, Tokyo, Japan

**PVP2012-78293: FATIGUE EVALUATION FOR THERMALLY STRATIFIED DVI PIPING**

H. H. Lee, J. H. Lee, D. J. Lee, S. H. Hur, I. K. Nam, J. H. Bae, KEPKO E&C, Yongin-si, Gyeonggi-do, Korea (Republic)

**PVP2012-78779: AN EVALUATION OF ENERGY DEFINITIONS FOR BURSTING PRESSURE VESSEL MODELING**

A. Pierorazio, Z. Syed, BakerRisk, Burlington, ON, Canada

**SESSION 1.4G (CT-2-1)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Conference F*

**DESIGN AND ANALYSIS OF PRESSURE SEALED JOINTS**

Developed by: M. Schaaf, AMTEC Services GmbH, Lauffen, Germany; H. Lejeune, CETIM, Nantes, France

Chair: M. Schaaf, AMTEC Services GmbH, Lauffen, Germany

Co-Chair: H. Lejeune, CETIM, Nantes, France

**PVP2012-78215: EVALUATION OF THE STUFFING BOX FORCES ASSOCIATED WITH THE THERMAL EXPANSION OF E-PTFE AND GRAPHITE PACKING SETS**

C. Girão, Teadit Industria e Comercio Ltda., Rio de Janeiro, RJ, Brazil; K. Guenther, Teadit, Pasadena, TX, USA

**PVP2012-78499: NUMERICAL ANALYSIS OF BOLTED TRUNNION SYSTEMS OF PACKAGES FOR RADIOACTIVE MATERIALS**

J. Sterthaus, V. Ballheimer, C. Kuschke, F. Wille, BAM Federal Institute for Materials Research and Testing, Berlin, Berlin, Germany

**PVP2012-78166: INVESTIGATIONS ON ALTERNATIVE TRACING GAS MIXTURES FOR VALVE FUGITIVE EMISSION MEASUREMENTS**

H. Lejeune, L. Cougnon, CETIM, Nantes, France

**SESSION 1.4H (DA-6-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Conference G*

**COMPOSITE MATERIALS AND STRUCTURES**

**Sponsored by the Design & Analysis and Materials & Fabrication Technical Committees**

Developed by: M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA; P. Mertiny, University of Alberta, Edmonton, AB, Canada

Chair: M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA

Co-Chair: P. Mertiny, University of Alberta, Edmonton, AB, Canada

**PVP2012-78308: LIMIT LOADS FOR STRUCTURAL ELEMENTS MADE OF HETEROGENEOUS MATERIALS**

M. Chen, A. Hachemi, D. Weichert, RWTH-Aachen, Aachen, Germany

**PVP2012-78237: DETERMINATION OF FIBER ORIENTATION ALONG THE LENGTH OF COMPLEX COMPOSITE STRUCTURE SUBJECTED TO INTERNAL PRESSURE AND AXIAL LOADING**

R. Hossain, P. Mertiny, J. Carey, University of Alberta, Edmonton, AB, Canada

**PVP2012-78648: EMPIRICAL ESTIMATION OF THE ABRASION ENDURANCE LIFE OF EPOXY COATINGS FOR APPLICATIONS ON TRANSMISSION PIPELINES**

T. Mally, R. H. Walker, Citadel Technologies, Tulsa, OK, USA; J. J. French, LeTourneau University, Longview, TX, USA

**SESSION 1.4I (DA-4-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Simcoe*

**SHAKEDOWN AND RATCHETING ANALYSIS**

Developed by: D. Vlaicu, Ontario Power Generation, Pickering, ON, Canada; M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Chair: D. Vlaicu, Ontario Power Generation, Toronto, ON, Canada

Co-Chair: I. Fanous, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78314: A FULLY IMPLICIT MULTI-AXIAL SOLUTION STRATEGY FOR DIRECT RATCHET BOUNDARY EVALUATION: THEORETICAL DEVELOPMENT**

A. Jappy, D. Mackenzie, University of Strathclyde, Glasgow, Scotland, United Kingdom; H. Chen, University of Strathclyde, Glasgow, United Kingdom

**PVP2012-78315: A FULLY IMPLICIT MULTI-AXIAL SOLUTION STRATEGY FOR DIRECT RATCHET BOUNDARY EVALUATION: IMPLEMENTATION AND COMPARISON**

A. Jappy, D. Mackenzie, H. Chen, University of Strathclyde, Glasgow, United Kingdom

**PVP2012-78567: NON-CYCLIC METHODS FOR SHAKEDOWN**

**ANALYSIS OF CRACKED STRUCTURES**

D. Vlaicu, Ontario Power Generation, Pickering, ON, Canada

**PVP2012-78673: PREDICTION OF RATCHET BOUNDARY WITH AN APPLICATION TO 90-DEGREE SMOOTH PIPE BEND**

A. G. Korba, Cairo University, Cairo, Egypt; H. F. Abdalla, American University in Cairo, Cairo, Egypt; M. M. Nassar, M. M. Megahed, Cairo University, Cairo, Egypt

**SESSION 1.4J (SPC-1-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Windsor West*

**20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—2**

Developed by: T. Taniguchi, Tottori University, Tottori, Japan

Chair: T. Taniguchi, Tottori University, Tottori, Japan

Co-Chair: P. Mertiny, University of Alberta, Edmonton, AB, Canada

**PVP2012-78548: ALTERNATIVE SELECTIONS OF DELAYED COKE DRUM MATERIALS BASED ON ASME MATERIAL PROPERTY DATA**

M. Nikic, Z. Xia, University of Alberta, Edmonton, AB, Canada

**PVP2012-78205: ESTIMATION OF REMAINING FATIGUE LIFE FOR ELBOW PIPE SUBJECTED TO CYCLIC OVERLOAD**

H. Abe, K. Matsuo, K. Takahashi, Yokohama National University, Yokohama, Japan

**PVP2012-78768: RESEARCH AND DEVELOPMENT OF VISCOUS-FRICTION HYBRID DAMPER**

T. Kawamura, Tokyo Denki University, Tokyo, Japan; S. Fujita, K. Minagawa, Saitama Institute of Technology, Saitama, Japan

**PVP2012-78347: THERMAL FATIGUE EVALUATION METHOD OF PIPES BY EQUIVALENT STRESS AMPLITUDE**

T. Suzuki, N. Kasahara, The University of Tokyo, Tokyo, Japan

**SESSION 1.4K (SPC-2-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Windsor East*

**STUDENT PAPER SYMPOSIUM—2**

Developed by: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Chair: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Co-Chair: K. Takahashi, Yokohama National University, Yokohama, Japan

**PVP2012-78204: INFLUENCE OF CIRCUMFERENTIAL FLAW LENGTH ON INTERNAL BURST PRESSURE OF A WALL-THINNED PIPE**

M. Tsuji, T. Meshii, University of Fukui, Fukui, Japan

**PVP2012-78243: AXI-SYMMETRICAL STRESS ANALYSIS AND SEALING PERFORMANCE EVALUATION OF A PIPE FLANGE CONNECTION UNDER ELEVATED TEMPERATURE AND INTERNAL PRESSURE**

Y. Omiya, T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

**PVP2012-78221: CONSTITUTIVE MODEL DEVELOPMENT FOR THERMO-MECHANICAL FATIGUE RESPONSE SIMULATION OF HAYNES 230**

R. Ahmed, North Carolina State University, Raleigh, NC, USA; M. N. Menon, Honeywell Aerospace, Phoenix, AZ, USA; T. Hassan, North Carolina State University, Raleigh, NC, USA

**PVP2012-78793: APPLICABILITY OF SEMI-ANALYTICAL FINITE ELEMENTS FOR ANALYZING UPLIFT DISPLACEMENT OF FLAT-BOTTOM CYLINDRICAL SHELL TANKS STATICALLY**

T. Nakashima, Tottori University, Osaka, Japan; T. Taniguchi, Tottori University, Tottori, Japan

### **SESSION 1.4L (MF-4-3)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Conference B*

#### **WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—III**

Developed by: E. Keim, AREVA NP GmbH, Erlangen, Germany; P. Gilles, AREVA NP SAS, Paris La Défense, France

Chair: E. Keim, AREVA NP GmbH, Erlangen, Germany

Co-Chair: P. Gilles, AREVA NP SAS, Paris La Défense, France

#### **PVP2012-78143: SIMULATION AND MEASUREMENT OF RESIDUAL STRESSES IN A STAINLESS STEEL RING WELDED CIRCULAR DISC**

G. Zheng, University of Bristol, Bristol, United Kingdom; S. Hossain, Veqter Ltd., Bristol, United Kingdom; M. Smith, EdF Energy Nuclear Generation Ltd., Gloucester, United Kingdom; D. Smith, University of Bristol, Bristol, United Kingdom

#### **PVP2012-78319: NUMERICAL SIMULATION OF RESIDUAL STRESSES IN NOREM02 PTA DEPOSITS: CALIBRATION AND EXPERIMENTAL VALIDATION (Presentation Only)**

J.-P. Mathieu, EDF R&D, Moret-sur-Loing, France; G. Beaurin, M. Coret, D. Nelias, LaMCos - INSA Lyon, Villeurbanne, France

#### **PVP2012-78405: OPTIMISED MODELLING OF WELD METAL CONSTITUTIVE BEHAVIOUR IN THE NET TG4 INTERNATIONAL WELD SIMULATION AND MEASUREMENT BENCHMARK**

M. Smith, EdF Energy Nuclear Generation Ltd., Gloucester, United Kingdom; O. Muransky, ANSTO, Kirrawee, NSW, Australia; C. Austin, Serco Assurance, Warrington, Cheshire, United Kingdom; P. J. Bendeich, L. Edwards, ANSTO, Kirrawee, NSW, Australia

#### **PVP2012-78409: PREDICTION AND MEASUREMENT OF WELD RESIDUAL STRESSES IN THERMALLY AGED GIRTH-WELDED AUSTENITIC STEEL PIPES**

O. Muransky, ANSTO, Kirrawee, NSW, Australia; M. Smith, EdF Energy Nuclear Generation Ltd., Gloucester, United Kingdom; P. J. Bendeich, Cory Hamelin, L. Edwards, ANSTO, Kirrawee, NSW, Australia

### **SESSION 1.4M (MF-6-4)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Conference C*

#### **FITNESS FOR SERVICE AND FAILURE ASSESSMENT—III**

Developed by: M. Cohn, Intertek, Sunnyvale, CA, USA; C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; B. Wiersma, Savannah River Nuclear Solutions, Aiken, SC, USA

Chair: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA

Co-Chair: M. Cohn, Intertek APTECH, Sunnyvale, CA, USA

#### **PVP2012-78408: FAILURE ANALYSIS OF AN IN-SERVICE NATURAL GAS PIPELINE**

H. Cao, Shandong Special Equipment Inspection Institute/China University of Petroleum, Jinan, China; X. Qiu, China University of Petroleum, Qingdao, China; X. Yao, M. Song, Shandong Special Equipment Inspection Institute, Jinan, China

#### **PVP2012-78589: FITNESS FOR SERVICE OF A DEGRADED GR 91 PIPE**

M. Cohn, S. Paterson, Intertek APTECH, Sunnyvale, CA, USA

#### **PVP2012-78841: CRACKING OF HEAVY WALL STEAM SEPARATORS DURING FABRICATION AN INVESTIGATION**

D. Kumar, Jacobs Canada Inc., Calgary, AB, Canada; L. Ganhao, Plains Midstream Canada; Calgary, AB, Canada

#### **PVP2012-78576: IMPROVED MODELING OF HYDRIDE FORMATION TO SUPPORT PRESSURE TUBE DEGRADATION ASSESSMENT (Presentation Only)**

F. Xu, D. Metzger, Candu Energy Inc., Mississauga, ON, Canada

### **SESSION 1.4P (CS-10-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, City Hall*

#### **ADVANCED ANALYSIS METHODS AND APPLICATIONS ON RESIDUAL STRESS AND CRACK PROPAGATION**

Developed by: Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan; K. Onizawa, Japan Atomic Energy Agency, Tokaimura, Ibaraki-ken, Japan

Chair: P. Hoang, Sargent Lundy LLC, Chicago, IL, USA

Co-Chair: D. Dewees, The Equity Engineering Group, Shaker Heights, OH, USA

#### **PVP2012-78354: DEVELOPMENT OF ULTRA LARGE SCALE COMPUTATION FOR TRANSIENT WELDING DEFORMATION AND STRESS USING IDEALIZED EXPLICIT FEM ACCELERATED BY GPU**

K. Ikushima, S. Itoh, M. Shibahara, Osaka Prefecture University, Sakai, Osaka, Japan

#### **PVP2012-78580: COMPUTATIONS OF STRESS INTENSITY FACTORS FOR DEEP CRACKS IN PLATES BY USING THE TETRAHEDRAL FINITE ELEMENT**

H. Okada, H. Koya, Tokyo University of Science, Noda, Japan; H. Kawai, University of Tokyo, Tokyo, Japan; Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan

#### **PVP2012-78574: COMPARISON OF HEAT INPUT METHODS IN WELDING RESIDUAL STRESS ANALYSIS**

D. Dewees, The Equity Engineering Group, Shaker Heights, OH, USA

#### **PVP2012-78357: PREDICTION OF RESIDUAL STRESS IN MULTI-PASS WELDED JOINT USING IDEALIZED EXPLICIT FEM**

M. Shibahara, S. Itoh, T. Okada, K. Ikushima, Osaka Prefecture University, Sakai, Osaka, Japan; S. Nishikawa, Japan Power Engineering and Inspection Corporation, Yokohama, Kanagawa, Japan

#### **PVP2012-78761: RECENT ADVANCEMENTS OF CRACK PROPAGATION ANALYSIS SOFTWARE SYSTEM USING THE TETRAHEDRAL FINITE ELEMENT (Presentation Only)**

H. Okada, S. Kaneko, Y. Tanaka, T. Nishikawa, Tokyo University of Science, Noda, Japan; H. Kawai, University of Tokyo, Tokyo, Japan

### **SESSION 1.4Q (DA-3-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Civic Ballroom North*

#### **FATIGUE EVALUATION**

Developed by: J.-M. Stephan, EDF R&D, Moret-sur-Loing, France

Chair: Y. J. Kim, Korea University, Seoul, Korea (Republic)

Co-Chair: D. Moinereau, EDF R&D, Moret-sur-Loing, France

#### **PVP2012-78090: LOW CYCLE FATIGUE BEHAVIOR OF WELDED COMPONENTS—A NEW APPROACH; EXPERIMENTS AND NUMERICAL SIMULATION**

E. Lang, TU Darmstadt, Darmstadt, Germany; J. Rudolph, AREVA NP

GmbH, Erlangen, Germany; T. Beier, M. Vormwald, TU Darmstadt, Darmstadt, Germany

**PVP2012-78737: PROPAGATION UNDER HIGH THERMAL CYCLE AMPLITUDE IN A DUCTILE MATERIAL**

C. Vallet, EDF R&D MMC, Moret-sur-Loing, France; T.-H. Chau, EDF R&D AMA, Clamart, France; J.-M. Stephan, EDF R&D, Moret-sur-Loing, France

**PVP2012-78767: INFLUENCE OF PWR PRIMARY WATER ON LCF BEHAVIOR OF TYPE 304L AUSTENITIC STAINLESS STEEL AT 300°C—COMPARISON WITH RESULTS OBTAINED IN VACUUM OR IN AIR**

L. de Baglion, AREVA, Paris, La Defense, France; J. Mendez, Institut P' Ensm, Futuroscope Chasseneuil, France; J.-A. Le Duff, A. Lefrançois, AREVA NP SAS, Paris La Défense, France

**PVP2012-78164: NUMERICAL STUDY OF THE SHORT CRACK INITIATION IN POLYCRYSTALLINE AGGREGATES**

Y. Guilhem, EDF R&D/MMC, Moret-sur-Loing, France; J.-M. Stephan, EDF R&D, Moret-sur-Loing, France; G. Cailletaud, Mines ParisTech, Evry, France; S. Basseville, Université Versailles Saint Quentin en Yvelines, Versailles, France

**SESSION 1.4R (MF-5-2)**

*Monday, July 16, 4:00 pm – 5:45 pm, Mezzanine, Essex Ballroom*

**EUROPEAN PROGRAMMES IN STRUCTURAL INTEGRITY—II**

Developed by: D. Moinereau, EDF R&D, Moret-sur-Loing, France; P. James, Serco TCS, Warrington, Cheshire, United Kingdom

Chair: E. Keim, AREVA NP GmbH, Erlangen, Germany

Co-Chair: T. Nicak, AREVA NP GmbH, Erlangen, Germany

**PVP2012-78044: A EUROPEAN PROJECT FOR APPLICATION OF WPS IN RPV ASSESSMENT INCLUDING BIAXIAL LOADING: NESC VII**

D. Moinereau, EDF R&D, Moret-sur-Loing, France; S. Chapuliot, AREVA, Paris La Défense, France; S. Marie, CEA, Gif-sur-Yvette, France; P. Gilles, AREVA NP SAS, Paris La Défense, France

**PVP2012-78077: FURTHER PREDICTIONS OF FRACTURE EXPERIMENTS OF A PRE-CRACKED PRESSURISED THERMAL SHOCK DISK (PTS-D) SPECIMEN UNDER WARM PRE-STRESSING LOADING CYCLES**

H. Teng, J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom; P. Budden, EDF Energy, Gloucester, Gloucestershire, United Kingdom

**PVP2012-78182: THE IMPORTANCE OF A STRONG TRAINING ELEMENT WITHIN THE EUROPEAN STYLE PROJECT.**

A. Toft, Serco, Warrington, Cheshire, United Kingdom; J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

**PVP2012-78344: NESC VII EUROPEAN PROJECT: DEMONSTRATION OF WARM PRE STRESSING EFFECT IN BIAXIAL LOADING CONDITIONS BENDING TESTS ON 18MND5 CRUCIFORM SPECIMENS AND THEIR INTERPRETATIONS**

C. Jacquemoud, T. Yuritzinn, S. Marie, CEA, Gif-sur-Yvette, France; S. Chapuliot, AREVA, Paris La Défense, France; D. Moinereau, EDF R&D, Moret-sur-Loing, France; M. Nedelec, IRSN, Fontenay-aux-Roses, France

**SESSION 1.4S (TW-6)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Civic Ballroom South*

**USE OF CFD IN DESIGN—PART II**

Developed by: M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA

Chair: M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Presented by: S. McGuffie, M. Porter, and T. Hirst, Porter McGuffie, Inc., Lawrence, KS, USA

**SESSION 1.4T (MF-15-4)**

*Monday, July 16, 4:00 pm – 5:45 pm, 2nd Floor, Civic and Essex Foyers*

**NDE DEMONSTRATION FORUM IV**

**Sponsored by the PVP Senate, Materials & Fabrication Technical Committee, and the ASME NDE Division**

Developed by: C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA; D. Rogers, Stress Engineering Services, Mason, OH, USA

**TUESDAY, JULY 17**

**Block 2.1: Tuesday, July 17 (8:30 am – 10: 15 am)**

**SESSION 2.1B (HP-3-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Elgin*

**THE DAVE KENDALL MEMORIAL SESSION**

Developed by: J. Keltjens, SABIC, Geleen, Netherlands

Chair: J. Keltjens, SABIC, Geleen, Netherlands

Co-Chair: R. Dixon, Structural Integrity Associates, Huntersville, NC, USA

**PVP2012-78179: INFLUENCE AND MODELING OF RESIDUAL STRESSES ON THE LIFE OF THICK WALLED PRESSURE VESSELS WITH THROUGH HOLES**

E. Troiano, Benet Laboratories, Watervliet, NY, USA; A. Parker, Defence Academy of the United Kingdom, Lewes, East Sussex, United Kingdom; J. Izzo, Benet Labs, Watervliet, NY, USA

**PVP2012-78298: COMPOUND AND MONOBLOC CYLINDERS INCORPORATING REVERSE-AUTOFRETTAGE TO REDUCE EXTERNAL HOOP STRESSES**

A. Parker, Defence Academy of the United Kingdom, Lewes, East Sussex, United Kingdom

**PVP2012-78377: KENDALL ANALYSIS OF CANNON PRESSURE VESSELS**

J. H. Underwood, John H. Underwood, Salem, NY, USA

**SESSION 2.1C (SE-7-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Wentworth*

**SEISMIC ISOLATION AND ENERGY ABSORPTION SYSTEMS**

Developed by: C.-S. Tsai, Feng Chia University, Taichung, Taiwan

Chair: A. Sone, Kyoto Institute of Technology, Kyoto, Japan

Co-Chair: G. Roussel, AVN, Brussels, Belgium

**PVP2012-78117: COMPONENT TESTS OF HUGE SCALE ALL-STEEL**



## **MULTI-CURVE BUCKLING RESTRAINED BRACES**

C.-S. Tsai, H.-C. Su, Feng Chia University, Taichung, Taiwan; T. C. Chiang, Earthquake Proof Systems, Inc., Taichung, Taiwan; Y. C. Lin, Feng Chia University, Taichung, Taiwan

## **PVP2012-78481: AN APPROXIMATE FORMULA TO CALCULATE THE RESTORING AND THE DAMPING FORCE OF AN AIR SPRING WITH AN ELONGATED CIRCULAR TUBE AS AN ORIFICE**

T. Asami, Y. Yokota, T. Ise, I. Honda, University of Hyogo, Himeji, Hyogo, Japan; H. Sakamoto, Tokkyokiki Corporation, Amagasaki, Hyogo, Japan

## **PVP2012-78540: NEW SEISMIC ISOLATION SYSTEM FOR FLOATING HOUSES**

C.-S. Tsai, H.-C. Su, W.-C. Liao, Y.M. Wang, Feng Chia University, Taichung, Taiwan

## **SESSION 2.1D (CS-9-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Kenora*

### **RECENT DEVELOPMENTS IN ASME CODES AND STANDARDS**

Developed by: M. Rana, Praxair, Inc., Tonawanda, NY, USA

Chair: M. Rana, Praxair, Inc., Tonawanda, NY, USA

Co-Chair: J. Zheng, Zhejiang University, Hangzhou, Zhejiang, China

## **PVP2012-78130: A REVIEW AND REMEDIATION OF A CODE NON-COMPLIANCE INCIDENT LESSONS LEARNED**

J. J. Aumuller, Z. Xia, University of Alberta, Edmonton, AB, Canada; V. A., Carucci, Carmagen Engineering Inc., Rockaway, NJ, USA

## **PVP2012-78571: ALTERNATIVE APPROACH FOR QUALIFICATION OF TEMPERBEAD WELDING IN THE NUCLEAR INDUSTRY**

S. L. McCracken, Electric Power Research Institute, Charlotte, NC, USA; R. E. Smith, Structural Integrity Associates, Huntersville, NC, USA

## **PVP2012-78075: DESIGN OF UNPARTITIONED, PLUG TYPE HEADER BOXES FOR AIR-COOLED HEAT EXCHANGERS IN REFINERY SERVICE**

H.-J. Nel, Sasol Technology, Secunda, Mpumalanga, South Africa; A. Nurick, A. Nel, University of Johannesburg, Johannesburg, Gauteng, South Africa; F. Lombaard, Sasol Technology, Secunda, Mpumalanga, South Africa

## **PVP2012-78072: HIGH PURITY PROCESS PIPING: THE ADDITION OF CHAPTER X HIGH PURITY PIPING TO THE ASME B31.3 PROCESS PIPING CODE**

B. K. Henon, Arc Machines, Inc., Shoreline, WA, USA; D. Cobb, Arc Machines, Inc., Pacoima, CA, USA

## **SESSION 2.1E (OAC-4-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Huron*

### **TOXIC SUBSTANCES: THERMAL EVALUATION—I**

Developed by: Z. Han, Argonne National Laboratory, Argonne, IL, USA; N. Gupta, Savannah River nuclear Solutions, Aiken, SC, USA

Chair: M. Greiner, University of Nevada, Reno, Reno, NV, USA

Co-Chair: M. Feldman, Oak Ridge National Laboratory, Knoxville, TN, USA

## **PVP2012-78022: THERMAL UPGRADING OF 9977 RADIOACTIVE MATERIAL (RAM) TYPE B PACKAGE**

N. Gupta, G. A. Abramczyk, Savannah River Nuclear Solutions, Aiken, SC, USA

## **PVP2012-78057: PRESSURIZATION OF CONTAINMENT VESSELS FROM PLUTONIUM OXIDE CONTENTS**

S. Hensel, N. M. Askew, J. Laurinat, Savannah River National Laboratory, Aiken, SC, USA; E. Skidmore, Savannah River Nuclear Solutions, Aiken, SC, USA

## **PVP2012-78637: THE MACARTHUR MAZE FIRE AND ROADWAY COLLAPSE: A "WORST CASE SCENARIO" FOR SPENT NUCLEAR FUEL TRANSPORTATION?**

C. Bajwa, E. Easton, US Nuclear Regulatory Commission, Rockville, MD, USA; H. E. Adkins Jr., J. Cuta, N. Klymyshyn, S. Suffield, Pacific Northwest National Laboratory, Richland, WA, USA

## **PVP2012-78282: PRESSURE BUILD-UP INSIDE PACKAGES CONTAINING WET INTERMEDIATE LEVEL RADIOACTIVE WASTE DUE TO THERMAL LOADS**

M. Nehrig, C. Bletzer, F. Wille, BAM Federal Institute for Materials Research and Testing, Berlin, Germany

## **SESSION 2.1F (FSI-3-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Kent*

### **DYNAMIC EXCITATION OF TUBES AND TUBE BUNDLES**

Developed by: C. Liang, George Washington University, Washington, DC, USA; H. Iyama, Kumamoto National College of Technology, Yatsushiro, Japan

Chair: K. Inaba, Tokyo Institute of Technology, Tokyo, Japan

Co-Chair: T. Watanabe, National Fisheries University, Shimonoseki, Japan

## **PVP2012-78122: SPECTRAL DIFFERENCE SOLUTION OF INCOMPRESSIBLE FLOW OVER AN INLINE TUBE BUNDLE**

C. Cox, C. Liang, M. Plesniak, George Washington University, Washington, DC, USA

## **PVP2012-78108: EVALUATION OF MASS TRANSFER COEFFICIENT UNDER SWIRL FLOW GENERATED BY THE COMBINATION OF PIPE ELEMENTS**

S. Suzuki, T. Nakamura, Osaka University, Osaka, Japan

## **PVP2012-78535: DPIV AROUND A FLEXIBLE CIRCULAR CYLINDER UNDERGOING CROSS-FLOW FORCED OSCILLATIONS**

F. J. Huera-Huarte, Z. Bangash, Universitat Rovira i Virgili, Tarragona, Spain

## **PVP2012-78699: NUMERICAL ANALYSIS OF INTERMITTENT STICK-SLIP BEHAVIOR OF TUBE-SUPPORT INTERACTION IN HEAT-EXCHANGERS**

R. Azizian, N. Mureithi, Ecole Polytechnique de Montreal, Montreal, QC, Canada

## **SESSION 2.1G (CT-3-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Conference F*

### **LEAK TIGHTNESS AND FUGITIVE EMISSIONS**

Developed by: T. Kobayashi, Numazu National College of Technology, Numazu, Japan; A. Alkelani, BMW Group, Greer, SC, USA

Chair: T. Kobayashi, Numazu College of Technology, Numazu, Shizuoka, Japan

Co-Chair: A. Alkelani, BMW Manufacturing, Greer, SC, USA

## **PVP2012-78147: PREDICTION OF LEAK RATES THROUGH POROUS GASKET AT HIGH TEMPERATURE**

L. Grine, H. A Bouzid, École de Technologie Supérieure, Montréal, QC, Canada

**PVP2012-78291: INVESTIGATIONS ON DETECTION OF COV BASED ON INFRARED CAMERA**

B. Thomas, E. Sauger, S. Fily, H. Lejeune, CETIM, Nantes, France

**PVP2012-78694: THE RESIDUAL BOLT FORCE AND THE SEALING PERFORMANCE OF FLANGED CONNECTIONS WITH EXPANDED PTFE GASKETS (BASED ON TEST RESULTS FOR ONE YEAR)**

T. Kobayashi, T. Hagiri, Numazu National College of Technology, Numazu, Japan; K. Nishiura, Mitsubishi Chemical Corporation, Kurashiki, Okayama, Japan; M. Hiratsuka, Nichias Corporation, Minato-Ku, Tokyo, Japan; K. Itoi, Nichias Corporation, Hamamatsu, Shizuoka, Japan

**PVP2012-78847: A COLLABORATIVE APPROACH TO ACHIEVING A GAS-TIGHT SEAL USING EXPANDED POLYTETRAFLUORETHYLENE (ePTFE) GASKETS IN A FIBERGLASS-REINFORCED PLASTIC (FRP) LAP-JOINT FLANGES**

J. Czerwinski, V. Garikipati, C. Jones, B. Pires, W.L. Gore & Associates, Inc., Elkton, MD, USA; J. P Ludman, D. H McCauley, E. I. du Pont de Nemours & Company, Wilmington, DE, USA; B. M. Linnemann, RL Industries, Fairfield, OH, USA

**SESSION 2.1H (DA-2-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Conference G*

**DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—I**

Developed by: J. McCabe, General Dynamics—Electric Boat, Groton, CT, USA; A. Dweib, Worley Parsons, Atyrau, Kazakhstan, Kazakhstan

Chair: C. Basavaraju, US Nuclear Regulatory Commission, Rockville, MD, USA

Co-Chair: W. Mekky, AMEC NSS, Toronto, ON, Canada

**PVP2012-78152: DEALING WITH HEAVY LOADS IN LARGE DIAMETER PIPING**

H. Rojas, Chevron ETC, Houston, TX, USA; A. Gutkovsky, Chevron ETC, Richmond, CA, USA

**PVP2012-78161: A PIPE BEND SUBJECT TO A UNIFORMLY DISTRIBUTED RADIAL FORCE**

J. Mazzeo, GenOn PGS, Pittsburg, CA, USA

**PVP2012-78197: EVALUATION OF ALLOWABLE EXTERNAL PRESSURE FOR BRANCH PIPE CONNECTIONS**

K. Iwahara, Hitachi-GE Nuclear Energy, Ltd., Hitachi, Ibaraki, Japan; K. Tachi, Hokuriku Electric Power Co., Inc., Hakui-gun, Ishikawa, Japan; Y. Amano, Kansai Electric Power Co., Inc., Mikata-gun, Fukui, Japan; K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; K. Tsunokawa, Toshiba Corporation, Yokohama, Japan

**SESSION 2.1I (DA-14-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Simcoe*

**SMALL MODULAR REACTORS & TOPICS IN BUCKLING**

Developed by: S. McGuffie, Porter McGuffie, Inc., Lawrence, KS, USA

Chair: S. McGuffie, Porter McGuffie, Inc., Lawrence, KS, USA

Co-Chair: C. Smith, Fluor Enterprises, Inc., Greenville, SC, USA

**PVP2012-78592: PARAMETRIC STUDY OF EXTERNAL PRESSURE ON STEAM GENERATOR TUBE BENDS**

M. Hokazono, C. Smith, Fluor Enterprises, Inc., Greenville, SC, USA

**PVP2012-78602: GRADED APPROACH TO SMALL MODULAR REACTOR IMPLEMENTATION**

W. Culp, B. Cintron, Fluor Enterprises, Inc., Greenville, SC, USA

**PVP2012-78703: DESIGN ASPECTS OF ONCE-THROUGH HELICAL COIL STEAM GENERATORS**

B. Webb, BJWebb Consulting, Corvallis, OR, USA

**SESSION 2.1J (SPC-1-3)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Windsor West*

**20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—3**

Developed by: W. Springer, University of Arkansas, Fayetteville, AR, USA

Chair: W. Springer, University of Arkansas, Fayetteville, AR, USA

Co-Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

**PVP2012-78169: CLEAVAGE DYNAMIC PROPAGATION ANALYSIS IN A NUCLEAR REACTOR PRESSURE VESSEL STEEL USING A HIGH-SPEED CAMERA**

A. Bousquet, CEA and Ecole Centrale Paris, Gif-sur-Yvette, France; S. Marie, CEA, Gif-sur-Yvette, France; P. Bompard, Ecole Centrale Paris, Châtenay-Malabry, France

**PVP2012-78194: ANALYTICAL AND FINITE ELEMENT MULTI-SHELL MODELLING OF AN INTERVERTEBRAL DISC TO STUDY DISC HERNIA**

S. Demers, H. Bouzid, S. Nadeau, Ecole de Technologie Supérieure, Montreal, QC, Canada

**PVP2012-78342: ISOTHERMAL FATIGUE RESPONSES AND CONSTITUTIVE MODELING OF HAYNES 230**

P. R. Barrett, North Carolina State University, Raleigh, NC, USA; M. N. Menon, Honeywell Aerospace, Phoenix, AZ, USA; T. Hassan, North Carolina State University, Raleigh, NC, USA

