Advance Program
& Registration Information

6TH CNS International Steam Generator Conference

November 8 -11, 2009

Hilton Toronto
Toronto, Ontario, Canada

"Management of Real-Life Equipment Conditions & Solutions for the Future"

CANADIAN NUCLEAR SOCIETY ®
SOCIÉTÉ NUCLÉAIRE CANADIENNE

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Preliminary Schedule of Events

Sunday, November 8, 2009

16:00	–	18:00	Poster Set-up	Toronto I
16:00	–	17:30	Exhibitor Move-in	Foyer/Toronto II/III
16:00	–	19:30	Registration	Foyer
18:30	–	20:00	Welcoming Reception	Foyer/Toronto II/III
18:30	–	20:00	Exhibits Open	Foyer/Toronto II/III

Monday, November 9, 2009

07:00	–	08:00	Poster Set-up	Toronto I
07:00	–	08:00	Speakers and Chairs of the Day Breakfast	Varley
07:30	–	17:45	Registration	Foyer
07:15	–	08:10	Coffee and Pastries Breakfast	Foyer/Toronto II/III
07:30	–	19:30	Trade Show Open	Foyer/Toronto II/III
08:10			Conference Opens	
08:30	–	12:20	Session 1 – Life Cycle Management	Toronto I
10:20	–	10:40	Refreshment Break	Foyer/Toronto II/III
12:20	–	13:30	Luncheon	Toronto II/III
13:30	–	17:00	Session 2 – Flow Induced Vibration/Fretting Wear & Design	Toronto I
15:00	–	15:20	Refreshment Break	Foyer/Toronto II/II
17:30	–	19:30	Poster Session and Reception	Toronto I

Tuesday, November 10, 2009

07:00	–	08:00	Speakers and Chairs of the Day Breakfast	Varley
07:30	–	17:45	Registration	Foyer
07:15	–	08:00	Coffee and Pastries Breakfast	Foyer/Toronto II/III
07:30	–	18:30	Trade Show Open	Foyer/Toronto II/III
08:00	–	12:15	Session 3 – Alloy 800 Tubing Material	Toronto I
09:50	–	10:10	Refreshment Break	Foyer/Toronto II/III
12:15	–	13:30	Luncheon	Toronto II/III
13:30	–	16:55	Session 4 – Nuclear Plant Chemistry	Toronto I
15:20	–	15:40	Refreshment Break	Foyer/Toronto II/III
18:00	–	18:30	Reception	Foyer/Toronto II/III
18:30	–	20:30	Banquet	Toronto II/III

Wednesday, November 11, 2009

07:00	–	08:00	Speakers and Chairs of the Day Breakfast	Varley
07:30	–	16:00	Registration	Foyer
07:15	–	08:00	Coffee and Pastries Breakfast	Foyer/Toronto II/III
07:30	–	16:00	Trade Show Open	Toronto II/III
08:00	–	12:15	Session 5 – Materials Degradation and Inspection I	Toronto I
09:50	–	10:10	Refreshment Break	Foyer/Toronto II/III
12:15	–	13:00	Luncheon	Toronto II/III
13:00	–	16:20	Session 5 – Materials Degradation and Inspection II	Toronto I
14:55	–	15:05	Refreshment Break	Foyer/Toronto II/III
16:20			Conference Closes	
16:20	–	18:00	Poster Tear-down	Toronto I
16:20	–	18:00	Exhibitor Move-out	

6TH CNS International Steam Generator Conference

November 8-11, 2009
Hilton Toronto
Toronto, Ontario, Canada

The 6th CNS International Steam Generator Conference, which is sponsored and organized by the Canadian Nuclear Society, Design & Materials Division, will follow in the tradition of the five predecessor Toronto Conferences of 1990, 1994, 1998, 2002 and 2006.

This conference provides a wide ranging forum on nuclear steam generator technology from degradation root-cause assessment to life-cycle management to inspection and maintenance as well as functional and structural performance characteristics; it also focuses on equipment architecture and design. The 6th conference has again adopted the theme:

"Management of Real-Life Equipment Conditions & Solutions for the Future"

This theme is particularly appropriate given the current renewed focus on the long-term reliability of Alloy 800 steam generator tubing material; and on the life-cycle-management measures necessary to enhance that reliability given the lessons-learned from recent and ongoing operating experience.

Objective

The conference objective is to explore the current condition of existing steam generation equipment, with emphasis on solutions for improving performance and service-life for existing equipment and the application of this knowledge to the next generation of replacement and new-build steam generators. Heat exchangers, condensers and balance-of-plant technology for nuclear power generation will also be discussed.

Of Interest to Whom

The conference will be of interest to those involved in the operation, maintenance, inspection, repair, replacement, life assessment, manufacture, design or research of steam generators and associated systems; also of heat exchangers, condensers and balance-of-plant equipment in nuclear power generation applications.

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Conference Registration

For on-line registration, or to obtain a copy of the registration form for faxing or mailing, visit: **www.cns-snc.ca**

Fees for registration are as follows (all in CDN $ and inclusive of 5% GST):

	By Oct. 9, 2009	After Oct. 9, 2009
CNS Members	$650	$750
Non-members	$750	$850
One-day	$350	$400
Students	$100	$150
CNS Retirees	$200	$250

Conference Registrar

Ms. Denise Rouben
CNS Office

480 University Ave, Suite 200
Toronto, Ontario M5G 1V2

Ph: 416-977-7620
Fax: 416-663-3504
e-mail: cns-snc@on.aibn.com

Hotel Accommodation

The official conference hotel is:
Hilton Toronto
145 Richmond Street West
Toronto, ON M5H 2L2
Phone: 416-869-3456

A block of rooms has been arranged for Conference participants at the Hilton Toronto at the special rate of $209/night single or double occupancy, plus applicable taxes. Reservations must be made directly with the Hilton Toronto by calling 1-800-267-2281 or 416-869-3456. To get the preferred rate, be sure to mention booking code NUCB09.

