CANADIAN NUCLEAR SOCIETY

www.cns-snc.ca

President's Message

Doddy Kastanya

Dear fellow CNS members,

Welcome to the second issue of the 2023 CNS Newsletter. I would like to use this opportunity to provide you with some updates related to activities around the CNS since our last Annual General Meeting in June as well as providing you with a sneak peek of what you should expect to see in this edition of the CNS Newsletter.

In early July 2023, I attended the CNA CEO Retreat at the Millcroft Inn. in Alton, ON. The meeting was attended by major players in the Canadian nuclear community. There were lots of discussions related to the future of the nuclear energy in Canada. The latest development related to the announcement at Bruce Power and at OPG (which happened the day after the retreat) was discussed. Challenges related to the deployment of new fleets of reactors in Canada dominated the discussions throughout the day. Toward the end of the meeting, I had a discussion with the CEO of COG about the potential of CNS supporting some trainings to the employee of SNN in Romania. This potential collaboration aligns well with the vision of the CNS which places us as the organization of choice in Canada for the nuclear science, engineering, and technology community and its stakeholders seeking accurate information about nuclear related disciplines and issues.

As the new CNS council began its work, we held our first council meeting on July 28, 2023. During this meeting, the chair and co-chairs for all Divisions and Committees of the CNS were confirmed. In addition, the members of the council appointed Derek Mullin as a member of the council and subsequently as the 1st Vice President of the CNS to fill the gap left by Moe Fadaee after his resignation. With this new appointment, I passed the responsibility of chairing the organizing committee for the 2024 Annual CNS Conference to Derek. I am happy to let you know that the preparation for the conference is progressing well.

As you know, the main business of the CNS is organizing nuclear-related conferences. In our history, some of the conferences required the support of a Professional Conference Organizer (PCO) during the preparation and execution of the conference. So, we have executed a new initiative to hire a single PCO to support multiple conferences for a couple of years. Earlier this month, we have sent out the request for proposals to several PCOs to support our large conferences in 2024 and 2025. Mohamed Younis is leading the committee for this initiative.

Concerning the contents of this edition of the CNS Newsletter, you will find the usual reminders of upcoming events that might interest you as well as something new, a look back at one of our recent successful conferences. In this edition of the Newsletter, we shared sad news of the passing of two members of the CNS along with notes of their valuable contributions to the Canadian nuclear community. We are also fortunate to have a couple of contributions from our members – Jeremy Whitlock and Morgan Brown. To complete this edition, we include the essay from the first-place winner of the 2023 Student Essay competition.

Finally, I would like to thank Cheryl Tasker-Shaw for her support in gathering materials for this edition of the Newsletter and providing supervision throughout its production. It is wonderful to have Cheryl's continued support to the effort of publishing the CNS Newsletter throughout the years. However, I am sure she will welcome any members of the CNS who would like to volunteer in helping her out and sharing her joy through the journey. Don't be shy! It is a nice and productive way of showing your support to our organization and to the nuclear community in Canada.

Recent and Upcoming Events

From Chary, on ICI conference

During July 23-27, 2023, Canada hosted the 11th International Conference on Isotopes (11ici.org) in Saskatoon, one of a series of conference under the umbrella of the World Council of Isotopes (wci-ici.org). It was held as a joint partnership of the University of Saskatchewan, Sylvia Fedoruk Centre of Nuclear Innovation and Discover Saskatoon. The activities included a pre-conference summer school during July 20-22, 2023. Organized as several sessions in five tracks concerned with various aspects of isotopes from production, supply and demand, the impact of policies and regulations and the public perception of isotopes, this conference was well received by the international participants from over 20 countries. A special panel session of Marie Curie, Harriett Brooks and Sylvia Fedoruk was held to acknowledge the prominent roles of women nuclear scientists internationally and locally. Young participants' contributions was recognized by a best abstract award. The participants were reminded of ubiquitous presence of isotopes and their influence in scientific research in a session on isotopes in Cosmos and Astrophysics. The 12th conference will be held in Florence, Italy during February 2026.

Summer School

In July, the University of Saskatchewan and the Sylvia Fedoruk Canadian Centre for Nuclear Innovation hosted an Isotope Summer School in conjunction with the 11th ICI meeting. A dozen students and young professionals from countries around the world had the opportunity to learn about the science of radionuclides, while getting hands-on experience in a nuclear facility. Participants benefited from interacting with nuclear science experts from across Canada, while building their professional networks through small-group projects and presentations.