**PVP2012-78611: APPLICATION OF A REMOTE HEALTH MONITORING SYSTEM FOR PIPELINE BOLTED JOINTS**

P. Razi, R. A. Esmaeel, F. Taheri, Dalhousie University, Halifax, NS, Canada

**SESSION 2.1K (SPC-2-3)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Windsor East*

**STUDENT PAPER SYMPOSIUM—3**

Developed by: J. C. Jo, Korea Institute of Nuclear Safety, Daejeon, Korea (Republic); Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Chair: J. C. Jo, Korea Institute of Nuclear Safety, Daejeon, Korea (Republic)

Co-Chair: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

**PVP2012-78697: A METHOD TO CHARACTERIZE THE FRACTURE RESISTANCE OF DISSIMILAR METAL WELDS**

A. Blouin, S. Chapuliot, AREVA, Paris La Défense, France; S. Marie, CEA, Gif-sur-Yvette, France

**PVP2012-78634: EFFECT OF POST-WELD HEAT TREATMENT ON THE PLASTIC BUCKLING OF WELDED CYLINDRICAL SHELLS**

J. Wang, Z. Chen, C. Yu, Zhejiang University, Hangzhou, China

**PVP2012-78483: DEVELOPMENT OF A WEB-BASED RBI PROGRAM FOR LNG PLANT CONSIDERING CRYOGENIC ENVIRONMENT**

J.-D. Kim, Sungkyunkwan University, Suwon, Korea (Republic); S.-C. Choi, Korea Gas Safety Corporation, Siheung, Korea (Republic); J.-B. Choi,

Sungkyunkwan University, Suwon, Korea (Republic)

### **SESSION 2.1L (MF-31-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Conference B*

#### **INFRASTRUCTURE ASSESSMENT FOR AGING AND EMERGING ENERGY TECHNOLOGIES—I**

Developed by: J. Todd, Penn State University, University Park, PA, USA

Chair: J. Todd, Penn State University, University Park, PA, USA

Co-Chair: A. Wallace, Kinectrics, Inc., Toronto, Canada

#### **PVP2012-78875: INFRASTRUCTURE ASSESSMENT IN THE PETROCHEMICAL AND OFFSHORE INDUSTRIES (Presentation Only)**

P. Grossweiler, M&H Energy Services, Houston, USA

#### **PVP2012-78877: INFRASTRUCTURE ASSESSMENT FOR THE PIPELINE INDUSTRY (Presentation Only)**

T. Bubenik, DNV, Dublin, USA

#### **PVP2012-78878: INFRASTRUCTURE ASSESSMENT IN THE FOSSIL INDUSTRY (Presentation Only)**

Kent Coleman, EPRI, Charlotte, NC, USA

#### **PVP2012-78887: INFRASTRUCTURE ASSESSMENT IN THE NUCLEAR INDUSTRY (Presentation Only)**

K. Balkey, Westinghouse Electric Company, Pittsburgh

### **SESSION 2.1M (MF-19-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Conference C*

#### **CREEP DEFORMATION AND LIFTING**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA

Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

Co-Chair: R. Dennis, Frazer-Nash Consultancy, Bristol, Avon, United Kingdom

#### **PVP2012-78102: CREEP LIFE PREDICTION OF GR.91 USING CREEP PARAMETERS IN TRANSIENT REGION**

F. Abe, National Institute for Materials Science, Tsukuba, Ibaraki, Japan

#### **PVP2012-78234: EQUILIBRIUM BASED CURVE FITTING METHOD FOR TEST DATA WITH NONUNIFORM VARIANCE**

Z. Wei, F. Yang, Tenneco, Grass Lake, MI, USA; S. Maleki, TWI Ltd., Cambridge, United Kingdom; K. Nikbin, Imperial College London, London, United Kingdom

#### **PVP2012-78323: EVALUATION OF LONG-TERM CREEP STRENGTH OF ASME GRADES 91, 92 AND 122 TYPE STEELS**

K. Kimura, National Institute for Materials Science, Tsukuba, Ibaraki, Japan; Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

#### **PVP2012-78421: MATERIAL DEGRADATION AND CREEP DAMAGE OF AGING COMPONENTS AT HIGH TEMPERATURE**

T. Ye, Z. Wang, F.-Z. Xuan, S.-T. Tu, East China University of Science and Technology, Shanghai, China; M. Liu, Zhengzhou University, Zhengzhou, Henan, China

### **SESSION 2.1P (CS-15-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, City Hall*

#### **INTEGRITY ISSUES FOR BURIED PIPE**

Developed by: R. McGill, Structural Integrity Associates, San Jose, CA, USA; S. Xu, Kinectrics, Toronto, ON, Canada

Chair: S. Xu, Kinectrics, Toronto, ON, Canada

Co-Chair: R. McGill, Structural Integrity Associates, San Jose, CA, USA

#### **PVP2012-78392: TECHNICAL BASIS FOR CODE CASE N-806, EVALUATION OF METAL LOSS IN CLASS 2 AND 3 METALLIC PIPING**

R. McGill, Structural Integrity Associates, San Jose, CA, USA; G. Antaki, Becht Engineering Co., Aiken, SC, USA; M. A. Moenssens, Westinghouse Electric Co. LLC, Madison, PA, USA; D. Scarth, Kinectrics, Toronto, ON, Canada

#### **PVP2012-78794: ADDRESSING THE CHALLENGE OF INSPECTING BURIED NUCLEAR PIPING IN NUCLEAR POWER PLANTS.**

P. Angell, S.-H. Wang, AECL Nuclear Laboratories, Chalk River, ON, Canada; P. Simon, H. Kleinfelder, K. Garrity, Mears Group, Inc., Rosebush, MI, USA; E. Sisk, EPRI, Charlotte, NC, USA

#### **PVP2012-78795: BURIED PIPING MANAGING THE CHALLENGE**

P. Angell, M. Moir, AECL Nuclear Laboratories, Chalk River, ON, Canada; D. Munson, Electric Power Research Institute, Palo Alto, CO, USA; M. Berger, R. Barton, OPG Pickering, Pickering, ON, Canada

#### **PVP2012-78543: IMPROVING THE VALUE OF EXCAVATIONS THROUGH INDIRECT INSPECTION & ENGINEERING ASSESSMENTS**

S. Biagiotti, E. Houston, Structural Integrity Associates, Centennial, CO, USA; D. Dedhia, G. J. Licina, Structural Integrity Associates, Inc., San Jose, CA, USA

### **SESSION 2.1Q (DA-12-1)**

*Tuesday, July 17, 8:30 am – 10: 15 am, 2nd Floor, Civic Ballroom North*

#### **BOLTED JOINT DESIGN—EXTREME LOADING CONDITIONS**

Developed by: W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia; T. Seipp, Becht Engineering, Calgary, AB, Canada

Chair: W. Koves, Pi Engineering Software Inc., Hoffman Estates, IL, USA

Co-Chair: D. W. Reeves, Chevron, Richmond, CA, USA

#### **PVP2012-78036: DESIGN ANALYSIS PROCESS FOR AN BOLTED JOINT ENCAPSULATION FLASK SUBJECT TO PRESSURE AND IMPACT LOADING**

A. Towse, J. Dodds, Assystem UK Ltd., Sunderland, Tyne and Wear, United Kingdom

#### **PVP2012-78541: FINITE ELEMENT BASED ANALYSIS OF BOLTED JOINTS UNDER EXTREME LOADING CONDITIONS**

S. R. Kummari, D. Dewees, R. G. Brown, The Equity Engineering Group, Inc., Shaker Heights, OH, USA

#### **PVP2012-78538: IMPROVEMENT OF LEAK TIGHTNESS ANALYSIS OF BOLTED CLOSURE SYSTEMS IN PRESSURE EQUIPMENT**

F. Billon, B. Drevon, G. Batmale, ONET Technologies, Marseille, France

#### **PVP2012-78750: BOLTED JOINT COMPONENT TEMPERATURES FOR MATERIAL SELECTION**

W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia; C. Rodery, BP plc, Webster, TX, USA; R. Brodzinski, BP Products North America, Naperville, IL, USA

### **SESSION 2.1R (MF-18-2)**

*Tuesday, July 17, 8:30 am – 10: 15 am, Mezzanine, Essex Ballroom*

#### **ANALYSIS OF FATIGUE, FRACTURE AND HYDROGEN EMBRITTLEMENT OF WELDS—II**

Developed by: M. Kerr, Office of Nuclear Regulatory Research, Washington, DC, USA; D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; F. Hosseinzadeh, The Open University, United Kingdom; P. Gilles, AREVA NP SAS, Paris La Défense, France

Chair: D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Co-Chair: M. Olson, University of California, Davis, CA, USA

**PVP2012-78137: ASSESSMENT OF FATIGUE CRACK GROWTH IN IMPERFECT LAP JOINT—PART 1 ANALYSIS OF STRESS DISTRIBUTION ON VIRTUAL CRACK PLANE**

M. Wakasa, Ishii Iron Works Co., Ltd., Tokyo, Japan; S. Igi, JFE Steel Corporation, Chiba, Japan; S. Yoshida, K. Sekine, Yokohama National University, Yokohama, Japan; T. Tsuchida, K. Iwata, Japan Oil, Gas and Metals National Corporation, Tokyo, Japan

**PVP2012-78140: DISSIMILAR METAL WELD PIPE FRACTURE TESTING ANALYSIS OF RESULTS AND THEIR IMPLICATIONS**

D. Rudland, R. Lukes, US Nuclear Regulatory Commission, Rockville, MD, USA; P. Scott, R. Olson, A. Cox, Battelle, Columbus, OH, USA; D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

**PVP2012-78365: ASSESSMENT OF FATIGUE CRACK GROWTH IN IMPERFECT LAP JOINT—PART 2 CRACK PROPAGATION ANALYSIS USING**

S. Igi, Y. Morikage, JFE Steel Corporation, Chiba, Japan; M. Wakasa, Ishii Iron Works Co., Ltd., Tokyo, Japan; S. Yoshida, M. Shiratori, K. Sekine, Yokohama National University, Yokohama, Japan; T. Tsuchida, K. Iwata, Japan Oil, Gas and Metals National Corporation, Tokyo, Japan

**PVP2012-78846: NUMERICAL ANALYSIS OF HYDROGEN DISTRIBUTION IN WELDS OF STRUCTURAL MATERIALS FOR PRESSURE VESSELS**

H. Mori, K. Saida, H. Ogiwara, Osaka University, Suita, Osaka, Japan; R. Kayano, Japan Steel Works, Ltd., Muroran, Hokkaido, Japan; K. Nishimoto, Osaka University, Suita, Osaka, Japan

**PVP2012-78805: STATUS OF FRENCH ROAD MAP TO IMPROVE ENVIRONMENTAL FATIGUE RULES**

C. Faidy, EDF, Villeurbanne, France

**SESSION 2.1S (TW-7)**

*Tuesday, July 17, 8:30 am – 10:15 am, 2nd Floor, Civic Ballroom South*  
**PRACTICAL PIPING VIBRATION PART I**

Developed by: M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA

Chair: M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Presented by: C. Becht IV, Becht Engineering Company, Inc., Liberty Corner, NJ, USA

**SESSION 2.1T (CT-14-1)**

*Tuesday, July 17, 8:30 am – 10:15 am, 2nd Floor, Civic and Essex Foyers*  
**SOFTWARE DEMONSTRATION FORUM I**

Developed by: J. F. Cory Jr., Siemens PLM Software, Milford, OH, USA

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**Block 2.2: Tuesday, July 17 (10:30 am – 12:15 pm)**

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**SESSION 2.2B (NDE-3-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Elgin*

**RECENT DEVELOPMENTS IN NDE TECHNOLOGY II**

**Sponsored by the ASME NDE Division and the PVP Operations, Applications & Components and Materials & Fabrication Technical Committees**

Developed by: W. Springer, University of Arkansas, Fayetteville, AR, USA; N. Tada, Okayama University, Okayama, Japan

Chair: W. Springer, University of Arkansas, Fayetteville, AR, USA; N. Tada

**PVP2012-78545: PIPELINE HEALTH INTEGRITY MONITORING (PHIM) BASED ON ACOUSTIC EMISSION TECHNIQUE**

G. Giunta, eni spA Gas&Power Division, San Donato Milanese, Italy; S. Budano, A. Lucci, Centro Sviluppo Materiali SpA, Rome, Italy; L. Prandi, eni spA Gas&Power Division, San Donato Milanese, Italy

**PVP2012-78815: USING LCR ULTRASONIC METHOD TO EVALUATE RESIDUAL STRESS THROUGH THE THICKNESS IN STAINLESS STEEL WELDED PLATES**

Y. Javadi, Islamic Azad University-Semnan Branch, Semnan, Iran; H. S. Pirzaman, M. H. Raeisi, M. A. Najafabadi, Amirkabir University of Technology, Tehran, Iran; G. Javadi, Tabaran Institute of Higher Education, Mashhad, Iran

**PVP2012-78860: DEVELOPMENT OF ULTRASONIC PHASED ARRAY INSPECTION OF POLYETHYLENE PIPE JOINTS**

M. Troughton, M. Spicer, F. Hagglund, TWI Ltd., Cambridge, Cambridgeshire, United Kingdom

**PVP2012-78478: EXPERIMENTAL INVESTIGATION OF IN-PLANE CONSTRAINT AND OUT-OF-PLANE CONSTRAINT EFFECTS ON CREEP CRACK GROWTH**

J.-P. Tan, G. Wang, F.-Z. Xuan, S.-T. Tu, East China University of Science and Technology, Shanghai, China

**SESSION 2.2C (MF-4-4)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Wentworth*

**WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—IV**

Developed by: P. Gilles, AREVA NP SAS, Paris La Défense, France; M. Mochizuki, Osaka University, Suita, Osaka, Japan

Chair: P. Gilles, AREVA NP SAS, Paris La Défense, France

Co-Chair: M. Mochizuki, Osaka University, Suita, Osaka, Japan

**PVP2012-78449: EFFECTS OF SIMULATION PARAMETERS ON RESIDUAL STRESSES OF INCONEL ALLOY 600 IN FINITE ELEMENT LASER SHOCK PEENING ANALYSIS**

J. H. Kim, Korea Military Academy, Seoul, Korea (Republic); Y. J. Kim, Korea University, Seoul, Korea (Republic); J. S. Kim, Korea Atomic Energy Research Institute, Daejeon, Korea (Republic); J. S. Kim, H. Y. Bae, Korea University, Seoul, Korea (Republic)

**PVP2012-78618: EFFECTIVENESS OF EXCAVATE AND WELD REPAIRS ON A LARGE DIAMETER PIPING DISSIMILAR METAL WELD BY FINITE ELEMENT ANALYSIS**

F. H. Ku, Structural Integrity Associates, Inc., San Jose, CA, USA; P. Riccardella, Structural Integrity Associates, Inc., Centennial, CO, USA; A. Alleshwaram, Structural Integrity Associates, Inc., San Jose, CA, USA; E. Willis, Electric Power Research Institute, Palo Alto, CA, USA

**PVP2012-78456: PREDICTION OF RESIDUAL STRESS DISTRIBUTION FOR RPV CRDM PENETRATION NOZZLES**

H. Y. Bae, Korea University, Seoul, Korea (Republic); J. H. Kim, Korea Military Academy, Seoul, Korea (Republic); Y. J. Kim, Korea University, Seoul, Korea (Republic); S. Lee, K. Lee, Korea Hydro and Nuclear Power Company, Daejeon, Korea (Republic)

**PVP2012-78812: IMPROVEMENT OF RESIDUAL STRESS DETERMINATION BY DEEP HOLE DRILLING CONSIDERING PLASTIC DEFORMATION**

M. Mochizuki, H. Kitano, S. Okano, Osaka University, Suita, Osaka, Japan

**SESSION 2.2D (CS-18-1)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Kenora*

**PROBABILISTIC AND RISK BASED ASSESSMENT FOR CODES AND STANDARDS**

Developed by: I. Varfolomeev, Fraunhofer IWM, Freiburg, Germany  
Chair: I. Varfolomeev, Fraunhofer IWM, Freiburg, Germany  
Co-Chair: B. Bezensek, Hunting Energy Services UK, Aberdeen, United Kingdom

**PVP2012-78058: COG RISK-INFORMED IN-SERVICE INSPECTION (RISI) PROJECT**

P. O'Regan, Electric Power Research Institute, Hopkinton, MA, USA; M. Rezaie-Manesh, Ontario Power Generation, Pickering, ON, Canada; S. Chesworth, Structural Integrity Associates, Inc., San Jose, CA, USA

**PVP2012-78748: FAILURE PROBABILITY ANALYSIS BASED ON FRI MODEL FOR SCC GROWTH INTRODUCING RESIDUAL STRESS DISTRIBUTION BY WELD**

N. Maeda, JNES, Tokyo, Japan; T. Shoji, Tohoku University, Sendai, Japan  
**PVP2012-78267: RISK-BASED INSPECTION (RBI) TECHNOLOGY IN THE APPLICATION OF SYNGAS-PURIFICATION UNITS**  
Z. F. Li, Chinese Special Equipment Inspection and Research Center, Beijing, China; Z. X. Wang, J. K. Miao, Sinopec Qilu Corporation, Zibo, China; H. Wang, China Special Equipment Inspection & Research Institute, Beijing, China

**SESSION 2.2E (OAC-4-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Huron*

**TOXIC SUBSTANCES: THERMAL EVALUATION—II**

Developed by: A. Smith, Retired, North Augusta, SC, USA; N. Gupta, Savannah River nuclear Solutions, Aiken, SC, USA  
Chair: D. Demoss, Sargent & Lundy, LLC, Chicago, IL, USA  
Co-Chair: M. Nehrig, BAM Federal Institute for Materials Research and Testing, Berlin, Germany

**PVP2012-78370: DEVELOPMENT AND USE OF A HOMOGENIZED FUEL REGION MODEL FOR THERMAL ANALYSIS OF A TRUCK PACKAGE UNDER NORMAL AND FIRE ACCIDENT CONDITIONS**

K. Kamichetty, V. R. Venigalla, M. Greiner, University of Nevada, Reno, Reno, NV, USA

**PVP2012-78826: PU/SS EUTECTIC ASSESSMENT IN 9975 PACKAGINGS IN A STORAGE FACILITY DURING EXTENDED FIRE**

N. Gupta, Savannah River Nuclear Solutions, Aiken, SC, USA

**PVP2012-78640: SPENT NUCLEAR FUEL TRANSPORTATION PACKAGE SEALS IN BEYOND DESIGN BASIS TEMPERATURE EXCURSIONS**

C. Bajwa, F. Gonzalez, R. Einziger, E. Easton, US Nuclear Regulatory Commission, Rockville, MD, USA; J. Yang, E. Hnetkovsky, National Institute of Standards and Technology, Gaithersburg, MD, USA

**PVP2012-78882: THERMAL ANALYSIS OF A NAC LWT PACKAGE UNDER NORMAL AND FIRE ACCIDENT CONDITIONS**

K. Mittal, M. Greiner, University of Nevada, Reno, Reno, NV, USA

**SESSION 2.2F (FSI-3-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Kent*

**FLUID STRUCTURE INTERACTION AND PLANT COMPONENTS**

Developed by: K. Inaba, Tokyo Institute of Technology, Tokyo, Japan; H. Iyama, Kumamoto National College of Technology, Yatsushiro, Japan

Chair: C. Liang, George Washington University, Washington, DC, USA

Co-Chair: T. Watanabe, National Fisheries University, Shimonoseki, Japan

**PVP2012-78633: PARALLEL ANALYSIS OF INCOMPRESSIBLE FLOW AND STRUCTURE INTERACTION USING ITERATIVE PARTITIONED METHOD**

S. Kataoka, JGC Corporation, Yokohama, Japan; S. Minami, H. Kawai, Shinobu Yoshimura, University of Tokyo, Tokyo, Japan

**PVP2012-78647: EFFECTS OF SPRING CONSTANT VARIATION IN THE LOW ASPECT RATIO DRAG COEFFICIENT DURING VORTEX-INDUCED VIBRATION OF AN ELASTICALLY MOUNTED CYLINDER**

C. Sheets, J. J. French, G. Reynolds, LeTourneau University, Longview, TX, USA

**PVP2012-78733: COMPACTION RING ANALYSIS OF CONCRETE PENETRATION**

J. Loveless, J. Conway, M. Barkey, S. Jones, The University of Alabama, Tuscaloosa, AL, USA

**SESSION 2.2G (CT-4-1)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Conference F*

**ASSEMBLY AND TIGHTENING OF BOLTED JOINTS**

Developed by: J. Waterland, VSP Technologies, Inc., Prince George, VA, USA; J. Payne, JPAC Inc., Long Valley, NJ, USA

Chair: J. Waterland, VSP Technologies, Inc., Prince George, VA, USA

Co-Chair: J. Veiga, Teadit Industria e Comercio Ltda, RIO DE JANEIRO, RJ, Brazil

**PVP2012-78411: EFFECTS OF SCATTERED BOLT PRELOAD ON THE SEALING PERFORMANCE OF PIPE FLANGE CONNECTION WITH GASKETS UNDER EXTERNAL BENDING MOMENT AND INTERNAL PRESSURE**

Y. Takagi, Materials Engineering Group, R&D Center, Yokohama, Japan; T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan; K. Sato, Nippon Valqua Industries, Ltd., Gojo, Japan; Y. Omiya, H. Doi, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

**PVP2012-78484: FEM CALCULATIONS AND EVALUATION OF**

**SEALING PERFORMANCE IN BOX-SHAPED FLANGE GASKET CONNECTIONS (INFLUENCE WHICH BOLTING PROCEDURE, BOLT SPACING) (Presentation Only)**

R. Kurosawa, Yokogawa Electric Corporation, Kofu, Japan; T. Sawa, Y. Omiya, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan; T. Kobayashi, Numazu National College of Technology, Numazu, Japan; K. Temma, Idemitsu, Ichihara, Japan

**PVP2012-78600: GASKET DESIGN AND ASSEMBLY FOR LARGE DIAMETER GLASS LINED VESSEL FLANGES**

J. Waterland, VSP Technologies, Inc., Prince George, VA, USA

**PVP2012-78651: LIFE CYCLE MANAGEMENT OF BOLTED JOINTS ON OIL AND GAS ASSETS FOR LEAK FREE START UP AND OPERATION**

R. Noble, Hydratight, Morpeth, Northumberland, United Kingdom

**SESSION 2.2H (DA-2-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Conference G*

**DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—II**

Developed by: C. Basavaraju, US Nuclear Regulatory Commission, Rockville, MD, USA; J. McCabe, General Dynamics—Electric Boat, Groton, CT, USA; A. Dweib, Worley Parsons, Atyrau, Kazakhstan, Kazakhstan

Chair: A. Usmani, AMEC NSS, Power and Process Americas, Toronto, ON, Canada

Co-Chair: W. Mekky, AMEC NSS, Toronto, ON, Canada

**PVP2012-78345: TÜV NORD GROUP STRATEGY CONCEPT COOP—AN ANSWER FOR THE NEW REQUIREMENTS OF THE POWER PLANT FLEXIBILISATION**

R. Trieglaff, A. Schulz, TÜV Nord SysTec, Hamburg, Germany; D. Rieck, IGN, Greifswald, Mecklenburg/Vorpommern, Germany; A. Schulze, TÜV Nord SysTec, Hamburg, Germany

**PVP2012-78588: SNUBBER OPTIMIZATION UTILIZING GAPPED STRUTS IN NUCLEAR POWER PLANTS RIVER BEND STATION**

M. P. Singley, Sargent & Lundy, LLC, Chicago, IL, USA; W. G. Chatterton, Entergy, Saint Francisville, LA, USA; J. H. Gray, M. A. Pressburger, V. K. Verma, Sargent & Lundy, Chicago, IL, USA

**PVP2012-78716: EVALUATION OF FRACTURE BEHAVIOR FOR PRESSURIZED T-PIPE BY FINITE ELEMENT ANALYSIS**

N. Miura, Central Research Institute of Electric Power Industry, Yokosuka, Japan; K. Yamakami, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; K. Iwahara, Hitachi-GE Nuclear Energy, Ltd., Hitachi, Ibaraki, Japan; K. Tsunokawa, Toshiba Corporation, Yokohama, Japan; K. Miyao, Electric Power Development Co., Ltd., Tokyo, Japan

**PVP2012-78711: CAUSE ANALYSIS OF AUSTENITIC STAINLESS STEEL PIPE LEAKAGE**

Z. Shen, C. Ye, Nanjing Boiler & Pressure Vessel and Inspection Institute, Nanjing, Jiangsu, China; M. Yan, Yangzi Petrochemical Co., Ltd., Nanjing, Jiangsu, China; D. Ji, Z. Shang, W. Zhang, Nanjing Boiler & Pressure Vessel Inspection Institute, Nanjing, Jiangsu, China; Y. Zhou, Yangzi Petrochemical Co., Ltd., Nanjing, Jiangsu, China

**SESSION 2.2I (DA-4-3)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Simcoe*

**NONLINEAR ANALYSIS**

Developed by: I. Fanous, Candu Energy Inc., Mississauga, ON, Canada; M. Y. A. Younan, American University in Cairo, Cairo, Egypt; D. Vlaicu, Ontario Power Generation, Pickering, ON, Canada

Chair: I. Fanous, Candu Energy Inc., Mississauga, ON, Canada

Co-Chair: D. Vlaicu, Ontario Power Generation, Toronto, ON, Canada

**PVP2012-78198: STUDY ON COLLAPSE CHARACTERISTICS AND CSR METHOD FOR 45 DEGREE CYLINDER-TO-CYLINDER INTERSECTIONS**

T. Honda, S. Kataoka, T. Sato, JGC Corporation, Yokohama, Japan

**PVP2012-78654: EFFECTS ON PLASTICITY AND STRUCTURAL INTEGRITY OF TUBE EXPANSION**

R. Khan, T. Pervez, S. Z. Qamar, Sultan Qaboos University, Al-Khoud, Oman

**PVP2012-78752: STRAIN LIMITS FOR THE ANALYSIS OF THE MECHANICAL BEHAVIOUR OF PRESSURIZED COMPONENTS**

K.-H. Herter, X. Schuler, M. Seidenfuss, Materials Testing Institute, University of Stuttgart, Stuttgart, Germany

**PVP2012-78674: SHAKEDOWN ANALYSIS OF A CYLINDRICAL VESSEL-NOZZLE INTERSECTION SUBJECTED TO STEADY INTERNAL PRESSURES AND CYCLIC OUT-OF-PLANE BENDING MOMENTS**

H. F. Abdalla, M. Y. A. Younan, American University in Cairo, Cairo, Egypt; M. M. Megahed, Cairo University, Cairo, Egypt

**SESSION 2.2J (SPC-1-4)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Windsor West*

**20TH RUDY SCAVUZZO STUDENT PAPER COMPETITION—4**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA

Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

Co-Chair: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

**PVP2012-78560: A FULL-FIELD RESIDUAL STRESS PROFILE ESTIMATION SCHEME FOR PIPE GIRTH WELDS**

S. Song, P. Dong, J. Zhang, University of New Orleans, New Orleans, LA, USA

**PVP2012-78283: SMALL SCALE EXPERIMENTS ON BOILING LIQUID EXPANDING VAPOR EXPLOSIONS: SUPERCRITICAL BLEVE**

D. Laboureur, J.-M. Buchlin, P. Rambaud, von Karman Institute, Rhode-St-Genese, Brabant, Belgium

**PVP2012-78784: A STUDY OF FORMULARIZATION OF UPLIFT BEHAVIOR AT THE BOTTOM PLATE OF LARGE LNG STORAGE TANKS DURING EARTHQUAKE**

S. Hayashi, T. Taniguchi, Tottori University, Tottori, Japan

**PVP2012-78497: QUANTIFICATION OF CREEP CAVITY EVOLUTION USING A NOVEL IMAGE PROCESSING TECHNIQUE**

H. Yang, C. M. Davies, J. P. Dear, Imperial College London, London, United Kingdom

**SESSION 2.2K (SPC-2-4)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Windsor East*

**STUDENT PAPER SYMPOSIUM—4**

Developed by: M. Aggarwal, Gannon University, Erie, PA, USA

Chair: M. Aggarwal, Gannon University, Erie, PA, USA

Co-Chair: W. Springer, University of Arkansas, Fayetteville, AR, USA

**PVP2012-78496: DYNAMIC FRACTURE AND ANTI-EXPLOSION CAPACITY INVESTIGATION OF COMPOSITE EXPLOSION CONTAINMENT VESSEL**

Y. H., J. Zheng, L. Ma, Zhejiang University, Hangzhou, Zhejiang, China

**PVP2012-78453: INVESTIGATION ON ON-BOARD HIGH-PRESSURE COMPOSITE TANKS SUBJECT TO LOCALIZED AND ENGULFING FIRE**

K. Ou, J. Zheng, Y. Zhao, Zhejiang University, Hangzhou, Zhejiang, China

**PVP2012-78638: SAFETY INVESTIGATION OF BURIED POLYETHYLENE PIPE SUBJECT TO SEISMIC LANDSLIDE**

J. Ma, J. Shi, J. Zheng, Zhejiang University, Hangzhou, Zhejiang Province, China

**SESSION 2.2L (MF-32-1)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Conference B*

**PANEL SESSION: INFRASTRUCTURE ASSESSMENT FOR AGING AND EMERGING ENERGY TECHNOLOGIES—II**

Developed by: J. Todd, Penn State University, University Park, PA, USA

Chair: J. Todd, Penn State University, University Park, PA, USA

Co-Chair: A. Wallace, Kinectrics, Inc., Toronto, Canada

*Panelists:*

G. Bezdikian, Georges Bezdikian Consulting Co., Le Vesinet, France

K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan

A. Wallace, Kinectrics, Inc., Toronto, Canada

**SESSION 2.2M (MF-19-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Conference C*

**CREEP BEHAVIOR OF WELDMENTS**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA

Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

Co-Chair: R. Dennis, Frazer-Nash Consultancy, Bristol, Avon, United Kingdom

**PVP2012-78393: EVALUATION OF LONG-TERM CREEP STRENGTH OF WELDED JOINTS OF ASME GRADES 91, 92, AND 122 TYPE STEELS**

M. Yaguchi, T. Matsumura, K. Hoshino, Central Research Institute of Electric Power Industry, Kanagawa, Japan

**PVP2012-78555: CREEP BEHAVIOUR OF P92 AND P92 WELDS AT 675°C**

D. W. J. Tanner, M. Saber, W. Sun, T. Hyde, The University of Nottingham, Nottingham, United Kingdom

**PVP2012-78577: CROSS-WELD CREEP COMPARISON OF POWER PLANT STEELS CRMOV, P91 AND P92**

D. W. J. Tanner, W. Sun, T. Hyde, The University of Nottingham, Nottingham, United Kingdom

**PVP2012-78693: PREDICTION OF CREEP VOID GROWTH IN HEAT-AFFECTED ZONE OF HIGH CHROMIUM STEEL WELDMENTS CONSIDERING MULTIAXIAL STRESS STATE**

E. Murakami, M. Hashimoto, S. Kikuhara, Babcock-Hitachi K.K., Kure, Hiroshima, Japan

**SESSION 2.2P (CS-15-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, City Hall*

**INSPECTION OF BURIED PIPE**

Developed by: R. McGill, Structural Integrity Associates, San Jose, CA, USA; S. Xu, Kinectrics, Toronto, ON, Canada

Co-Chair: S. Xu, Kinectrics, Toronto, ON, Canada

Chair: R. McGill, Structural Integrity Associates, San Jose, CA, USA

**PVP2012-78144: INSPECTION OF BURIED PIPING IN NUCLEAR POWER PLANTS—FIELD OBSERVATIONS AND CHALLENGES**

G. Ogundele, G. Goszczynski, Kinectrics Inc., Toronto, ON, Canada; D. VanSligtenhorst, Brouco Services Inc., Orleans, ON, Canada

**PVP2012-78561: MAXIMIZING BURIED PIPE CORROSION KNOWLEDGE FROM EACH EXCAVATION**

A. Crompton, Structural Integrity Associates, Centennial, CO, USA; R. Royer, Structural Integrity Associates, Huntersville, NC, USA; M. Tallon, Progress Energy - Brunswick Nuclear Plant, Southport, NC, USA; S. Biagiotti, Structural Integrity Associates, Centennial, CO, USA

**PVP2012-78257: APPLICATION OF TORSIONAL MODE OF ULTRASONIC GUIDED WAVE IN PRESSURE PIPELINE**

Y. Zuo, X. Tang, H. Yu, Y. Qian, J. F. Wang, Shanghai Institute of Special Equipment Inspection & Technical Research, Shanghai, China, Shanghai, China

**SESSION 2.2Q (DA-12-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Civic Ballroom North*

**BOLTED JOINT DESIGN—PRACTICAL CONSIDERATIONS**

Developed by: W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia; W. Koves, Pi Engineering Software Inc., Hoffman Estates, IL, USA