For on-line reservations, please visit the conference web-site: **www.cns-snc.ca**

Conference Organizers

Conference Honorary Chair
John MacQuarrie,
General Manager Nuclear Power Babcock & Wilcox Canada

Conference General Chair
John Roberts, *Bruce Power, Actively Retired*

Technical Program Chair
Graham MacDonald, *GE Hitachi*

Technical Program Co-Chairs
David Garber, *AREVA NP Canada Ltd.*
Guylaine Goszczynski, *Kinectrics, Inc.*
Jovica Riznic, *Canadian Nuclear Safety Commission*

Conference Developer & Executive Chair
Bill Schneider, *Babcock & Wilcox Canada*

Sponsorships Chair
Blair Fraser, *Babcock & Wilcox Canada*

Speakers' Breakfast Chair
Guylaine Goszczynski, *Kinectrics Inc.*

Poster Session Chair
James Smith, *Consultant to SNC-Lavalin Nuclear*

Poster Judge
Paul Shipp, *Babcock & Wilcox Canada*

Q&A and Proceedings Supervisors
Zane Walker, *AECL*
Daniel Gammage, *Babcock & Wilcox Canada*

Event Administrator

Elizabeth Muckle-Jeffs
The Professional Edge

1027 Pembroke Street East, Suite 200
Pembroke, Ontario K8A 3M4

Ph: 613-732-7068
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Fax: 613-732-3386
e-mail: Elizabeth@theprofessionaledge.com

6TH CNS International Steam Generator Conference

November 8-11, 2009
Hilton Toronto
Toronto, Ontario, Canada

Conference Venue

This 6th CNS Int'l Steam Generator Conference is held at the Hilton Toronto Hotel on Richmond at University Avenue – the perfect facility for this type of event with its the technical sessions, hospitality events, and SG industry Trade Show.

Welcoming Reception, Reception and Dinner

For any technical conference the informal sessions are of utmost importance for meeting old friends, making new connections, and for the sharing of your experiences. Be sure to attend the Welcoming Reception on Sunday evening, and also the Reception and Banquet on Tuesday, where Dr. Roger Staehle will share his years of experience working with Admiral Rickover.

Poster Program

The Poster Program, which has always been a vital part of this conference, is being enhanced by: i) having the Posters set up around the perimeter of the Conference room so as to be part of every Technical Session of the Conference, ii) having them grouped by Session (as they are in the Program), iii) and, under the mentoring of Poster Session Chair Jim Smith, having about five Poster Presenters per Session say, in 45 seconds or less, why people shoud come and visit their Poster. All of this will bring the focus of the Posters into the mainstream of the Conference.

Poster Competition

As is the tradition of this Conference, all Posters will participate in a competition in which they are judged, by Poster Judge Paul Shipp and associate, according to criteria relating to: i) relevance to a current problem of the industry (40%), ii) quality and newness of work as it relates to the problem identified in Item i) (30%) and, iii) effectiveness/degree of impact achieved in addressing the problem of Item i) through the poster presentation and via other communications, including the technical papers (30%). The prize will not buy a new Mercedes, but it will provide valuable recognitionof the authors' work.

Q&A and Proceedings Management

This Conference and its documented record are to serve the needs of the future and of those not in attendance – as well as those priviledged to attend in person. We therefore have a formal program of Q&A documentation and Proceedings preparation, all under the supervision of Zane Walker and Daniel Gammage, who have been frustrated in past by the lack of such rigor at events he wasn't personally able to attend. Note that this new process puts much of the responsibility for documentation accuracy on the Presenters – and there are consequences for non-completion of answers, paper review, etc.

www.cns-snc.ca

Conference Proceedings

The formal Conference Proceedings are planned for publication on CD by December 2009. One copy will be mailed to each registrant. Additional copies of the Conference Proceedings may be purchased. See Conference Registration Form, page 26.

Preliminary Proceedings

A pre-production version of the Conference Proceedings will be available at the Speaker and Poster Presenter Check-in Desk for author review during the Conference.

Action

During the Conference all Speakers and Poster Presenters are required to review the final version of their papers in the pre-production version of the Conference Proceedings. Changes will only be permitted to correct errors resulting from the final formatting and rendering to PDF format. No other review of the papers will be undertaken.

Action

Poster and Oral Presenters are also required to submit complete Q&A documentation for each question submitted to them.

Such Q&A documentation is required for all questions or comments representing a challenge to the work (not for minor clarifications).

In the event that Speakers or Poster Presenters do not comply with the requirement to provide documentation of Q&A, the Q&A/Proceedings Supervisors reserve the right to indicate non-compliance in the Conference Proceedings, or in extreme cases, to exclude the paper.

Audio/Video Recording Policy

All technical papers presented during this Conference will be fully documented in the Conference Proceedings. Recording of any sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication or copyright is strictly prohibited. Permission to record can only be provided after application to, and approval by, the Canadian Nuclear Society and by the individual author/presenter.

Copyright

Copyright in papers submitted to the 6th CNS International Steam Generator Conference remains with the author; but the CNS may freely reproduce the papers in print, electronic or other forms. The CNS retains a royalty-free right to charge fees for such material as it sees fit.

Cancellation Policy

Cancellation of registration must be submitted in writing to the Conference Registrar, Denise Rouben (see Conference Registrar, page 4) no later than October 16, 2009. Refunds, less a $105 processing fee, will be issued after the conference. No refunds will be provided for cancellations received after October 16, 2009.