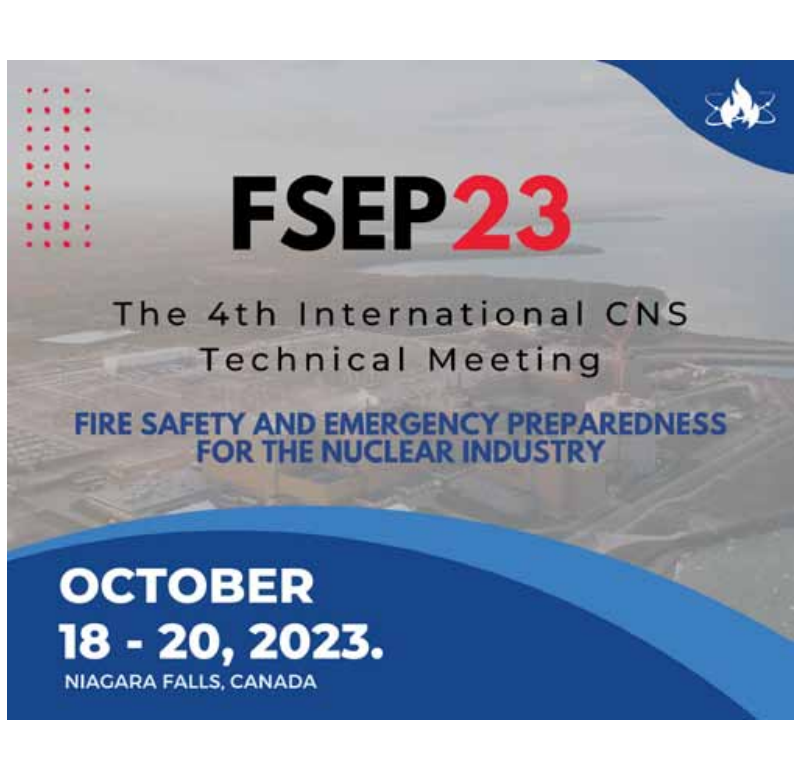
Canadian Workshop on Fusion Energy Science and Technology (CWFEST) 2023

OCTOBER 24 ALL DAY

The Canadian Workshop on Fusion Energy Science and Technology (CWFEST-2023) is a 1-day virtual event during which representatives from a number of fusion startups and organizations will discuss their successes and challenges in commercializing fusion energy.

This workshop is a collaboration between the Canadian Nuclear Society Fusion Energy and Accelerator Scienc and Technology Division (CNS-FEASTD) and the Fusion Energy Council of Canada (FECC).

Canadian Workshop on Fusion Energy Science and Technology (CWFEST) 2023 (xcdsystem.com)


FSEP23
The 4th International CNS Technical Meeting
FIRE SAFETY AND EMERGENCY PREPAREDNESS FOR THE NUCLEAR INDUSTRY
OCTOBER 18 - 20, 2023.
NIAGARA FALLS, CANADA

DIET 2023: Innovation Unleashed

Submit An Abstract Today!

The Canadian Nuclear Society invites you to be a speaker at the Fourth International Conference on Disruptive, Innovative, and Emerging Technologies in the Nuclear Industry. This conference will be held from November 6th to 8th 2023. Day 1 is hybrid (in-person & virtual), while Day 2 & 3 are virtual. The in-person venue will be in downtown Toronto at a central waterfront location, to be announced soon.

The theme of this year's conference is Innovation Unleashed. The CNS DIET 2023 Conference provides a forum for exchanging views, ideas, and information relating to DIET, such as Artificial Intelligence, Machine Learning, Data Analysis, Big Data, and Digital Twins. Visit our website to learn more.

The Technical Committee invites submissions in a wide array of technical areas within the nuclear industry, with the criteria for submission being: an abstract of fewer than 200 words, providing a brief background, objective, and highlights of the proposed presentation. (No paper is required!)

Deadline for submissions is September 17th!

Visit our online platform to get started on your application today!

Want to connect and network with the brightest minds in our industry? Early bird cut-off is September 30th. The capacity for **Day 1 (in-person) is limited**, secure your seat!

Register Now!

Connect with us:

Follow us on LinkedIn and Twitter, browse our website.

For general inquiries, please contact Meleana Conquer (Conference Coordinator)

Kevin Lee (Co-chair)
Moe Fadaee (Co-Chair)
Chris Cochrane (Technical Program Chair)
Daniel Foster-Roman (Plenary Program Chair)

Copyright (C) 2023 Canadian Nuclear Society. All rights reserved.

Our mailing address is:

Want to change how you receive these emails?
You can update your preferences or unsubscribe

The 21st International Conference on Environmental Degradation of Materials in Nuclear Power Systems – Water Reactors

The CNS' Materials, Chemistry, and Fitness-for-Service Division was extremely pleased to be able to host ENVDEG 2023 in St. John's Newfoundland from August 6-10. Over 150 delegates, enjoyed the conference and the wonderful city of St. John's.

Stuart Medway, the Chair of ENVDEG 2023 highlighted that the purpose of the 21st Environmental Degradation meeting was to foster an exchange between plant operators, industry and academic researchers concerning materials degradation issues and solutions in the nuclear power plants of today and the future.

This meeting covered issues facing nickel base alloys, stainless steels, pressure vessel and piping steels, zirconium alloys, and other materials in nuclear power systems. Components covered included pressure boundary components, reactor vessels and internals, steam generators, fuel cladding, irradiated components, fuel storage containers, and balance of plant components and systems. Also included was a look to the future with sessions on advanced manufacturing methods, SMRs and Gen IV reactors.
Thanks also to Ontario Power Generation for being the Host Sponsor and to Chief Nuclear Engineer Mark Knutson for giving the opening plenary talk at the conference. Special thanks also to the other sponsoring organizations: Canadian Nuclear Laboratories, Dominion Engineering Inc., EPRI, KAERI, Naval Nuclear Laboratory, and Studsvik. The success of the conference was only possible with their generous sponsorship and support.