Chair: J. Taagepera, Chevron ETC, Richmond, CA, USA

Co-Chair: S. Hamilton, Alltite, Inc., Wichita, KS, USA

**PVP2012-78217: JUSTIFICATION FOR A NEW INDUSTRY STANDARD FOR TORQUE WRENCH CALIBRATION**

S. Hamilton, T. J. Smith, Alltite, Inc., Wichita, KS, USA

**PVP2012-78668: BOLTED JOINT ASSEMBLER QUALIFICATION—DREAM OR REALITY?**

W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia

**PVP2012-78701: A SIMPLE RECIPE TO SOLVING ALL REFINING SEALING ISSUES**

D. W. Reeves, Chevron, Richmond, CA, USA; W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia

**PVP2012-78702: COMMON MISUNDERSTANDINGS ABOUT GASKETS AND BOLTED CONNECTION INTERACTIONS**

D. W. Reeves, Chevron, Richmond, CA, USA; W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia

**SESSION 2.2R (MF-5-3)**

*Tuesday, July 17, 10:30 am – 12:15 pm, Mezzanine, Essex Ballroom*

**EUROPEAN PROGRAMMES IN STRUCTURAL INTEGRITY—III**

Developed by: P. James, Serco TCS, Warrington, Cheshire, United Kingdom; T. Nicak, AREVA NP GmbH, Erlangen, Germany

Chair: D. Moinereau, EDF R&D, Moret-sur-Loing, France

Co-Chair: E. Keim, AREVA NP GmbH, Erlangen, Germany

**PVP2012-78464: R6 V AND PROPOSED VG PLASTICITY CORRECTION TERMS FOR COMBINED LOADING APPLIED TO EXPERIMENTS**

P. James, C. Madew, Serco Energy, Warrington, Cheshire, United Kingdom  
**PVP2012-78564: A DISLOCATION-BASED CLEAVAGE INITIATION MODEL FOR PRESSURE VESSEL STEELS**

Kristine Cochran, Oak Ridge National Laboratory, Oak Ridge, TN, USA; Marjorie Erickson, PEAI, Davidsonville, MD, USA; P. Williams, Hilda Klasky, R. Bass, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**PVP2012-78722: R6, VG AND RSE-M ESTIMATES OF EXPERIMENTAL FAILURE FOR COMBINED LOADING**

P. James, C. Madew, Serco Energy, Warrington, Cheshire, United Kingdom; A. Goodfellow, M. Gallegillo, New Nuclear Build, EDF Energy, Barnwood, London, United Kingdom

**PVP2012-78835: D. LIDBURY CONTRIBUTION TO THE MULTI-SCALE MODELING APPROACH (Presentation Only)**

A. Al Mazouzi, EDF R&D, Moret-sur-Loing, France

**SESSION 2.2S (TW-8)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Civic Ballroom South*  
**PRACTICAL PIPING VIBRATION PART II**

Developed by: M. Ruggles-Wrenn, Air Force Institute of Technology, WPAFB, OH, USA

Chair: M. Y. A. Younan, American University in Cairo, Cairo, Egypt

Presented by: C. Becht IV, Becht Engineering Company, Inc., Liberty Corner, NJ, USA

**SESSION 2.2T (CT-14-2)**

*Tuesday, July 17, 10:30 am – 12:15 pm, 2nd Floor, Civic and Essex Foyers*  
**SOFTWARE DEMONSTRATION FORUM II**

Developed by: J. F. Cory Jr., Siemens PLM Software, Milford, OH, USA

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**Block 2.3: Tuesday, July 17 (2:00 pm – 3:45 pm)**

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**SESSION 2.3B (NDE-3-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Elgin*

**RECENT DEVELOPMENTS IN NDE TECHNOLOGY III**

Sponsored by the ASME NDE Division and the PVP Operations, Applications & Components and Materials & Fabrication Technical Committees

Developed by: W. Springer, University of Arkansas, Fayetteville, AR, USA  
Chair: N. Tada, Okayama University, Okayama, Japan

Co-Chair: W. Springer, University of Arkansas, Fayetteville, AR, USA  
**PVP2012-78067: EFFECTIVENESS OF AE ON-LINE TESTING RESULTS OF ATMOSPHERIC VERTICAL STORAGE TANK FLOORS**

Y. Xu, X. Wang, X. Wang, Y. Wang, Zhejiang Provincial Special Equipment Inspection and Research Institute, Hangzhou, China

**PVP2012-78410: STUDY ON THE CAUSE AND NONDESTRUCTIVE TEST OF BACKSIDE CRACKS IN STAINLESS STEEL LININGS**

H. Cao, Shandong Special Equipment Inspection Institute/China University of Petroleum, Jinan, China; C. Wang, Shandong Special Equipment

Inspection Institute, Jinan, China; X. Qiu, China University of Petroleum, Qingdao, China

**PVP2012-78256: REMOTE FIELD EDDY CURRENT TESTING TECHNOLOGY FOR CARBON STEEL PIPE OF HEAT EXCHANGER**

Y. Chen, J. Zheng, W. Luo, Guangdong Institute of Special Equipment Inspection, Guangzhou, Guangdong, China

**SESSION 2.3C (SE-6-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Wentworth*

**SEISMIC ISSUES FOR NEW REACTOR LICENSING ACTIVITIES**

Developed by: S. A. Karamanos, University of Thessaly, Volos, Greece

Chair: J. Xu, US Nuclear Regulatory Commission, Rockville, MD, USA

Co-Chair: T. Clark, Idaho National Laboratory, Idaho Falls, ID, USA

**PVP2012-78369: LOAD COMBINATION REDUCTION METHODOLOGY FOR THE US EPR STANDARD NUCLEAR POWER PLANT**

S.-K. Jung, J. Harrold, N. Alchaar, AREVA NP Inc., Charlotte, NC, USA

**PVP2012-78373: APPLICATION OF A LARGE-SCALE DATABASE SYSTEM FOR THE ANALYSIS AND DESIGN OF THE US EPR STANDARD NUCLEAR POWER PLANT**

S.-K. Jung, J. Harrold, N. Alchaar, AREVA NP Inc., Charlotte, NC, USA

**PVP2012-78458: EXPERIMENTAL PARAMETER STUDY ON FREE STANDING RACK**

A. Iwasaki, Y. Nekomoto, H. Morita, K. Taniguchi, D. Okuno, T. Matsuoka, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; N. Chigusa, The Kansai Electric Power Co., Inc., Tokyo, Japan

**SESSION 2.3D (CS-8-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Kenora*

**ASME CODE SECTION XI ACTIVITIES—I**

Developed by: R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA; D. Scarth, Kinectrics, Toronto, ON, Canada; R. Crane, ASME, New York, NY, USA

Chair: R. Crane, ASME, New York, NY, USA

Co-Chair: R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA

**PVP2012-78187: CLOSED FORM SOLUTIONS FOR STRESS INTENSITY FACTOR COEFFICIENTS FOR CIRCUMFERENTIAL ID SURFACE FLAWS IN CYLINDERS IN ASME SECTION XI APPENDIX A**

D. Lee, Babcock & Wilcox, Barberton, OH, USA; R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA

**PVP2012-78190: ALTERNATIVE ACCEPTANCE CRITERIA FOR FLAWS IN FERRITIC STEEL COMPONENTS OPERATING IN THE UPPER SHELF TEMPERATURE RANGE**

H. Gustin, Structural Integrity Associates, Centennial, CO, USA; D. Scarth, S. Xu, Kinectrics, Toronto, ON, Canada; R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA

**PVP2012-78227: UNDERSTANDING EQUIVALENT MARGINS ANALYSIS FOR REQUIRED UPPER SHELF ENERGY**

M. Benson, G. Stevens, M. Kirk, US Nuclear Regulatory Commission, Rockville, MD, USA; R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA; D. Scarth, Kinectrics, Toronto, ON, Canada

**PVP2012-78019: CODE CASE N-803: AMBIENT TEMPERATURE TEMPERBEAD WELDING USING THE UNDERWATER LASER BEAM WELDING PROCESS (Presentation Only)**



B. Newton, Westinghouse, Rock Hill, SC, USA

### **SESSION 2.3E (OAC-4-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Huron*

#### **TOXIC SUBSTANCES: STRUCTURAL EVALUATION—I**

Developed by: N. Gupta, Savannah River nuclear Solutions, Aiken, SC, USA

Chair: A. Reich, Streamline Automation LLC, Huntsville, AL, USA

Co-Chair: N. Gupta, Savannah River nuclear Solutions, Aiken, SC, USA

#### **PVP2012-78302: MECHANICAL BEHAVIOUR OF HIGH BURN-UP SNF UNDER NORMAL AND ACCIDENT TRANSPORT CONDITIONS—PRESENT APPROACHES AND PERSPECTIVES**

V. Ballheimer, F. Wille, A. Rolle, B. Droste, BAM Federal Institute for Materials Research and Testing, Berlin, Germany

#### **PVP2012-78112: EVALUATION OF CUMULATIVE DAMAGE FROM DROP TO PUNCTURE CONDITIONS**

W. Choi, S. Lee, K.-S. Bang, J.-C. Lee, K.-S. Seo, Korea Atomic Energy Research Institute, Daejeon, Korea (Republic)

#### **PVP2012-78707: DYNAMIC FINITE ELEMENT ANALYSIS OF DRUM-TYPE SHIPPING PACKAGES FOR RADIOACTIVE MATERIALS**

Z. Han, Argonne National Laboratory, Argonne, IL, USA; V. Shah, Y. Y. Liu, Argonne National Laboratory, Argonne, IL, USA

### **SESSION 2.3F (FSI-3-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Kent*

#### **FLUID STRUCTURE INTERACTION AND WAVE PROPAGATION**

Developed by: S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan; H. Iyama, Kumamoto National College of Technology, Yatsushiro, Japan; T. Watanabe, National Fisheries University, Shimonoseki, Japan

Chair: K. Shimojima, Okinawa National College of Technology, Okinawa, Japan

Co-Chair: K. Inaba, Tokyo Institute of Technology, Tokyo, Japan

#### **PVP2012-78192: BASIC STUDY ON PRESSURE VESSEL FOR VAPORIZATION OF CRYOGENIC FLUIDS BY CONTACTING NORMAL TEMPERATURE FLUIDS**

T. Watanabe, National Fisheries University, Shimonoseki, Japan; H. Maehara, Shock Wave and Condensed Matter Research Center, Kumamoto University, Kumamoto, Kumamoto, Japan; S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan

#### **PVP2012-78193: BASIC STUDY ON VESSEL TO MAKE ICE BALL AND COOLANT FOR KEEPING FRESHNESS OF MARINE PRODUCTS**

T. Watanabe, National Fisheries University, Shimonoseki, Japan; H. Maehara, Shock Wave and Condensed Matter Research Center, Kumamoto University, Kumamoto, Kumamoto, Japan; S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan

#### **PVP2012-78461: STUDY OF UNSTEADY SUPERSONIC JET USING SHOCK TUBE WITH SMALL HIGH-PRESSURE CHAMBER**

H. Fukuoka, Nara National College of Technology, Nara, Japan; M. Yaga, University of the Ryukyus, Okinawa, Japan; T. Takiya, Hitachi Zosen Corporation, Osaka, Japan

#### **PVP2012-78292: SHOCK WAVE PROPAGATION INSIDE OF PRESSURE VESSEL USED FOR FOOD PROCESSING**

H. Iyama, Kumamoto National College of Technology, Yatsushiro, Japan; Y. Higa, S. Itoh, Okinawa National College of Technology, Nago, Japan

### **SESSION 2.3G (CT-5-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, Mezzanine, Conference F*

#### **THREADED FASTENERS**

Developed by: S. Nassar, Oakland University, Rochester, MI, USA; F. Toshimichi, Kobe University, Kobe, Japan

Chair: S. Nassar, Oakland University, Rochester, MI, USA

Co-Chair: F. Toshimichi, Kobe University, Kobe, Japan

#### **PVP2012-78367: DEFORMATION AND SLIPPAGE MODELING FOR INVESTIGATING BOLT LOOSENING UNDER HARMONIC TRANSVERSE EXCITATION**

X. Yang, S. Nassar, Oakland University, Rochester, MI, USA

#### **PVP2012-78398: A LOOSENING MECHANISM OF BOLTED JOINTS UNDER REPEATED TRANSVERSE DISPLACEMENTS**

T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan, M. Ishimura, Shonan Institute of Technology, Fujisawa, Japan; T. Nagao, Hiroshima University, Higashihiroshima, Japan

#### **PVP2012-78508: FINITE ELEMENT SIMULATION OF PROCESS CONTROL METHODS FOR BOLT TIGHTENING IN JOINTS WITH NON-PARALLEL UNDERHEAD CONTACT**

S. Ganeshmurthy, S. Nassar, Oakland University, Rochester, MI, USA

#### **PVP2012-78517: NON-LOOSENING PERFORMANCE OF PLASTICALLY PRE-DEFORMED NUTS UNDER CYCLIC LOADS**

Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan; S. Kumakura, Kanagawa University, Yokohama, Japan; T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

### **SESSION 2.3H (DA-2-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, Mezzanine, Conference G*

#### **DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—III**

Developed by: J. McCabe, General Dynamics–Electric Boat, Groton, CT, USA; A. Dweib, Worley Parsons, Atyrau, Kazakhstan, Kazakhstan

Co-Chair: W. Mekky, AMEC NSS, Toronto, ON, Canada

Chair: C. Basavaraju, US Nuclear Regulatory Commission, Rockville, MD, USA

#### **PVP2012-78685: PRESSURE TESTS FOR THICKNESS MANAGEMENT OF WALL THINNING TEES**

K. Teshima, Y. Iwamoto, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; K. Hojo, Mitsubishi Heavy Industries, Ltd., Kobe, Japan; T. Oka, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; K. Kobayashi, Tohoku Electric Power Co., Inc., Sendai, Japan; S. Tsuno, Hokkaido Electric Power Co., Inc., Sapporo, Japan

#### **PVP2012-78686: COMPARISON BETWEEN PRESSURE TESTS AND SIMULATIONS FOR THICKNESS MANAGEMENT OF WALL THINNING T-JOINTS**

K. Teshima, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; M. Ochi, Mitsubishi Heavy Industries, Ltd., Takasago, Japan; S. Asada, K. Hojo, Mitsubishi Heavy Industries, Ltd., Kobe, Japan; T. Suzuki, Tokyo Electric Power Co., Inc., Tokyo, Japan; M. Kugimoto, Chubu Electric Power Co., Inc., Nagoya, Japan

**PVP2012-78717: THE PROPOSAL OF WALL THICKNESS MANAGEMENT CRITERIA OF T-PIPES**

K. Tsunokawa, Toshiba Corporation, Yokohama, Japan; T. Ohira, Japan Atomic Power Company, Tokyo, Japan; N. Miura, Central Research Institute of Electric Power Industry, Yokosuka, Japan; Y. Kitajima, D. Yoshimura, Toshiba Corporation, Yokohama, Japan

**PVP2012-78790: THE PROPOSAL OF A GUIDELINE FOR THICKNESS MANAGEMENT OF WALL THINNING T-JOINTS**

M. Ochi, Mitsubishi Heavy Industries, Ltd., Takasago, Japan; K. Yamakami, Y. Hamaguchi, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; K. Naito, Chugoku Electric Power Co., Inc., Hiroshima, Japan; K. Toyota, Shikoku Electric Power Co., Inc., Takamatsu, Japan; K. Teshima, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan

**SESSION 2.3I (DA-8-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Simcoe*

**THERMAL STRESSES—I**

Developed by: A. Segall, Penn State, University Park, PA, USA  
Chair: A. Segall, Penn State, University Park, PA, USA  
Co-Chair: S. Iyer, AMEC NSS Ltd., Toronto, ON, Canada

**PVP2012-78126: STUDY ON THE FREQUENCY RESPONSE CHARACTERISTICS OF THERMAL STRESS INDUCED BY MULTIDIMENSIONAL FLUID TEMPERATURE FLUCTUATION**

C. S. P. Torres, Worley Parsons, Windsor, Queensland, Australia; N. Kasahara, The University of Tokyo, Tokyo, Japan

**PVP2012-78229: THERMOMECHANICAL ANALYSIS OF PRESSURE VESSELS**

M. Benson, D. Rudland, M. Kirk, US Nuclear Regulatory Commission, Rockville, MD, USA

**PVP2012-78358: EXPERIMENTAL AND FEA SIMULATION OF COATING-DEFECT BIRTH AND EVOLUTION UNDER SEVERE THERMAL- AND PRESSURE-TRANSIENTS**

J. Harris, A. Segall, D. Robinson, Penn State, University Park, PA, USA; R. Carter, US Army Research Laboratory, MD, USA

**PVP2012-78619: CREEP LIFE SIMULATION AND ASSESSMENT OF HIGH TEMPERATURE PIPING SYSTEMS AND COMPONENTS**

B. Rose, J. Widrig, Quest Integrity Group, Boulder, CO, USA

**SESSION 2.3K (MF-3-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, Mezzanine, Windsor East*

**MATERIALS FOR HYDROGEN SERVICE**

Developed by: M. Brongers, Det Norske Veritas (U.S.A) Inc., Dublin, OH, USA; I. Garcia, A. Duncan, Savannah River National Laboratory, Aiken, SC, USA; Y. Tanaka, Nippon Steel Techno-Research, Osaka, Japan

Chair: M. Brongers, Det Norske Veritas (U.S.A) Inc., Dublin, OH, USA

Co-Chair: A. Duncan, Savannah River National Laboratory, Aiken, SC, USA

**PVP2012-78030: STANDARD RELIABLE TESTING PROCEDURE FOR 2%CR-1MO-V WELDING QUALITY CONTROL & ACCEPTANCE PREVENTION OF SAW FILLER MATERIAL REHEAT CRACKING DURING FABRICATION OF HEAVY REACTORS MINI-JIP PROGRAM.**

S. Pillot, Industeel, ArcelorMittal, Le Creusot, France; C. Chauvy, Industeel, ArcelorMittal, Rive de Gier, France

**PVP2012-78448: COMBINED EFFECT OF TEMPER AND HYDROGEN EMBRITTLEMENT ON THRESHOLD FOR HYDROGEN-INDUCED FRACTURE IN CR-MO STEELS**

H. Shimazu, S. Konosu, Ibaraki University, Hitachi, Japan; Y. Tanaka, Nippon Steel Techno-Research, Osaka, Japan; M. Yuga, JFE Steel Corp., Kurashiki, Japan; H. Yamamoto, Chiyoda Advanced Solutions Corp., Yokohama, Japan; N. Ohtsuka, Mu Ltd., Ohtsu, Japan

**PVP2012-78709: PRESSURE CYCLING OF STEEL PRESSURE VESSELS WITH GASEOUS HYDROGEN**

C. S. Marchi, A. P. Harris, M. Yip, B. P. Somerday, Sandia National Laboratories, Livermore, CA, USA; K. A. Nibur, Hy-Performance Materials Testing, LLC, Bend, OR, USA

**PVP2012-78009: MATERIALS USED FOR PRESSURE VESSELS IN CRYOGENIC SERVICES (Presentation Only)**

D. Ristic, Argonne National Laboratory, Lemont, IL, USA

**SESSION 2.3L (MF-4-6)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, Mezzanine, Conference B*

**WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—VI**

Developed by: A. H. Mahmoudi, Bu-Ali Sina University, Hamedan, Iran; D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA

Co-Chair: T. Nicak, AREVA NP GmbH, Erlangen, Germany

Chair: D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA

**PVP2012-78032: PREDICTION OF WELD RESIDUAL STRESS IN A PWR PRESSURIZER SURGE NOZZLE: A PROPOSED FAST COMPUTATIONAL 3D ANALYSIS METHOD AND INFLUENCE OF ITS HEAT SOURCE MODEL**

A. Maekawa, Institute of Nuclear Safety System, Inc., Fukui, Japan; A. Kawahara, H. Serizawa, H. Murakawa, Osaka University, Osaka, Japan

**PVP2012-78156: MITIGATION OF DISTORTION IN AN EDGE-WELDED BAR BY OPTIMIZING WELDING CURRENT PROFILE DURING WELDING**

M. Asadi, University of Ottawa, Ottawa, ON, Canada; J. Goldak, Carleton University, Ottawa, ON, Canada; C. Bayley, Dockyard Laboratory Pacific, Victoria, BC, Canada

**PVP2012-78742: FINITE ELEMENT RESIDUAL STRESS ANALYSIS OF A NARROW GAP DISSIMILAR METAL WELD**

F. Obermeier, AREVA NP GmbH, Erlangen, Germany; S. Courtin, AREVA NP SAS, Paris La Défense, France; T. Nicak, E. Keim, AREVA NP GmbH, Erlangen, Germany

**PVP2012-78883: SUMMARY OF FINITE ELEMENT (FE) SENSITIVITY STUDIES CONDUCTED IN SUPPORT OF THE NRC/EPRI WELDING RESIDUAL STRESS (WRS) PROGRAM**

M. Kerr, Office of Nuclear Regulatory Research, Washington, DC, USA; H. Rathbun

**SESSION 2.3M (MF-19-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, Mezzanine, Conference C*

**CREEP CRACK INITIATION AND GROWTH**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA  
Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA  
Co-Chair: C. M. Davies, Imperial College, London, United Kingdom  
**PVP2012-78096: SPECIMEN ORIENTATION AND CONSTRAINT EFFECTS ON THE CREEP CRACK GROWTH BEHAVIOUR OF 316H STAINLESS STEEL**

A. Mehmanparast, C. M. Davies, Imperial College London, London, United Kingdom; D. W Dean, EDF, Barnwood, United Kingdom; K. Nikbin, Imperial College London, London, United Kingdom

**PVP2012-78312: CREEP AND FRACTURE BEHAVIOR OF CENTRIFUGAL CAST HP40NB ALLOY CONTAINING LEAD**

T. Chen, X. Chen, Y. Lu, J. Ye, X. Lian, Hefei General Machinery Research Institute, Hefei, Anhui, China

**PVP2012-78480: TDFANALYSIS OF CREEP CRACK INITIATION IN PRE STRAINED AND AS RECEIVED TYPE 316H STAINLESS STEEL**

C. M. Davies, Imperial College London, London, United Kingdom; D. W Dean, EDF, Barnwood, United Kingdom; A. Mehmanparast, Imperial College London, London, United Kingdom

**PVP2012-78680: INFLUENCE OF PRIOR DEFORMATION ON CREEP CRACK GROWTH BEHAVIOUR OF 316H AUSTENITIC STEELS**

H. Y. Nezhad, University of Limerick, Limerick, Ireland; Noel P. O'Dowd, Materials and Surface Science Institute, Limerick, Ireland; C. M. Davies, A. Mehmanparast, K. Nikbin, Imperial College London, London, United Kingdom

### **SESSION 2.3P (CS-24-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, City Hall*

#### **USE OF MODERN FE METHODS FOR CODE ASSESSMENT—I**

Developed by: M. Martin, K. Wright, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

Chair: M. Martin, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

Co-Chair: L. Rawson, Rolls-Royce PLC, Derby, United Kingdom

**PVP2012-78040: APPLICATION OF LIMIT LOAD ANALYSIS TO COMPLEX STRUCTURES**

A. Towse, Assystem UK Ltd., Sunderland, Tyne and Wear, United Kingdom; M. Martin, A. Allen, C. Andrews, P. Hurrell, R. Philipson, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

**PVP2012-78171: APPLICATION OF GURSON MODEL TO NI-BASED ALLOY WELD JOINT PIPE WITH AN AXIAL OR A CIRCUMFERENTIAL SURFACE FLAW**

K. Hojo, Mitsubishi Heavy Industries, Ltd., Kobe, Japan; N. Ogawa, Mitsubishi Heavy Industries, Ltd., Takasago, Japan

**PVP2012-78359: ELASTIC-PLASTIC FATIGUE EVALUATION OF A HEAVY WALL NOZZLE SUBJECT TO RAPID THERMAL TRANSIENTS**

D. Dewees, The Equity Engineering Group, Shaker Heights, OH, USA; M. Cooch, DuPont Engineering Research and Technology, Wilmington, DE, USA

**PVP2012-78542: INVESTIGATION OF TRANSIENT THERMAL ANALYSIS COMPUTATIONAL EFFICIENCY IMPROVEMENTS VIA FREQUENCY DOMAIN METHODS**

G. Banyay, Westinghouse Electric Company, Cranberry Township, PA, USA; E. Rudnyi, CAD-FEM GmbH, Grafing, Germany; J. Brigham,

University of Pittsburgh, Pittsburgh, PA, USA

### **SESSION 2.3Q (DA-3-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Civic Ballroom North*

#### **CREEP AND CORROSION**

Developed by: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan; S. Krishnamurthy, UOP LLC, Des Plaines, IL, USA

Chair: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

Co-Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA

**PVP2012-78133: CREEP FAILURE SIMULATIONS FOR 316H AT 5500C**

N.-H. Kim, Y. J. Kim, Korea University, Seoul, Korea (Republic); C. M. Davies, K. Nikbin, Imperial College London, London, United Kingdom; D. Dean, British Energy, Barnwood, United Kingdom

**PVP2012-78160: PREDICTION OF CREEP CRACK GROWTH FOR MODIFIED 9CR-1MO AT 600OC**

N.-H. Kim, Y. J. Kim, Korea University, Seoul, Korea (Republic); W.-G. Kim, H. Y. Lee, Korea Atomic Energy Research Institute (KAERI), Daejeon, Korea (Republic)

**PVP2012-78712: CAUSE ANALYSIS OF PIPE EXPLOSION OF SUPER-HEATED STEAM PIPE**

Z. Shen, C. Ye, Nanjing Boiler & Pressure Vessel Supervision and Inspection Institute, Nanjing, Jiangsu, China; C. Liu, East China University of Science and Technology, Shanghai, Shanghai, China; C. Li, Nanjing East DSM Chemical Industry Co., Ltd., Nanjing, Jiangsu, China; D. Ji, W. Zhang, Nanjing Boiler & Pressure Vessel Inspection Institute, Nanjing, Jiangsu, China

**PVP2012-78585: NUMERICAL CRACK GROWTH SIMULATION FOR CREEP CRACKING OF NI-BASE SUPERALLOY**

C. M. Stewart, A. P. Gordon, University of Central Florida, Orlando, FL, USA

### **SESSION 2.3R (MF-2-1)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, Mezzanine, Essex Ballroom*

#### **THE DAVID LIBBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—I**

Developed by: P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA; Y. J. Kim, Korea University, Seoul, Korea (Republic)

Chair: J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

Co-Chair: P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA

**PVP2012-78046: DEGRADATION OF GRAPHITE IN GAS COOLED REACTORS DUE TO RADIOLYTIC OXIDATION**

R. Moskovic, Magnox Limited, South Gloucestershire, United Kingdom

**PVP2012-78500: ESTIMATION STRESS INTENSITY FACTORS DUE TO WELDING RESIDUAL STRESSES FOR CIRCUMFERENTIALLY CRACKED PIPES**

C.-Y. Oh, J. S. Kim, Y. J. Kim, Korea University, Seoul, Korea (Republic); Y.-J. Oh, KEPCO E&C, Seongnam, Korea (Republic); K. Lee, S.-H. Lee, Korea Hydro and Nuclear Power Company, Daejeon, Korea (Republic)

**PVP2012-78729: DEFORMATION VERSUS MODIFIED J-INTEGRAL**

## RESISTANCE CURVES FOR DUCTILE MATERIALS

X.-K. Zhu, Battelle Memorial Institute, Columbus, OH, USA; P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA

### **PVP2012-78796: IMPACT OF DEGRADATION OF POLYETHYLENE FILMS UNDER SIMULATED CLIMATIC CONDITIONS ON THEIR MECHANICAL BEHAVIOUR AND THERMAL STABILITY AND LIFETIME**

A. Dehbi, K. Djakhdanne, University Ibn Khaldoun Tiarret, Tiarret, Algeria; A.-H. I. Mourad, United Arab Emirates University, Al-Ain, United Arab Emir.

### **SESSION 2.3T (CT-14-3)**

*Tuesday, July 17, 2:00 pm – 3:45 pm, 2nd Floor, Civic and Essex Foyers*  
**SOFTWARE DEMONSTRATION FORUM III**

Developed by: J. F. Cory Jr., Siemens PLM Software, Milford, OH, USA

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## **Block 2.4: Tuesday, July 17 (4:00 pm – 5:45 pm)**

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### **SESSION 2.4B (HP-8-1)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Elgin*

#### **CODES AND STANDARDS IN HIGH-PRESSURE TECHNOLOGY**

Developed by: D. Gross, Dominion Engineering Incorporated, Reston, VA, USA; E. Rodriguez, Global Nuclear Network Analysis, LLC, Santa Fe, NM, USA

Chair: D. Gross, Dominion Engineering, Inc., Reston, VA, USA

Co-Chair: T. Ligon, Dominion Engineering, Reston, VA, USA

#### **PVP2012-78519: CODE ASPECTS RELATED TO COMBINATION OF STRESSES DUE TO HYDROGEN DETONATIONS LOCAL EFFECTS**

J. Minichiello, Bechtel National, Inc., Richland, WA, USA; D. Gross, Dominion Engineering Incorporated, Reston, VA, USA; S. Ahnert, Ripple Design, Llc, Philadelphia, PA, USA; T. Ligon, Dominion Engineering, Reston, VA, USA

#### **PVP2012-78525: CODE ASPECTS RELATED TO COMBINATION OF STRESSES DUE TO HYDROGEN DETONATION BEAM AND COMBINED EFFECTS**

J. Minichiello, Bechtel National, Inc., Richland, WA, USA; D. Gross, Dominion Engineering Incorporated, Reston, VA, USA; T. Ligon, Dominion Engineering, Reston, VA, USA

#### **PVP2012-78039: PROPOSAL OF REVISED FLAW ACCEPTANCE CRITERIA FOR ULTRASONIC EXAMINATION OF WELDS IN SECTION VIII DIVISION 3 (PART 1)**

S. Terada, Kobe Steel, Ltd., Takasago, Hyogo, Japan; T. Yoshida, Mitsui Engineering & Shipbuilding Co., Ltd., Tamano, Okayama, Japan

#### **PVP2012-78884: PROPOSAL OF REVISED FLAW ACCEPTANCE CRITERIA FOR ULTRASONIC EXAMINATION OF WELDS IN SECTION VIII DIVISION 3 (PART 2)**

S. Terada, Kobe Steel, Ltd., Takasago, Hyogo, Japan; T. Yoshida, Mitsui Engineering & Shipbuilding Co., Ltd., Tamano, Okayama, Japan

### **SESSION 2.4C (SE-9-1)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Wentworth*

#### **BASE ISOLATION AND VIBRATION CONTROL SYSTEMS**

Developed by: S. Fujita; A. Sone, Kyoto Institute of Technology, Kyoto, Japan; O. Furuya, Tokyo City University, Tokyo, Japan; K.