The Canadian Nuclear Society

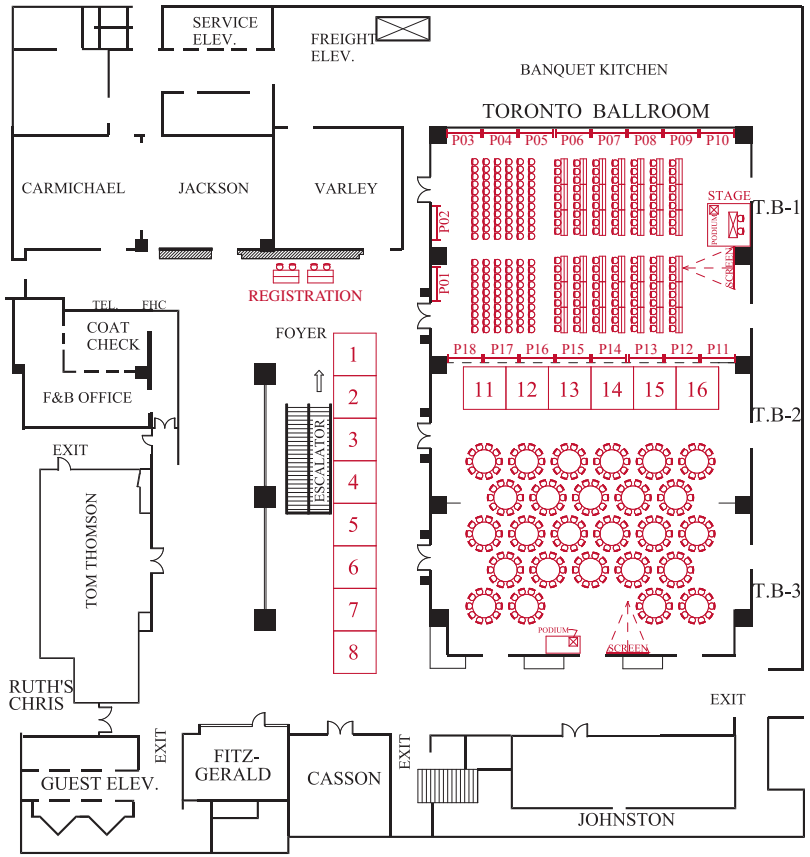
The Canadian Nuclear Society (CNS), is a technical society dedicated to the exchange of information on all aspects of nuclear science and technology which supports conferences, courses and specialty programs. For membership contact the CNS office at www.cns-snc.ca, attention Ms. Denise Rouben (see Conference Registrar, page 4).

www.cns-snc.ca

Trade Show

Exhibit Booths provide the opportunity for businesses to showcase their engineering and service capabilities pertaining to maintenance, inspection, repair, replacement, life assessment, manufacture or design of steam generators, heat exchangers and associated systems.

Contact the Conference's Event Administrator to obtain an Exhibitor Information and Registration Package.



Booth	Trade Show Exhibitor
1-2	Babcock & Wilcox Canada
3	Kinectrics Inc.
4	Aberfoyle Metal Treaters Inc.
5	Atomic Energy of Canada Limited
6-7	Zetec Inc.
8	E.S. Fox Ltd.

Booth	Trade Show Exhibitor
11	Structural Integrity Associates, Inc.
12-13	Westinghouse Electric Company
14	SNC-Lavalin Nuclear
15	Curtiss-Wright Flow Control Company, Nuclear Group
16	River Technologies, LLC

Financial Sponsors and Exhibitors

Financial Sponsors and Exhibitors not only provide much appreciated support for the conference; they also provide an unambiguous statement of the value they place upon the work discussed. The Early Exhibitors and Financial Sponsors are:

ABERFOYLE METAL TREATERS LTD.

FOX CONSTRUCTORS LTD.

AREVA

INTECH

AECL EACL

KINECTRICS

B&W babcock & wilcox canada ltd.

ONTARIO POWER GENERATION

River Technologies, LLC Nuclear Decontamination Specialists

Black & McDonald

BROOKS

SNC·LAVALIN

Bruce Power

Structural Integrity Associates, Inc.

Canadian Nuclear Safety Commission / Commission canadienne de sûreté nucléaire

CNSC CCSN

CURTISS WRIGHT Flow Control Company

Westinghouse

Dominion Engineering, Inc.

ZETEC

www.cns-snc.ca

Honorary Chair

John MacQuarrie

General Manager, Nuclear Power,
Babcock & Wilcox Canada Ltd.

John MacQuarrie, P.Eng, M.A.Sc is the General Manager of the Nuclear Power business unit for Babcock & Wilcox Canada Ltd. (B&W Canada) headquartered in Cambridge, Ontario. In this role Mr. MacQuarrie directs B&W Canada's nuclear business unit which includes: engineering, research and product development, proposals, project management, field services and construction.

Mr. MacQuarrie holds a Masters of Applied Science degree in Mechanical Engineering from the University of Toronto and is a licensed professional engineer in the province of Ontario. A long standing member of the Canadian Nuclear Society, MacQuarrie has over 15 years of experience in the nuclear industry gained through his various roles at B&W Canada.

B&W Canada is a world leading supplier of steam generation products, related technologies and services to the nuclear power industry and has delivered more than 290 nuclear steam generators to nuclear plants around the world since the 1960s.

Active steam generator design/supply projects that Mr. MacQuarrie currently oversees include Bruce A stations for Bruce Power, Crystal River Unit 3 for Progress Energy and Davis Besse for First Energy (both unique Once Through Steam Generators originally designed by the B&W Company).

General Chair

John G. Roberts

Steam generator, or boiler, chemistry has been a priority for John since his days at Trawsfynydd, Wales, in the early 1970s. A decade later, John was the Chemist who oversaw the construction, commissioning and early operation of Bruce B. In order to minimize corrosion product generation and transport to steam generators, from secondary side components and piping, John had Ontario Hydro Construction change their usual approach to system erection and hydrostatic testing. John took a similar approach in the early 1990s to the construction and commissioning of Cernavoda Unit 1. The 36 steam generators of these five Units (John's "babies") continue to perform excellently with respect to chemistry and corrosion. Minimal quantities of deposits have been transported from the feed train to these steam generators.

The return to service of Bruce Units 3 & 4 was overseen by John, as the Chemistry Design Authority for Bruce Power. More recently, he was part of the team that identified and stopped a significant shutdown degradation mechanism of steam generator tubes.

"For persistent commitment to high standards of chemistry control…", John was honoured with a Canadian Nuclear Achievement Award in 2005.

John is a member at large of the Canadian Nuclear Society Council and Chair of the CNS Design and Materials Division. John is also a member of the Royal Society of Chemistry and a member of the RSC Radiochemistry sub-committee.

Invited Speakers

Paul Spekkens

Dr. Paul Spekkens, B.Sc., Ph.D., is Vice President, Science & Technology Development at Ontario Power Generation Inc. (OPG). OPG's goal is to be a premier North American energy company, based in Ontario, operating in a safe, open and environmentally responsible manner.