Also thanks to the Organizing Committee: Stuart Medway (Chair), David Morton (Technical Chair), Mychailo Toloczko, to the CNS MCFD Chairs, Mohammadreza Baghbanan & Daniel Gammage, and to PCO Flavia StClair who did a wonderful job coordinating the event. The CNS looks forward to the next opportunity when ENVDEG comes to Canada to be host once again

WELCOME TO THE
21st INTERNATIONAL CONFERENCE ON
Environmental Degradation of Materials in Nuclear Power Systems - Water Reactors

Core Business Blog

by Neil Alexander

Over the last year and a half, I have been working with the executive and council to develop a communications strategy that will get the maximum effect from the resources we can commit. While the main objective has always been to raise the public's understanding of nuclear issues a main concern has been how to respond to the volumes of misinformation that tend to circulate and which, through repetition, progressively become what the public believes to be the truth.

One thing we recognized early on is that we are all at our most persuasive when we speak to people in our own communities and that to do that everyone to needed good answers to the questions they might get. To enable people to respond effectively we have set up:

1. The core business blog. This is a blog about issues that are coming up in the media. The blogs provide the facts behind arising issues and suggest ways to talk about them. It Is set up to be a dialogue so that ideas can be shared so that we can progressively learn from each other. While it is aimed at our members it is available to the public and we hope the media will begin to use it as a resource.

The core business blog can be found on the CNS website under publications, or you can click here https://www.cns-snc.ca/the-core-business-blog/ and go directly to it.

2. A series of virtual Lunch and Learns. These occasional events address key issues that are in the news and allow you to learn directly from the people involved as to what is going on. I am very much looking forward to speaking with Chris Mudrick of Bruce Power about their new build opportunity on September 6th and hope that you will be able to listen in.

We hope that providing this information to you will help you speak with people about the issues and confidently correct the things they may have read in the media.

In parallel, we wanted to directly address the misinformation at its source and so we have been responding to media articles. This has been a bit like whack-a-mole with the added complication that hitting these moles just seems to encourage them to pop up more frequently. It turns out that they are immune to both common sense and facts! We have learned that our resources limit it us to responding to only the most egregious examples.

Instead, we have decided to try and get ahead of the story and get the facts out before the anti-nuclear campaigners can corrupt them. This should at the very least mean that people will question what the anti-nuclear campaigners say and will prevent them from having the free ride they have tended to have in the past.

We intend to do this by generating a series of "CNS statements" that will take relevant nuclear subjects and explain them in a way that helps the public understand them in appropriate context. These statements will not be like the nuclear fact sheets produced by the Canadian Nuclear Association, nor will they lobby for any particular outcome, but they will explain the subject matter in a way that is meaningful.

It's a lofty ambition and it's going to take support from our membership. To make sure we get that support we are creating a steering committee for the program (I will be announcing its members shortly). This steering committee will decide on the subjects to be addressed; help choose the people that will be on the subject specific subcommittees; and decide when the statements should be sent to the council for approval.

This approach, which includes many checks and balances, will enable us to produce robust, relevant and profoundly safe statements that will have a long shelf life.

This coming year is going to be an exciting one for the CNS communications program!

Dispatch from the Danube

The Problem of "Near-Zero"

Jeremy Whitlock
July 26, 2023

Contrary to the portrayal in this summer's "Oppenheimer" (and now widespread public belief), the atomic scientists did not worry about the Trinity test igniting a fusion excursion in the atmosphere and destroying the world.

The prospect was raised early in the Manhattan Project, investigated, and discarded.

They did continue to discuss and joke about it, and the hook of the tone-deaf scientist has always been publicly tantalizing – long before "Big Bang Theory" cashed in on it.

Unfortunately, scientists typically avoid saying something won't happen, preferring instead 'near zero' probabilities – because that's how the universe works.

"Almost certainly" is as close as I think I've heard anyone get in this business.

This fundamental fact has been at the root of science's public communication problem for centuries, culminating in our cultural fear of radiation – initiated by the mushroom cloud, fuelled by the cold war, leveraged by Hollywood and other beneficiaries.

It's why most people think low levels of radiation are dangerous, and largely why we're still polluting our planet to generate electricity nearly a century after learning how to avoid this.

The public, of course, intrinsically accepts "near zero" whenever they cross the road, but for anything related to radiation this will not stand: the consequences are that abhorrent.

Thus, we see modern nuclear waste technologies – from geological repositories to near-surface disposal – vilified despite objectively representing our most sustainable industrial waste strategies.

We celebrate any announcement of a new reactor project like it's 1950 and we're being innovative in saving the planet.

We wring our hands over the release to the sea of tritiated Fukushima water, which is cleaner than the sea itself.

We live in fear of the next nuclear incident anywhere, however small, lest it cause another country like Germany to turn its back on progress.

At the end of "Oppenheimer" we are reminded that the events of 1945 did, in fact, initiate a chain reaction that may still destroy the world: the arms race.

It actually initiated another chain reaction that has killed thousands more over the decades since, and presents an equally sobering existential threat: public fear of radiation.

Sitting in the dark at the IMAX in Vienna, listening to the gasps of disbelief around me as General Groves learns that his giggling scientists are taking bets on whether the 'Gadget' will destroy New Mexico, the USA, or the world – I couldn't help but feel doomed.

A "nuclear family"

by J. Ungrin

Wikipedia defines a nuclear family as "an elementary family or conjugal family group consisting of two parents and their children (one or more). It is in contrast to a single-parent family, the larger extended family, or a family with more than two parents."

Jim Ungrin, Artifacts Chair of the Society for the Preservation of Canada's Nuclear Heritage Inc. (SPCNHI) recently learned from his neighbour, Terry Cooper, that the "nuclear family" can have a much different meaning for the nuclear industry.