Minagawa, Saitama Institute of Technology, Saitama, Japan

Chair: G. Roussel, AVN, Brussels, Belgium

Co-Chair: C.-S. Tsai, Feng Chia University, Taichung, Taiwan

#### **PVP2012-78196: A LOAD COMBINATION METHOD FOR SEISMIC DESIGN OF MULTI-DEGREE-OF-FREEDOM PIPING SYSTEMS WITH FRICTION CHARACTERISTICS AND MULTIPLE SUPPORT SYSTEMS**

A. Sone, T. Yamauchi, A. Masuda, Kyoto Institute of Technology, Kyoto, Japan

#### **PVP2012-78419: LIQUID INERTIA DAMPER HAVING A SCREW SHAPED PISTON**

T. Matsuoka, Meiji University, Kawasaki, Kanagawa, Japan

#### **PVP2012-78531: EXPERIMENTAL INVESTIGATION ON SEISMIC MITIGATION OF MOTION SENSITIVE EQUIPMENT USING MULTIPLE DIRECTION OPTIMIZED-FRICTION PENDULUM SYSTEM WITH MULTIPLE SLIDING INTERFACES**

C.-S. Tsai, H.-C. Su, Y. M. Wang, Feng Chia University, Taichung, Taiwan  
**PVP2012-78653: STUDY ON VIBRATION ATTENUATION ELEMENT USING DAMPING POLYURETHANE GEL MATERIAL**

O. Furuya, Tokyo City University, Tokyo, Japan; K. Goda, K. Ishihana, Ohtsu Chemical Co., Ltd., Osaka, Japan

### **SESSION 2.4D (CS-8-2)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Kenora*

#### **ASME CODE SECTION XI ACTIVITIES—II**

Developed by: R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA; D. Scarth, Kinectrics, Toronto, ON, Canada; R. Crane, ASME, New York, NY, USA

Chair: D. Scarth, Kinectrics, Toronto, ON, Canada

Co-Chair: R. Crane, ASME, New York, NY, USA

#### **PVP2012-78265: TECHNICAL BASIS FOR CASE N-766-1 NICKEL ALLOY REACTOR COOLANT INLAY AND ONLAY FOR MITIGATION OF PWR FULL PENETRATION CIRCUMFERENTIAL NICKEL ALLOY WELDS IN CLASS 1 ITEMS**

S. E. Marlette, Westinghouse Electric Company, Cranberry Township, PA, USA; J. G. Weicks, Entergy, Jackson, MS, USA; W. Bamford, C. K. Ng, N. L. Glunt, A. Udyawar, Westinghouse Electric Company, Cranberry Township, PA, USA

#### **PVP2012-78719: WEIGHT FUNCTION METHOD WITH PIECE-WISE POLYNOMIAL INTERPOLATION TO CALCULATE STRESS INTENSITY FACTORS FOR COMPLICATED STRESS DISTRIBUTIONS**

Y. Li, H. Itoh, K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan; S. Xu, D. Scarth, Kinectrics, Toronto, ON, Canada

#### **PVP2012-78236: CALCULATION OF STRESS INTENSITY FACTOR FOR SURFACE FLAWS USING UNIVERSAL WEIGHT FUNCTIONS WITH PIECE-WISE CUBIC STRESS INTERPOLATION**

S. Xu, D. Scarth, Kinectrics, Toronto, ON, Canada; R. Cipolla, Intertek Aptech, Sunnyvale, CA, USA

### **SESSION 2.4E (OAC-4-5)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Huron*

#### **TOXIC SUBSTANCES: STRUCTURAL EVALUATION—II**

Developed by: N. Gupta, Savannah River Nuclear Solutions, Aiken, SC, USA

Chair: A. Smith, Retired, North Augusta, SC, USA  
Co-Chair: C. Bajwa, US Nuclear Regulatory Commission, Rockville, MD, USA

**PVP2012-78740: DROP ANALYSIS OF STRUCTURES AND DEVELOPMENT OF IMPACT ENERGY ABSORBER**

S. Babu, NAC International, Norcross, GA, USA; I. Grewal, R. Jategaonkar, J. Biswas, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78594: ANNEALING REQUIREMENT OF FLOW-FORMED CONTAINMENT VESSELS FOR TYPE B RADIOACTIVE MATERIALS**

G. Mok, B. L. Anderson, R. S. Hafner, M. F. DeMicco, L. B. Hagler, E. W. Russell Jr., C. K. Syn, Lawrence Livermore National Laboratory, Livermore, CA, USA

**PVP2012-78797: CONTAINMENT OF LOW-LEVEL RADIOACTIVE WASTE AT THE DOE SALTSTONE DISPOSAL FACILITY**

J. Jordan, G. Flach, Savannah River National Laboratory, Aiken, SC, USA

**SESSION 2.4F (FSI-3-4)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Kent*

**SHOCK WAVE PROPAGATION**

Developed by: S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan; H. Iyama, Kumamoto National College of Technology, Yatsushiro, Japan; T. Watanabe, National Fisheries University, Shimonoseki, Japan

Chair: S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan

Co-Chair: T. Watanabe, National Fisheries University, Shimonoseki, Japan

**PVP2012-78284: NUMERICAL SIMULATION OF ECCENTRIC EXPLOSIVE FORMING USING A CYLINDRICAL PRESSURE VESSEL**

H. Iyama, Kumamoto National College of Technology, Yatsushiro, Japan; S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan

**PVP2012-78417: IMPROVEMENT METHOD OF SUGAR EXTRACTION EFFICIENCY OF SUGARCANE BY 3D OVAL STRUCTURE PRESSURE VESSEL USING UNDERWATER SHOCK WAVE**

K. Shimojima, Y. Miyafuji, K. Naha, E. Kuraya, Okinawa National College of Technology, Okinawa, Japan; A. Takemoto, Kumamoto University, Kumamoto, Japan; S. Itoh, K. Watanabe, Okinawa National College of Technology, Nago, Okinawa, Japan

**PVP2012-78439: DESIGN AND DEVELOPMENT OF PRESSURE VESSEL FOR IMPROVEMENT OF MANUFACTURING RICE-POWDER EFFICIENCY USING UNDERWATER SHOCK WAVE**

K. Shimojima, K. Naha, Y. Miyafuji, S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan

**PVP2012-78821: EXAMINATION OF POWER SUPPLY OF THE RICE POWDER MAKING DEVICE WITH THE PRESSURE VESSEL HAVING THE CLEAR WINDOW USING UNDERWATER SHOCK WAVE.**

R. Matsubara, O. Higa, T. Matsui, K. Higa, K. Shimojima, Y. Miyafuji, K. Naha, S. Itoh, Okinawa National College of Technology, Nago, Okinawa, Japan; S. Tanaka, Kumamoto University, Kumamoto, Japan

**SESSION 2.4G (CT-6-1)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, Mezzanine, Conference F*

**ELEVATED TEMPERATURE BEHAVIOR OF BOLTED JOINTS**

Developed by: J. Veiga, Teadit Industria e Comercio Ltda, Rio de Janeiro, RJ, Brazil; K. Guenther, Teadit, Pasadena, TX, USA

Chair: J. Veiga, Teadit Industria e Comercio Ltda, Rio de Janeiro, RJ, Brazil

Co-Chair: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

**PVP2012-78054: BOLT PRELOAD REDUCTION OF PIPE FLANGE CONNECTIONS AFTER PLANT SHUTDOWN**

F. Toshimichi, M. Nomura, Y. Uemori, Kobe University, Kobe, Japan; K. Sato, Nippon Valqua Industries, Ltd., Gojo, Japan

**PVP2012-78184: PRACTICAL EVALUATION OF PTFE THERMAL BEHAVIOR USING THE HOT BLOWOUT THERMAL CYCLING TEST**

A. Bausman, VSP Technologies, Inc., Kingsport, TN, USA; J. Waterland, VSP Technologies, Inc., Prince George, VA, USA

**PVP2012-78395: VISCO-ELASTIC FEM STRESS ANALYSIS OF BOLTED FLANGE CONNECTIONS WITH PTFE-BLENDED GASKETS UNDER ELEVATED TEMPERATURE**

K. Sato, S. Kurokawa, Nippon Valqua Industries, Ltd., Gojo-city, Japan; T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

**PVP2012-78349: SERRATED METAL GRAPHITE FACED GASKETS FOR RING JOINT FLANGES**

J. Veiga, Teadit Industria e Comercio Ltda, Rio de Janeiro, RJ, Brazil; N. Kavanagh, C. Cicolatti, Teadit Ltda, Rio de Janeiro, RJ, Brazil; V. Zandona, Braskem - UNIB2, Triunfo, RS, Brazil; F. Castro, Braskem - UNIB 3, Santo Andre, SP, Brazil

**SESSION 2.4H (DA-2-4)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, Mezzanine, Conference G*

**DESIGN & ANALYSIS OF PIPING & PIPING COMPONENTS—IV**

Developed by: J. McCabe, General Dynamics—Electric Boat, Groton, CT, USA; C. Basavaraju, US Nuclear Regulatory Commission, Rockville, MD, USA; A. Dweib, Worley Parsons, Atyrau, Kazakhstan, Kazakhstan

Chair: W. Mekky, AMEC NSS, Toronto, ON, Canada

Co-Chair: A. Usmani, AMEC NSS, Power and Process Americas, Toronto, ON, Canada

**PVP2012-78331: LIMIT & SHAKEDOWN LOADS DETERMINATION FOR LOCALLY THINNED WALL PIPE BRANCH CONNECTION SUBJECTED TO PRESSURE AND BENDING MOMENTS**

Y. Fouad, M. Y. A. Younan, H. F. Abdalla, American University in Cairo, Cairo, Egypt

**PVP2012-78422: POWER SPECTRAL DENSITY ANALYSIS OF ACOUSTICALLY INDUCED VIBRATION IN PIPING SYSTEMS**

A. Dweib, WorleyParsons, Atyrau, Kazakhstan

**PVP2012-78800: DETAILED FINITE ELEMENT ANALYSIS OF DARLINGTON NGS FEEDER PIPES WITH LOCALLY THINNED REGIONS BELOW PRESSURE MINIMUM THICKNESS**

I. Haq, M. Stojakovic, S. Fabbri, Ontario Power Generation, Pickering, ON, Canada

**PVP2012-78801: FAILURE ANALYSIS OF THE HIGH TEMPERATURE STEAM PIPE FOR BURST**

Q. Liu, F. Shangguan, K. Tong, B. Duan, G. Li, Tubular Goods Research Institute of China National Petroleum Corporation, Xi'an, Shaanxi, China

## **SESSION 2.4I (DA-8-2)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Simcoe*

### **THERMAL STRESSES—I**

Developed by: S. Iyer, AMEC NSS Ltd., Toronto, ON, Canada

Chair: A. Segall, Penn State, University Park, PA, USA

Co-Chair: S. Iyer, AMEC NSS Ltd., Toronto, ON, Canada

#### **PVP2012-78321: ASSESSMENT OF SLOT INFLUENCE IN THE FATIGUE THERMAL LIFE OF COKE DRUMS**

G. A. Vivas, E. D. Araque, PDVSA Intevep S.A, Los Teques, Miranda, Venezuela; Alberto D. Pertuz, Central University of Venezuela, Caracas, Venezuela; M. Oka, S.H.I. Examination & Inspection Ltd., Ehime, Japan

#### **PVP2012-78343: LIFETIME ESTIMATION OF ALUMINUM PLATE FIN HEAT EXCHANGERS**

R. Hölzl, The Linde Group, Pullach, Bavaria, Germany

#### **PVP2012-78360: INVESTIGATING THE EFFECT OF PIPE THICKNESS ON FLANGE FACE DISTORTIONS IN WELDED PIPE-FLANGE JOINTS**

M. S. Choobi, University of Applied Science and Technology, Iranian Welding Research and Engineering Center, Tehran, Iran

#### **PVP2012-78403: FINITE ELEMENT ANALYSIS OF THERMAL STRESSES IN 304 STAINLESS STEEL PLATE-FIN STRUCTURE**

H. Cao, Shandong Special Equipment Inspection Institute/China University of Petroleum, Jinan, China; X. Qiu, W. Jiang, China University of Petroleum, Qingdao, China; J. Gong, Nanjing University of Technology, Nanjing, China

## **SESSION 2.4K (MF-12-1)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, Mezzanine, Windsor East*

### **PIPELINE INTEGRITY—I**

Developed by: X.-K. Zhu, Battelle Memorial Institute, Columbus, OH, USA; A. Sisan, DNV, London, United Kingdom

Chair: X.-K. Zhu, Battelle Memorial Institute, Columbus, OH, USA

Co-Chair: S. Polasik, Det Norske Veritas (U.S.A.), Inc., Dublin, OH, USA

#### **PVP2012-78730: FINITE ELEMENT ANALYSIS OF BURST PRESSURE FOR PIPELINES WITH LONG CORROSION DEFECTS**

X. Zhu, B. N Leis, Battelle, Columbus, OH, USA

#### **PVP2012-78091: SIMULATION OF DUCTILE CRACK PROPAGATION IN PIPELINE STEELS**

A. Dunbar, X. Wang, Carleton University, Ottawa, ON, Canada; W. R. Tyson, Natural Resources Canada Ottawa, ON, Canada; S. Xu, Natural Resources Canada, Hamilton, ON, Canada

#### **PVP2012-78575: EFFECTIVE MODELING OF FATIGUE CRACK GROWTH IN PIPELINES**

S. Polasik, C. Jaske, Det Norske Veritas (USA), Inc., Dublin, OH, USA

## **SESSION 2.4L (MF-4-7)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, Mezzanine, Conference B*

### **WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—VII**

Developed by: D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA; B. Brust, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Chair: E. Kurth, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Co-Chair: D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA

#### **PVP2012-78578: WELDING RESIDUAL STRESS IN A LARGE DIAMETER NUCLEAR REACTOR PRESSURE VESSEL NOZZLE**

T. Zhang, B. Brust, G. Wilkowski, H. Xu, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; A. Betervide, O. Mazzantini, Proyecto Atucha II, Buenos Aires, Argentina

#### **PVP2012-78639: SIMULATION OF WELD RESIDUAL STRESSES IN DISSIMILAR METAL WELD INCORPORATING MICROSTRUCTURE-MECHANICAL INTERACTION (Presentation Only)**

W. Zhang, D. Qiao, Z. Feng, Y. Wang, Oak Ridge National Laboratory, Oak Ridge, TN, USA; P. Crooker, Electric Power Research Institute, Palo Alto, CA, USA

#### **PVP2012-78657: A SENSITIVITY ANALYSIS OF NRC WELDING RESIDUAL STRESS VALIDATION PROGRAM INTERNATIONAL ROUND ROBIN PROGRAM**

J. Goldak, Carleton University, Ottawa, ON, Canada; S. Tchernov, J. Zhou, D. Downey, Goldak Technologies Inc., Ottawa, ON, Canada

#### **PVP2012-78760: INVESTIGATIVE STUDY OF 2-D VS. 3-D WELD RESIDUAL STRESS ANALYSES OF NRC PHASE II MOCKUP**

F. H. Ku, S. S. Tang, Structural Integrity Associates, Inc., San Jose, CA, USA

## **SESSION 2.4M (MF-19-4)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, Mezzanine, Conference C*

### **CREEP-FATIGUE INTERACTION**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA

Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

Co-Chair: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

#### **PVP2012-78230: DETERMINISTIC AND PROBABILISTIC CREEP-FATIGUE-OXIDATION CRACK GROWTH MODELING**

Z. Wei, F. Yang, B. Lin, L. Luo, D. Konson, Tenneco, Grass Lake, MI, USA; K. Nikbin, Imperial College London, London, United Kingdom

#### **PVP2012-78402: A STUDY ON FATIGUE AND CREEP-FATIGUE LIFE ASSESSMENT USING CYCLIC THERMAL TESTS WITH MOD.9CR-1MO STEEL STRUCTURES**

M. Ando, Japan Atomic Energy Agency, Ibaraki, Japan; H. Kanasaki, Mitsubishi Heavy Industry, Hyogo, Japan; S. Date, Mitsubishi Heavy Industry, Nagasaki, Japan; K. Kikuchi, Mitsubishi Heavy Industries, Hyogo, Japan; K. Satoh, Mitsubishi FBR Systems, Tokyo, Japan; H. Takasho, ASCEND, Ibaraki, Japan; K. Tsukimori, Japan Atomic Energy Agency, Ibaraki, Japan

#### **PVP2012-78460: CYCLIC VISCO-PLASTICITY TESTING AND MODELING OF A SERVICE-AGED P91 STEEL**

C. Hyde, W. Sun, T. Hyde, J. P. Rouse, The University of Nottingham, Nottingham, United Kingdom; T. Farragher, S. Leen, NUI Galway, Galway, Ireland

#### **PVP2012-78810: STUDY OF SENSITIVITY OF DAMAGE PARAMETERS C\_1, C\_2, C\_3 AND C\_4 ON FB2 MATERIAL UNDER LOW CYCLE FATIGUE TEST**

R. Hormozi, K. Nikbin, Farid Biglari, Imperial College London, London, United Kingdom

### **SESSION 2.4P (CS-24-2)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, City Hall*

#### **USE OF MODERN FE METHODS FOR CODE ASSESSMENT—II**

Developed by: K. Wright, Rolls-Royce, Derby, Derbyshire, United Kingdom; M. Martin, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

Chair: M. Martin, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

Co-Chair: C. Andrews, Rolls-Royce PLC, Derby, United Kingdom

#### **PVP2012-78042: DETAILED FATIGUE CHECKS BASED ON A LOCAL MONITORING CONCEPT**

J. Rudolph, S. Bergholz, R. Hilpert, AREVA NP GmbH, Erlangen, Germany

#### **PVP2012-78296: STRAIN BASED FATIGUE METHODS USING MODERN FINITE ELEMENT ANALYSIS FOR THE ASSESSMENT OF PRESSURE VESSELS EQUIVALENT TO THE ASME III CODE**

L. Rawson, D. Rice, Rolls-Royce PLC, Derby, United Kingdom

#### **PVP2012-78829; DEVELOPMENT OF EQUIVALENT GEOMETRIC FEATURES FOR USE IN STRAIN-BASED FATIGUE ANALYSIS (Presentation Only)**

T. Damiani, Bechtel Marine Propulsion Corp. - Bettis Laboratory, West Mifflin, PA, USA

#### **PVP2012-78065: A DIRECT METHOD ON THE EVALUATION OF CYCLIC BEHAVIOUR WITH CREEP EFFECT**

H. Chen, W. Chen, J. Ure, University of Strathclyde, Glasgow, United Kingdom

### **SESSION 2.4Q (DA-1-2)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Civic Ballroom North*

#### **DESIGN AND ANALYSIS OF HEAT EXCHANGERS AND COMPONENTS**

Developed by: T. Seipp, Becht Engineering, Calgary, AB, Canada; J. Taagepera, Chevron ETC, Richmond, CA, USA

Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA

Co-Chair: C. Rodery, BP plc, Webster, TX, USA

#### **PVP2012-78084: RESIDUAL STRESS EVALUATION OF HYDRAULICALLY EXPANDED TUBE-TO-TUBESHEET JOINT**

Y. Otani, Y. Sakakibara, M. Tsunori, Y. Ohtake, N. Shutto, IHI Corporation, Yokohama, Kanagawa, Japan

#### **PVP2012-78563; PRACTICAL CONSIDERATIONS WHEN CONDUCTING A TRANSIENT ANALYSIS OF A HEAT EXCHANGER TUBE RUPTURE**

D. R. Thornton, P. A. Henry, R. A. Sadowski, The Equity Engineering Group, Inc., Shaker Heights, OH, USA

#### **PVP2012-78620: IMPROVED DESIGN OF END CLOSURE FOR SCREW LOCKING RING U SHAPED TUBE HEAT EXCHANGER**

P. Chen, C. Luo, Beijing University of Chemical Technology, Beijing, China

#### **PVP2012-78335: STRUCTURAL VERIFICATION OF PRESSURE EQUIPMENT FOR THE UPGRADE, LIFE-EXTENSION AND POWER UPGRADE OF A BWR NUCLEAR POWER PLANT—CHALLENGES, EXPERIENCES AND LESSONS (Presentation Only)**

L. Jansson, L. Zeng, ÅF-Industry AB, Gothenburg, Sweden

### **SESSION 2.4R (MF-2-2)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, Mezzanine, Essex Ballroom*

#### **THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—II**

Developed by: J.-A. Wang, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Chair: J.-A. Wang, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Co-Chair: A.-H. I. Mourad, United Arab Emirates University, Al-Ain, United Arab Emir.

#### **PVP2012-78142: THE COMBINED EFFECTS OF RESIDUAL STRESS AND WARM PRESTRESSING ON CLEAVAGE FRACTURE IN STEELS**

K. Rosahl, J. Booker, D. Smith, University of Bristol, Bristol, United Kingdom

#### **PVP2012-78404: QUANTIFYING THE CONSTRAINT OF THREE-DIMENSIONAL BIAXIALLY LOADED SPECIMENS CONTAINING SEMI-ELLIPTICAL CRACKS USING THE J-A2 METHOD**

L. Sharpe, Penn State, University Park, PA, USA; Y. Chao, University of South Carolina, Columbia, SC, USA

#### **PVP2012-78698: CONSTRAINT AND FAILURE ASSESSMENT DIAGRAM UNDER BIAXIAL LOADING ON SEMI-ELLIPTIC SURFACE CRACKS**

Z. Wang, R. Zhang, Jiangsu University, Zhenjiang, Jiangsu Province, China; Y. Chao, University of South Carolina, Columbia, SC, USA; P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA

#### **PVP2012-78783: FRACTURE TOUGHNESS DETERMINED FROM FULL-SCALE PIPE**

A.-H. I. Mourad, J. Altarawneh, A. El Domiaty, United Arab Emirates University, Al-Ain, United Arab Emir.; Y. Chao, University of South Carolina, Columbia, SC, USA

### **SESSION 2.4T (CT-14-4)**

*Tuesday, July 17, 4:00 pm – 5:45 pm, 2nd Floor, Civic and Essex Foyers*

#### **SOFTWARE DEMONSTRATION FORUM IV**

Developed by: J. F. Cory Jr., Siemens PLM Software, Milford, OH, USA

## **WEDNESDAY, JULY 18**

### **Block 3.1: Wednesday, July 18 (8:30 am – 10:15 am)**

### **SESSION 3.1B (HP-2-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, Elgin*

#### **STRUCTURAL RESPONSE OF VESSELS TO EXPLOSIVE EVENTS—I**

Developed by: T. Ligon, Dominion Engineering, Reston, VA, USA; E. Rodriguez, Global Nuclear Network Analysis, LLC, Santa Fe, NM, USA

Chair: T. Ligon, Dominion Engineering, Reston, VA, USA

Co-Chair: D. Gross, Dominion Engineering Incorporated, Reston, VA, USA

#### **PVP2012-78562: SUBMERGED PRESSURE VESSEL TESTING HAZARDS**

J. Montoya, D. Ketchum, M. Edel, Baker Engineering and Risk Consultants, San Antonio, TX, USA

**PVP2012-78104: PROGRESS ON THE MECHANISMS OF THE STRAIN GROWTH PHENOMENON IN CONTAINMENT VESSELS**

Q. Dong, Y. Gu, B. Hu, Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China

**PVP2012-78027: QUALIFICATION OF NUCLEAR EQUIPMENT AGAINST HYDROGEN DETONATION USING EXPLICIT AND IMPLICIT FINITE ELEMENT METHODS**

M. Breach, GE-Hitachi, Wilmington, OK, USA

**PVP2012-78378: QUANTITATIVE RISK ANALYSIS OF HYDROGEN EVENTS AT WTP PART 1 OF 2 THE OPERATIONAL FREQUENCY ANALYSIS**

M. G. Wentink, Bechtel National Incorporated, Richland, WA, USA; K. O’Kula, URS Safety Management Solutions LLC, Aiken, SC, USA; R. E. Jones, J. Collin, D. Gross, Dominion Engineering Incorporated, Reston, VA, USA; C. R. Lux, URS Safety Management Solutions LLC, Aiken, SC, USA

**SESSION 3.1C (SE-10-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, Wentworth*

**SEISMIC EVALUATION OF SYSTEMS, STRUCTURES, & COMPONENTS I**

Developed by: T. Clark, Idaho National Laboratory, Idaho Falls, ID, USA; G. Roussel, AVN, Brussels, Belgium

Chair: K. Minagawa, Saitama Institute of Technology, Saitama, Japan

Co-Chair: O. Furuya, Tokyo City University, Tokyo, Japan

**PVP2012-78428: APPLICATION OF ENERGY BALANCE EQUATION TO 2 DEGREE-OF-FREEDOM MODEL**

K. Minagawa, Saitama Institute of Technology, Saitama, Japan; S. Fujita  
**PVP2012-78559: BEAM-MODE BUCKLING OF BURIED PIPELINE SUBJECTED TO SEISMIC GROUND MOTION**

M. Mitsuya, T. Sakanoue, H. Motohashi, Tokyo Gas, Yokohama, Japan

**PVP2012-78872: CORRELATION OF NEAR-FAULT GROUND MOTIONS FOR WESTERN UNITED STATES**

Y.-N. Huang, National Taiwan University, Taipei, Taiwan

**PVP2012-78372: NON-ITERATIVE REINFORCED CONCRETE DESIGN METHODOLOGY FOR COMBINED AXIAL FORCE AND BENDING MOMENT**

S.-K. Jung, J. Harrold, N. Alchaar, AREVA NP Inc., Charlotte, NC, USA

**SESSION 3.1D (CS-21-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, Kenora*

**HDPE PIPE AND RELATED ISSUES IN CODES AND STANDARDS**

Developed by: S. Kalyanam, D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Chair: P. Rush, MPR Associates, Alexandria, VA, USA

Co-Chair: D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

**PVP2012-78080: NSF/ANSI 14: THIRD PARTY CERTIFICATION FOR HDPE PIPE**

A. Ciechanowski, NSF International, Ann Arbor, MI, USA

**PVP2012-78655; SAFETY ASSESSMENT OF COLD WELDING DEFECT**

**IN ELECTRO-FUSION JOINT OF POLYETHYLENE PIPE**

J. Shi, J. Zheng, Zhejiang University, Hangzhou, Zhejiang Province, China; W. Guo, Zhejiang Province Special Equipment Inspection and Research Institute, Hangzhou, Zhejiang, China; C. Xu, Zhejiang University, Hangzhou, Zhejiang, China

**PVP2012-78777: DETERMINATION OF TENSILE ELASTIC MODULUS IN HIGH DENSITY POLYETHYLENE PIPING AT SEISMIC STRAIN RATES**

D. Munson, EPRI, Palo Alto, CA, USA; T. Adams, S. Nickholds, JD Stevenson and Associates, Independence, OH, USA

**PVP2012-78776: DETERMINATION OF MATERIAL DAMPING VALUES FOR HIGH DENSITY POLYETHYLENE PIPE MATERIALS**

D. Munson, EPRI, Palo Alto, CA, USA; T. Adams, S. Hall, JD Stevenson and Associates, Independence, OH, USA

**SESSION 3.1E (OAC-4-4)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, Huron*

**TOXIC SUBSTANCES: MISCELLANEOUS TOPICS**

Developed by: N. Gupta, Savannah River nuclear Solutions, Aiken, SC, USA

Chair: F. Wille, BAM Federal Institute for Materials Research and Testing, Berlin, Berlin, Germany

Co-Chair: W. Choi, Korea Atomic Energy Research Institute, Daejeon, Korea (Republic)

**PVP2012-78495: SYSTEM FOR THE AUTOMATED MITIGATION OF HYPERGOLIC PROPELLANT LEAKS**

A. Reich, Streamline Automation LLC, Huntsville, AL, USA

**PVP2012-78642: SPENT FUEL STORAGE IN THE POST-YUCCA MOUNTAIN PARADIGM**

E. Easton, C. Bajwa, US Nuclear Regulatory Commission, Rockville, MD, USA; Z. Li, M. Gordon, US Nuclear Regulatory Commission, Rockville, MD, USA

**PVP2012-78070: ANALYSIS OF VENTING OF A RESIN SLURRY**

J. Laurinat, S. Hensel, Savannah River National Laboratory, Aiken, SC, USA

**SESSION 3.1F (FSI-4-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, Kent*

**STRUCTURES UNDER EXTREME LOADING CONDITIONS**

Developed by: H. Levine, Weidlinger Associates, Inc., Mountain View, CA, USA; D. Sommerville, Structural Integrity Associates, Mukilteo, WA, USA; S. Jones, The University of Alabama, Tuscaloosa, AL, USA

Chair: H. Levine, Weidlinger Associates, Inc., Mountain View, CA, USA

Co-Chair: D. Sommerville, Structural Integrity Associates, Mukilteo, WA, USA; S. Jones, The University of Alabama, Tuscaloosa, AL, USA

**PVP2012-78116: FLOW FIELD IN A BOILING WATER REACTOR ANNULUS DUE TO A RECIRCULATION OUTLET LINE BREAK—A COMPARATIVE STUDY BETWEEN POTENTIAL FLOW AND COMPUTATIONAL FLUID DYNAMICS METHODOLOGIES**

R. Ananth, S. Sowah, J. Gillis, Structural Integrity Associates, Inc., San Jose, CA, USA



**PVP2012-78627: BLAST ANALYSIS, DESIGN AND RESEARCH: A CANADIAN PERSPECTIVE**

W. Mekky, AMEC NSS, Toronto, ON, Canada; W. El-Dakhkhni, McMaster University, Hamilton, NU, Canada

**PVP2012-78728: AIRBLAST LOADS ON STRUCTURES IN COMPLEX CONFIGURATIONS**

D. Vaughan, H. Levine, P. Hassig, Weidlinger Associates, Inc., Mountain View, CA, USA; R. Smilowitz, Weidlinger Associates, Inc., New York, NY, USA

**PVP2012-78705: TAYLOR CYLINDER TESTING OF ANISOTROPIC SPECIMENS**

J. Conway, K. O'Brien, M. Barkey, S. Jones, The University of Alabama, Tuscaloosa, AL, USA

**SESSION 3.1G (CT-7-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, Mezzanine, Conference F*

**COMPUTATIONAL APPLICATIONS IN FATIGUE, FRACTURE, AND DAMAGE MECHANICS**

Developed by: R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

Chair: W. Reinhardt, Candu Energy Inc., Mississauga, ON, Canada

Co-Chair: R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada

**PVP2012-78511: BOLTED JOINTS FRACTURE ANALYSIS STUDY USING MODERN METHODS**

D. Griffin, G. Reed, A. Mills, Assystem UK, Sunderland, Tyne and Wear, United Kingdom; R. Brayshaw, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

**PVP2012-78522: ERROR ANALYSIS FOR FEM ANALYSIS OF CRACKS USING SUBMODELS**

D. Gloger, M. Enderlein, M. Kuna, TU Bergakademie Freiberg, Freiberg, Germany

**PVP2012-78714: UNIFIED APPROACH TO NOTCH STRESS STRAIN CONVERSION (NSSC) RULES**

R. Adibi-Asl, AMEC NSS, Toronto, ON, Canada; R. Seshadri, Memorial University, St. John's, NF, Canada

**SESSION 3.1H (DA-11-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, Mezzanine, Conference G*

**PIPING AND EQUIPMENT DYNAMICS—I**

Developed by: M. Porter, Porter McGuffie, Inc., Lawrence, KS, USA; R. Baliga, ADVENT Engineering Services, Inc., San Ramon, CA, USA

Chair: S. McGuffie, Porter McGuffie, Inc., Lawrence, KS, USA

Co-Chair: R. Robleto, KBR, Houston, TX, USA; A. Dweib, Worley Parsons, Atyrau, Kazakhstan, Kazakhstan

**PVP2012-78047: ALIGNMENT OF STRESS INTENSIFICATION AND FLEXIBILITY FACTORS FOR THE B31 BOOK SECTIONS**

D. H. Creates, D. Côté, Ontario Power Generation Inc., Pickering, ON, Canada

**PVP2012-78322: PIPE ELEMENTS CURRENTLY AVAILABLE FOR NUCLEAR POWER PIPING ANALYSIS AND THEIR BENCHMARK TESTS**

L. Zeng, L. Jansson, ÅF-Industry AB, Gothenburg, Sweden

**PVP2012-78505: WAVELET ANALYSIS OF FLEXURAL WAVE FRONTS**

**IN WATER/SLURRY HAMMER**

K. Inaba, H. Takahashi, Y. Kurokawa, K. Kishimoto, Tokyo Institute of Technology, Tokyo, Japan

**PVP2012-78879: STRUCTURAL SEISMIC ANALYSIS OF A NUCLEAR FUEL HANDLING MACHINE**

S. K. Sherfey, Westinghouse Electric Company, Chattanooga, TN, USA

**SESSION 3.1K (MF-14-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, Mezzanine, Windsor East*

**LEAK-BEFORE-BREAK—I**

Developed by: J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom; B. Bezensek, Hunting Energy Service UK Ltd., Scotland, United Kingdom; D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; A. Chakraborty, Structural Integrity Associates, San Jose, CA, USA

Co-Chair: B. Bezensek, Hunting Energy Service UK Ltd., Scotland, United Kingdom

Chair: D. Dedhia, Structural Integrity Associates, Inc., San Jose, CA, USA

**PVP2012-78061: EFFECT OF ROTATIONAL STIFFNESS EVOLUTION AT CRACK PART ON CRITICAL CRACK SIZE IN SFR**

T. Wakai, Japan Atomic Energy Agency, Oarai, Ibaraki, Japan; H. Machida, S. Yoshida, TEPCO Systems Corporation, Tokyo, Japan

**PVP2012-78279: INFLUENCE OF NOZZLE TRANSITION ON LEAK BEFORE BREAK PARAMETERS**

P. Baas, F. Blom, NRG, Petten, Netherlands

**PVP2012-78303: STYLE—COMPARISON OF LEAK-BEFORE-BREAK METHODOLOGIES APPLIED IN EUROPE**

J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom

**PVP2012-78170: BENCHMARKING XLPR VERSION 1.0 WITH THE PRO-LOCA VERSION 3.0 CODE**

R. Kurth, E. Kurth, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; B. Young, A. Cox, R. Olson, P. Scott, Battelle, Columbus, OH, USA; D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA; R. Iyengar, C. Harrington, EPRI, Irving, TX, USA

**SESSION 3.1L (MF-4-8)**

*Wednesday, July 18, 8:30 am – 10:15 am, Mezzanine, Conference B*

**WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—VIII**

Developed by: B. Brust, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; E. Keim, AREVA NP GmbH, Erlangen, Germany

Chair: J. Goldak, Carleton University, Ottawa, ON, Canada

Co-Chair: M. R. Hill, University of California, Davis, Davis, CA, USA

**PVP2012-78071: NUMERICAL SIMULATION OF MECANO-WELDING PROCESS FOR CYLINDER MANUFACTURING**

Z. Feng, H. Champlaud, Ecole de Technologie Supérieure, University of Quebec, Montreal, QC, Canada

**PVP2012-78720: MAGNITUDE AND DISTRIBUTION OF RETAINED RESIDUAL STRESSES IN LABORATORY FRACTURE MECHANICS SPECIMENS EXTRACTED FROM WELDED COMPONENTS**