Dr. Spekkens was appointed to his current position in January 2001. He is responsible for the management of major component programs in OPG to manage the business impacts of degradation in fuel channels, feeders, steam generators and reactor components. He is also responsible for the leadership of OPG's nuclear Research and Development Program.

Dr. Spekkens began his career with Ontario Hydro (the predecessor company of OPG) in 1977 with the Research Division. He worked in the area of primary system chemistry and activity transport; secondary system chemistry and steam generator corrosion; chemical cleaning and decontamination.

Gary Newman

Chief Engineer, Vice President of Engineering, Bruce Power

Mr. Gary Newman, M.A.Sc., P. Eng., is the Chief Engineer and Vice President of Engineering at Bruce Power L.P.

Bruce Power's vision is to become Canada's World Class Nuclear Operator, committed to providing safe, reliable, affordable, and environmentally sound electricity.

Mr. Newman was appointed to his current position in June 2008. He is the Design Authority for Bruce Power and carries responsibility for all Engineering activity at the Bruce Power L.P. site and is the current Bruce Power representative for the CANDU Owners Group, Nuclear Safety Solutions and University Network of Excellence in Nuclear Engineering Board of Directors.

Mr. Newman joined Bruce Power in 2004 as the Department Manager of Equipment Life Cycle Engineering and prior to that was employed by AMEX - Nuclear Safety Solutions Ltd. and Ontario Power Generation. He originally jointed Ontario Hydro in 1990.

Invited Speakers

Dr. Roger W. Staehle

Roger Staehle is an Adjunct Professor of the Department of Chemical Engineering and Materials Science at the University of Minnesota and an industrial consultant. He is a former Dean of the Institute of Technology at the University. Previously, he was a professor of Metallurgical Engineering at The Ohio State University and founded and directed the Fontana Corrosion Center. His research interests include predicting the corrosion performance of engineering equipment, stress corrosion cracking, passivity, and corrosion in aqueous environments. His consulting includes work for major international industries and governments in the areas of predicting corrosion performance, corrosion, and the prevention and analysis of failures. Industries for which he consults include nuclear, energy, chemical, petrochemical, food, medical, insurance, utility, construction, transportation and electronic.

Roger Staehle was elected to the National Academy of Engineering in 1978 and received the Willis Rodney Whitney Award for outstanding contributions to corrosion science in 1980. At Ohio State he was the International Nickel Professor of Corrosion Science and Engineering. He was honored in 2001 by the Metallurgical Society with a full week meeting held in his honor. He is a fellow of the American Society for Metals, The National Association of Corrosion Engineers, and The Electrochemical Society. He has served on numerous boards of directors and has co-founded two companies. He is a Trustee of the Great Northern Iron Ore Properties. He has edited 23 volumes relating to corrosion and has published 160 technical papers. He is a former Editor of Corrosion Journal and of Advances in Corrosion Science and Technology.

He is a consultant to many industries and government organizations throughout the world.

Invited Speakers

Keith Fruzzetti

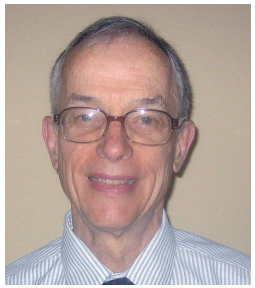
Dr. Keith Fruzzetti is a Technical Executive in the Materials and Chemistry program area of the Nuclear Power Sector at EPRI. His research activities focus on chemistry optimization for Pressurized Water Reactors (PWRs) and Boiling Water Reactors (BWRs), primarily with respect to corrosion mitigation, fuel performance, and radiation management.

Dr. Fruzzetti joined EPRI in 2001 as a Senior Project Manager in the Chemistry, Low Level Waste, and Radiation Management program. He managed technical projects to develop chemistry solutions for both primary and secondary system PWR issues, including dispersant application for mitigation of steam generator fouling.

Before joining EPRI, Dr. Fruzzetti worked at NWT Corporation as a Senior Consultant involved in PWR primary and secondary water chemistry issues. These included modeling of crud deposition on fuel cladding, hydrogen generation from fuel cask spacer disks, and evaluation of chemistry effects on steam generator corrosion. In addition, he was the principal investigator on numerous resin and condensate polishing projects for PWR and BWR utility clients.

Dr. Fruzzetti received a BS degree in chemical engineering from San Jose State University and his MS and PhD degrees, also in chemical engineering, from the University of California, Davis. His field of emphasis was in non-linear process control.

Dr. Fruzzetti serves as the U.S. Corresponding Member and Core Member for the International Conference on Water Chemistry of Nuclear Reactor Systems.



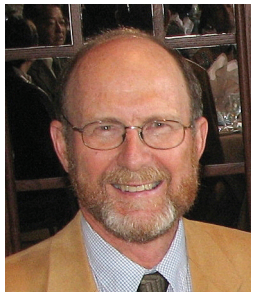
Jeffrey A. Gorman

Jeff Gorman has been working on materials issues related to nuclear power since 1959, when he was assigned to Naval Reactors. He studied civil engineering at Cornell before working for Naval Reactors. After leaving Naval Reactors, he did graduate work in engineering science, with emphasis on materials science, at CalTech. Since 1968 he has worked as a consulting engineer in the civilian nuclear power program, with most of his work involving materials, corrosion, stress analysis, and fracture mechanics.

In 1980, Dr. Gorman was a co-founder of Dominion Engineering, Inc. (DEI). He retired from the company at the end of 2005, but he continues to actively work for the company on a contract basis about three quarters time. A significant part of his consulting work while working for DEI first as an employee and currently as a contractor has been for EPRI. His work for EPRI has included preparation of many workshop proceedings involving PWR steam generator technology, preparation of topical reports on materials and corrosion issues, and assisting in revision of water chemistry guidelines.

He has also worked extensively for utilities and other industrial organizations on materials and corrosion issues, such as evaluation of the causes of failures of pressure vessels and piping, and developing predictions of the probable rate of failure of PWR steam generator tubes. In the past few years a significant portion of his work has involved steam generators in CANDU plants, including those with tubes made of Alloy 400, Alloy 600, and Alloy 800.