The story begins with Allan Cooper who joined Atomic Energy of Canada Limited (AECL) in Chalk River as an engineer in 1964. He later left AECL and joined Ontario Hydro where he worked at Nuclear Power Demonstration (NPD) as a Licenced Shift Manager until it was shut down in 1987. He then rejoined AECL and eventually, post retirement, worked as an engineer at Cernavoda in Romania, where he was part of the Canadian construction/commissioning team for the CANDU reactors being built there.

Allan and his wife Ruby had four sons, Terry, Dave, John and Brent. They all caught their father's enthusiasm for the nuclear industry and found careers in it. Terry became an Authorized Nuclear Operator (ANO) (formerly known as First Operator) and worked for many years at Bruce B Nuclear Generating Station (NGS); Dave also became an ANO at Bruce B NGS; John became a Supervising Nuclear Operator at Bruce B NGS. Finally, Brent, who started out as an operator at Bruce A NGS, moved on to Pickering NGS, then on to MAPLE at CRNL where he became a Licenced Operator and, finally, he joined the Canadian Nuclear Safety Commission (CNSC) and served as a CNSC Inspector at Chalk River.

A remarkable family story. However, it does not end there. The enthusiasm for things nuclear spread to the third generation of the Cooper family. Terry's son, Allan (named in honour of his grandfather), became an ANO and Shift Manager at Pickering NGS, while another son, Kurtis, has become a Mechanical Supervisor at Bruce A NGS. Meanwhile, John's son, Michael, followed the Cooper family tradition and became a Control Technician at Bruce B NGS.

The Cooper family involvement in things nuclear was not a male-only affair. Dave Cooper's daughter, Jenna, became an ANO at the Darlington NGS and then moved on to Bruce NGS, where she became a Shift Manager.

The success of the Canadian nuclear industry has been a story of many people and many families. The Cooper family is the only known family with three generations licenced to operate a nuclear facility in Canada. Their contributions have been large enough that perhaps we should try to convince Wikipedia to list a second meaning for their definition of a "nuclear family."

SPCNHI continues to welcome contributions about the nuclear industry. Contributions are most often centered on technical successes or events but, as this anecdote illustrates, there are many stories about the people that need to be told. Please send your always-welcome hard-copy contributions to the Society for the Preservation of Canada's Nuclear Heritage Inc., Box 441, Deep River, ON, K0J 1P0 and digital ones to info@nuclearheritage.ca. If you are visiting in the Deep River area, please contact us to arrange a tour of our museum; you can also visit us with a virtual museum tour at nuclearheritage.com

Why Should We Build Small Modular Reactors in Canada?

Rehaan Ghimire
O'Neill Collegiate and Vocational Institute
[First Place Winner of the 2023 Essay Contest]

1. Introduction

1.1 Energy Security and Nuclear Power

Energy is one of the most important factors affecting our quality of life. With a global population of 8 billion by the end of 2022, ensuring energy security and decarbonizing electricity generation has become a pressing concern. Our current electricity generation systems generate vast amounts of greenhouse gases and other pollutants, contributing to environmental degradation and accelerating climate change—a real existential threat for humanity [1]. As a high school student, I am fully aware of the current energy crisis, especially in Asia and Africa, where substantial populations reside. It is imperative that we focus on reliable,base load power from clean energy sources to address this issue and decarbonize the electricity generation and auto industry. In my school and through various media channels, I have learned about nuclear energy and its potential benefits for energy security and decarbonization through the use of small modular reactors (SMRs) [2,3]. Nuclear energy, which is generated by the fission (i.e., splitting atoms and releasing energy) of uranium or plutonium, could prove to be a viable solution to tackle these challenges in both developing and developed countries. Canada is a Tier 1 nuclear country, possessing full capability in nuclear technology and a well-established supply chain. Approximately 60% of Ontario's electricity comes from nuclear power thanks to the homegrown CANDU (CANadian Deuterium Uranium) nuclear technology, which has been successfully utilized in Canada (mainly in Ontario) and other countries like Argentina, China, India, Pakistan, Romania, and South Korea since the 1970s. Furthermore, Canada boasts a long history of operating nuclear reactors for electricity generation, including research and test reactors [4]. However, conventional reactors are relatively bigger, more expensive, and take a significant amount of time to construct. As a result, big nuclear reactors are less competitive (in terms of construction time and costs) compared to other energy sources, such as gas-fired or coal-fired power plants [5].

1.2 Small Modular Reactors in Canada

To make nuclear power more competitive than other power production methods and ensure future energy security, a small modular reactor (SMR) can be constructed easily within a short time frame. Their lower capital investment and modular design can substantially increase their adoption worldwide. While the primary working conditions of both large and small reactors are the same, SMRs are specifically designed to produce less power (i.e., between 10 and 300 Megawatts Electrical (MWel)), featuring small size, simplicity, modular design (i.e., factory manufacture), and relatively short construction times [5,6]. Consequently, these reactors can be deployed quickly, even in remote locations such as the Canadian Arctic. Canada has recently launched its SMR road map, giving top priority to this emerging nuclear technology. It is considered the 'next wave of nuclear innovation' and has the potential for decarbonization of electricity generation, leading to the development of this new technology [7,8]. Moreover, Ontario, Saskatchewan, New Brunswick, and Alberta have signed a memorandum of understanding (MOU) to collaborate and leverage the advantages of this emerging nuclear technology. Therefore, SMRs are receiving top priority from different levels of government and provinces in Canada [2,3].