R. Hurlston, University of Manchester, Stalybridge, Cheshire, United Kingdom; A. Sherry, Dalton Nuclear Research Institute, Manchester, United Kingdom; J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

**PVP2012-78364: NUMERICAL SIMULATION OF RESIDUAL STRESSES INDUCED IN COMPACT TENSION SPECIMENS USING ELECTRON BEAM WELDING**

P. Kapadia, C. M. Davies, Imperial College London, London, United Kingdom; D. W Dean, EDF, Barnwood, United Kingdom; K. Nikbin, Imperial College London, London, United Kingdom

**PVP2012-78180: EFFECT OF WELD RESIDUAL STRESS FITTING ON STRESS INTENSITY FACTOR FOR CIRCUMFERENTIAL SURFACE CRACKS IN PIPE**

D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; M. Kerr, Office of Nuclear Regulatory Research, Washington, DC, USA; S. Xu, Kinectrics, Toronto, ON, Canada

**SESSION 3.1M (MF-10-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, Mezzanine, Conference C*

**MECHANISTIC MODELING OF MATERIALS—I**

Developed by: A. Horn, Serco TCS, Warrington, Cheshire, United Kingdom

Chair: A. Horn, Serco TCS, Warrington, Cheshire, United Kingdom

Co-Chair: P. James, Serco TCS, Warrington, Cheshire, United Kingdom

**PVP2012-78008: ANALYSIS OF NOTCH EFFECT IN FRACTURE MICROMECHANISMS**

S. Cicero, V. Madrazo, I. Carrascal, R. Cicero, University of Cantabria, Santander, Cantabria, Spain

**PVP2012-78328: A NUMERICAL AND EXPERIMENTAL STUDY OF THE FACTORS INFLUENCING THE DIFFERENCE IN CLEAVAGE FRACTURE BEHAVIOUR BETWEEN SENB AND CVN SPECIMENS**

R. Smith, Materials Performance Centre, University of Manchester, Manchester, United Kingdom; A. Horn, Serco TCS, Warrington, Cheshire, United Kingdom; A. Sherry, Dalton Nuclear Research Institute, Manchester, United Kingdom

**PVP2012-78751: FRACTURE TOUGHNESS EVALUATION IN C(T) SPECIMENS WITH REDUCED OUT-OF-PLANE CONSTRAINT**

R. Kulka, Frazer-Nash Consultancy, Dorking, United Kingdom; A. Sherry, Dalton Nuclear Research Institute, Manchester, United Kingdom

**SESSION 3.1P (CS-20-1)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, City Hall*

**COMBINATION OF MULTIPLE LOADS FOR WALL THINNING**

Developed by: P. Hoang, Sargent Lundy LLC, Chicago, IL, USA; Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan

Chair: K. Onizawa, Japan Atomic Energy Agency, Tokai-mura, Ibaraki-ken, Japan

Co-Chair: K. Takahashi, Yokohama National University, Yokohama, Japan

**PVP2012-78554: ANALYSIS OF 4" SCHEDULE 160 PIPE WITH A WALL THINNING SUBJECT TO TORSION, BENDING AND PRESSURE LOADS**

**B. Bezensek, Hunting Energy Services UK, Aberdeen, United Kingdom**  
**PVP2012-78736: EFFECT OF TORSION ON COLLAPSE BENDING MOMENT FOR 24-INCH DIAMETER SCHEDULE 80 PIPES WITH WALL THINNING**

K. Hasegawa, Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan; B. Bezensek, Hunting Energy Service UK Ltd., Scotland, United Kingdom; P. Hoang, Sargent Lundy LLC, Chicago, IL, USA

**PVP2012-78623: EFFECTS OF BENDING AND TORSION LOADS ON LOCALLY THINNED PIPE BURST PRESSURE**

P. Hoang, Sargent Lundy LLC, Chicago, IL, USA; K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan; B. Bezensek, Hunting Energy Service UK Ltd., Scotland, United Kingdom; Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan

**SESSION 3.1Q (DA-3-4)**

*Wednesday, July 18, 8:30 am – 10:15 am, 2nd Floor, Civic Ballroom North*  
**PIPING INTEGRITY I**

Developed by: P. Gilles, AREVA NP SAS, Paris La Défense, France; S. Marie, CEA, Gif-sur-Yvette, France

Chair: J.-M. Stephan, EDF R&D, Moret-sur-Loing, France

Co-Chair: R. Robledo, KBR, Houston, TX, USA

**PVP2012-78188: A NOVEL FRACTURE SPECIMEN FOR ASSESSMENT OF CIRCUMFERENTIAL COMPLEX-CRACKS IN PIPES**

D.-J. Shim, G. Wilkowski, S. Kalyanam, B. Brust, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

**PVP2012-78277: ELEMENT SIZE DEPENDENT DAMAGE MODELING OF DUCTILE CRACK GROWTH IN CIRCUMFERENTIAL THROUGH-WALL-CRACKED PIPE TESTS**

J.-H. Kim, N.-H. Kim, Y. J. Kim, Korea University, Seoul, Korea (Republic); D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

**PVP2012-78305: DUCTILE FAILURE SIMULATION OF BENDING PIPES WITH MULTIPLE CIRCUMFERENTIAL SURFACE CRACKS USING AN ELEMENT-SIZE DEPENDENT DAMAGE MODEL**

J.-H. Kim, N.-H. Kim, Y. J. Kim, Korea University, Seoul, Korea (Republic); K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan; K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan

**PVP2012-78107: CONSIDERATION OF ENVIRONMENTALLY ASSISTED FATIGUE ON AUSTENITIC STAINLESS STEEL CALCULATION AND PRACTICAL APPLICATION**

S. H. Reese, E.ON Kernkraft GmbH, Hannover, Germany; J. Seichter, Siempelkamp Prüf- und Gutachter-Gesellschaft mbH, Dresden, Germany; D. Klucke, E.ON Kernkraft GmbH, Hannover, Germany

**SESSION 3.1R (MF-2-3)**

*Wednesday, July 18, 8:30 am – 10:15 am, Mezzanine, Essex Ballroom*

**THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—III**

Developed by: D. Scarth, Kinectrics, Toronto, ON, Canada

Chair: D. Scarth, Kinectrics, Toronto, ON, Canada

Co-Chair: S. Xu, Kinectrics, Toronto, ON, Canada

**PVP2012-78018: THE FATIGUE BEHAVIOUR OF A HIGH STRENGTH CrNi-STEEL REGARDING FRETTING FATIGUE**

T. Christiner, J. Reiser, I. Gódor, W. Eichlseder, Montanuniversitaet Leoben

- Lehrstuhl fuer Allgemeinen Maschinenbau, Leoben, Styria, Austria; F. Trieb, R. Stuehlinger, BHDТ GmbH, Hoenigsberg, Styria, Austria

**PVP2012-78125: FRACTOGRAPHY OF FATIGUE AND CREEP-FATIGUE TEST OF PERFORATED PLATE USING SCANNING ELECTRON MICROSCOPE**

O. Watanabe, University of Tsukuba, Tsukuba, Japan; M. Kikuchi, Hitachi Engineering & Services Co., Ltd., Hitachinaka, Ibaraki, Japan; A. Matsuda, University of Tsukuba, Tsukuba, Ibaraki, Japan

**PVP2012-78311: FATIGUE LIMIT PREDICTION OF SUS630 STAINLESS STEEL MATRIX BASED ON SMALL CRACK MECHANICS**

D. Nie, Hefei General Machinery Research Institute, Hefei, Anhui, China; Y. Mutoh, Nagaoka University of Technology, Nagaoka, Japan

**PVP2012-78749: ASSESSMENT OF CONSTRAINT EFFECTS ON LOCAL BEHAVIOUR OF A PROPAGATING CRACK UNDER CYCLIC LOADING**

M. Goldthorpe, The University of Manchester, Manchester, United Kingdom; A. Sherry, Dalton Nuclear Research Institute, Manchester, United Kingdom

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**Block 3.2: Wednesday, July 18 (10:30 am – 12:15 pm)**

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**SESSION 3.2B (HP-2-2)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, Elgin*

**STRUCTURAL RESPONSE OF VESSELS TO EXPLOSIVE EVENTS—II**

Developed by: M. Edel, Baker Engineering and Risk Consultants, San Antonio, TX, USA; E. Rodriguez, Global Nuclear Network Analysis, LLC, Santa Fe, NM, USA

Chair: M. Edel, Baker Engineering and Risk Consultants, San Antonio, TX, USA

Co-Chair: E. Rodriguez, Global Nuclear Network Analysis, LLC, Santa Fe, NM, USA

**PVP2012-78105: EXPERIMENTAL STUDY ON A MULTIPLE-USE SPHERICAL CONTAINMENT VESSEL**

B. Hu, Q. Dong, Y. Gu, Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China

**PVP2012-78106: COUNTER-INTUITIVE BEHAVIOR IN ELASTIC-PLASTIC SPHERICAL SHELLS AND THE APPLICATION TO THE DESIGN OF CONTAINMENT VESSELS**

Y. Gu, B. Hu, Q. Dong, Institute of Fluid Physics, China Academy of Engineering Physics, Mianyang, China

**PVP2012-78450: PREDICTION OF TIME TO CRACK INITIATION AND ACTUAL BEHAVIOR OF AN IMPULSIVELY LOADED DETONATION CHAMBER OF CHEMICAL WEAPONS DESTRUCTION**

K. Asahina, Kobe Steel, Ltd., Kobe, Japan; R. Nickell, Applied Science & Technology, San Diego, CA, USA; K. Akasaka, Shinko Inspection & Service Co., Ltd., Takasago, Japan; T. Hamada, Shinko Research Co., Ltd., Kobe, Japan

**SESSION 3.2C (SE-13-1)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, Wentworth*

**SEISMIC RESPONSE AND DESIGN OF STORAGE TANKS, PIPING AND OTHER COMPONENTS**

Developed by: T. Taniguchi, Tottori University, Tottori, Japan; A. Maekawa, Institute of Nuclear Safety System, Inc., Fukui, Japan

Chair: S. A. Karamanos, University of Thessaly, Volos, Greece

Co-Chair: T. Ito, Osaka Prefecture University, Sakai, Osaka Prefecture, Japan

**PVP2012-78031: EFFECTS OF BASE UPLIFTING ON THE SEISMIC RESPONSE OF UNANCHORED LIQUID STORAGE TANKS**

M. Vathi, S. A. Karamanos, University of Thessaly, Volos, Greece

**PVP2012-78052: SEISMIC RESPONSE REDUCTION IN PIPING SYSTEMS USING PLASTIC DEFORMATION OF PIPE SUPPORT STRUCTURES**

T. Takahashi, A. Maekawa, Institute of Nuclear Safety System, Inc., Fukui, Japan

**PVP2012-78211: INVESTIGATION ON DEVELOPING SEISMIC SAFETY EVALUATION METHOD USING ELASTO-PLASTIC ANALYSIS**

T. Nakamori, N. Kojima, Y. Ueda, M. Monde, H. Shimizu, H. Okamoto, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; K. Ikeda, T. Hosotani, Shikoku Electric Power Company, Incorporated, Kagawa, Japan; D. Matsuzaki, Toshiba Corporation, Yokohama, Japan; K. Ishihama, Hitachi-GE Nuclear Energy, Ltd., HITACHI, Japan

**PVP2012-78804: WAVE PROPAGATION ANALYSIS OF A COOLING PIPING STRUCTURE OF A MODEL PLANT (Presentation Only)**

A. Nishida, Japan Atomic Energy Agency, Chiba, Japan

**SESSION 3.2D (CS-22-1)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, Kenora*

**INTEGRITY EVALUATIONS OF CAST STAINLESS STEEL PIPE**

Developed by: K. Hojo, Mitsubishi Heavy Industries, Ltd., Kobe, Japan; T. Griesbach, Structural Integrity Associates, Inc., San Jose, CA, USA

Chair: K. Hojo, Mitsubishi Heavy Industries, Ltd., Kobe, Japan

Co-Chair: T. Griesbach, Structural Integrity Associates, Inc., San Jose, CA, USA

**PVP2012-78051: RESEARCH ON ULTRASONIC INSPECTION OF CAST AUSTENITIC STAINLESS STEEL PIPING**

K. Sakamoto, Japan Nuclear Energy Safety Organization, Minato-ku, Tokyo, Japan; T. Furukawa, I. Komura, Y. Kamiyama, Japan Power Engineering and Inspection Corporation, Yokohama, Kanagawa, Japan; T. Mihara, University of Toyama, Toyama-shi, Toyama, Japan

**PVP2012-78477: NEW FLAWS FOR QUALIFICATION OF CAST STAINLESS STEEL INSPECTION**

I. Virkkunen, Trueflaw, Espoo, Finland; D. Kull, EPRI NDE Center, Charlotte, NC, USA; M. Kemppainen, Trueflaw, Espoo, Finland

**PVP2012-78687: ELASTIC-PLASTIC FRACTURE MECHANICS ANALYSIS OF CAST STAINLESS STEEL PIPES (COMPARISON OF TWO-PARAMETER AND J-T ANALYSIS METHODS)**

M. Kamaya, Institute of Nuclear Safety System, Inc., Fukui, Japan; K. Hojo, Mitsubishi Heavy Industries, Ltd., Kobe, Japan

**PVP2012-78843: AGEING MANAGEMENT OF CAST STAINLESS STEEL COMPONENTS IN FRENCH PWRS**

C. Faigy, EDF, Villeurbanne, France

**PVP2012-78710: PROBABILISTIC MODELS OF RELIABILITY OF CAST AUSTENITIC STAINLESS STEEL PIPING**

H. Qian, D. Harris, Structural Integrity Associates, Inc., San Jose, CA, USA;  
T. Griesbach, Structural Integrity Associates, Inc., San Jose, CA, USA

### **SESSION 3.2E (OAC-5-1)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, Huron*

#### **VALVES AND PUMPS**

Developed by: I. Ezekoye, Westinghouse Electric Co., Cranberry Township, PA, USA

Chair: J. Chan, Southern California Edison, San Clemente, CA, USA

Co-Chair: M. Brumovsky, Nuclear Research Institute Rez plc, Rez, Czech Republic

#### **PVP2012-78129: EXPERIMENTAL INCOMPRESSIBLE FORCES APPLIED IN A SAFETY RELIEF VALVE**

S. Chabane, F. Corbin, A. Couzinet, D. Pierrat, CETIM, Nantes, France; M. Bayart, Weir Power&Industrial France, Châteauneuf les Martigues, France

#### **PVP2012-78231: DESIGN AND BASELINE TESTING OF MOTOR OPERATED VALVES (MOVS) FOR GENERATION 3+ NUCLEAR POWER GENERATING PLANTS**

F. Bensinger, M. Hobbs, Flowserve Corp., Raleigh, NC, USA; R. Gradle, Flowserve, Raleigh, NC, USA

#### **PVP2012-78489: HYDRO-ABRASIVE WEAR DAMAGE AT REACTOR RECIRCULATION PUMP BEARING JOURNALS**

R. Engel, A. Fibier, J. Heldt, A. Ronecker, Kernkraftwerk Leibstadt AG, Leibstadt, Switzerland

#### **PVP2012-78780: MANAGING CHECK VALVE FLANGE LEAKS TECHNICAL SOLUTIONS AND CHALLENGES TO OVERCOME**

I. Ezekoye, W. E. Densmore, W. M. Turkowski, R. E. Becse, Westinghouse Electric Co., Cranberry Township, PA, USA

### **SESSION 3.2F (NDE-4-1)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, Kent*

#### **CORROSION INSPECTION ISSUES**

**Sponsored by the ASME NDE Division and the PVP Operations, Applications & Components and Materials & Fabrication Technical Committees**

Developed by: M. Carte, Olympus NDT, Houston, TX, USA; W. Springer, University of Arkansas, Fayetteville, AR, USA

Chair: M. Carte, Olympus NDT, Houston, TX, USA

Co-Chair: W. Springer, University of Arkansas, Fayetteville, AR, USA

#### **PVP2012-78149: DETECTING STRESS CORROSION CRACKING IN AUSTENITIC & FERROMAGNETIC MATERIALS USING EDDY CURRENT ARRAY TECHNOLOGY (Presentation Only)**

M. Carte, Olympus NDT, Houston, TX, USA

#### **PVP2012-78151: PIPELINE INTEGRITY CORROSION MAPPING WITH PHASED ARRAY ULTRASONICS (Presentation Only)**

C. S. Riccardelli, Riccardelli Consulting Services, Saratoga Springs, UT, USA; J. Browning, University of Ultrasonics, Moss Point, MS, USA

#### **PVP2012-78141: STATE-OF-THE-ART PULSED EDDY CURRENT SYSTEM FOR DETECTION OF CORROSION UNDER INSULATION (CUI) (Presentation Only)**

B. Nidathavolu, ApplusRTD, Houston, TX, USA

### **SESSION 3.2G (CT-8-1)**

*Wednesday, July 18, 10:30 am – 12:15 pm, Mezzanine, Conference F*

#### **NEW AND EMERGING METHODS OF ANALYSIS AND APPLICATIONS**

Developed by: Y. H. Park, New Mexico State University, Las Cruces, NM, USA

Chair: Y. H. Park, New Mexico State University, Las Cruces, NM, USA

Co-Chair: D. Dewees, The Equity Engineering Group, Shaker Heights, OH, USA

#### **PVP2012-78076: LARGE VESSEL NOZZLE PENETRATION GEOMETRIC OPTIMISATION STUDY IN 3D INCORPORATING DESIGN OF EXPERIMENTS TECHNIQUES**

A. Towse, Assystem UK Ltd., Sunderland, Tyne and Wear, United Kingdom; M. Martin, A. Allen, C. Andrews, Rolls-Royce PLC, Derby, Derbyshire, United Kingdom

#### **PVP2012-78232: NODAL FORCE BASED FINITE ELEMENT METHOD AND ITS APPLICATION IN DURABILITY ANALYSIS**

Z. Wei, F. Yang, M. Yule, Tenneco, Grass Lake, MI, USA; P. Dong, University of New Orleans, New Orleans, LA, USA

#### **PVP2012-78242: PROPERTIES OF BIMETALIC CORE-SHELL NANOCLUSTERS**

Y. H. Park, New Mexico State University, Las Cruces, NM, USA; I. Hijazi, Prince Mohammad Bin Fahd University, Al Khobar, Saudi Arabia

#### **PVP2012-78573: COMPARISON OF 2D AND 3D WELDING SIMULATIONS OF A SIMPLE PLATE**

D. Dewees, The Equity Engineering Group, Shaker Heights, OH, USA

### **SESSION 3.2H (DA-11-2)**

*Wednesday, July 18, 10:30 am – 12:15 pm, Mezzanine, Conference G*

#### **PIPING AND EQUIPMENT DYNAMICS—II**

Developed by: M. Porter, S. McGuffie, Porter McGuffie, Inc., Lawrence, KS, USA; R. Robleto, KBR, Houston, TX, USA

Chair: R. Baliga, ADVENT Engineering Services, Inc., San Ramon, CA, USA

Co-Chair: A. Dweib, Worley Parsons, Atyrau, Kazakhstan, Kazakhstan

#### **PVP2012-78590: PRESSURE DISTRIBUTION INSIDE PIPES DUE TO DDT**

J. Geng, K. Thomas, Baker Engineering and Risk Consultants, San Antonio, TX, USA

#### **PVP2012-78625: IMPLICATIONS OF REVISED SEISMIC SPECTRA FOR EASTERN NORTH AMERICA ON RESPONSE OF NONSTRUCTURAL COMPONENT AND PIPING**

W. Mekky, AMEC NSS, Toronto, ON, Canada; H. H. H. Mohammed, Stress Analysis Group, Toronto, ON, Canada

#### **PVP2012-78798: STARTUP AND SHUTDOWN STEAM GENERATOR SEPARATOR PIPING FORCES FOR A COAL-FIRED SUPERCRITICAL POWER PLANT**

R. Vijaykumar, J. Jarvis, A. Vieira, J. Humphrey, D. Zheng, Bechtel Power Corp, Frederick, MD, USA

#### **PVP2012-78613: ADVANTAGE OF BLADDER SURGE TANKS IN PIPELINES**

W. Young, Young Engineering & Manufacturing, Inc., San Dimas, CA, USA

### **SESSION 3.2I (DA-8-3)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, Simcoe*

#### **THERMAL STRESSES—III**

Developed by: W. Koves, Pi Engineering Software Inc., Hoffman Estates, IL, USA

Chair: S. Iyer, AMEC NSS Ltd., Toronto, ON, Canada

Co-Chair: W. Koves, Pi Engineering Software Inc., Hoffman Estates, IL, USA

#### **PVP2012-78738: THE PREDICTION OF GLOBAL TEMPERATURE PROFILES IN PIPING SYSTEMS SUBMITTED TO THERMAL-STRATIFIED FLOW FROM MEASURED TEMPERATURES ON OUTSIDE WALL**

H. S. Park, S. Kang, K. Yoon, T. Choi, M. Song, E. Lee, KEPCO E&C, Daejeon, Korea (Republic)

#### **PVP2012-78427: RADIALLY POLARIZED AND MAGNETIZED ROTATING CYLINDERS UNDER THERMAL LOADING**

H. Akbarzadeh, Z. Chen, University of New Brunswick, Fredericton, NB, Canada

#### **PVP2012-78363: EFFECT OF CLAMPING ON RESIDUAL STRESSES IN WELDED PIPE-FLANGE JOINTS**

M. S. Choobi, University of Applied Science and Technology, Iranian Welding Research and Engineering Center, Tehran, Iran

### **SESSION 3.2K (MF-12-2)**

*Wednesday, July 18, 10:30 am – 12:15 pm, Mezzanine, Windsor East*

#### **PIPELINE INTEGRITY—II**

Developed by: X.-K. Zhu, Battelle Memorial Institute, Columbus, OH, USA; S. Cravero

Chair: X.-K. Zhu, Battelle Memorial Institute, Columbus, OH, USA

Co-Chair: G. Shen, MTL/CANMET, Hamilton, ON, Canada

#### **PVP2012-78656: APPLICABILITY OF SE(T) AND SE(B) FRACTURE SPECIMENS IN CRACK GROWTH MEASUREMENTS OF PIPELINE GIRTH WELDS**

L. L. S. Mathias, University of Sao Paulo, Sao Paulo, Brazil; G. H. B. Donato, FEI University Center, Sao Bernardo do Campo, Sao Paulo, Brazil; C. Ruggieri, University of Sao Paulo, Sao Paulo, Brazil

#### **PVP2012-78037: CMOD COMPLIANCE OF B×B SINGLE EDGE BEND SPECIMENS**

G. Shen, MTL/CANMET, Hamilton, ON, Canada; W. Tyson, MTL/CANMET, Ottawa, ON, Canada; J. Gianetto, MTL/CANMET, Hamilton, ON, Canada

#### **PVP2012-78731: APPLICATIONS OF MECHANICS METHODS TO CO<sub>2</sub> TRANSPORTATION AND STORAGE (Presentation Only)**

X.-K. Zhu, Battelle Memorial Institute, Columbus, OH, USA

#### **PVP2012-78087: STRUCTURES AND PROPERTIES OF X80 PIPELINE GIRTH WELDS FOR DIFFERENT WELDING PROCEDURES**

X. He, Y. Liu, L. Zhu, K. Tong, X. Shao, CNPC Tubular Goods Research Institute, Xi'an, China

### **SESSION 3.2L (MF-4-9)**

*Wednesday, July 18, 10:30 am – 12:15 pm, Mezzanine, Conference B*

#### **WELDING RESIDUAL STRESS AND DISTORTION SIMULATION AND MEASUREMENT—IX**

Developed by: E. Keim, AREVA NP GmbH, Erlangen, Germany; P. Gilles, AREVA NP SAS, Paris La Défense, France

Chair: E. Keim, AREVA NP GmbH, Erlangen, Germany

Co-Chair: P. Gilles, AREVA NP SAS, Paris La Défense, France

#### **PVP2012-78089: RESIDUAL STRESS PREDICTIONS ON A 29 NARROW GAP DISSIMILAR METAL WELD AND COMPARISON WITH A 14 CONFIGURATION**

S. Courtin, AREVA NP SAS, Paris La Défense, France; X. Ficquet, VEQTER Limited, Bristol, United Kingdom; T. Lê, P. Gilles, M. Yescas, AREVA NP SAS, Paris La Défense, France

#### **PVP2012-78407: THE IMPACT OF AXI-SYMMETRIC BOUNDARY CONDITIONS ON PREDICTED RESIDUAL STRESSES AND SHRINKAGE IN A PWR NOZZLE DISSIMILAR METAL WELD**

P. J. Bendeich, O. Muransky, ANSTO, Kirrawee, NSW, Australia; M. Smith, EdF Energy Nuclear Generation Ltd., Gloucester, United Kingdom; C. Hamelin, L. Edwards, ANSTO, Kirrawee, NSW, Australia

#### **PVP2012-78524: FINITE ELEMENT MODELLING OF REDUCED PRESSURE ELECTRON BEAM STAINLESS STEEL PLATE AND PIPE WELDS**

B. Pellereau, P. Hurrell, C. Gill, K. Ayres, Rolls-Royce plc, Derby, Derbyshire, United Kingdom

#### **PVP2012-78838: EFFECT OF PARTIAL WELDING ON RESIDUAL STRESS AND STRUCTURAL INTEGRITY IN PIPING WELDS**

J. Katsuyama, K. Masaki, K. Onizawa, Japan Atomic Energy Agency, Tokai-mura, Ibaraki-ken, Japan

### **SESSION 3.2M (MF-10-2)**

*Wednesday, July 18, 10:30 am – 12:15 pm, Mezzanine, Conference C*

#### **MECHANISTIC MODELING OF MATERIALS—II**

Developed by: A. Horn, Serco TCS, Warrington, Cheshire, United Kingdom

Chair: A. Horn, Serco TCS, Warrington, Cheshire, United Kingdom

Co-Chair: P. James, Serco TCS, Warrington, Cheshire, United Kingdom

#### **PVP2012-78306: EFFECT OF PIPE POST-YIELD BEHAVIOUR ON CRACK DRIVING FORCE IN A MISMATCHED GIRTH WELD**

S. Hertelé, W. De Waele, R. Denys, M. Verstraete, K. Van Minnebruggen, Ghent University, Zwijnaarde, Belgium; A. Horn, Serco TCS, Warrington, Cheshire, United Kingdom

#### **PVP2012-78774: ADVANCED ASSESSMENT OF THE INTEGRITY OF DUCTILE COMPONENTS**

M. Daly, A. Sherry, Dalton Nuclear Research Institute, Manchester, United Kingdom; J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom

#### **PVP2012-78803: A CYCLIC PLASTICITY MODELING FOR UNIAXIAL AND MULTIAXIAL RATCHETING SIMULATION OF AUSTENITIC STEEL**

S. Meziani, L. Djimli, University Mentouri Constantine, Constantine, Algeria

### **SESSION 3.2P (CS-20-2)**

*Wednesday, July 18, 10:30 am – 12:15 pm, 2nd Floor, City Hall*

#### **COMBINATION OF MULTIPLE LOADS FOR CRACK EVALUATIONS**

Developed by: Y. Li, Japan Nuclear Energy Safety Organization, Tokyo, Japan; P. Hoang, Sargent Lundy LLC, Chicago, IL, USA

Chair: N. Kasahara, The University of Tokyo, Tokyo, Japan

Co-Chair: H. Qian, Structural Integrity Associates, Inc., San Jose, CA, USA

**PVP2012-78069: EXPERIMENTAL INVESTIGATION ON FAILURE ESTIMATION METHOD FOR CRACKED CYLINDERS SUBJECTED TO COMBINED TENSILE AND TORSION LOADS**

Y. Li, K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan; N. Miura, Central Research Institute of Electric Power Industry, Yokosuka, Japan; K. Hoshino, Central Research Institute of Electric Power Industry, Kanagawa, Japan

**PVP2012-78662: EXPERIMENTAL INVESTIGATION ON NET-SECTION-COLLAPSE CRITERION FOR CIRCUMFERENTIALLY CRACKED CYLINDERS SUBJECTED TO TORSIONAL MOMENT**

N. Miura, Central Research Institute of Electric Power Industry, Yokosuka, Japan; K. Hoshino, Central Research Institute of Electric Power Industry, Kanagawa, Japan; Y. Li, K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan

**PVP2012-78678: ESTIMATION OF LOW CYCLE FATIGUE LIFE OF ELBOWS CONSIDERING MULTI-AXIAL STRESS EFFECT**

K. Takahashi, K. Matsuo, K. Ando, Yokohama National University, Yokohama, Japan; Y. Urabe, Japan Nuclear Technology Institute, Tokyo, Japan

**SESSION 3.2R (MF-2-4)**

*Wednesday, July 18, 10:30 am – 12:15 pm, Mezzanine, Essex Ballroom*

**THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—IV**

Developed by: P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA; A.-H. I. Mourad, United Arab Emirates University, Al-Ain, United Arab Emir.