Invited Speakers



Michel J. Pettigrew

Michel J. Pettigrew is currently Professor of Mechanical Engineering and BWC/AECL/NSERC Chair of Fluid-Structure Interaction at École Polytechnique in Montréal. He was Principal Research Engineer and Technical Director of the Vibration and Tribology Unit at the Chalk River Laboratories of Atomic Energy of Canada until mid-2000. His research and consulting interests include solid mechanics, flow-induced vibration with emphasis on two-phase flows and vibration damage caused by fretting-wear. He has developed design guidelines to prevent vibration problems in heat exchange equipment. He has given many specialist courses and has done extensive consulting for the nuclear industry in Canada and internationally.

Pettigrew holds five patents, is the author of some 325 publications and technical reports and has received several distinguished awards such as the CNS W. B. Lewis Medal, the R&D 100 Award, the Professional Engineers of Ontario Engineering Medal, the ASME PVP Medal and two ASME Best Paper Awards. He has organized several international symposia on flow-induced vibration including FIV-1996, FIV-1999, FIV-2001 FIV-2003 and FIV-2005. He was also an Associate Editor of the ASME Journal of Pressure Vessel Technology (2001-2008).

Pettigrew obtained a Mechanical Engineering Degree from École Polytechnique, Montréal, an M.Sc. from the University of Birmingham, England, under an Athlone Fellowship and is a Fellow of the ASME.

Ken Karwoski

Mr. Karwoski is the Senior Level Advisor for Steam Generators and Materials Inspection at the U.S. Nuclear Regulatory Commission. He has over 20 years in the nuclear field, with over 15 years at the Nuclear Regulatory Commission. Mr. Karwoski is responsible for the oversight of steam generator issues in the United States. He has been involved in reviewing tube integrity evaluations, tube repair criteria, and repair processes.

Robert L. Tapping

Robert (Bob) Tapping, Director of the Components and Systems Division at AECL Chalk River Laboratories, has worked in the corrosion field for 35 years of which 30 were at AECL. At AECL he has been responsible for corrosion R&D in most CANDU plant materials, and has spent considerable time carrying out R&D studies related to steam generator chemistry and materials. He is the AECL program manager for steam generators, covering all aspects from thermalhydraulics, chemistry, materials and inspection. In his current position, Bob has program responsibility for AECL's R&D on out-of-core materials and components and radiation chemistry, as well as all aspects of steam generator technology and aging management, including work for COG, commercial and AECL in-house projects.

08:10 **Conference Opening**
John Roberts, *Conference General Chair*

08:14 **Welcome to the Conference**
John MacQuarrie, *Conference Honorary Chair*

08:22 **Conference Terms of Reference**
Bill Schneider, *Conference Developer & Executive Chair*

Technical Sessions

Session 1: Life Cycle Management

Session Chair: John Slade, *NB Power Nuclear*
Session Co-Chair: Roy McGillvray, *Babcock & Wilcox Canada*

08:30 Paper 1.01
SG LCM Challenges - Ongoing and New-Build
Paul Spekkens, *Ontario Power Generation*

09:05 45 second Poster Snap-shots (five posters)

09:10 **Open Discussion: Life Cycle Management**

09:30 Paper 1.02
Performance Based Inspection Plan for Steam Generators at Point Lepreau
Jeffrey A. Gorman, Velvet D. Moroney and Glenn White, *Dominion Engineering, Inc.*; John Slade, *NB Power Nuclear*; Tracy Gendron, *Atomic Energy of Canada Limited*

09:55 Paper 1.03
Vertical Steam Generators for VVER: Myths and Reality
Nikolay Trunov, *OKB Gidropress*

10:20 – 10:40 **Refreshment Break**

10:40 Paper 1.04
Restoration to Serviceability of Bruce 'A' Heat Transfer Equipment
Daniel Gammage, Chris Machowski and Roy McGillivray, *Babcock & Wilcox Canada*; David Durance, D. Kazimer and K. Werner, *Bruce Power*

11:05 Paper 1.05
Investigation of Ageing Status Assessment and Lifetime Evaluation Based on Actual Operation Conditions of QNPC NPP
Gui Chun and Chen Yinqiang, *China Nuclear Power Operation Technology Corporation, Ltd.*; Liu Hongyun and Shi Huilie, *Research Institute of Nuclear Power Operation*; Tao Jun, Wei Wenbing, *Qinshan Nuclear Power Corporation, Ltd.*

11:30 Paper 1.06
Recent Safety Issues Concerning Steam Generators in France and their Analysis by IRSN
Thierry Sollier, Marc Le Calvar, François Balestreri and Fréderic Mermaz, *Institut de Radioprotection et de Sureté Nucléaire (IRSN)*

www.cns-snc.ca

11:55 Paper 1.07
Steam Generator Replacement a Story of Continuous Improvement
M. Steve Sills and Richard Wilkerson, *SGT LLC*

Life Cycle Management Posters

Paper 1.08P
CNSC Proposed Guideline for the Examination of Steam Generator Tubes Removed for Periodic Surveillance
Nicholas Christodoulou, Blair Carroll, Jovica Riznic, Sue Liu and Raoul Awad, *Canadian Nuclear Safety Commission*

Paper 1.09P
Crack Leak Rate Models for Steam Generator Tube Integrity Assessment
Shripad T. Revankar and B. Wolf, *Purdue University;* Saurin Majumdar, *Argonne National Laboratory;* Jovica Riznic, *Canadian Nuclear Safety Commission*

Paper 1.10P
Health Monitoring Requirements for CANDU® Steam Generators
Kevin E. Williams, Carl Turner, Gordon Burton and Richard Lakhan, *Atomic Energy of Canada Limited*

Paper 1.11P
Application of Concept Mapping Principles to Managing Steam Generator Knowledge at the CNSC
George Tsikouras, *Algonquin College*, Mariam Karouni, *University of Ottawa*, Jovica Riznic, *Canadian Nuclear Safety Commission*

12:20 – 13:30 **Luncheon**

Session 2: Flow Induced Vibration/Fretting Wear and Design

Session Chair: Stephen Fluit, *Babcock & Wilcox Canada*
Session Co-Chair: Stan Buhay, *Ontario Power Generation*

13:30 Paper 2.01
Advancements in Flow-Induced Vibration Research and Design Criteria
Michel J. Pettigrew, *École Polytechnique de Montréal*