2. We Should Build SMRs in Canada for the Following Reasons:

2.1 Energy Security and Decarbonizing Electricity Generation:

Still, different provinces such as Saskatchewan, Alberta, and the Arctic territories' primary source for electricity generation is fossil fuels. On the other hand, Ontario relies significantly on nuclear energy (i.e., 60% electricity of Ontario comes from nuclear) and 36% in New Brunswick (contributing to about 15% of Canada's total electricity) [4,9]. However, some aging reactors will need to be decommissioned in the next decade, creating a demand for clean energy alternatives (i.e., SMRs) to replace these closed or decommissioned nuclear reactors in Ontario. Additionally, significant reductions in carbon emissions are necessary in other provinces and territories to achieve our net-zero targets by 2050 [7]. Hence, building SMRs is imperative to decarbonize electricity generation and meet our net-zero targets.

2.2 Remote and Mining Community Energy Needs and Decarbonization:

Remote communities in Canada, including those in the Arctic, depend on diesel generators for their electricity needs. The transportation of diesel fuel and generators is challenging in those locations [7,8]. As a result, people living in Nunavut (Canada) are paying more than five times the amount for their electricity compared to those in southern Canada. SMR can replace diesel generators and provide electricity at a significantly lower price. Additionally, remote mining and resource extraction companies can utilize this clean technology for reliable energy and reduce emissions [10].

2.3 Economic Benefit – International Markets:

The potential global market for SMRs is estimated to reach $150 billion annually by 2040. Canada can capitalize on this vast SMR market by successfully constructing and demonstrating grid-scale SMRs [7]. Canada has already exported its homegrown CANDU technology and successfully demonstrated its capability to export nuclear technology. CANDU technology is highly regarded for its energy production and safety, as there have been no nuclear incidents reported from CANDU nuclear power plants until now. Therefore, we can also leverage our nuclear success to develop CANDU SMRs and other home grown SMR technologies [4].

2.4 Flexibility:

One of the unique features of SMRs is their small sizes, modular design and factory manufacture. So, if a small population needs limited power (for instance 300 MWel or less), in that case, we can construct SMRs according to their needs. Over time, if the population increases or industries are established and more electricity is needed, we can add new modules to the existing ones. Since all the infrastructures are the same, adding new modules would be cheaper and easier than constructing new SMRs [5].

2.5 Cost:

One of the most concerning factors for the success of nuclear power is its construction and operation costs. Conventional reactors (>1000 MWel) require ten billion dollars and sometimes go over budget due to inflation over time. However, since SMRs are small, the initial cost of building the plant is much less than constructing a much more complex, non-modular, sizeable nuclear plant. Being relatively cheaper than a large reactor, SMRs present a smaller-risk venture for power companies compared to large nuclear power plants [5,7].

2.6 Safety and Security:

Regarding safety, SMRs are inherently safe reactors with passive safety systems, such as natural circulation (i.e., gravity-driven), which reduces the risk of severe accidents. Due to automated techniques and small size, these reactors can run with little supervision, resulting in cost savings for operations. Additionally, due to inherent safety features, most SMRs have good potential for locating near population centers [4], thereby reducing electricity transport costs and ultimately lowering the cost to customers [5,7].

2.7 Jobs:

In Canada, the nuclear sector contributes $6 billion annually, providing 30,000 direct and indirect jobs. It is expected that SMRs will create an additional 6,000 direct and indirect jobs per year between 2030 and 2040, particularly in Science, Technology, Engineering, and Mathematics (STEM) fields. Consequently, the development of SMRs can be the cornerstone for economic prosperity in Canada [7].

2.8 Technological Advancements:

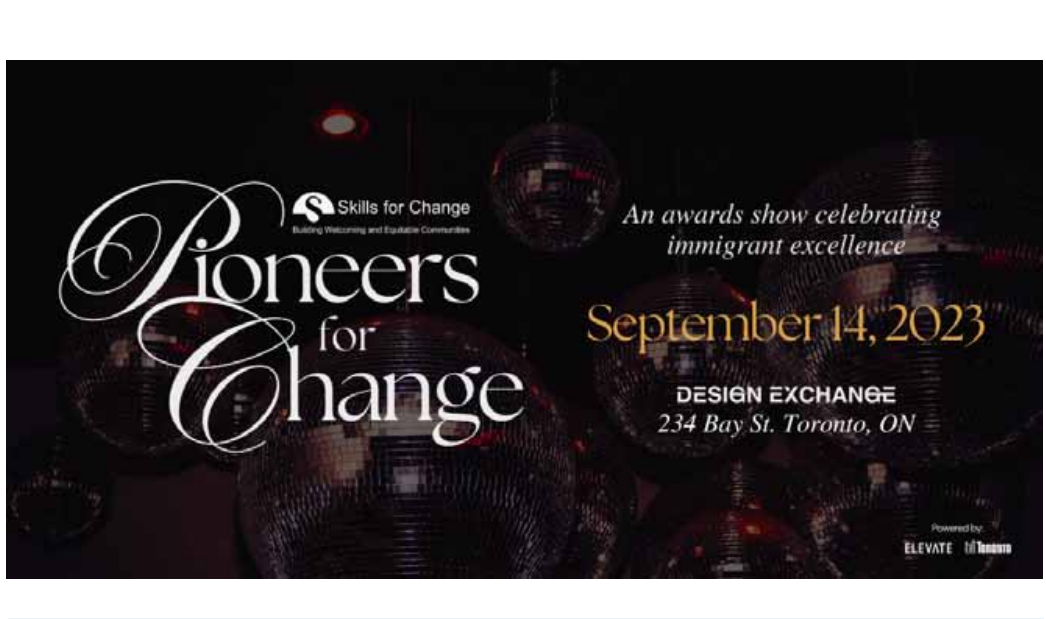
As Canada is already a leading nuclear nation, investments in research and development (R&D) for SMR technology development, demonstration projects, and finally, constructing a grid-scale SMRs can further enhance Canada's capabilities and nuclear technology competitiveness in the world nuclear reactor design arena [7].