Chair: P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA

Co-Chair: A. E. Méndez-Torres, Savannah River National Laboratory, Aiken, SC, USA

**PVP2012-78225: DETERMINATION OF THE INTERACTION BETWEEN PRIMARY AND SECONDARY STRESSES USING AN IDEALISED MODEL**

G. Horne, D. Smith, University of Bristol, Bristol, United Kingdom

**PVP2012-78782: SPIRAL NOTCH TORSION TEST USE FOR DETERMINING FRACTURE TOUGHNESS OF STRUCTURAL MATERIALS**

J.-A. Wang, F. Ren, T. Tan, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**PVP2012-78802: INVESTIGATING DUCTILE FAILURE AT THE MICROSCALE IN ENGINEERING STEELS: A MICROMECHANICAL FINITE ELEMENT MODEL**

D.-F. Li, University of Limerick, Limerick, Ireland; N. P. O'Dowd, Materials and Surface Science Institute, Limerick, Ireland

**PVP2012-78856: METHODS FOR THE EXPERIMENTAL EVALUATION OF TRUE STRESS-STRAIN CURVES AFTER NECKING OF CONVENTIONAL TENSILE SPECIMENS: EXPLORATORY INVESTIGATION AND PROPOSALS**

G. Donato, G. Ganharul, N. B. Azevedo, FEI University, Sao Bernardo do Campo, Sao Paulo, Brazil

**THURSDAY, JULY 19**

**Block 4.1: Thursday, July 19 (8:30 am – 10:15 pm)**

**SESSION 4.1B (NDE-4-2)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Elgin*

**PLANT INSPECTION ISSUES**

**Sponsored by the ASME NDE Division and the PVP Operations, Applications & Components and Materials & Fabrication Technical Committees**

Developed by: W. Springer, University of Arkansas, Fayetteville, AR, USA; M. Carte, Olympus NDT, Houston, TX, USA

Chair: W. Springer, University of Arkansas, Fayetteville, AR, USA

Co-Chair: M. Carte, Olympus NDT, Houston, TX, USA

**PVP2012-78016; RBI IN PRESSURE RELIEVING DEVICES (Presentation Only)**

J. Esquivel, CUASMEX Services, Saltillo, Coahuila, Mexico

**PVP2012-78488: TUBE INSPECTION USING ACOUSTIC PULSE REFLECTOMETRY: APPLICATION TO A TUBULAR AIR HEATER (Presentation Only)**

N. Amir, H. Primack, D. Furman, S. Zilberman, AcousticEye, Tel Aviv, Israel

**PVP2012-78550: APR—MITIGATING RISK BY INCREASING INSPECTION EFFECTIVENESS AND COVERAGE IN TUBING APPLICATIONS (Presentation Only)**

T. Jackson, Hi-Tech Testing Service Inc., Deer Park, TX, USA

**PVP2012-78864: MICROWAVE INSPECTION METHOD TO DETECT DEFECTS AND COLD FUSION JOINTS IN HIGH DENSITY POLYETHYLENE PIPE (Presentation Only)**

R. Stakenborghs, Evisive, Baton Rouge, LA, USA

**SESSION 4.1C (SE-3-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Wentworth*

**STRUCTURAL DYNAMICS—LINEAR AND NONLINEAR**

Developed by: K. Fujita, Osaka City University, Osaka-prefecture, Japan, Japan

Chair: K. Fujita, Osaka City University, Osaka-prefecture, Japan, Japan

Co-Chair: S. A. Karamanos, University of Thessaly, Volos, Greece

**PVP2012-78451: EXPERIMENTAL STUDY ON FREE STANDING RACK LOADING FULL FUEL ASSEMBLY**

A. Iwasaki, Y. Nekomoto, H. Morita, K. Taniguchi, D. Okuno, T. Matsuoka, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; N. Chigusa, Kansai Electric Power Co., Inc., Tokyo, Japan

**PVP2012-78462: ANALYSIS STUDY ON FREE STANDING RACK UNDER THE EARTHQUAKE EXCITATION**

A. Iwasaki, Y. Nekomoto, H. Morita, K. Taniguchi, D. Okuno, T. Matsuoka, Mitsubishi Heavy Industries, Ltd., Hyogo, Japan; N. Chigusa, The Kansai Electric Power Co., Inc., Tokyo, Japan

**PVP2012-78278: DYNAMIC STABILITY OF AN ELASTIC BEAM SUBJECTED TO FOLLOWER FORCES**

K. Fujita, A. Gotou, Osaka City University, Osaka-prefecture, Japan, Japan

**PVP2012-78778: DYNAMIC TESTING OF HIGH DENSITY POLYETHYLENE VENT AND DRAIN CONFIGURATIONS**

D. Munson, EPRI, Palo Alto, CA, USA; T. Adams, S. Nickholds, JD Stevenson and Associates, Independence, OH, USA

**SESSION 4.1D (CS-13-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Kenora*

**RECENT DEVELOPMENTS IN EUROPEAN CODES AND STANDARDS**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA; J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

Co-Chair: J. Sharples, Serco Energy, Warrington, Cheshire, United Kingdom

**PVP2012-78033: PRESENTATION OF NEW EDITION OF RCC M CODE IN 2011.EVOLUTIONS IN INTERNATIONAL CONTEXT**

P. Malouines, AFCEN, Paris La Defense, France

**PVP2012-78330: PRESENTATION OF RCC-MRX CODE 2012 FOR SODIUM REACTORS (SFR), RESEARCH REACTOR (RR) AND FUSION (ITER): GENERAL ORGANIZATION AND RECENT DEVELOPMENTS**

T. Lebarbé, C. Petesch, CEA, Gif-sur-Yvette, France; D. Bonne, Areva, Lyon, France; F. de la Burgade, Areva, Saint Paul Lez Durance, France; M. Blat-Yrieix, EDF, Moret-sur-Loing, France

**PVP2012-78649: THE CASE FOR EQUALITY, BRINGING BOLTED JOINT MANAGEMENT IN LINE WITH WELDED JOINT MANAGEMENT. TRENDS IN EUROPEAN STANDARDS**

R. Noble, Hydratight, Morpeth, Northumberland, United Kingdom

**SESSION 4.1E (OAC-6-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Huron*

**FAILURE, REPAIR, AND FITNESS-FOR-SERVICE**

Developed by: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Chair: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Co-Chair: J. T. Reynolds, Intertek/Moody, Steamboat Springs, CO, USA

**PVP2012-78121: CASE STUDIES OF LARGE MECHANICAL INTEGRITY FAILURES IN THE REFINING AND PETROCHEMICAL INDUSTRY (Presentation Only)**

J. T. Reynolds, Intertek/Moody, Steamboat Springs, CO, USA

**PVP2012-78348: SENSITIVITY ANALYSIS OF FITNESS-FOR-SERVICE ASSESSMENT BASED ON RELIABILITY FOR CYLINDRICAL PRESSURE VESSELS WITH LOCAL METAL LOSS**

T. Kaida, Sumitomo Chemical Co., Ltd., Niihama City, Ehime, Japan; S. Izumi, S. Sakai, The University of Tokyo, Tokyo, Japan

**PVP2012-78853: RISKS ASSOCIATED WITH THE USE OF THREADED PIPING COMMON CAUSES FOR FAILURE AND THEIR REMEDIES (Presentation Only)**

A. Cheta, Shell Exploration and Production, Houston, TX, USA

**SESSION 4.1F (FSI-6-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Kent*

**FSI ISSUES IN AERONAUTICAL ENGINEERING & SLOSHING TOPICS**

Developed by: J. W. Hall, University of New Brunswick, Fredericton, NB, Canada; M. Benaouicha, Naval Academy Research

Institute, Brest, France; J. C. Jo, Korea Institute of Nuclear Safety, Daejeon, Korea (Republic)

Chair: C. Giannopapa, Eindhoven University of Technology, Eindhoven, Netherlands

Co-Chair: D. Brochard, Commissariat à l'Energie Atomique et aux Energies Alternatives, Gif-sur-Yvette, France

**PVP2012-78148: VORTEX-SHEDDING FROM VARIOUS YAWED TANDEM CIRCULAR CYLINDER ARRANGEMENTS**

S. Wilkins, J. W. Hall, University of New Brunswick, Fredericton, NB, Canada

**PVP2012-78389: NUMERICAL ANALYSIS OF HYDROFOIL DYNAMICS BY USING A FLUID-STRUCTURE INTERACTION APPROACH**

T. E. Rajaomazava III, M. Benaouicha, J.-A. Astolfi, Naval Academy Research Institute, Brest, France

**PVP2012-78447: SIMULATION FOR A FLOATING ROOF BEHAVIOR OF CYLINDRICAL STORAGE TANK DUE TO WIND LOAD—PART 1 CFD ANALYSIS**

S. Kuroda, H. Uejima, IHI Corporation, Yokohama, Japan; K. Ishida, IHI Corporation, Tokyo, Japan; S. Yoshida, M. Shiratori, K. Sekine, Yokohama National University, Yokohama, Japan; T. Tsuchida, K. Iwata, Japan Oil, Gas and Metals National Corporation, Tokyo, Japan

**PVP2012-78163: SIMULATION FOR A FLOATING ROOF BEHAVIOR OF CYLINDRICAL STORAGE TANK DUE TO WIND LOAD—PART 2 SLOSHING RESPONSE ANALYSIS**

S. Yoshida, Yokohama National University, Yokohama, Japan; S. Kuroda, H. Uejima, IHI Corporation, Yokohama, Japan; K. Ishida, IHI Corporation, Tokyo, Japan; M. Shiratori, K. Sekine, Yokohama National University, Yokohama, Japan; T. Tsuchida, K. Iwata, Japan Oil, Gas and Metals National Corporation, Tokyo, Japan

**SESSION 4.1G (CT-9-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Conference F*

**COMPUTATIONAL MODEL VERIFICATION AND EXPERIMENTAL QUALIFICATION**

Developed by: X. Duan, Candu Energy Inc., Mississauga, ON, Canada

Chair: A. Weck, University of Ottawa, Ottawa, ON, Canada

Co-Chair: M. Wang, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78092: CONSTRUCTING A VALIDATED DEFORMATION MECHANISMS MAP USING LOW TEMPERATURE CREEP STRAIN ACCOMMODATION PROCESSES FOR NICKEL-BASE ALLOY 718**

M. Asadi, D. Guillot, A. Weck, University of Ottawa, Ottawa, ON, Canada; S. Hegde, Johns Manville - Berkshire Hathaway Group, Littleton, CO, USA; A. Koul, Life Prediction Technologies Incorporation, Ottawa, ON, Canada; T. Sawatzky, H. Saari, Carleton University, Ottawa, ON, Canada

**PVP2012-78153: RESIDUAL STRESS MODELING OF INDUCTION-BENT PIPES**

Y. Ding, M. Yetisir, Atomic Energy of Canada Limited, Chalk River, ON, Canada; H. McDonald, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78381: NON-LOCAL DAMAGE MODEL TO PREDICT THE EFFECT OF PRE-STRAIN ON DUCTILE FRACTURE IN ALUMINUM ALLOY 5052**

Y. Alinaghian, M. Asadi, A. Weck, University of Ottawa, Ottawa, ON, Canada

## **SESSION 4.1H (DA-9-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Conference G*

### **FITNESS FOR SERVICE—I**

Developed by: C. Rodery, BP plc, Webster, TX, USA  
Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA  
Co-Chair: K. Oyamada, The High Pressure Gas Safety Institute of Japan; Tokyo, Japan

### **PVP2012-78013: FAILURE ANALYSIS AT STEAM CONDENSER FIN FAN COOLER TUBES, RAS TANURA REFINERY**

A. D. AlDakhil, J. A. AlSudairy, I. A. Al-Buraiqi, Saudi Aramco, Dhahran, Saudi Arabia

### **PVP2012-78048: RISK-BASED OPERATIONS ASSESSMENT OF A MULTILAYERED VESSEL UNDER CYCLIC LOADING CONDITIONS**

M. Zhao, R. Parkinson, UOP LLC, Des Plaines, IL, USA

### **PVP2012-78078: FITNESS-FOR-SERVICE ASSESSMENT OF A STEAM PIPELINE OPERATING IN THE CREEP RANGE AFTER 230000 HOURS OF SERVICE**

L. Scano, Studio Tecnico Scano, Udine, Italy

## **SESSION 4.1I (DA-16-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Simcoe*

### **CFD, BUCKLING & SPECIAL TOPICS IN DESIGN & ANALYSIS**

Developed by: S. McGuffie, M. Porter, Porter McGuffie, Inc., Lawrence, KS, USA; S. Krishnamurthy, UOP LLC, Des Plaines, IL, USA

Chair: S. McGuffie, Porter McGuffie, Inc., Lawrence, KS, USA

Co-Chair: P. Mertiny, University of Alberta, Edmonton, AB, Canada

### **PVP2012-78491: CFD ANALYSES OF THE TN-24P PWR SPENT FUEL STORAGE CASK**

R. A. Brewster, CD-adapco, Melville, NY, USA; E. Baglietto, Massachusetts Institute of Technology, Cambridge, MA, USA; E. Volpenhein, CD-adapco, Cincinnati, OH, USA; C. Bajwa, US Nuclear Regulatory Commission, Rockville, MD, USA

### **PVP2012-78374; BUCKLING OF TRUNCATED CONES WITH LOCALIZED IMPERFECTIONS**

J. Blachut, The University of Liverpool, Liverpool, United Kingdom

### **PVP2012-78441: ESTIMATION OF STRESS INTENSITY FACTOR FOR AXIAL SURFACE CRACK IN THE WELDED CRDM NOZZLE**

Y.-C. Park, J. Jeong, J.-B. Choi, Sungkyunkwan University, Suwon, Korea (Republic); Y.-S. Chang, Kyung Hee University, Suwon, Korea (Republic); S.-W. Kim, H.-P. Kim, Korea Atomic Energy Research Institute, Daejeon, Korea (Republic)

## **SESSION 4.1J (DA-12-3)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Windsor West*

### **PANEL SESSION: INTERNATIONAL PROGRESS IN BOLTED JOINT INTEGRITY—I**

Developed by: W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia; T. Seipp, Becht Engineering, Calgary, AB, Canada; W. Koves, Pi Engineering Software Inc., Hoffman Estates, IL, USA

Chair: P. Petrunich, Fluid Sealing Association, aef, AL, USA

Co-Chair: K. Kolb, Lamons, Inc.; Houston, TX, USA

### *Panelists:*

P. Petrunich, Fluid Sealing Association, aef, AL, USA

M. Schaaf, AMTEC Services GmbH, Lauffen, Germany

H. Lejeune, CETIM, Nantes, France

T. Sawa, Hiroshima University, Higashi-hiroshima, Hiroshima, Japan

## **SESSION 4.1K (MF-14-2)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Windsor East*

### **LEAK-BEFORE-BREAK—II**

Developed by: J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom; B. Bezensek, Hunting Energy Service UK Ltd., Scotland, United Kingdom; D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; A. Chakraborty, Structural Integrity Associates, San Jose, CA, USA

Chair: J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom

Co-Chair: D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

### **PVP2012-78181: ADVANCES IN COD EQUATIONS CIRCUMFERENTIAL THROUGH-WALL CRACKS**

B. Young, R. Olson, Battelle, Columbus, OH, USA; M. Kerr, Office of Nuclear Regulatory Research, Washington, DC, USA

### **PVP2012-78186: INITIAL DEVELOPMENT OF THE EXTREMELY LOW PROBABILITY OF RUPTURE (xLPR) VERSION 2.0 CODE**

D. Rudland, US Nuclear Regulatory Commission, Rockville, MD, USA; C. Harrington, EPRI, Irving, TX, USA

### **PVP2012-78466: A SPECIAL FINITE ELEMENT FOR LEAK-BEFORE-BREAK ANALYSIS**

P. Gill, University of Manchester, Manchester, United Kingdom; J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom; K. Davey, University of Manchester, Manchester, United Kingdom

## **SESSION 4.1L (MF-7-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Conference B*

### **MATERIALS AND TECHNOLOGIES FOR NUCLEAR POWER PLANTS**

Developed by: W. Ren, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Chair: W. Ren, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Co-Chair: A. Duncan, Savannah River National Laboratory, Aiken, SC, USA

### **PVP2012-78614: INFLUENCE OF AUSTENITIC STAINLESS STEEL BASE METALS ON HOT CRACKING SUSCEPTIBILITY OF HIGH CHROMIUM NICKEL-BASE FILLER METALS**

S. L. McCracken, J. K. Tatman, Electric Power Research Institute, Charlotte, NC, USA

### **PVP2012-78351: PROPERTY DATA, MATERIALS TEST RESULTS AND MATERIALS DESIGN DATA: SYSTEMS FOR THEIR EFFICIENT MANAGEMENT**

W. Marsden, E. R. Cope, Granta Design, Cambridge, Essex, United Kingdom



**PVP2012-78371: MODELLING THE GRAPHITE FRACTURE MECHANISMS**

C. Jacquemoud, S. Marie, CEA, Gif-sur-Yvette, France; M. Nedelec, IRSN, Fontenay-aux-Roses, France

**PVP2012-78416: ANALYSIS ON IRRADIATION ELONGATION PERFORMANCE OF ZR-2.5NB PRESSURE TUBES IN CANDU POWER REACTORS OF QINSHAN**

T. Jiongran, TQNPC, Haiyan, China

**SESSION 4.1M (MF-26-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Conference C*

**ADVANCED MATERIALS FOR PRESSURE APPLICATIONS**

Developed by: A. Duncan, Savannah River National Laboratory, Aiken, SC, USA

Chair: A. Duncan, Savannah River National Laboratory, Aiken, SC, USA

Co-Chair: W. Ren, Oak Ridge National Laboratory, Oak Ridge, TN, USA; B. Burdett, Rolls-Royce, Derby, United Kingdom

**PVP2012-78115: HOT ISOSTATIC PRESSING OF STAINLESS STEEL, LARGE BORE VALVE PRESSURE BOUNDARIES FOR A PWR APPLICATION**

J. Sulley, M. Bohan, Rolls Royce, Derby, Derbyshire, United Kingdom

**PVP2012-78739: HOT ISOSTATIC PRESSING OF STAINLESS STEEL AND HARDFACING POWDERS FOR PWR COMPONENTS—MATERIALS & MANUFACTURING BENEFITS**

B. Burdett, Rolls-Royce, Derby, United Kingdom

**PVP2012-78226: EPRI GUIDELINE FOR FABRICATION OF COMPONENTS MANUFACTURED FROM GRADE 91 STEEL**

J. Parker, Electric Power Research Institute, Charlotte, NC, USA; K. Coleman, EPRI, Charlotte, NC, USA

**PVP2012-78725: MICROSTRUCTURAL STABILITY AND LATTICE MISFIT CHARACTERISATIONS OF NIMONIC 263**

Q. Luo, Sheffield Hallam University, Sheffield, United Kingdom; K. Chi, Doosan Power Systems, Renfrew, United Kingdom; S. Li, Sheffield Hallam University, Sheffield, United Kingdom; P. Barnard, Doosan Power Systems, Renfrew, United Kingdom

**PVP2012-78849: REHEATING TREATMENT OF X100 BEND PIPE STEEL**

Z. Xiaoli, Zhong Yuan University Of Technology, Zhengzhou, China

**SESSION 4.1P (CS-12-1)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, City Hall*

**INTEGRITY MANAGEMENT**

Developed by: G. Jia, X. Li, China Special Equipment Inspection and Research Institute, Beijing, China

Chair: G. Jia, China Special Equipment Inspection & Research Institute, Beijing, China

Co-Chair: X. Li, China Special Equipment Inspection and Research Institute, Beijing, China

**PVP2012-78266: STUDY ON SAFETY AND MANAGEMENT TECHNOLOGY OF ROAD TANKERS**

X. Xue, X. Tang, Shanghai Institute of Special Equipment Inspection & Technical Research, Shanghai, China; W. Zhou, Sub Committee of Moveable Pressure Vessel of China Standardization Committee on Boilers

and Pressure, Shanghai, China; J. Ding, . J. Yao, Shanghai Institute of Special Equipment Inspection & Technical Research, Shanghai, China

**PVP2012-78652: DEVELOPMENT ON PREDICTIVE MAINTENANCE INTELLIGENT MANAGEMENT SYSTEM OF STATIC EQUIPMENTS**

G. Jia, H. Wang, X. Li, W. Wang, China Special Equipment Inspection and Research Institute, Beijing, China

**PVP2012-78675: PRACTICE OF RBI IN REFINERY AND CHEMICAL PLANTS OF CHINA**

X. Ma, Y. Xie, Jiangsu Province Special Equipment Safety Supervision Inspection Institute, Nanjing, Jiangsu, China

**PVP2012-78222: INTEGRITY ASSESSMENT OF PRESSURE VESSELS AND PIPELINES UNDER FIRE ACCIDENT ENVIRONMENT**

X. Chen, Z. Ai, Z. Fan, R. Li, P. Xu, H. Jiang, Hefei General Machinery Research Institute, Hefei, Anhui, China

**SESSION 4.1Q (DA-3-5)**

*Thursday, July 19, 8:30 am – 10:15 pm, 2nd Floor, Civic Ballroom North*

**PIPING INTEGRITY II**

Developed by: R. Robleto, KBR, Houston, TX, USA

Chair: R. Robleto, KBR, Houston, TX, USA

Co-Chair: P. Gilles, AREVA NP SAS, Paris La Défense, France

**PVP2012-78202: CRACK OPENING AREA FOR THROUGH CRACK IN THE SHELLS SUBJECTED TO MEMBRANE AND BENDING LOAD**

I. Orynyak, Institute for Problems of Strength, Kiev, Ukraine; V. Kozlov, Scientific Technical Centre of NAEK Energoatom, Kiev, Ukraine; E. Yakovleva, Institute for Problems of Strength, Kiev, Ukraine

**PVP2012-78352: SMALL BORE PIPING SYSTEM FATIGUE—DETERMINATION OF FAVORED CRACK LOCATION AND RELATED ADMISSIBLE VIBRATION CRITERION**

J. Berger, J. Guillou, Electricité de France, Villeurbanne, France; E. Poirier, Electricité de France, Marseille, France

**PVP2012-78629: DEVELOPMENT OF ELASTIC-PLASTIC CONSTITUTIVE MODELS FOR THE EVALUATION OF NUCLEAR PIPING SYSTEMS UNDER SEVERE CYCLIC LOADING**

Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan; Y. Tanaka, Tokyo Electric Power Company, Yokohama, Kanagawa, Japan

**PVP2012-78696: BRITTLE FRACTURE ANALYSIS OF DISSIMILAR METAL WELD JOINTS**

A. Blouin, AREVA NP, Paris La Défense, France; S. Chapuliot, AREVA, Paris La Défense, France; S. Marie, CEA, Gif-sur-Yvette, France; J.-M. Bergeau, ENISE/LTDS, Saint-Etienne, France

**SESSION 4.1R (MF-2-5)**

*Thursday, July 19, 8:30 am – 10:15 pm, Mezzanine, Essex Ballroom*

**THE DAVID LIBBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—V**

Developed by: T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA; J.-A. Wang, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Chair: T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Co-Chair: M. Yamamoto, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

**PVP2012-78661: A ROUND ROBIN PROGRAM OF MASTER CURVE EVALUATION USING MINIATURE C(T) SPECIMENS—FIRST ROUND ROBIN TEST ON UNIFORM SPECIMENS OF REACTOR PRESSURE VESSEL MATERIAL**

M. Yamamoto, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan; A. Kimura, Kyoto University, Uji, Kyoto, Japan; K. Onizawa, Japan Atomic Energy Agency, Tokai-mura, Ibaraki-ken, Japan; K. Yoshimoto, MHI, Takasago, Hyogo, Japan; T. Ogawa, Toshiba Corporation, Yokohama, Japan; A. Chiba, Hitachi GE Nuclear Energy, Hitachi, Ibaraki, Japan; T. Hirano, IHI, Isogo, Kanagawa, Japan; T. Sugihara, Nuclear Development, Tokai, Ibaraki, Japan; M. Sugiyama, Nippon Nuclear Fuel Development, Higashi Ibaraki, Ibaraki, Japan; N. Miura, N. Soneda, Central Research Institute of Electric Power Industry, Yokosuka, Japan

**PVP2012-78689: EVALUATION OF THE FRACTURE TOUGHNESS BEHAVIOR OF SA508 STEELS CONSIDERING BIAXIAL LOADING CONDITION**

J. M. Kim, K.-H. Lee, H.-J. Lee, B.-S. Lee, Korea Atomic Energy Research Institute, Daejeon, Korea (Republic)

**PVP2012-78813: EFFECT OF UNDERMATCHED WELD ON DEFORMATION AND BRITTLE FRACTURE BEHAVIORS IN HIGH-TENSILE STRENGTH STEEL PLATE WELDED JOINT**

M. Mochizuki, Osaka University, Suita, Osaka, Japan; T. Kawabata, Sumitomo Metal Industries, Ltd., Suita, Japan

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**Block 4.2: Thursday, July 19 (10:30 am – 12:15 pm)**

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**SESSION 4.2B (HP-2-3)**

*Thursday, July 19, 10:30 am – 12:15 pm, 2nd Floor, Elgin*

**STRUCTURAL RESPONSE OF PIPING SYSTEMS TO GASEOUS DETONATIONS—I**

Developed by: E. Rodriguez, Global Nuclear Network Analysis, LLC, Santa Fe, NM, USA

Chair: M. Edel, Baker Engineering and Risk Consultants, San Antonio, TX, USA

Co-Chair: E. Rodriguez, Global Nuclear Network Analysis, LLC, Santa Fe, NM, USA

**PVP2012-78526: CORRELATION OF PIPING SYSTEM DETONATION TEST DATA AND SYSTEM ANALYSES**

T. Ligon, Dominion Engineering, Reston, VA, USA; J. Minichiello, Bechtel National, Inc., Richland, WA, USA; D. Gross, Dominion Engineering Incorporated, Reston, VA, USA

**PVP2012-78482: MODELING OF THE EFFECT OF PLASTICITY ON THE RESPONSE OF PIPES TO INTERNAL MOVING DETONATIONS**

J. Smeulers, TNO Fluid Dynamics, Delft, Netherlands; G. Pape, Delft Technology Research Laboratories, Bergschenhoek, Netherlands; N. Ligterink, TNO Flow Dynamics, Delft, Netherlands

**PVP2012-78379: QUANTITATIVE RISK ANALYSIS OF HYDROGEN EVENTS AT WTP PART 2 OF 2—DEVELOPMENT OF EVENT FREQUENCY-SEVERITY MODEL**

M. G. Wentink, Bechtel National Incorporated, Richland, WA, USA; R. E.

Jones, Dominion Engineering Incorporated, Reston, VA, USA; K. O’Kula, URS Safety Management Solutions LLC, Aiken, SC, USA; D. Gross, J. Collin, Dominion Engineering Incorporated, Reston, VA, USA

**PVP2012-78539: DETONATION AND TRANSITION TO DETONATION IN PARTIALLY WATER-FILLED PIPES**

N. Bitter, J. Shepherd, California Institute of Technology, Pasadena, CA, USA

**SESSION 4.2C (SE-5-1)**

*Thursday, July 19, 10:30 am – 12:15 pm, 2nd Floor, Wentworth*

**FORUM ON APPROPRIATE CRITERIA AND METHODS FOR THE SEISMIC DESIGN OF PIPING SYSTEMS**

Developed by: G. Slagis, G C Slagis Associates, Pleasant Hill, CA, USA

Chair: V. Matzen, University of North Carolina, Raleigh, NC, USA

Co-Chair: A. Maekawa, Institute of Nuclear Safety System, Inc., Fukui, Japan

**PVP2012-78811: THE 2011 FORUM ON APPROPRIATE CRITERIA AND METHODS FOR SEISMIC DESIGN OF NUCLEAR PIPING**

G. Slagis, G C Slagis Associates, Pleasant Hill, CA, USA

**SESSION 4.2D (CS-14-1)**

*Thursday, July 19, 10:30 am – 12:15 pm, 2nd Floor, Kenora*

**HIGH TEMPERATURE CODES AND STANDARDS**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA

Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA

Co-Chair: T. Asayama, Japan Atomic Energy Agency, Ibaraki-ken, Japan

**PVP2012-78123: CRACK INITIATION/PROPAGATION OF PERFORATED PLATE UNDER DISPLACEMENT-CONTROLLED CREEP-FATIGUE TEST AT ELEVATED TEMPERATURE**

O. Watanabe, University of Tsukuba, Tsukuba, Japan; T. Akiyama, Hitachi Construction Machinery, Tsukuba, Ibaraki, Japan; A. Matsuda, University of Tsukuba, Tsukuba, Ibaraki, Japan

**PVP2012-78454: ELASTIC FOLLOW-UP FACTORS TO ESTIMATE C(T) UNDER SECONDARY LOADING**

K.-H. Lee, Y. J. Kim, Korea University, Seoul, Korea (Republic); R. Ainsworth, Manchester University, Manchester, United Kingdom; D. W. Dean, EDF, Barnwood, United Kingdom

**PVP2012-78263; RESEARCH ON CREEP RUPTURE OF T92/HR3C DIS-SIMILAR METAL WELDED JOINTS**

F. Gu, Y. Chen, Shanghai Institute of Special Equipment Inspection & Technical Research, Shanghai, China; S. Ye, Shanghai Boiler Works, Ltd., Shanghai, China

**PVP2012-78700: APPLICATION OF THE SYSTEM BASED CODE CONCEPT TO THE ASME CODE FOR LIQUID METAL REACTORS**

T. Asayama, S. Takaya, M. Morishita, Japan Atomic Energy Agency, Ibaraki-ken, Japan

**SESSION 4.2E (OAC-6-2)**

*Thursday, July 19, 10:30 am – 12:15 pm, 2nd Floor, Huron*

**PLANT DESIGN AND OPERATIONS**

Developed by: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Chair: Y. Shoji, Nabtesco Corp., Kobe, Hyogo-ken, Japan

Co-Chair: A. Cheta, Shell Exploration and Production, Houston, TX, USA

**PVP2012-78050: DESIGN, OPERATION AND MAINTENANCE OF SURGE TANK PRESSURE VESSEL AND SYSTEM FOR UNDERGROUND PUMPING PLANT (Presentation Only)**

S. Gerges, Los Angeles County Sanitation District, Whittier, CA, USA

**PVP2012-78175: HISTORY AND CURRENT DEVELOPMENTS WITH RING TYPE METALLIC JOINTS**

R. Currie, Flexitallic, Cleckheaton, United Kingdom

**PVP2012-78228: BENEFITS OF ENRICHED BORIC ACID IN PWRS (Presentation Only)**

D. Wiedenmann, Ceradyne, Quapaw, OK, USA; F. Nordmann, Beauchamp, France

**PVP2012-78177: COMPARATIVE STUDY OF LEAK-TIGHTNESS PERFORMANCE OF WAFER TYPE AND LUG-WAFER TYPE VALVES DURING A FIRE**

A. Cheta, Shell Exploration and Production, Houston, TX, USA; G. Jung, Shell Global Solutions, Houston, TX, USA

**SESSION 4.2G (CT-10-1)**

*Thursday, July 19, 10:30 am – 12:15 pm, Mezzanine, Conference F*

**PROBABILISTIC ASSESSMENT OF COMPONENT/STRUCTURAL INTEGRITY**

Developed by: M. Wang, Candu Energy Inc., Mississauga, ON, Canada; X. Duan, Candu Energy Inc., Mississauga, ON, Canada

Chair: M. Wang, Candu Energy Inc., Mississauga, ON, Canada

Co-Chair: X. Yuan, Ryerson University, Toronto, ON, Canada

**PVP2012-78235: EXTREME VALUE DISTRIBUTION THEORY AND ITS APPLICATION IN DURABILITY ANALYSES**

Z. Wei, Tenneco, Grass Lake, MI, USA; P. Dong, University of New Orleans, New Orleans, LA, USA; R. Kurth, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; L. Gao, Tenneco, Grass Lake, MI, USA

**PVP2012-78327: RELIABILITY ANALYSIS FOR THE FEEDER SUBJECT TO WALL LOSS**

M. Wang, Candu Energy Inc., Mississauga, ON, Canada; X. Yuan, Ryerson University, Toronto, ON, Canada; X. Duan, M. Kozluk, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78756: PROBABILISTIC ESTIMATION OF FLOW-ACCELERATED CORROSION RATE AT THE WELDED JOINTS OF THE NUCLEAR PIPING SYSTEM**

D. Lu, M. D. Pandey, M. I. Jyrkama, University of Waterloo, Waterloo, ON, Canada

**PVP2012-78216: DERIVATION OF INPUT DISTRIBUTIONS FOR PROBABILISTIC EVALUATION USING IN-REACTOR MEASUREMENTS**

E. Nadeau, Candu Energy Inc., Mississauga, ON, Canada

**SESSION 4.2H (DA-9-2)**

*Thursday, July 19, 10:30 am – 12:15 pm, Mezzanine, Conference G*

**FITNESS FOR SERVICE—II**

Developed by: M. Zhao, UOP LLC, Des Plaines, IL, USA

Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA

Co-Chair: C. Rodery, BP plc, Webster, TX, USA

**PVP2012-78207; PLASTIC COLLAPSE ASSESSMENT PROCEDURE IN**

**P-M DIAGRAM METHOD FOR PIPE BENDS WITH A LOCAL THIN AREA UNDER COMBINED PRESSURE AND OUT-OF-PLANE BENDING MOMENT**

K. Oyamada, High Pressure Gas Safety Institute of Japan, Tokyo, Japan; S. Konosu, Ibaraki University, Hitachi, Japan; T. Ohno, High Pressure Gas Safety Institute of Japan, Tokyo, Japan

**PVP2012-78544: THE CORRECT MEASUREMENTS AND STRESS ANALYSIS OF CYLINDER/PIPE WITH OUT-OF-ROUNDNESS**

I. Orynyak, Institute for Problems of Strength, Kiev, Ukraine; I. Lokhman, Ukrtransgas, Kiev, Ukraine; A. Bohdan, Institute for Problems of Strength, Kiev, Ukraine

**PVP2012-78839: STEAM LINE INTEGRITY ANALYSES FOR LTO: ENHANCING CREDIBILITY WITH COMPREHENSIVE MEASUREMENT**

H. Rothenhöfer, AMTEC Services, Lauffen, Germany; A. Manke, EnBW Kernkraft GmbH, Neckarwestheim, Germany

**SESSION 4.2J (DA-12-4)**

*Thursday, July 19, 10:30 am – 12:15 pm, Mezzanine, Windsor West*

**PANEL SESSION: INTERNATIONAL PROGRESS IN BOLTED JOINT INTEGRITY—II**

Developed by: W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia; T. Seipp, Becht Engineering, Calgary, AB, Canada; W. Koves, Pi Engineering Software Inc., Hoffman Estates, IL, USA

Chair: P. Petrunich, Fluid Sealing Association, aef, AL, USA

Co-Chair: K. Kolb, Lamons, Inc.; Houston, TX, USA

*Panelists:*

W. Brown, Integrity Engineering Solutions, Dunsborough, Western Australia, Australia

T. Kobayashi, Numazu National College of Technology, Numazu, Japan

J. Veiga, Teadit Industria e Comercio Ltda, Rio de Janeiro, RJ, Brazil

**SESSION 4.2L (MF-9-1)**

*Thursday, July 19, 10:30 am – 12:15 pm, Mezzanine, Conference B*

**WALL THINNING CAUSED BY FLOW ACCELERATED CORROSION**

Developed by: K. Hasegawa, Japan Nuclear Energy Safety Organization, Tokyo, Japan

Chair: J.-W. Kim, Chosun University, Gwangju, Korea (Republic)

Co-Chair: N. Maeda, JNES, Tokyo, Japan

**PVP2012-78443: DEVELOPMENT OF A WALL THINNING RATE MODEL FOR LIQUID DROPLET IMPINGEMENT EROSION**

R. Morita, Y. Uchiyama, Central Research Institute of Electric Power Industry, Tokyo, Japan

**PVP2012-78503: APPLICATION OF IR THERMOGRAPHY TECHNIQUE FOR INSPECTION OF LOCAL WALL-THINNING DEFECT IN NUCLEAR PIPING COMPONENTS**

J.-W. Kim, K.-W. Yun, H. Jung, Chosun University, Gwangju, Korea (Republic)

**PVP2012-78832: MECHANISTIC STUDY OF FAC PROCESSES FOCUSED ON THE OXIDE LAYER PROPERTIES**

H. Abe, Y. Watanabe, Tohoku University, Sendai, Japan

**SESSION 4.2M (MF-13-1)**

*Thursday, July 19, 10:30 am – 12:15 pm, Mezzanine, Conference C*

**SMALL-SCALE AND MINIATURE MECHANICAL TESTING**

Developed by: B. Dogan, ETD Consultant, Charlotte, NC, USA  
Chair: B. Dogan, ETD Consultant, Charlotte, NC, USA  
Co-Chair: T. H. Hyde, The University of Nottingham, Nottingham,  
United Kingdom