14:05 45 second Poster Snap-shots (five posters)

14:10 Paper 2.02
Fluidelastic Instability Model for Steam Generator Tubes Subjected to Two-phase Flows
Njuki Mureithi, Téguewindé Pierre Sawadogo, Reza Azizian and Michel J. Pettigrew, *École Polytechnique*

14:35 Paper 2.03
Advanced Non-Linear Flow-Induced Vibration and Fretting-Wear Analysis Capabilities
Mohammad Toorani, Li Pan, R. Li, Brady Vincent and Nick Idvorian, *Babcock & Wilcox Canada*

15:00 – 15:20 **Refreshment Break**

15:20 Paper 2.04
Tube-Support Effectiveness in Steam Generators: Dynamic Interaction Between Tube and Anti-Vibration Bar
Isabelle Nowlan, Michel J. Pettigrew and Annie Ross, *École Polytechnique de Montréal*

15:45 Paper 2.05
Three-Dimensional Analysis of the 700 MWe Steam Generator Design with Variable Pitch in the U-Bend Region
Benny John, *NPCIL*; John Pietralik and Qi Chen, *Atomic Energy of Canada Limited*

16:10 Paper 2.06
CFD Simulation of Particle Entrapment of Steam Generator Sludge Collector/Loose Parts Weir
Chunyun Wang, Naeem Karim and Jason Burr, *Westinghouse Electric Company*

16:35 Paper 2.07
Development of a Nuclear Steam Generator System for Gas-Cooled Reactors for Application in Oil Sands Extraction
James Smith and Ralph Hart, *Consultants to SNC-Lavalin Nuclear Inc.*; Lloyd Lazic, *SNC-Lavalin Nuclear Inc.*

17:00 **Adjourn**

17:30 – 19:30 **Wine & Cheese Poster Session**

Flow Induced Vibration/Fretting Wear and Design Posters

Paper 2.08P
Gasket Sealing Performance Simulation During Cycling Operation Condition
Nick Idvorian and Nansheng Sun, *Babcock & Wilcox Canada*

Paper 2.09P
Two-Phase Flow Induced Vibrations in CANDU® Steam Generators
Alejandro Gidi, *SNC-Lavalin Nuclear Inc.*

Paper 2.10P
CATHENA Analysis of CANDU® 6 Steam Generators for Steam Main Break at a Remote Location
Tong Liu, *Atomic Energy of Canada Limited*

Paper 2.11P
Experience in Designing Steam Generators for Nuclear Power Plants Developed by JSC Afrikantov OKBM
Oleg A. Bykh and V.V. Petrunin, *JSC Afrikantov OKBM*

Paper 2.12P
CANDU® 6 Steam Generator Thermalhydraulic Modeling and Simulation
Polad Zahedi, *University of Toronto*; Majid Borairi, *Atomic Energy of Canada Limited*

Paper 2.13P
Experimental Modelling of Flow-Induced Vibration of Multi-Span U-Tubes in a CANDU® Steam Generator
Atef Mohany, Paul Feenstra and Victor Janzen, *Atomic Energy of Canada Limited*

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Flow Induced Vibration/Fretting Wear and Design Posters (continued)

Paper 2.14P
PIPO-FE: An Updated Computer Code to Evaluate Heat Exchanger Flow-Induced Vibration
Yingke Han and Victor Janzen, *Atomic Energy of Canada Limited*

Paper 2.15P
Modeling of Fluidelastic Instability in Tube Bundle Subjected to Two-Phase Cross-Flow
Téguewindé Pierre Sawadogo, Njuki Mureithi, Reza Azizian and Michel J. Pettigrew, *École Polytechnique de Montréal*

Paper 2.16P
Dynamic Modeling of Heat Exchanger Tube-to-Support Interaction
Reza Azizian, Njuki Mureithi, Michel J. Pettigrew and Téguewindé Pierre Sawadogo, *École Polytechnique de Montréal*

Paper 2.17P
Design Specifications to Ensure Flow-induced Vibration and Fretting-wear Performance in CANDU® Steam Generators and Heat Exchangers
Victor Janzen, Yingke Han, *Atomic Energy of Canada Limited*; Michel J. Pettigrew, *École Polytechnique de Montréal*

Paper 2.18P
Steam Generator Closures: Retrofit to HydraNuts
Stephen Fluit and Rob Hoare, *Babcock & Wilcox Canada*; Steve Greenwell, *Curtiss Wright Flow Control Company, NOVA*

Session 3: Alloy 800 Tubing Material

Session Chair: Paul Spekkens, *Ontario Power Generation*
Session Co-Chair: Mike Upton, *Bruce Power*

08:00 Paper 3.01
SG Life Cycle Management, Replacement & OpEx Sharing
Jeffrey A. Gorman, Velvet D. Moroney and Glenn White, *Bruce Power*

08:20 **Open Discussion: Alloy 800 Tubing Material**

08:35 Paper 3.02
Alloy 800 Steam Generator Tube Performance
Jeffrey A. Gorman, Velvet D. Moroney and Glenn White, *Dominion Engineering Inc*

09:00 Paper 3.03
Embalse Steam Generators – Status in 2009
Pablo Luna, *Nucleoelectrica Argentina S.A. – CNE*; Metin Yetisir and Bob Roy, *Atomic Energy of Canada Limited*; Rob MacEacheron, *Babcock & Wilcox Canada*

09:25 Paper 3.04
Replacement of Steam Generators for Embalse NGS – The Steam Generator Cartridge Design and Manufacturing Issues, Localization and Site Assembly Challenges
Jerzy Parkitny and Shankar Subash, *Atomic Energy of Canada Limited*; Pablo Luna, *Nucleoelectrica Argentina S.A. - CNE*

09:50 – 10:10 **Refreshment Break**

10:10 Paper 3.05
Effect of Surface Cold Work on Corrosion of Alloy 690TT in High Temperature High Pressure Water
Jianqiu Wang, Zhiming Zhang, En-hou Han and Wei Ke, *Chinese Academy of Sciences*

10:35 Paper 3.06
Degradation of Alloy 800 Steam Generator Tubing and Its Long-Term Behavior Predictions for Plant Life Management
Yucheng C. Lu and Robert Tapping, *Atomic Energy of Canada Limited*; Mahesh D. Pandey, *University of Waterloo*