3. Conclusions

Due to its small size, modular design, high safety, and low costs, the SMR can revive nuclear energy for electricity production and help achieve net zero by 2050. Additionally, it can accelerate Canada's technological advancement, nuclear leadership on the world stage, and job creation. Therefore, I urge all levels of government to build SMRs and take advantage of this clean technology.

References

1. Tcvetkov, P., 2021, "Climate Policy Imbalance in the Energy Sector: Time to Focus on the Value of CO2 Utilization," Energies 2021, 14(2), 411, https://doi.org/10.3390/en14020411
2. CBC news, 2023, "Alta., Ont., Sask. and N.B. sign agreement to explore small nuclear reactor,". accessed Jan. 22, 2023, https://www.cbc.ca/news/canada/edmonton/nuclear-reactors-clean-energy-option-1.5986796
3. Prince Albert Daily Herald, April 14, 2021, "Alberta joins Saskatchewan, Ontario and New Brunswick in nuclear reactor partnership," accessed Jan. 20, 2023, https://paherald.sk.ca/alberta-joins-saskatchewan-ontario-and-new-brunswick-in-nuclear-reactor-partnership/
4. International Atomic Energy Agency (IAEA), 2022, "Country Nuclear Power Profiles 2022 Edition, Canada," accessed Jan. 25, 2023, https://cnpp.iaea.org/countryprofiles/Canada/Canada.htm
5. Carelli, M. D., and Ingersoll, D. T., eds., 2015, Handbook of Small Modular Nuclear Reactors, 1st ed., Elsevier, Woodhead Publishing, U.K., p. 501.
6. International Atomic Energy Agency (IAEA), 2022, "Advances in small modular reactor technology developments. A Supplement to IAEA Advanced Reactors Information System (ARIS)," Vienna, Austria, accessed Dec. 6, 2022, https://aris.iaea.org/Publications/SMR_booklet_2022.pdf
7. Canadian Small Modular Reactor Roadmap Steering Committee, 2018, "A Call to Action: A Canadian Roadmap for Small Modular Reactors," Ottawa, Ontario, Canada, accessed Dec. 1, 2022, https://smrroadmap.ca/wp-content/uploads/2018/11/SMRroadmap_EN_nov6_Web-1.pdf?x64773
8. SMR Action Plan, 2022, "Canada's SMR Action Plan Progress Update," accessed Jan. 12, 2023, https://smractionplan.ca/sites/default/files/full_approved_progress_update_en_access.pdf
9. Canada Energy Regulator, 2023, "Provincial and Territorial Energy Profiles – Canada," accessed Jan. 12, 2023, https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-canada.html
10. International Atomic Energy Agency, 2021, "Benefits and Challenges of Small Modular Fast Reactors: Proceedings of a Technical Meeting," IAEA, Vienna, Austria, Report No. IAEA-TECDOC-1972, accessed Dec. 1, 2022, https://www.iaea.org/publications/14928/benefits-and-challenges-of-small-modular-fast-reactors



The recipient of our 2023 Pioneers for Change Alumni Award is....

Dr. Mohinder Grover

Dr. Mohinder Grover is an electrical engineer specializing in Dependability (a collective term for Reliability, Maintainability, Availability and Maintenance Support) and Quality Assurance. In his over 40 years in the nuclear industry, he has worked at Ontario Hydro (OH), Ontario Power Generation (OPG), Atomic Energy of Canada Limited (AECL) and Candu Energy. At OH / OPG, he won several accolades for his technical and volunteer work. He was awarded AECL President's Distinguished Merit Award in 2008 for demonstrating leadership and technical excellence in Quality Management / Quality Assurance. In 2001, for his exceptional volunteer work, Pickering Nuclear awarded Dr. Grover the Volunteer Service Medal to mark the Year of Volunteers.

Dr. Grover has been volunteering for several technical and charitable organizations. He has been a supporter and mentor at Skills for Change for almost 20 years, and has mentored several International Engineering graduates over those years helping them settle in Canada, find a job and / or obtain Professional Engineer License in Ontario. Several of his mentees have remained in contact with him much after the formal mentoring relationship had come to an end. In recognition of his mentor work, Skills for Change has awarded Certificates of Appreciation to Dr. Grover. Dr. Grover says that by helping his mentees to achieve their goals, he drives a lot of joy and satisfaction by being a part of their success. Dr. Grover also mentors for Professional Engineers Ontario, Standards Council of Canada and World Sikh Organization.