**PVP2012-78463: A BASIS FOR SELECTING THE MOST APPROPRIATE SMALL SPECIMEN CREEP TEST TYPE**

T. Hyde, C. Hyde, Wei Sun, The University of Nottingham, Nottingham, United Kingdom

**PVP2012-78553: DETERMINATION OF ACTUAL TENSILE AND FRACTURE CHARACTERISTICS OF CRITICAL COMPONENTS OF INDUSTRIAL PLANTS UNDER LONG TERM OPERATION BY SPT**

K. Matocha, Material and Metallurgical Research, Ltd., Ostrava, Czech Republic

**PVP2012-78791: SEM IN SITU OBSERVATION ON INFLUENCE OF CHARACTERISTIC INCLUSION PARAMETERS ON CRACK INITIATION AND PROPAGATION IN X80 PIPELINE STEEL UNDER TENSILE LOAD**

K. Tong, H. Zhang, X. He, Q. Liu, J. Li, CNPC Tubular Goods Research Institute, Xi'an, Shanxi, China

**PVP2012-78691: INDUSTRIAL APPLICATION OF SMALL PUNCH TESTING FOR IN-SERVICE COMPONENT CONDITION ASSESSMENT: AN OVERVIEW**

B. Dogan, ETD Consultant, Charlotte, NC, USA; T. Hyde, The University of Nottingham, Nottingham, United Kingdom

**SESSION 4.2P (CS-12-2)**

*Thursday, July 19, 10:30 am – 12:15 pm, 2nd Floor, City Hall*

**ENGINEERING FAILURE ANALYSIS**

Developed by: X. Chen, Hefei General Machinery Research Institute, Hefei, Anhui, China; J. Shi, Zhejiang University, Hangzhou, Zhejiang Province, China

Chair: X. Chen, Hefei General Machinery Research Institute, Hefei, Anhui, China

Co-Chair: J. Shi, Zhejiang University, Hangzhou, Zhejiang Province, China

**PVP2012-78251: FRACTURE FAILURE ANALYSIS OF 304 STAINLESS STEEL BOLT IN CHEMICAL PLANT ONSHORE**

J. F. Wang, X. Tang, H. Yu, Y. Qian, Wu Ruqing, Shanghai Institute of Special Equipment Inspection & Technical Research, Shanghai, China

**PVP2012-78261; CRACKING FAILURE ANALYSIS OF ETHYLENE OXIDE EVAPORATOR**

C. Du, H. Wang, China Special Equipment Inspection & Research Institute, Beijing, China

**PVP2012-78259: ANALYSIS OF CRACKS IN THE 15MNBRS SPHERICAL TANKS**

W. Wang, X. Li, G. Li, China Special Equipment Inspection Research Institute, Beijing, China; Y. L. Zhang, Beijing University of Technology, Beijing, China; Z. Wang, No.6 Chemical Works of Sinopec Beijing YanShan Company, Beijing, China

**PVP2012-78274: EXPERIMENTAL AND NUMERICAL RESEARCH ON EXPLOSION OF QUICK ACTUATING PRESSURE VESSELS WHEN OPENING WITH RESIDUAL PRESSURE**

S. Han, Y. Liu, W. Li, C. He, S. Sheng, R. Gu, F. Wang, Hangzhou Special Equipment Inspection Institute, Hangzhou, China

**SESSION 4.2Q (DA-3-6)**

*Thursday, July 19, 10:30 am – 12:15 pm, 2nd Floor, Civic Ballroom North*

**EVALUATION OF FRACTURE TOUGHNESS**

Developed by: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

Chair: P. Gilles, AREVA NP SAS, Paris La Défense, France

Co-Chair: Y. J. Kim, Korea University, Seoul, Korea (Republic)

**PVP2012-78110: DEVELOPMENT OF TESTS ON SENT SPECIMENS TO STUDY GEOMETRY EFFECTS IN THE BRITTLE TO DUCTILE TRANSITION**

P. Le Delliou, EDF R&D, Moret-sur-Loing, France; Joumana El-Gharib, EDF R&D, Clamart, France

**PVP2012-78213: ASSESSMENT OF DUCTILE CAST IRON FRACTURE MECHANICS ANALYSIS WITHIN LICENSING OF GERMAN TRANSPORT PACKAGES**

S. Komann, Y. Kiyak, F. Wille, U. Zerst, M. Weber, D. Klingbeil, BAM Federal Institute for Materials Research and Testing, Berlin, Berlin, Germany

**PVP2012-78529: A NUMERICAL STUDY ON CMOD COMPLIANCE FOR SINGLE-EDGED BENDING SPECIMENS**

E. Wang, Western University, London, ON, Canada; G. Shen, MTL/CAN-MET, Hamilton, ON, Canada; W. Zhou, Western University, London, ON, Canada; D. Duan, TransCanada Pipelines Limited, Calgary, AB, Canada

**PVP2012-78770: PREDICTION OF INITIATION TOUGHNESS UNDER SMALL SCALE YIELDING (SSY) AND  $J_{0.2BL}$  VS. Q FRACTURE LOCUS**

**USING LOCAL APPROACH METHODOLOGIES IN 304SS**

A. Wasyluk, University of Manchester, Manchester, United Kingdom; J. Sharples, Serco Technical Consulting Services, Warrington, Cheshire, United Kingdom; A. Sherry, Dalton Nuclear Research Institute, Manchester, United Kingdom

**SESSION 4.2R (MF-2-6)**

*Thursday, July 19, 10:30 am – 12:15 pm, Mezzanine, Essex Ballroom*

**THE DAVID LIDBURY MEMORIAL SYMPOSIUM ON FRACTURE, FATIGUE, AND FAILURE ASSESSMENT—VI**

Developed by: A. E. Méndez-Torres, Savannah River National Laboratory, Aiken, SC, USA

Chair: P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA

Co-Chair: L. An, University of Central Florida, Orlando, FL, USA; P.-S. Lam, Savannah River National Laboratory, Aiken, SC, USA

**PVP2012-78851: POLYMER-DERIVED CERAMIC BASED TEMPERATURE SENSOR FOR EXTREME ENVIRONMENTS (Presentation Only)**

C. X. Xu, L. An, University of Central Florida, Orlando, FL, USA

**PVP2012-78859: THE PARADIGM SHIFT IN RESEARCH ALGORITHMS USING HIGH PERFORMANCE COMPUTING (Presentation Only)**

L. M. Vicente, Polytechnic University of Puerto Rico, San Juan, PR, USA

**PVP2012-78757: FAILURE MODE OF LASER WELDS IN LAP-SHEAR SPECIMENS OF STEEL SHEETS WITH DIFFERENT THICKNESSES (Presentation Only)**

K. Asim, J. Lee, J. Pan, University of Michigan, Ann Arbor, MI, USA

**PVP2012-78848: STRUCTURAL HEALTH MONITORING WITH PIEZOELECTRIC WAFER ACTIVE SENSORS EXPOSED TO IRRADIATION EFFECTS**

B. Lin, University of South Carolina, Columbia, SC, USA; A. E. Méndez-Torres, Savannah River National Laboratory, Aiken, SC, USA; M. Gresil, V. Giurgiutiu, University of South Carolina, Columbia, SC, USA

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**Block 4.3: Thursday, July 19 (2:00 pm – 3:45 pm)**

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**SESSION 4.3D (CS-23-1)**

*Thursday, July 19, 2:00 pm – 3:45, 2nd Floor, Kenora*

**SECTION III CODES AND STANDARDS ACTIVITIES FOR ELEVATED TEMPERATURE SERVICE**

Developed by: T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA; R. Barnes

Chair: T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA

Co-Chair: R. I. Jetter, Consultant, Pebble Beach, CA, USA

**PVP2012-78062: SECTION III, DIVISION 5—DEVELOPMENT AND FUTURE DIRECTIONS**

D. K. Morton, Idaho National Laboratory, Idaho Falls, ID, USA; R. I. Jetter, Consultant, Pebble Beach, CA, USA; J. E. Nestell, MPR Associates, Alexandria, VA, USA; Tim Burchell, T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**PVP2012-78081: ELEVATED TEMPERATURE PRIMARY LOAD DESIGN METHOD USING PSEUDO ELASTIC-PERFECTLY PLASTIC MODEL**

P. Carter, Stress Engineering Services Inc., Mason, OH, USA; T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA; R. I. Jetter, Consultant, Pebble Beach, CA, USA

**PVP2012-78082: APPLICATION OF ELASTIC PERFECTLY PLASTIC CYCLIC ANALYSIS TO ASSESSMENT OF CREEP STRAIN**

P. Carter, Stress Engineering Services Inc., Mason, OH, USA; R. I. Jetter, Consultant, Pebble Beach, CA, USA; T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**PVP2012-78083: APPLICATION OF SHAKEDOWN ANALYSIS TO EVALUATION OF CREEP-FATIGUE LIMITS**

P. Carter, Stress Engineering Services Inc., Mason, OH, USA; R. I. Jetter, Consultant, Pebble Beach, CA, USA; T.-L. Sham, Oak Ridge National Laboratory, Oak Ridge, TN, USA

**SESSION 4.3E (OAC-8-1)**

*Thursday, July 19, 2:00 pm – 3:45, 2nd Floor, Huron*

**AGING MANAGEMENT AND LICENSE RENEWAL—I**

Developed by: G. Bezdikian, Georges Bezdikian Consulting Co., Le Vesinet, France; G. G. Young, Entergy Nuclear, Jackson, MS, USA

Chair: G. Bezdikian, Georges Bezdikian Consulting Co., Le Vesinet

Co-Chair: G. G. Young, Entergy Nuclear, Jackson, MS, USA

**PVP2012-78218: FRENCH REACTOR VESSEL INTEGRITY**

H. Churier, EDF-SEPTEN, Villeurbanne, France

**PVP2012-78604: NUCLEAR PLANT LICENSE RENEWAL STATUS IN THE U.S.**

G. G. Young, Entergy Nuclear, Jackson, MS, USA

**PVP2012-78852: EXPERIENCES GAINED DURING THE DEVELOPMENT OF THE LICENSE RENEWAL APPLICATION FOR UNIT 1 OF PAKS NPP**

S. Ratkai, T. Katona, Nuclear Power Plant Paks, Paks, Tolna, Hungary;

**PVP2012-78854: COMPARISON OF PLANT LIFE MANAGEMENT APPROACHES FOR LONG TERM OPERATION**

F. Nuzzo, K.-S. Kang, IAEA, Vienna, Austria

**SESSION 4.3H (DA-9-30)**

*Thursday, July 19, 2:00 pm – 3:45, Mezzanine, Conference G*

**FITNESS FOR SERVICE—III**

Developed by: T. Seipp, Becht Engineering, Calgary, AB, Canada

Chair: C. Rodery, BP plc, Webster, TX, USA

Co-Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA

**PVP2012-78131: MECHANICAL BEHAVIOR OF STEEL PIPES WITH LOCAL WALL DISTORTIONS UNDER CYCLIC LOADING**

A.-E. Pournara, S. A. Karamanos, University of Thessaly, Volos, Greece

**PVP2012-78135; MULTILAYER UREA REACTOR SAFETY EVALUATION BASED ON ACOUSTIC EMISSION EXAMINATION**

S. Mingda, Shandong Special Equipment Inspection Institute, Jinan, Shandong, China; W. Weiqiang, Shandong University, Jinan, Shandong, China; H. Cao, Shandong Special Equipment Inspection Institute/China University of Petroleum, Jinan, China; . Lixin, Z. Bo, Shandong Special Equipment Inspection Institute, Jinan, Shandong, China

**PVP2012-78250: FAILURE ANALYSIS OF BURNER MUFFLE IN SHELL GASIFIER**

W. Liu, J. Shi, Chinese Special Equipment Inspection and Research Institute, Beijing, China; Q. Chen, Hubei Corporation, Sinopec, Zhijiang, China; G. Xie, Y. Zhou, Chinese Special Equipment Inspection and Research Institute, Beijing, China

**SESSION 4.3L (MF-16-1)**

*Thursday, July 19, 2:00 pm – 3:45, Mezzanine, Conference B*

**PLASTIC PIPE**

**Sponsored by the Materials & Fabrication and Codes & Standards Technical Committees**

Developed by: D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA; S. Kalyanam, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Chair: D.-J. Shim, Engineering Mechanics Corporation of Columbus, Columbus, OH, USA

Co-Chair: S. Xu, Kinectrics, Toronto, ON, Canada

**PVP2012-78775; BENDING FATIGUE TESTING OF PIPE AND PIPING COMPONENTS FABRICATED FROM HIGH DENSITY POLYETHYLENE MATERIALS....AN UPDATE**

T. Adams, JD Stevenson and Associates, Independence, OH, USA; D. Munson, EPRI, Palo Alto, CA, USA; S. Hall, JD Stevenson and Associates, Independence, OH, USA; J. Andrasik, Smithers Scientific Laboratories, Akron, Afghanistan

**PVP2012-78271: A STUDY ON RESIDUAL STRESS EVALUATION OF HPDE PIPING (Presentation Only)**

J. S. Kim, Suncheon National University, Suncheon, Jeonnam, Korea (Republic); S. G. Lee, H. B. Park, KEPCO E&C, Sung Nam, Kyunggi, Korea (Republic)

**PVP2012-78671: INVESTIGATION ON THE ALLOWABLE TEMPERATURE DURING ELECTROFUSION WELDING OF POLYETHYLENE PIPE**

S. Zhong, J. Shi, Zhejiang University, Hangzhou, Zhejiang, China; W. Guo, Zhejiang Province Special Equipment Inspection and Research Institute, Hangzhou, Zhejiang, China; J. Zheng, Zhejiang University, Hangzhou, Zhejiang, China

**SESSION 4.3P (CS-12-3)**

*Thursday, July 19, 2:00 pm – 3:45, 2nd Floor, City Hall*

**EXTREME PRESSURE EQUIPMENT**

Developed by: J. Zheng, Zhejiang University, Hangzhou, Zhejiang, China; P. Gu, MSC Software Corporation, San Diego, CA, USA

Chair: J. Zheng, Zhejiang University, Hangzhou, Zhejiang, China

Co-Chair: P. Gu, MSC Software Corporation, San Diego, CA, USA

**PVP2012-78269: MATERIALS SAFETY FOR HYDROGEN GAS EMBRITTLMENT OF METALS IN HIGH-PRESSURE HYDROGEN STORAGE FOR FUEL CELL VEHICLES**

L. Zhang, Zhejiang University of Technology, Hangzhou, Zhejiang, China; M. Wen, Shanghai Jiaotong University, Shanghai, Shanghai, China; Z. Li, J. Zheng, X. Liu, Y. Zhao, C. Zhou, Zhejiang University, Hangzhou, Zhejiang, China

**PVP2012-78300: RESEARCH ON SYSTEMIC RISK OF PRESSURE SPECIAL EQUIPMENT**

J. Yang, J. Zheng, X. Li, W. Luo, Guangdong Institute of Special Equipment Inspection, Guangzhou, Guangdong, China

**PVP2012-78418: STATIONARY FLAT STEEL RIBBON WOUND VESSELS FOR STORAGE OF HIGH PRESSURE HYDROGEN**

J. Zheng, X. Liu, P. Xu, P. Liu, Zhejiang University, Hangzhou, Zhejiang, China; C. Wei, X. Ye, Juhua Group Corp. Engineering Co., Ltd., Quzhou, Zhejiang, China

**PVP2012-78650: THE STUDY OF EVALUATION ABOUT SAFETY PERFORMANCE OF TRANSPORTABLE PRESSURE VESSEL**

K. An, H. Geng, Hebei Supervision and Inspection Institute of Boiler and Pressure Vessel, Shijiazhuang, China; H. Dong, China Special Equipment Inspection and Research Institute, Beijing, China; Q. Zhang, X. Liu, Hebei Supervision and Inspection Institute of Boiler and Pressure Vessel, Shijiazhuang, China

**SESSION 4.3Q (DA-3-7)**

*Thursday, July 19, 2:00 pm – 3:45, 2nd Floor, Civic Ballroom North*

**CASE STUDIES**

Developed by: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

Chair: M. Zhao, UOP LLC, Des Plaines, IL, USA

Co-Chair: Y. Takahashi, Central Research Institute of Electric Power Industry, Yokosuka, Kanagawa, Japan

**PVP2012-78012: BAUSCHINGER EFFECT ON THE SIFS OF A SEMI-ELLIPTICAL CRACK EMANATING FROM AN EROSION AT THE BORE**

**OF A FULLY AUTOFRETTAGED PRESSURIZED CYLINDER**

Q. Ma, Walla Walla University, College Place, WA, USA; C. Levy, Florida International University, Miami, FL, USA; M. Perl, Ben Gurion University of the Negev, Beer Sheva, Beer Sheva, Israel

**PVP2012-78157: FAILURE LOAD ASSESSMENT OF AXIALLY CRACKED TUBE CONSIDERING SUPPORT-INDUCED RESTRAINT EFFECT**

H. S. Kim, C. K. Oh, H. K. Youm, T. E. Jin, KEPCO Engineering & Construction Co., Seongnam, Gyeonggi, Korea (Republic); H. D. Kim, H. S. Chung, Korea Hydro & Nuclear Power Co., Daejeon, Korea (Republic)

**PVP2012-78100: MODIFICATIONS TO THE STRESS VALUE COMPUTATION FOR FATIGUE ANALYSIS OF SHELL TO BOTTOM JOINT OF STEEL TANKS ON CONCRETE RING WALL FOUNDATIONS**

S. Sathyanarayanan, S. M. R. Adluri, Memorial University of Newfoundland, St. John's, NF, Canada

**PVP2012-78532: UNIQUE FRACTURE BEHAVIOUR OF MULTI-PERFORATED MEDIA**

F. Billon, F. Taborda, J.-O. Lesage, ONET Technologies, Marseille, France

**SESSION 4.3R (MF-25-1)**

*Thursday, July 19, 2:00 pm – 3:45, Mezzanine, Essex Ballroom*

**COMPOSITE PRESSURE VESSELS**

Developed by: H. Faria, INEGI, Porto, Portugal; S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

Chair: H. Faria, INEGI, Porto, Portugal

Co-Chair: S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

**PVP2012-78145: APPLICABILITY OF OPTICAL FIBRE BRAGG GRATING SENSORS IN THE STRUCTURAL HEALTH MONITORING OF COMPOSITE OVERWRAPPED PRESSURE VESSELS**

G. Pereira, J. Figueiredo, H. Faria, INEGI, Porto, Portugal; A. T. Marques, University of Porto, Porto, Portugal

**PVP2012-78366: STRESS OPTIMIZATION OF A PIEZOELECTRIC-CONTROLLED COMPOSITE CURVED BEAM**

V. Vo, A. Maha, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

**PVP2012-78382: SHAPE RECOVERY MODEL OF A CURVED BEAM USING PIEZOELECTRIC ACTUATION**

A. Maha, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

**PVP2012-78547: NOVEL IMPACT/DEBONDING TOLERANT SANDWICH PANEL WITH MILLITUBES GRID STIFFENED FOAM CORE**

G. Li, G. Ji, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

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**Block 4.4: Thursday, July 19 (4:00 pm – 5:45 pm)**

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**SESSION 4.4D (CS-17-1)**

*Thursday, July 19, 4:00 pm – 5:45 pm, 2nd Floor, Kenora*

**REPAIR, REPLACEMENT AND MITIGATION FOR FITNESS-FOR-SERVICE RULES**

Developed by: R. Yonekawa, Bechtel Power Corporation, San Francisco, CA, USA; K. Dozaki, The Japan Atomic Power Company, Tokyo, Japan

Chair: B. Bezensek, Hunting Energy Services UK, Aberdeen, United Kingdom

Co-Chair: S. Xu, Kinectrics, Toronto, ON, Canada

**PVP2012-78467: UNDERWATER REMOTE MICROSCOPIC OBSERVATION TECHNIQUE FOR 3D CURVED SURFACE OF LWR STRUCTURES**

S. Aoike, Hitachi, Ltd. Hitachi Research Laboratory, Hitachi-chi Ibaraki-ken, Japan; K. Kurosawa, S. Ohmori, M. Tanaka, Hitachi-GE Nuclear Energy, Ltd., Hitachi-shi Ibaraki-ken, Japan

**PVP2012-78468: RELIABILITY OF WATER JET PEENING FOR ALLOY 600 PWSCC MITIGATION**

O. Koji, Mitsubishi Heavy Industries, Ltd., Kobe, Japan; S. Noriaki, S. Harutaka, Mitsubishi Heavy Industries, Ltd., Kobe, Japan

**PVP2012-78824: APPLICATION OF WATER JET PEENING ON PRE-CRACKED NICKEL BASED ALLOY AND STAINLESS STEEL**

R. Morinaka, Hitachi-GE Nuclear Energy, Ltd., Hitachi-shi, Ibaraki-ken, Japan; K. Hasegawa, Japan Atomic Power Company, Tokai-mura, Nakagun, Ibaraki-ken, Japan; N. Saito, Hitachi, Ltd., Hitachi-shi, Ibaraki-ken, Japan; F. Yoshikubo, A. Kanno, Hitachi-GE Nuclear Energy, Ltd., Hitachi-shi, Ibaraki-ken, Japan

**SESSION 4.4E (OAC-8-2)**

*Thursday, July 19, 4:00 pm – 5:45 pm, 2nd Floor, Huron*

**AGING MANAGEMENT AND LICENSE RENEWAL II**

Developed by: G. G. Young, Entergy Nuclear, Jackson, MS, USA; G. Bezdikian, Georges Bezdikian Consulting Co., Le Vesinet, France

Chair: G. G. Young, Entergy Nuclear, Jackson, MS, USA

Co-Chair: G. Bezdikian, Georges Bezdikian Consulting Co., Le Vesinet, France

**PVP2012-78289: BENCHMARK CAMPAIGN ON THE UNCERTAINTY TREATMENT ANALYSIS TOOLS DEVELOPED FOR FRENCH NUCLEAR REACTOR PRESSURE VESSELS INTEGRITY ASSESSMENT**

J.-P. Fontes, EDF R&D, Clamart, France; E. Dautrême, E. Remy, EDF R&D, Chatou, France; R. Beaufils, E. Meister, EDF-DPI/SEPTEN, Villeurbanne, France; T. Demol, J.-P. Izard, T. Pernot, AREVA NP, Paris La Défense, France; G. Defaux, CEA/DAM, Bruyères-le-Chatel, France; T. Yalamas, Phimeca, Courmon d'Auvergne, France

**PVP2012-78502: CHARACTERIZING AUSTENITIC MATERIALS AND NICKEL ALLOYS WITH ELECTRO-MAGNETIC IMAGING**

Z. Kuljis, Westinghouse Electric Co., Windsor, CT, USA; B. Lisowyj, Omaha Public Power District, Blair, NE, USA

**PVP2012-78507: RESIDUAL STRESS DISTRIBUTION AND GUIDELINES FOR CRACK INSPECTION IN PIPE BENDS**

M. Yetisir, Atomic Energy of Canada Limited, Chalk River, ON, Canada; Z. Walker, Candu Energy Inc., Mississauga, ON, Canada

**PVP2012-78244: FAILURE PROBABILITY ASSESSMENT FOR BOILING WATER REACTOR PRESSURE VESSELS UNDER LOW TEMPERATURE OVER-PRESSURE EVENT**

H.-W. Chou, Institute of Nuclear Energy Research, Taoyuan County, Taiwan; C.-C. Huang, B.-Y. Chen, H.-C. Lin, R.-F. Liu, Institute of Nuclear Energy Research, Taoyuan County, Taiwan

**SESSION 4.4L (MF-11-1)**

*Thursday, July 19, 4:00 pm – 5:45 pm, Mezzanine, Conference B*

**INTEGRITY ISSUES IN SCC AND CORROSION FATIGUE**

Developed by: M. Mochizuki, Osaka University, Suita, Osaka, Japan

Chair: H. Mori, Osaka University, Suita, Osaka, Japan

Co-Chair: J. Katsuyama, Japan Atomic Energy Agency, Tokai-mura, Ibaraki-ken, Japan

**PVP2012-78043: ELECTROCHEMICAL PROPERTIES OF 304 STAINLESS STEEL UNDER PROPORTIONAL AND NON-PROPORTIONAL MULTIAXIAL CORROSION FATIGUE**

Y. Huang, F.-Z. Xuan, East China University of Science and Technology, Shanghai, China; T. Itoh, University of Fukui, Fukui, Japan; S.-T. Tu, East China University of Science and Technology, Shanghai, China

**PVP2012-78471: ESTIMATION OF SCC CRACK GROWTH BEHAVIOR UNDER WELD RESIDUAL STRESS IN THE BOTTOM OF A REACTOR PRESSURE VESSEL BY FINITE ELEMENT ANALYSIS**

F. Iwamatsu, K. Miyazaki, Hitachi, Ltd., Hitachi-shi, Ibaraki, Japan; Masahito Mochizuki, Osaka University, Suita, Osaka, Japan

**SESSION 4.4P (CS-12-4)**

*Thursday, July 19, 4:00 pm – 5:45 pm, 2nd Floor, City Hall*

**STRUCTURAL INTEGRITY**

Developed by: Z. Chen, Zhejiang University, Hangzhou, China

Chair: Z. Chen, Zhejiang University, Hangzhou, China

Co-Chair: J. Shi, Zhejiang University, Hangzhou, Zhejiang Province, China

**PVP2012-78138: ELASTIC-PLASTIC STRESS ANALYSIS OF PRESSURE VESSELS**

Y. Deng, Hubei Special Equipment Safety Inspection and Research Institute, Wuhan, Hubei, China; G. Chen, Standardization Administration of the People's Republic of China, Beijing, China

**PVP2012-78210: RESEARCH ON STRUCTURE SECURITY OF A SPHERICAL TANK UNDER WIND AND SEISMIC EFFECT**

X. Li, Z. Chen, W. Wang, W. Jing, S. Shao, Chinese Special Equipment Inspection and Research Institute, Beijing, China

**PVP2012-78276: RESEARCH ON DEFORMATION-INDUCED MARTENSITE OF THE AUSTENITE STAINLESS STEEL BELLOWS BASED ON MAGNETISM TESTING METHOD**

S. Sheng, S. Han, H. Chen, H. Wu, F. Wang, Y. Liu, Hangzhou Special Equipment Inspection Institute, Hangzhou, China

**PVP2012-78636: DESIGN OF A NEW BEARING ON THE LARGE NET SHELL ROOF TANK**

Z. Chen, H. Gao, W. Guo, F. Chen, J. Wang, W. Hong, Zhejiang University, Hangzhou, China

**SESSION 4.4R (MF-25-2)**

*Thursday, July 19, 4:00 pm – 5:45 pm, Mezzanine, Essex Ballroom*

**COMPOSITE PIPING SYSTEMS**

Developed by: G. Ji, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA; H. Faria, INEGI, Porto, Portugal

Chair: G. Ji, Louisiana State University, Baton Rouge, LA, USA

Co-Chair: H. Faria, INEGI, Porto, Portugal

**PVP2012-78609: EFFECTS OF PROGRAMMING TEMPERATURE ON THE EFFICIENCY OF SELF-HEALING POLYMERS**

Y. Yougoubare, I. Okoro, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

**PVP2012-78610: EFFECTS OF SHAPE GEOMETRY ON THE EFFICIENCY OF SELF-HEALING POLYMERS**

I. Okoro, Y. Yougoubare, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA

**PVP2012-78682; DEPENDENCES OF BONDING STRENGTH OF CERAMIC TO METAL JOINT ON INTERFACE WEDGE ANGLE IN METAL SIDE**

M. Tateno, E. Yokoi, Kogakuin University, Hachioji, Tokyo, Japan

**PVP2012-78759: MULTIFUNCTIONAL MWCNT REINFORCED SELF-HEALING SYSTEM**

G. Ji, G. Li, S.-S. Pang, Louisiana State University, Baton Rouge, LA, USA



## CHAIR/CO-CHAIR, DEVELOPERS, PLENARY SPEAKERS, TUTORIAL SPEAKERS

NAME	TITLE	SESSION	NAME	TITLE	SESSION
Adibi-Asl, R.	Co-Ch, Dev	1.1B, 1.3K, 1.1G, 3.1G	Edel, M.	Ch, Dev	3.2B, 4.2B
Aggarwal, M.	Ch, Dev	2.2K	Elliott, W. M.	Ps	1.2A
Alkelani, A.	Co-Ch, Dev	2.1G	Ezekoye, I.	Co-Ch, Dev	1.4E, 3.2E
An, L.	Co-Ch	4.2R	Fanous, I.	Ch, Co-Ch, Dev	1.1H, 1.1I, 1.3I, 1.4I, 2.2I
Andrews, C.	Co-Ch	2.4P	Faria, H.	Ch, Co-Ch, Dev	4.3R, 4.4R
Antaal, B. S.	Co-Ch, Dev	1.1D, 1.3D	Feldman, M.	Co-Ch	2.1E
Arastu, A.	Dev	1.3F, 1.4F	Fontes, J.-P.	Co-Ch	1.3E
Asayama, T.	Co-Ch	4.2D	Fujita, K.	Ch, Dev	4.1C
Au-Yang, M. K.	Co-Ch, Dev	1.1F	Fujita, S.	Dev	1.1C, 2.4C
Bajwa, C.	Co-Ch	2.4E	Furuya, O.	Ch, Co-Ch, Dev	1.1C, 1.4C, 2.4C, 3.1C
Baliga, R.	Ch, Dev	3.1H, 3.2H	Garcia, I.	Dev	2.3K
Barnes, R.	Dev	4.3D	Giannopapa, C.	Ch	4.1F
Basavaraju, C.	Ch, Dev	2.1H, 2.2H, 2.3H, 2.4H	Gilles, P.	Ch, Co-Ch, Dev	1.3R, 1.4L, 2.2C, 3.1Q, 3.2L, 4.1Q, 4.2Q
Becht IV, C.	Ts	2.1S, 2.2S	Goldak, J.	Ch	3.1L
Bees, W.	Ts	0.2S	Greiner, M.	Ch	2.1E
Benaouicha, M.	Dev	4.1F	Griesbach, T.	Co-Ch, Dev	3.2D
Bezdikian, G.	Co-Ch, Ch, Dev	1.3E, 4.3E, 4.4E	Gross, D.	Ch, Co-Ch, Dev	2.4B, 3.1B
Bezensek, B.	Co-Ch, Ch, Dev	1.1P, 2.2D, 3.1K, 4.1K, 4.4D	Gu, P.	Co-Ch	4.3P
Bouزيد, H.	Ch, Dev	1.3G	Guenther, K.	Dev	2.4G
Brochard, D.	Co-Ch	4.1F	Gupta, N.	Co-Ch, Dev	1.1E, 2.1E, 2.2E, 2.3E, 2.4E, 3.1E
Brongers, M.	Ch, Dev	2.3K	Hall, J. W.	Dev	4.1F
Brown, W.	Dev	2.1Q, 2.2Q, 4.1J, 4.2J	Hamilton, S.	Co-Ch	2.2Q
Brumovsky, M.	Ch, Co-Ch, Dev	1.4E, 3.2E	Han, Z.	Dev	2.1E
Brust, B.	Dev	1.1L, 1.3L, 2.4L, 3.1L	Harris, S.	Dev	1.1E
Burdett, B.	Co-Ch	4.1M	Hasegawa, K.	Dev	4.2L
Carte, M.	Ch, Co-Ch, Dev	3.2F, 4.1B	Hill, M. R.	Co-Ch	3.1L
Chakraborty, A.	Dev	3.1K, 4.1K	Hirst, T.	Ts	1.3S, 1.4S
Chan, J.	Ch	3.2E	Hoang, P.	Ch, Dev	1.4P, 3.1P, 3.2P
Chen, H.	Ch	1.1B	Hojo, K.	Ch, Dev	3.2D
Chen, M.	Co-Ch	1.3H	Horn, A.	Ch, Dev	3.1M, 3.2M
Chen, X.	Ch, Dev	4.2P	Hosseinzadeh, F.	Ch, Dev	1.3R, 2.1R
Chen, Z.	Ch, Dev	4.4P	Huang, C.-C.	Ch	1.1E
Cheta, A.	Co-Ch	4.2E	Hyde, T. H.	Co-Ch	4.2M
Choi, W.	Co-Ch	3.1E	Inaba, K.	Ch, Co-Ch, Dev	2.1F, 2.2F, 2.3F
Cipolla, R.	Co-Ch, Dev	1.4D, 2.3D, 2.4D	Ito, T.	Co-Ch, Dev	1.3C, 3.2C
Clark, T.	Ch, Co-Ch, Dev	1.3C, 2.3C, 3.1C	Itoh, S.	Ch, Dev	2.3F, 2.4F
Cohn, M.	Ch, Co-Ch, Dev	1.1M, 1.3M, 1.4M	Iwamatsu, F.	Co-Ch	1.1P
Cory Jr., J. F.	Dev	2.1T, 2.2T, 2.3T, 2.4T	Iyama, H.	Dev	2.1F, 2.2F, 2.3F, 2.4F
Crane, R.	Ch, Co-Ch, Dev	2.3D, 2.4D	Iyer, S.	Ch, Co-Ch, Dev	1.1H, 2.3I, 2.4I, 3.2I
Davies, C. M.	Co-Ch	2.3M	James, P.	Co-Ch, Dev	1.1R, 1.4R, 2.2R, 3.1M, 3.2M
Dedhia, D.	Ch	3.1K	Jamieson, T.	Ps	1.2A
Demoss, D.	Ch	2.2E	Jaske, C.	Ch, Co-Ch, Dev	1.1M, 1.1T, 1.2T, 1.3M, 1.3T, 1.4M, 1.4T
Dennis, R.	Co-Ch	2.1M, 2.2M	Jetter, R. I.	Co-Ch	4.3D
Deweese, D.	Co-Ch	1.4P, 3.2G	Ji, G.	Ch, Dev	4.4R
Dixon, R.	Co-Ch, Dev	1.4B, 2.1B	Jia, G.	Ch, Dev	4.1P
Dogan, B.	Ch, Co-Ch, Dev	2.1J, 2.1M, 2.2J, 2.2M, 2.3M, 2.4M, 4.1D, 4.2D, 4.2M	Jo, J. C.	Ch, Dev	1.3F, 1.4F, 2.1K, 4.1F
Dozaki, K.	Dev	4.4D	Jones, S.	Dev	3.1F
Duan, X.	Dev	4.1G, 4.2G	Kalyanam, S.	Dev	3.1D, 4.3L
Duncan, A.	Co-Ch, Dev	4.1L, 4.1M, 2.3K	Kang, K.-S.	Ch	1.3E
Dweib, A.	Co-Ch, Dev	2.1H, 2.2H, 2.3H, 2.4H, 3.2H			