11:00 Paper 3.07
Degradation Susceptibility of Steam Generator Tubing Materials Under ACR Steam Generator Secondary Side Crevice Conditions
Sue Liu, *Canadian Nuclear Safety Commission*; Yucheng C. Lu and M. Dupuis, *Atomic Energy of Canada Limited*

11:25 Paper 3.08
Effects of Thermal Treatment on Microstructure of Inconel 690 and Incoloy 800
XianChao Hao, Shuo Li, Ming Gao, Bo Chen and YanTao Zhou, *Chinese Academy of Sciences*

11:50 Paper 3.09
Predicting Steam Generator Tube Failures
Romney B. Duffey, Robert L. Tapping, *Atomic Energy of Canada Limited*

12:15 – 13:00 **Luncheon**, Toronto II/III

Session 4: Nuclear Plant Chemistry

Session Chair: John Roberts, *Bruce Power, Retired*
Session Co-Chair: Rod Nashiem, *Bruce Power*

13:30 Paper 4.01
Operating Experience Driven Advancements in Plant Chemistry Practice and Standards
Keith Fruzzetti, *EPRI*

14:05 45 second Poster Snap-shots (five posters)

14:10 **Open Discussion: Nuclear Plant Chemistry**

14:30 Paper 4.02
Extended Layup of Steam Generators During a Refurbishment Outage
Chuck R, Marks and Michael J. Little, *Dominion Engineering, Inc.*;
John Slade, *NB Power Nuclear*, Tracy Gendron, *Atomic Energy of Canada Limited*

14:55 Paper 4.03
Advanced Scale Conditioning Agent (ASCA) Applications: 2009 Experience Update
Michael J. Little, Robert D. Varrin, Jr., Aaron T. Pellman and
Marc Kreider, *Dominion Engineering, Inc.*

15:20 – 15:40 **Refreshment Break**

15:40 Paper 4.04
Modes and Influences of Possible Future Processes of Degradation of Tubes in Steam Generators
Roger Staehle, *Staehle Consulting*

16:05 Paper 4.05
Singular Deposit Formation in PWR Due to Electrokinetic Phenomena – Application to SG Clogging
Michael Guillodo, T. Muller, Morgan Barale and Marc Foucault, M-H Chinard and Christian Brun, *AREVA NP SAS*; G. Corredera and O. de Bouvier, *Electricité de France*

16:25 Paper 4.06
Time Domain Models for Damping-Controlled Fluidelastic Instability Forces in Multi-Span Tubes with Loose Supports
Marwan A. Hassan, R.J. Rogers and A.G. Gerbe, *University of New Brunswick*

16:50 **Adjourn**

18:00 **Reception**

18:30 – 20:30 **Banquet**

19:30 Dinner Speaker – **"Rickover and Nuclear Reliability"**
Roger Staehle, *Staehle Consulting*

Nuclear Plant Chemistry Posters

Paper 4.07P
Industry SG Heat-Transfer Fouling Trends and Probabilistic Fouling Predictions
Marc Kreider, Velvet D. Moroney, Glenn White and Robert D. Varrin, Jr., *Dominion Engineering, Inc.*

Paper 4.08P
2009 Industry Update on Dispersant Use for Steam Generator Fouling Control
Keith Fruzzetti, EPRI; Marc Kreider, Carly E. Anderson and Chuck R. Marks, *Dominion Engineering, Inc.*; David Morey and P. Robert Walton, *Exelon Corporation*

Paper 4.09P
Transport of Lead to Crack Tips in Steam Generator Tubes
Gerry Adler and Chuck R. Marks, *Dominion Engineering, Inc.*; Keith Fruzzetti, *EPRI*

Paper 4.10P
Size Effects of TiO_2 on Stress Corrosion Cracking Resistance of Steam Generator Tube Materials
Byung-Seon Choi, Kyung-Mo Kim, Eun-Hee Lee, Uh-Chul Kim, Jung-Won Na and Wan-Young Maeng, *Korea Atomic Energy Research Institute*

Paper 4.11P
Effect on Zn injection on the PWSCC Resistance of Alloy 600 in Water at 360º C
Wan-Young Maeng, Uh-Chul Kim, Mun-Whan Kim and Byung-Seon Choi, *Korea Atomic Energy Research Institute*

Paper 4.12P
Characterization of Radiation Fields around CANDU® Steam Generators
Yury Verzilov and Aamir Husain, *Kinectrics Inc.*

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Session 5: Materials, Degradation and Inspection I

Session Chair: Charles Harris, *U.S. Nuclear Regulatory Commission*
Session Co-Chair: Graham MacDonald, *GE Hitachi*

08:00 Paper 5.01
Steam Generator Tube Integrity Requirements and Operating Experience in the United States
Kenneth J. Karwoski, *United States Nuclear Regulatory Commission*

08:35 45 second Poster Snap-shots (five posters)

08:40 **Open Discussion: Materials, Degradation and Inspection**

09:00 Paper 5.02
Update of the SG Tube Intergranular Attack/Stress Corrosion Cracking in Bruce Unit 4
Ken Sedman and David Durance, *Bruce Power*

09:25 Paper 5.03
An Overview of Ultrasonic Inspection Achievements and Experience with CANDU® Steam Generators
John Huggins, Kevin Maynard, K. Chan and Z. Chen, *Kinectrics Inc.*;
Tom Malkiewicz, E. Shoon and Jim Prince, *Ontario Power Generation*

09:50 – 10:10 **Refreshment Break**

10:10 Paper 5.04
State of the Art Review of OPG Steam Generator Tubing Degradation Mechanisms
Alex Brennenstuhl, *Ontario Power Generation*; Sridhar Ramamurthy, *Surface Science Western/University of Western Ontario*; G.M. Good, *The University of Western Ontario*

10:35 Paper 5.05
Mechanized Inspection of Steam Generator Components During Manufacture
Heinz-Josef Otte, K. Leupoldt and W. Meister, *Cegelec AT GmbH & Co. K.G.*