In addition to Skills for Change, Dr. Grover has been volunteering at several professional and charitable organizations. To name a few, this includes Professional Engineers Ontario (PEO), the International Electrotechnical Commission (IEC) Technical Committee 56, United Way, White Ribbon Campaign, Terry Fox Foundation, Habitat for Humanity, Gursikh Sabha Canada (A Sikh place of worship), and Mosaic Interfaith.

Dr. Grover has represented Canada on the IEC Technical Committee 56 for over 30 years. In 2012, he was awarded the prestigious 1906 IEC award in recognition of his long standing and distinguished service to IEC in its standardization work.

For his many years of volunteer work with different organizations, Dr. Grover has been bestowed with several honours and awards, both by technical and charitable organizations. Some of these honours / awards include: Sovereign's Medal for Volunteers awarded by the Governor General of Canada (2022), invested as a Member and then later on as Officer of the PEO Order of Honour (2017 & 2022), appointed as the Fellow of Engineers Canada (FEC) (2010), Engineering Institute of Canada (FEIC) (2017), and Canadian Nuclear Society (FCNS) (2021), Letters of appreciation given by Terry Fox Foundation for raising funds(~$ 60,000) by participating in Terry Fox Run for 38 consecutive years, Certificate of appreciation by Standards Council of Canada for 30 years of volunteer contribution (2020),), recognition by PEO for 20 years of volunteer service to engineering profession (2019), honour bestowed by the Premier of Ontario (by Order-in-Council) with appointment to Ontario Honours and Awards Advisory Council (2016-2019), Meritorious Service Award for Community Service conferred by Engineers Canada (2013), Ontario Medal for Good Citizenship invested by the Government of Ontario (2010), several Volunteer Services awards given by the Government of Ontario (2011 – 2019), Citizenship Award presented by PEO & Ontario Society of Professional Engineers (OSPE) (2009), and several others.

Congratulations Dr. Grover!

Dear SfC Supporter,

Our annual Pioneers for Change fundraiser gala celebrates the diverse and inclusive Canada. Through this event, we commit to not only celebrating the achievements of immigrants, but also to breaking down systemic barriers for newcomers to thrive in their new country.

Our past winners include:

- **Adrianne Clarkson** (Former Governor General of Canada)
- **Robert Herjavec** (Canadian Businessman and star of Shark Tank)
- **Altaf Quadeer** (Former Skills for Change Client and Teacher)
- **Cameron Bailey** (CEO of the Toronto International Film Festival)
- **Aleksandar Antonijevic** (Principal Dancer at the Canadian National Ballet)
- **Joe Mihevc** (City Councilor)
- **Mohamad Fakih** (CEO of Paramount Foods)

On September 14, 2023, Join us at the Design Exchange in Toronto for a night of inspiration as we celebrate the outstanding contributions of immigrants in Canadian society. This year, we're commemorating not only three decades of this incredible event but also the remarkable 40-year journey of Skills for Change. You won't want to miss out!

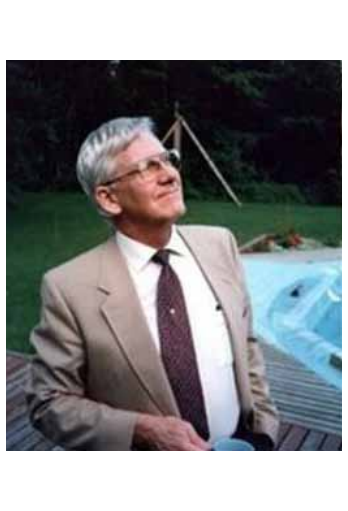
Buy Your Tickets Today

www.eventbrite.ca/e/pioneers-for-change-tickets-601463001027?aff=oddtdtcreator

Want to be a sponsor?

Reach out to Sampada Kukade at skukade@skillsforchange.org

HELGI "VERN" AUSTMAN
(1930 – 2023)



It is with sadness that we report the passing of Helgi "Vern" Austman. On Sunday, July 16th, 2023, Vern succumbed after a three-year struggle with Parkinson's disease. All his family were at his side through his last few days, in his home at Trillium Court in Kincardine, Ontario.

Vern was born in the Sveinbjornson family farm house, in Elfros, Saskatchewan, on July 28th, 1930, the son of Sigurjon (Sam) Austman and Gudny Lovisa (Louise) Sveinbjornson. He grew up in Calgary, Alberta, along with his five siblings: Doreen, Karin, Myrna, Diana and Neil.

Vern attended the engineering program at the University of Alberta in Edmonton before embarking on an eventful career lasting over 40 years in Canada's nuclear power program. He was involved in the commissioning of many of Canada's CANDU reactors, starting with the very first at Rolphton, Ontario, and culminating with Ontario's most recent at Darlington. He served as the plant manager at both Bruce NGS A and Darlington NGS. He also served as commissioning manager for a pair of CANDU reactors in Rajasthan, India.

Vern married the love of his life, Frances (née Gardener), on July 19th, 1952, in Calgary. Together they raised four children, Daniel (Susan), Gord (Margie), Sam (the late Katherine), and Kristin. All three sons carried on in their father's footsteps in the nuclear power industry. Kristin carried on her father's love of education, self-improvement, and helping others.

Vern will be dearly missed also by his siblings Karin (Dennis), Myrna (Mike), Diana and Neil (Brenda) and by many grandchildren and great-grandchildren.

Vern was predeceased by his parents, sister, Doreen, daughter-in-law, Katherine and great-grandchildren, Jack, Josephine and Steven.