## CHAIR/CO-CHAIR, DEVELOPERS, PLENARY SPEAKERS, TUTORIAL SPEAKERS

NAME	TITLE	SESSION	NAME	TITLE	SESSION
Karamanos, S. A.	Ch, Dev	1.1C, 2.3C, 3.2C, 4.1C	Nicak, T.	Ch, Co-Ch, Dev	1.1R, 1.4R, 2.2R
Kasahara, N.	Ch	3.2P	Nitzel, M.	Dev.	1.2A
Katsuyama, J.	Co-Ch	4.4L	Okada, H.	Co-Ch	1.3P
Keim, E.	Ch, Co-Ch, Dev	1.1R, 1.4L, 1.4R, 2.2R, 3.1L, 3.2L	Olson, M.	Co-Ch	2.1R
Keltjens, J.	Ch, Dev	2.1B	Onizawa, K.	Ch, Dev	1.3P, 1.4P, 3.1P
Keltjens, J.	Co-Ch, Dev	1.1J, 1.3R	Oyamada, K.	Co-Ch	4.1H
Kerr, M.	Dev	2.1R	Pang, S.-S.	Co-Ch, Dev	4.3R, 4.4R
Kim, J.-W.	Ch	4.2L	Park, Y. H.	Ch, Dev	3.2G
Kim, Y. J.	Ch, Co-Ch, Dev	1.4Q, 2.3R, 4.2Q	Payne, J.	Dev	2.2G
Kobayashi, N.	Co-Ch, Dev	1.3B	Petrunch, P.	Ch	4.1J, 4.2J
Kobayashi, T.	Ch, Dev	2.1G	Polasik, S.	Co-Ch	2.4K
Kolb, K.	Co-Ch	4.1J, 4.2J	Porter, M.	Dev, Ts	1.3S, 1.4S, 3.1H, 3.2H
Koves, W.	Ch, Co-Ch, Dev	2.1Q, 2.2Q, 3.2I, 4.1J, 4.2J	Qian, Q.	Co-Ch	3.2P
Krishnamurthy, S.	Dev	2.3Q, 4.1I	Rana, M.	Ch, Dev	2.1D
Kurth, E.	Ch, Co-Ch	1.1L, 1.3L, 2.4L	Rawson, L.	Co-Ch	2.3P
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Goldak, J.	2.3L, 2.4L	Han, Z.	2.3E	Hosseinzadeh, F.	1.3L
Goldthorpe, M.	3.1R	Haq, I.	2.4H	Hou, Q.	1.3F
Gommez, F.	1.3R	Hari, Y.	1.3D	Housari, B.	1.3G
Gong, J.-M.	2.4I	Harrington, C.	4.1K	Houston, E.	2.1P
Gonzalez, F.	2.2E	Harris, A. P.	2.3K	Hu, B.	3.1B, 3.2B
Goodfellow, A.	2.2R	Harris, D.	3.2D	Hu, Y.	2.2K
Gordon, A. P.	2.3Q	Harris, J.	2.3I	Huang, C.-C.	4.4E
Gordon, M.	3.1E	Harris, S.	1.3M	Huang, Y.	4.4L
Goszczynski, G.	2.2P	Harrold, J.	2.3C, 3.1C	Huang, Y.-N.	3.1C
Gotou, A.	4.1C	Harutaka, S.	4.4D	Hubert, L.	1.4G, 2.1G, 4.1J
Gradle, R.	3.2E	Hasegawa, Kunio	1.1P, 1.3P, 2.2L, 2.4D, 3.1P, 3.1Q, 3.2P	Huera-Huarte, F. J.	2.1F
Gray, J. H.	2.2H	Hasegawa, Kunih.	4.4D	Huin, N.	1.4D
Green, V.	4.2J	Hashemi, M.	1.3H	Humphrey, J.	3.2H
Greiner, M.	2.2E	Hashimoto, M.	2.2M	Hunt, D.	1.1B
Gresil, M.	4.2R	Hassan, T.	1.4K, 2.1J	Hur, S. H.	1.4F
Gresnigt, A. M.	1.4C	Hassig, P.	3.1F	Hurlston, R.	3.1L
Grewal, I.	2.4E	Hatta, M.	1.3C	Hurrell, P.	2.3P, 3.2L
Gribble, D. J.	1.3H	Hayashi, S.	2.2J	Hyde, C.	2.4M, 4.2M
Griesbach, T.	3.2D	He, C.	4.2P	Hyde, T.	2.2M, 2.4M, 4.2M
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Grine, L.	2.1G	Hegde, S.	4.1G	Ikeda, S.	1.3K
Grisolia, O.	1.3D			Ikushima, K.	1.4P

Inaba, K.	3.1H	Jyrkama, M. I.	4.2G	Kim, W.-G.	2.3Q
Indermohan, H.	1.1B	Kai, S.	1.4C	Kim, Y. J.	2.2C, 2.3Q, 2.3R, 3.1Q, 4.2D
Ise, T.	2.1C	Kaida, T.	4.1E	Kimura, A.	4.1R
Ishida, K.	4.1F	Kalyanam, S.	3.1Q	Kimura, K.	2.1M
Ishihana, K.	2.4C	Kamada, T.	1.1C	Kinoshita, K.	1.3J
Ishimaru, H.	1.3P	Kamaya, M.	3.2D	Kirk, M.	2.3D, 2.3I
Ishimura, M.	2.3G	Kamichetty, K.	2.2E	Kishimoto, K.	3.1H
Itatani, M.	1.1D, 1.3P	Kamiyama, Y.	3.2D	Kitajima, Yu.	1.3B
Ito, T.	1.3C	Kanamaru, S.	1.4F	Kitajima, Ya.	2.3H
Ito, Y.	1.3K	Kanasaki, H.	2.4M	Kitano, H.	2.2C
Itoh, H.	1.3P, 2.4D	Kaneko, N.	1.4C	Kiyak, Y.	4.2Q
Itoh, Shig.	2.3F, 2.4F	Kaneko, S.	1.4P	Glasky, H.	1.1R, 2.2R
Itoh, Shin.	1.4P	Kang, K.-S.	4.3E	Kleinfelder, H.	2.1P
Itoh, T.	4.4L	Kang, S.-Y.	3.2I	Klucke, D.	3.1Q
Itoi, K.	2.1G	Kanno, A.	4.4D	Klymyshyn, N.	2.1E
Iwahara, K.	2.1H, 2.2H	Kapadia, P.	3.1L	Kobayashi, K.	2.3H
Iwamatsu, F.	1.1P, 4.4L	Karamanos, S. A.	1.4C, 3.2C, 4.3H	Kobayashi, N.	1.3B
Iwamoto, Y.	2.3H	Kargarnovin, M. H.	1.3H, 1.3I	Kobayashi, T.	2.1G, 2.2G, 4.1J, 4.2J
Iwasaki, A.	2.3C, 4.1C	Kasahara, N.	1.3K, 1.4F, 1.4J, 2.3I	Koji, O.	4.4D
Iyama, H.	2.3F, 2.4F	Kasai, N.	1.3B	Kojima, N.	3.2C
Izumi, S.	1.1I, 4.1E	Kataoka, S.	2.2F, 2.2I	Komann, S.	4.2Q
Izzo, J.	2.1B	Katona, T.	4.3E	Komura, I.	3.2D
Jackson, T.	4.1B	Katsuyama, J.	1.3P, 3.2L	Kondo, K.	1.3G
Jacquemoud, C.	1.4R, 4.1L	Kavanagh, N.	2.4G	Konosu, S.	2.3K, 4.2H
Jain, R.	1.3I	Kawabata, T.	4.1R	Konson, D.	1.1I, 2.4M
Jaiswal, S.	1.1Q	Kawahara, A.	2.3L	Korba, A. G.	1.4I
James, P.	2.2R	Kawai, H.	1.4P, 2.2F	Koul, A.	4.1G
Jansson, L.	2.4Q, 3.1H	Kawamura, T.	1.4J	Koya, H.	1.4P
Jappy, A.	1.4I	Kayano, R.	2.1R	Kozlov, V.	4.1Q
Jarvis, J.	3.2H	Keim, E.	1.1R, 2.3L	Kozluk, M.	4.2G
Jaske, C.	2.4K	Kelly, J.	1.1B	Ku, F. H.	2.2C, 2.4L
Jategaonkar, R.	2.4E	Kemppainen, M.	3.2D	Kuljis, Z.	4.4E
Javadi, G.	2.2B	Kerr, M.	2.3L, 3.1L, 4.1K	Kulka, R.	3.1M
Javadi, Y.	2.2B	Ketchum, D.	3.1B	Kull, D.	3.2D
Jeong, J.-U.	4.1I	Keynes, M.	1.3L	Kumakura, S.	2.3G
Jetter, R. I.	4.3D	Khan, R.	2.2I	Kumar, D.	1.4M
Ji, D.	2.2H, 2.3Q	Kikuchi, K.	2.4M	Kummari, S. R.	2.1Q
Ji, G.	4.3R, 4.4R	Kikuchi, M.	1.1P, 3.1R	Kuna, M.	3.1G
Jia, G.	4.1P	Kikuchi, T.	1.3G	Kuraya, E.	2.4F
Jiang, W.-C.	2.4I	Kikuhara, S.	2.2M	Kuroda, S.	4.1F
Jin, T. E.	4.3Q	Kim, B. J.	1.3F	Kurokawa, S.	2.4G
Jing, W.	4.4P	Kim, H. D.	4.3Q	Kurokawa, Y.	3.1H
Jiongran, T.	4.1L	Kim, H. S.	4.3Q	Kurosawa, K.	4.4D
Jo, S. W.	1.3F	Kim, J. H.	2.2C	Kurosawa, R.	2.2G, 4.1J
Jones, C.	2.1G	Kim, J. M.	4.1R	Kurth, E.	3.1K
Jones, R. E.	3.1B, 4.2B	Kim, Ji. S.	2.2C, 2.3R	Kurth, R.	3.1K, 4.2G
Jones, S.	2.2F, 3.1F	Kim, Jou. S.	2.2C	Kuschke, C.	1.4G
Joosten, M.	1.1L	Kim, Jon. S.	4.3L	Labounty, D.	1.1Q
Jordan, J.	2.4E	Kim, J.-D.	2.1K	Laboureur, D.	2.2J
Julyk, J.	1.1H	Kim, J.-H.	3.1Q	Lam, P.-S.	2.3R, 2.4R
Jung, G.	4.2E	Kim, J.-W.	4.2L	Lang, E.	1.4Q
Jung, H.-C.	4.2L	Kim, N.-H.	2.3Q, 3.1Q	Latif, L.	1.1Q
Jung, S.-K.	2.3C, 3.1C	Kim, S.-W.	4.1I	Lauerova, D.	1.1E

Laurinat, J.	2.1E, 3.1E	Liu, C.	2.3Q	Masatomo, H.	1.3P
Le Duff, J.-A.	1.4D, 1.4Q	Liu, M.-S.	2.1M	Masuda, A.	2.4C
Le Pêcheur, A.	1.4D	Liu, P.	4.3P	Mathias, L. L. S.	3.2K
Lê, T.	3.2L	Liu, Q.	2.4H, 4.2M	Mathieu, J.-P.	1.4L
Lear, W. E.	1.3F	Liu, R.-F.	4.4E	Matocha, K.	4.2M
Lebarbé, T.	4.1D	Liu, W.	4.3H	Matsubara, R.	2.4F
Lee, B.-S.	4.1R	Liu, Xian.	4.3P	Matsuda, A.	3.1R, 4.2D
Lee, D.	2.3D	Liu, Xiao.	4.3P	Matsui, T.	2.4F
Lee, D. J.	1.4F	Liu, Yang.	3.2K	Matsumura, T.	2.2M
Lee, H. H.	1.4F	Liu, YanL.	4.2P	Matsuo, K.	1.4J, 3.2P
Lee, H. Y.	2.3Q	Liu, Y. Y.	2.3E	Matsuoka, T.	2.4C
Lee, H.-J.	4.1R	Lixin, W.	4.3H	Mayinger, W.	1.4D
Lee, J.	4.2R	Loisnard, D.	1.4D	Mazzeo, J.	2.1H
Lee, J. H.	1.4F	Lokhman, I.	4.2H	Mccracken, S. L.	2.1D, 4.1L
Lee, J.-C.	2.3E	Lombaard, F.	2.1D	Mcdonald, C.	1.3M
Lee, K.	2.2C, 2.3R	Loveless, J.	2.2F	Mcdonald, H.	4.1G
Lee, Ki.-H.	4.1R	Lu, D.	4.2G	Mcgill, R.	2.1P
Lee, Ku.-H.	4.2D	Lu, K.	1.3J	Megahed, M. M.	1.4I, 2.2I
Lee, Sa.	2.3E	Lu, Y.	2.3M	Mehmanparast, A.	2.3M
Lee, Su.	2.2C	Lucci, A.	2.2B	Mehta, H.	1.1D
Lee, S. G.	4.3L	Ludman, J. P.	2.1G	Meier, G.	1.1R
Lefrançois, A.	1.4D, 1.4Q	Lukes, R.	2.1R	Meister, E.	1.1E, 4.4E
Legras, L.	1.4D	Luo, C.	2.4Q	Mekky, W.	3.1F, 3.2H
Leis, B. N.	2.4K	Luo, L.	1.1I, 2.4M	Mendez, J.	1.4D, 1.4Q
Lesage, J.-O.	4.3Q	Luo, Q.	4.1M	Méndez-Torres, A. E.	4.2R
Levine, H.	3.1F	Luo, W.	2.3B, 4.3P	Menon, M. N.	1.4K, 2.1J
Levy, C.	4.3Q	Ma, J.	2.2K	Mertiny, P.	1.4H
Li, C.	2.3Q	Ma, L.	2.2K	Meshii, T.	1.3J, 1.3K, 1.3Q, 1.4K
Li, D.-F.	3.2R	Ma, Q.	4.3Q	Metzger, D.	1.4M
Li, Gua.	4.2P	Ma, X.	1.1E, 4.1P	Meziani, S.	3.2M
Li, G.-F.	2.4H	Machida, H.	1.1D, 3.1K	Miao, J. K.	2.2D
Li, Guo.	4.3R, 4.4R	Mackenzie, D.	1.4I	Mihara, T.	3.2D
Li, J.	4.2M	Madew, C.	1.1M, 2.2R	Milligan, J. P.	1.4B
Li, R.	4.1P	Madrazo, V.	3.1M	Mills, A.	3.1G
Li, S.	4.1M	Maeda, J.	1.1I	Minagawa, K.	1.3K, 1.4J, 3.1C
Li, W.	4.2P	Maeda, N.	2.2D	Minami, S.	2.2F
Li, Xi.	4.1P, 4.2P, 4.4P	Maehara, H.	2.3F	Mingda, S.	4.3H
Li, Xu.	4.3P	Maekawa, A.	2.3L, 3.2C	Mingya, C.	1.3Q
Li, Y.	1.1P, 1.3P, 1.4P, 2.4D, 3.1P, 3.2P	Maggi, C.	1.1J	Minichiello, J.	2.4B, 4.2B
Li, Zhia.	3.1E	Maha, A.	4.3R	Mitchell, E.	1.3M
Li, Zhiy.	4.3P	Maleki, S.	2.1M	Mitsuya, M.	3.1C
Li, Z. F.	2.2D	Mally, T.	1.4H	Mittal, K.	2.2E
Lian, X.	2.3M	Malouines, P.	4.1D	Miura, K.	1.3B
Liang, C.	2.1F	Maneschky, J. E.	1.1H	Miura, N.	1.1D, 2.2H, 2.3H, 3.2P, 3.2P
Liao, W.-C.	2.1C	Manke, A.	4.2H	Miyafuji, Y.	2.4F
Licina, G. J.	2.1P	Marie, S.	1.1R, 1.3M, 1.3Q, 1.4R, 2.1J,	Miyao, K.	2.2H
Ligon, T.	2.4B, 4.2B		2.1K, 4.1L, 4.1Q	Miyazaki, K.	1.1P, 2.1H, 2.3H, 3.1Q, 4.4L
Ligterink, N.	4.2B	Mark, A.	1.3L	Mochizuki, M.	2.2C, 4.1R, 4.4L
Lin, Bi.	4.2R	Marlette, S. E.	1.3Q, 2.4D	Moenssens, M. A.	2.1P
Lin, Bu.	1.1I, 2.4M	Marques, A. T.	4.3R	Mohammed, H. H. H.	3.2H
Lin, H.-C.	4.4E	Marsden, W.	4.1L	Moinereau, D.	1.1R, 1.4R
Lin, Y. C.	2.1C	Martin, M. A.	1.1I, 2.3P, 3.2G	Moir, M.	2.1P
Lisowjy, B.	4.4E	Masaki, K.	1.3P, 3.2L	Mok, G.	2.4E



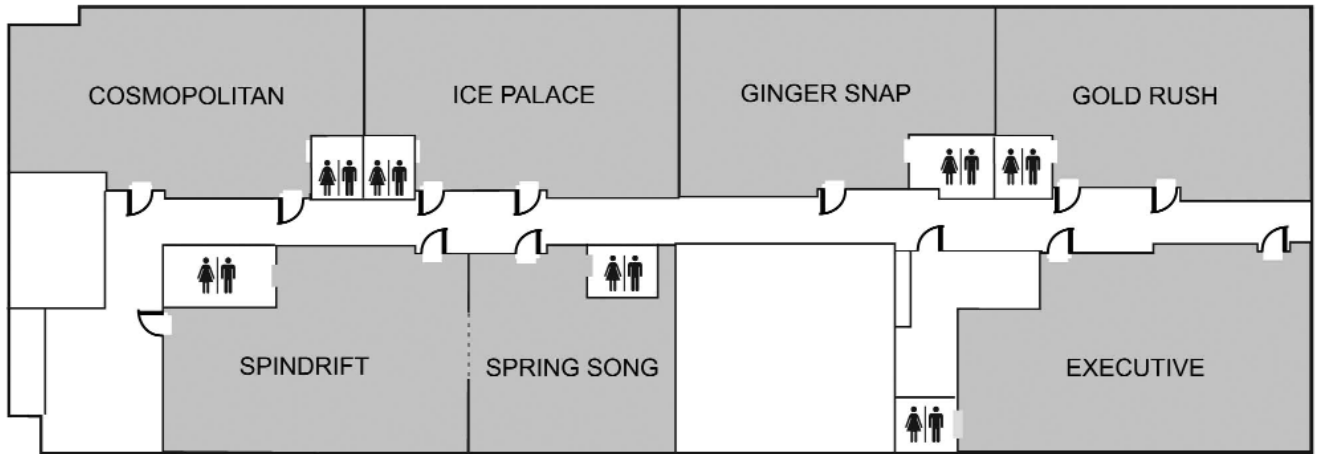
Monde, M.	3.2C	Nickell, R.	3.2B	Oyamada, K.	4.2H
Montoya, J.	3.1B	Nickolds, S.	3.1D, 4.1C	Palm, N.	1.1Q
Moody, F.	1.1F	Nidathavolu, B.	3.2F	Pan, J.	4.2R
Mori, H.	2.1R	Nie, D.	3.1R	Pandey, M. D.	4.2G
Morikage, Y.	2.1R	Nikbin, K.	2.1M, 2.3M, 2.3Q, 2.4M, 3.1L	Pang, S.-S.	4.3R, 4.4R
Morinaka, R.	4.4D	Nikic, M.	1.4J	Panwala, M. S.	1.1Q
Morishita, M.	4.2D	Nishida, A.	3.2C	Pape, G.	4.2B
Morita, H.	2.3C, 4.1C	Nishikawa, S.	1.4P	Park, H. B.	4.3L
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Morris, A.	1.4E	Nishimoto, K.	2.1R	Park, Y. H.	3.2G
Morton, D. K.	4.3D	Nishiura, K.	2.1G	Park, Y.-C.	4.1I
Moskovic, R.	2.3R	Noble, R.	2.2G, 4.1D	Parker, A.	2.1B
Motohashi, H.	3.1C	Nomura, K.	1.3B	Parker, J.	1.1M, 4.1M
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Munson, D.	1.3E, 2.1P, 3.1D, 4.1C, 4.3L	Noriaki, S.	4.4D	Paterson, S.	1.4M
Murakami, E.	2.2M	Nurick, A.	2.1D	Pavier, M.	1.1M
Murakawa, H.	2.3L	Nuzzo, F.	4.3E	Pellereau, B.	3.2L
Muransky, O.	1.3L, 1.4L, 3.2L	O'Brien, K.	3.1F	Pereira, G.	4.3R
Mureithi, N.	2.1F	O'Dowd, N. P.	2.3M, 3.2R	Perl, M.	4.3Q
Mutoh, Y.	3.1R	O'Kula, K.	3.1B, 4.2B	Pertuz, A. D.	2.4I
Nadeau, E.	4.2G	O'Regan, P.	2.2D	Pervez, T.	2.2I
Nadeau, S.	2.1J	Obermeier, F.	2.3L	Peters, D.	1.4B
Nagami, T.	1.3C	Ochi, M.	2.3H	Petesich, C.	4.1D
Nagao, T.	2.3G	Ochiai, M.	1.3B	Petrunich, P.	4.1J
Nagata, S.	4.1J	Ogawa, N.	2.3P	Pettigrew, M.	1.1F
Naha, K.	2.4F	Ogawa, T.	1.3B, 1.3P, 4.1R	Pierorazio, A.	1.4F
Naito, K.	2.3H	Ogiwara, H.	2.1R	Pierrat, D.	3.2E
Nakagawa, C.	1.3C	Ogundele, G.	2.2P	Pillot, S.	1.1R, 2.3K
Nakamori, T.	3.2C	Oh, C. K.	4.3Q	Pires, B.	2.1G
Nakamura, Ta.	1.1F	Oh, C.-Y.	2.3R	Pirzaman, H. S.	2.2B
Nakamura, Te.	2.1F	Oh, Y.-J.	2.3R	Plesniak, M.	2.1F
Nakashima, T.	1.4K	Ohira, T.	2.3H	Poirier, E.	4.1Q
Nakhodchi, S.	1.3I	Ohmori, S.	4.4D	Polasik, S.	2.4K
Nam, I. K.	1.4F	Ohno, T.	4.2H	Pournara, A.-E.	4.3H
Narayanan, A.	1.4E	Ohtake, Y.	2.4Q	Prandi, L.	2.2B
Narazaki, C.	1.3P	Oka, M.	2.4I	Pressburger, M. A.	2.2H
Nassar, M. M.	1.4I	Oka, T.	2.3H	Preussner, B.	1.1J
Nassar, S.	2.3G	Okada, H.	1.3P, 1.4P	Primack, H.	4.1B
Nedelec, M.	4.1L	Okada, T.	1.4P	Primault, C.	1.3R
Nehrig, M.	2.1E	Okano, S.	2.2C	Prueter, P. E.	1.1G
Nekomoto, Y.	2.3C, 4.1C	Okoro, I.	4.4R	Qamar, S. Z.	2.2I
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Nel, H.-J.	2.1D	Olson, M.	1.3R	Qian, S.	1.4F
Nelias, D.	1.4L	Olson, R.	1.3R, 2.1R, 3.1K, 4.1K	Qian, Y.	2.2P, 4.2P
Nenni, J. A.	1.1J	Omiya, Y.	1.3G, 1.4K, 2.2G	Qiao, D.	1.1L, 2.4L
Nestell, J. E.	4.3D	Onizawa, K.	1.3P, 3.2L, 4.1R	Qiu, X.-Q.	1.4M, 2.3B, 2.4I
Neumann, M.	1.3E	Orynyak, I.	4.1Q, 4.2H	Raeisi, M. H.	2.2B
Newton, B.	2.3D	Osakabe, K.	1.3P	Rajaomazava, T. E.	4.1F
Nezhad, H. Y.	2.3M	Otani, A.	1.4C	Rambaud, P.	2.2J
Ng, C. K.	1.3Q, 2.4D	Otani, Y.	2.4Q	Ranganath, S.	1.1G
Nibur, K. A.	2.3K	Ou, K.	2.2K	Rasouli, P.	1.3I
Nicak, T.	1.1R, 2.3L	Oy, F.	1.4D	Rasoulidanesh, S.	1.3R

Ratcliffe, S.	1.1H	Sampson, D. A.	1.1D	Shimizu, H.	3.2C
Rathbun, H.	2.3L	San Marchi, C.	2.3K	Shimajima, K.	2.4F
Ratkai, S.	4.3E	Sathyanarayanan, S.	4.3Q	Shintaku, Y.	1.1P
Rawson, L.	2.4P	Sato, K.	1.3G, 2.2G, 2.4G	Shintani, A.	1.3C
Razi, P.	2.1J	Sato, M.	1.3K	Shiratori, M.	2.1R, 4.1F
Reece-Barkell, H.	1.1B	Sato, T.	2.2I	Shobu, T.	1.3B
Reed, G.	3.1G	Satoh, K.	2.4M	Shoji, T.	2.2D
Reese, S. H.	1.4D, 3.1Q	Sauger, E.	2.1G	Shoji, Y.	2.3G
Reeves, D. W.	2.2Q, 4.2J	Sawa, T.	1.3G, 1.4K, 2.2G, 2.3G, 2.4G,	Shokrollahi, H.	1.3I
Reich, A.	3.1E		4.1J, 4.2J	Shutto, N.	2.4Q
Reinhardt, W.	1.1B, 1.1G	Scano, L.	4.1H	Simha, H.	1.1G
Reiser, J.	3.1R	Scarth, D.	2.1P, 2.3D, 2.4D	Simon, P.	2.1P
Remy, E.	4.4E	Schaaf, M.	4.1J	Singley, M. P.	2.2H
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Royer, R.	2.2P	Sharif, M.	1.4B	Stephan, J.-M.	1.4Q
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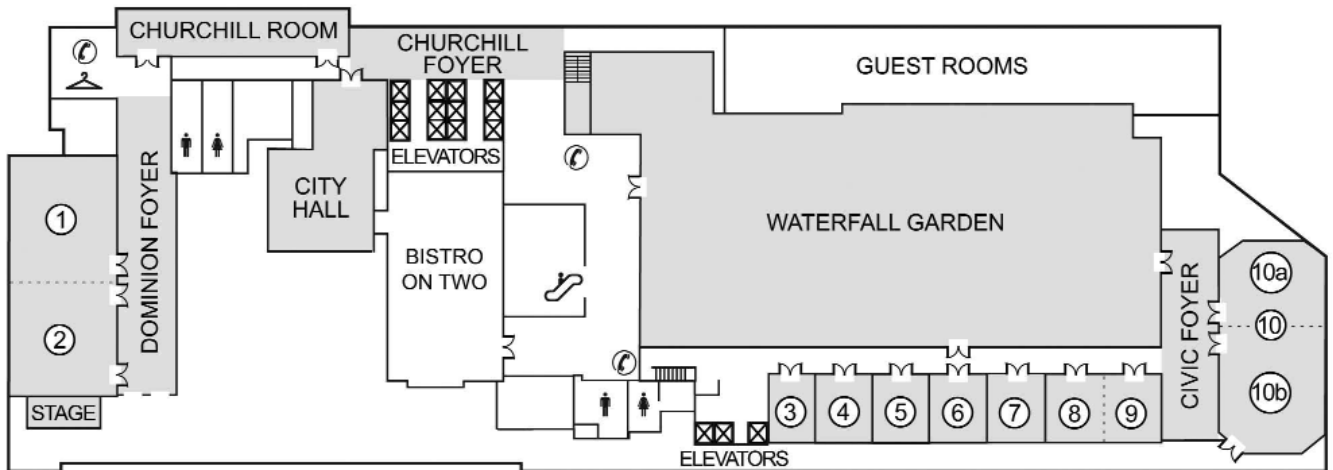
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## SHERATON CENTRE TORONTO HOTEL MEETING AND FUNCTION ROOMS



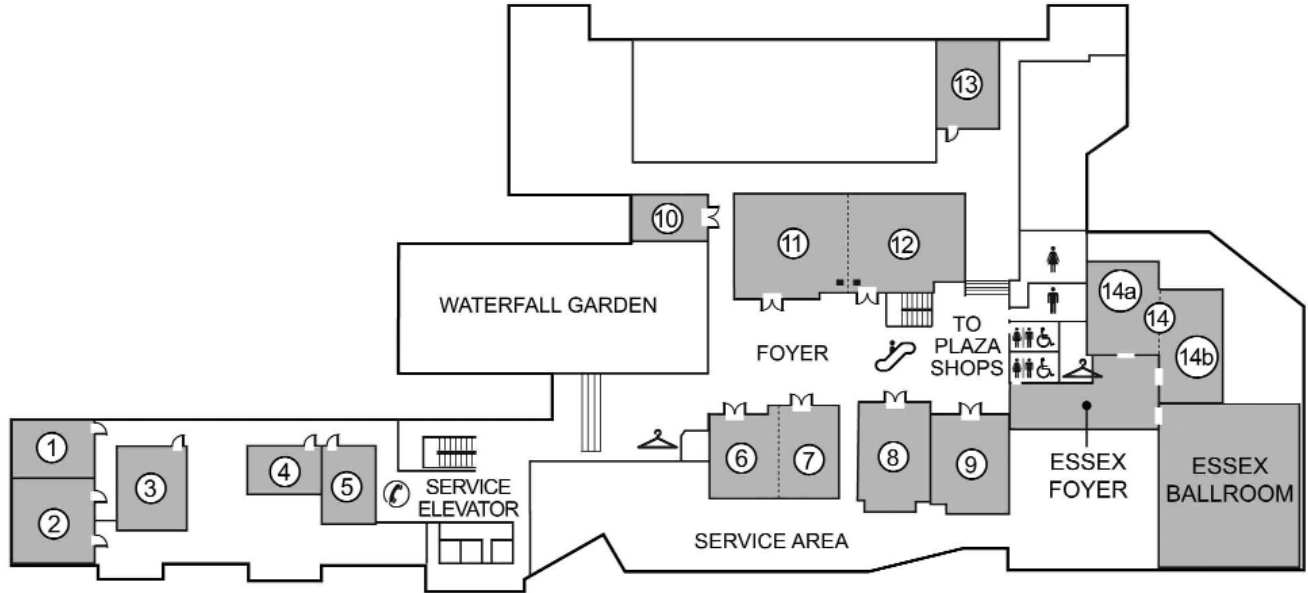
Fourth Floor



Second Floor

- |                            |                           |
|----------------------------|---------------------------|
| 1. Dominion Ballroom North | 7. Kent                   |
| 2. Dominion Ballroom South | 8. Simcoe                 |
| 3. Elgin                   | 9. Dufferin               |
| 4. Wentworth               | 10. Civic Ballroom        |
| 5. Kenora                  | 10a. Civic Ballroom North |
| 6. Huron                   | 10b. Civic Ballroom South |

## SHERATON CENTRE TORONTO HOTEL MEETING AND FUNCTION ROOMS



### Mezzanine Level

- |                      |                       |
|----------------------|-----------------------|
| 1. York              | 9. Conference Room G  |
| 2. Peel              | 10. Conference Room A |
| 3. Tata Telepresence | 11. Conference Room B |
| 4. Oxford            | 12. Conference Room C |
| 5. Carleton          | 13. Conference Room H |
| 6. Conference Room D | 14. Windsor           |
| 7. Conference Room E | 14a. Windsor West     |
| 8. Conference Room F | 14b. Windsor East     |

Pinnacle room is on the 43rd Floor.



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