11:00 Paper 5.06
The Current Status of Mitigation, Experience and Repair Regarding Alloy 600 Issues on Japanese Steam Generator Nozzles
Takafumi Hiro, Taketoshi Okabe and Tomoyuki Inoue, Mitsubishi Heavy Industries

11:25 Paper 5.07
Advances in Automatic Data Analysis Capabilities
James Benson and Thomas Bipes, *EPRI*; Lalita Udpa, *Michigan State University*

11:50 Paper 5.08
Lab Assessment of Bruce Unit 4 SG Top-of-Tube-sheet Cracking
John Jevec, Jeff Sarver, Jianguo Yu and Peter King, *Babcock & Wilcox Canada*;
Ken Sedman, *Bruce Power*

12:15 – 13:00 **Luncheon**, Toronto II/III

Session 5 *(continued)*: Materials, Degradation and Inspection II

Session Chair: Jovica Riznic, *Canadian Nuclear Safety Commission*
Session Co-Chair: David Garber, *AREVA*

13:00 Paper 5.09
Steam Generator Degradation R&D: Future Challenges
Robert L. Tapping, *Atomic Energy of Canada Limited*

13:35 45 second Poster Snap-shots (five posters)

13:40 Paper 5.10
Localized Corrosion of Nickel-based Steam Generator Tubing Alloys in Sodium Sulfate Solutions Containing Thiosulfate
William Zhang and Roger C. Newman, *University of Toronto*

14:05 Paper 5.11
Oxide Formed on Steam Generator Tubing Materials in Lead Containing High Temperature Aqueous Solution
Dong-Jin Kim and Hong-Pyo Kim, *Korea Atomic Energy Research Institute*

14:30 Paper 5.12
Pressurization Rate Effect on Ligament Rupture and Burst Pressures of Cracked Steam Generator Tubes
Saurin Majumdar and K. Kasza, *Argonne National Laboratory*

14:55 – 15:05 **Refreshment Break**

15:05 Paper 5.13
Data Analysis Algorithms for Flaw Sizing Based on Eddy Current Rotating Probe Examination of Steam Generator Tubes
Sasan Bakhtiari and Thomas W. Elmer, *Argonne National Laboratory*

15:30 Paper 5.14
NDE Errors and their Propagation in Sizing and Growth Estimates
Dag Horn, Laura Obrutsky and Richard Lakhan, *Atomic Energy of Canada Limited*

15:55 Paper 5.15
Performance Evaluation of KANUPP Steam Generators for Operating them During Plant Life Extension
Afaque Shaikh, Moiz Khan, Adam Noora and Mohammad Shahin, *Karachi Nuclear Power Plant*

16:20 **Adjourn**

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Materials, Degradation and Inspection Posters

Paper 5.16P
A New Probe for Assessing the Thickness of Primary-Side Magnetite Deposits in Steam Generator Tubing
Brian Lepine, Richard Lakhan, L. Daveyand Joseph Renaud, *Atomic Energy of Canada Limited*

Paper 5.17P
Residual Solidification Stress in Plug Welds
Dorel Muth and Nick Idvorian, *Babcock & Wilcox Canada*

Paper 5.18P
Asset Tracking in Harsh Environments
Edward O'Neal, *InfoSight Corporation*

Paper 5.19P
ANL/CANTIA Code for Steam Generator Tube Integrity Assessment
Shripad T. Revankar and B. Wolf, *Purdue University*; Saurin Majumdar, *Argonne National Laboratory*; Jovica Riznic, *Canadian Nuclear Safety Commission*

Paper 5.20P
The Effect of Inspection Uncertainties in Predicting the Rate of Degradation in SG Tubing
D. Lu and Mahesh Pandey, *University of Waterloo*; Jovica Riznic, *Canadian Nuclear Safety Commission*

Paper 5.21P
Materials Database for SCW Reactor Development and Possible Applications in Advanced Power Generation
Gordon Gu, Wenyue Zheng and L-A Sullivan, *Natural Resources Canada*; David Guzonas, *Atomic Energy of Canada Limited*

Paper 5.22P
Analytical Modeling of Tube-to-Tubesheet Joints Subjected to Plasticity and Creep
Abdel-Hakim Bouzid and Nor Eddine Laghzale, *École de Technologie Supérieure*

Paper 5.23P
NDE Inspection Qualification for Steam Generator Tubes at Ontario Power Generation
Sean Sullivan, Ivan Vela, Tom Malkiewicz, T. Harasym and Gordon Bruce, *Ontario Power Generation,* John Huggins, *Kinectrics, Inc.*

Paper 5.24P
An Evaluation of the Statistical Variability in Thermal Expansion Properties of Steam Generator Tubesheet (SA-508) and Tubing Alloy (Alloy -660TT)
Peter C. Riccardella and John F. Staples, *Structural Integrity Associates, Inc.*; Joseph T. Kandra, *Westinghouse Electric Company*

Paper 5.25P
Research on Mechanism and Evaluation of Steam Generator Thermal Performance Degradation in NPP
Shi Huilie, Wang Xianyuan, Liu Hongyun and Wang Wei, *Research Institute of Nuclear Power Operation*

Paper 5.26P
Characterization of Oxides and Corrosion on a Steam Generator Tube Removed from Embalse Steam Generator No. 3 After 7287 Effective Full Power Days
Roberto Bordoni, Mauricio Chocron, Marcela Miyagusuku, Ana Ma. Olmedo and Arturo Burkart, *Comisión Nacional de Energía Atómica*; Narciso Fernandez, Diego Quinteros and Ricardo Sainz, *Nucleoeléctrica Argentina Sociedad Anónima*

Paper 5.27P
Advances in Production of Realistic Cracks to NDT Development and Qualification Purposes of Steam Generator Tubes
Iikka Virkkunen and Mika Kemppainen, *Trueflaw Ltd.*; Jean-Michel Tchilian and Joel Martens, *AREVA NP*

Paper 5.28P
Stochastic Evaluation of Electrochemical Noise Generation During SCC of Ni-based Alloys for SG Tubing at High Temperature Caustic Environments
Sung-Woo Kim and Hong-Pyo Kim, *Korea Atomic Energy Research Institute*

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Steam Generator Conference
November 8-11, 2009
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In all cases, after submission of form, fee payment may be made by phone if desired.

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