Besides his family and his work, Vern's greatest passion was for genealogical research, and he was fiercely proud of his entirely Icelandic heritage. He also delved deeply into studies of physics and geology, the latter no doubt inspired partly by the spectacularly unique geology of his homeland.

Vern's family extends heartfelt thanks to all the staff in Long Term Care at Trillium Court and to Dr. Gurbin. Their kindness and hard work made his last year as bearable as possible under the circumstances. (Dr. Gurbin was also our family doctor for a couple of years in Kincardine in the 1960's!) Vern also received excellent care at Brucelea Haven in Walkerton, and at the Chesley and Kincardine Hospitals.

A celebration to honour Vern's life will be held at Trillium Court, 550 Philip Place, Kincardine on Thursday, August 10th, 2023 from 2:00 to 4:00 p.m.

If you wish to remember Vern in a substantial way, please do so with a donation to your community hospital or to a charity of your choice.

Dr. Derek H. Lister, C.Eng., Professor Emeritus, Member of the Order of Canada (1939 – 2023)

It is with sadness that we report of the passing of Dr. Derek H. Lister, former NSERC Senior Industrial Research Chair in Nuclear Engineering, Department Chair of Chemical Engineering and Professor Emeritus (2006). Derek passed away peacefully on July 12th, 2023 at the Ruddy-Shenkman Hospice in Kanata, Ontario following a short battle with brain cancer.

After a successful career in the nuclear industry that began in 1962 with the Atomic Power Division of the English Electric Co. Ltd in England, followed by 23 years at Atomic Energy of Canada Ltd, Chalk River, Derek moved to the University of New Brunswick in 1992 to take up the NSERC/NB Power/AECL Industrial Research Chair in Nuclear Engineering. The internationally renowned expertise Derek brought to UNB from his career at AECL encompassed the fields of chemistry and corrosion in nuclear reactor coolant systems and he quickly established a formidable research group and laboratory focused on three main areas: radioactivity and mass transport in primary reactor coolants; flow-accelerated corrosion (FAC) in primary and secondary coolant systems; and fouling under heat-exchange conditions.

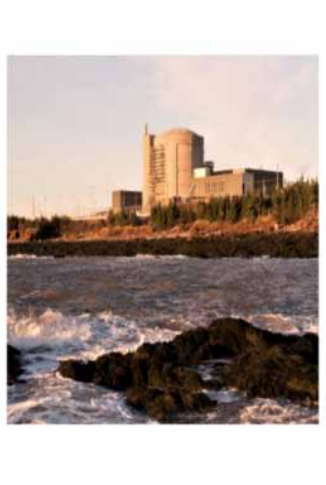
Following his "retirement" in 2005, Derek was quickly awarded Professor Emeritus status (2006) where he continued his research activities until he could no more. In recent years, in addition to the key areas highlighted above, Derek had expanded R&D activities into related fields including studying the impact of film-forming substances on corrosion and the mechanisms of their action - a new area of coolant chemistry and control gaining significant interest internationally. Over his 30+ years at UNB, Derek supervised over 100 graduate students (PhD's and MSc's), 9 Post-Doctoral Fellows and hosted 6 visiting Research Scientists. He published extensively, producing over 50 peer-reviewed journal articles, numerous book chapters and endless contributions in conference proceedings, many as invited keynote speaker, all in addition to the scores of commercial reports produced for industry collaborators.

Throughout his career, Derek was a key technical resource lending his expertise to numerous organizations. He has served on the scientific advisory boards for Atomic Energy of Canada Ltd, the Nuclear Waste Management Organization, the University Network for Excellence in Nuclear Engineering (UNENE) and UNB's own Centre for Nuclear Energy Research (CNER). Internationally, Derek was a core member of Nuclear Plant Chemistry (NPC) conference series organizing committee and a long-standing and productive member of the Power Cycle Chemistry Working Group of the International Association for the Properties of Water and Steam (IAPWS). As a testament to his impact and career, on December 27, 2019, Derek was appointed as a Member of the Order of Canada, the second highest honour of merit awarded to Canadian citizens, "For his contributions to nuclear energy research and improvements to occupational safety."

Derek was a respected and long-standing colleague, scientist, teacher and mentor throughout his career and will be missed. In accordance with Derek's final wishes, in lieu of a public memorial service, his family will be holding a private memorial dinner in his honour at some date in the future.

Join or Renew CNS Membership

Reasons to become a member of the CNS



- Take advantage of many excellent opportunities to grow professionally by meeting and networking with colleagues in Canada and internationally.
- Many volunteer positions are available which offer opportunities to grow personally by learning and networking with others in Canada's nuclear field.
- Receive special member registration fees to CNS Conferences and Courses.
- Membership is free for students and discounted rates are available for retirees and recent graduates!
- Receive early notices by e-mail of many other items of interest

Membership fees:

- $92.00 for regular members, and $86.40 for each additional year
- $54.10 for retiree members, and $48.40 for each additional year
- $31.00 for student members from outside Canada
- **Free for Canadian students! As part of the registration process, you will be asked to confirm your full-time-student status (student card or other institution documents) in the current year. Once that confirmation is received, your membership will be approved.**
  Note: to be eligible for the student fee for CNS conferences and courses, you must be a CNS student member in good standing.

The Canadian Nuclear Society Head Office:

998 Bloor St W., #501
Toronto, ON
M6H 1L0