CSSE SCIS
The Canadian Society of Senior Engineers | La Société canadienne des ingénieurs séniors

October 2021

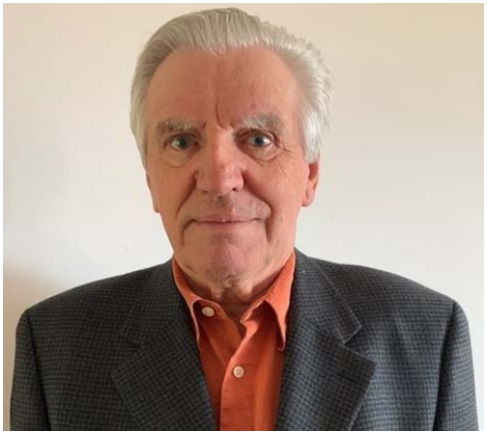
Volume 18, Issue 3

Experience MATTERS!
L'expérience, ça compte!

CSSE Newsletter

Inside this issue:

President's Editorial



President Guy Van Uytven

CSSE/SCIS is an EIC society and as president I attended on 19 September their Council Meeting. Among the issues discussed let me quote the following:

"President's Report: President **Dolatabadi** remarked that, pursuant to two postponements in 2020 and 2021, the EIC Awards Gala will hopefully now take place on 30 April 2022. We are anticipating strong participation given the triple cohort of winners to be recognized. The deadline for nominations for 2022 awards is 15 November (midnight) and President **Dolatabadi** invited all Council members to encourage their members to nominate candidates reflective of EDI (equality, diversity and inclusion) concerns." Click on the following link to view the nominating process: eic-ici.ca/honours_awards/nomination/

"Strategic Conferences Planning (SCP) Chair **Reg Andres** mentioned that the White Paper drafting effort caused him to question the continuing appeal of the current theme (Sustainability in the North) and attempting to collaborate with other organizations that are also invested in Northern interests. He now believes that broadening the scope to sustainability in general and focusing on multi-disciplinary solutions might have greater appeal with constituent societies. He intends to call a meeting of the SCP this October to discuss and come to an updated consensus on the theme and specific plans on how best EIC societies could collaborate on it". Because of my personal interest in a North American Supergrid (see my opinion pieces in this website under Papers) I have asked to be included in this SCP October meeting and will report on it in the next Newsletter.

(Continued on page 2)

A member society of the Engineering Institute of Canada
Une société membre de l'Institut canadien des ingénieurs

President's Editorial *(Continued)*

"History & Archives (H&A) Chair **Suzelle Barrington** presented her committee report mentioning that the last five months had been very active with three meetings focused primarily on the Oral History Interviews Project. Seven societies plus the EIC contributed $10.5K in year one, matched by MITACS funding. Fourteen interviews have been conducted and a couple more are still in the works. The outcomes are edited video and written transcripts that will be published on EIC's site and archived at the OTU Library. In addition, articles describing the project have been distributed through various society channels. Next year, the plan is to hire two interns to double the interviewing productivity. **Suzelle** noted that the pledged project funds are short just $1.5K to allow this and both the CNS and the CMBES are considering participating. The goal of using the videos/ transcripts to help promote engineering careers amongst the youth has been added to the project, and it is hoped that articles based on interviews content will eventually be published".

"UN Climate Change Conference: Exec Dir **Gosselin** informed Council that he had registered CSCE member **Darrel Danyluk** and four University of Calgary graduate students, to formally represent the EIC as observers at the upcoming UN Climate Change Convention in Glasgow, Scotland. Their travel expenses are being subsidized/funded by U of C. A participation report is expected to be produced after the event and will be circulated to Council". CSSE Fellows Dr. **Soheil Asgarpour** and **Ken Putt** subsequently met with **Darrel Danyluk** to ensure he was aware of the work Canada had done within the Petroleum Technology Alliance Canada PTAC on fugitive methane detection, monitoring, mitigation and use.

On 16 September our Edmonton CSSE branch organized a PowerPoint presentation by **Bruce Peachey** on the Alberta H.E.R.O. project (Hydrogen Economy Retrofit Option). Nice to see that other branches are starting to emulate Victoria's highly successful conferences which are presented the first Friday of every month (October to June). The Victoria conferences can be attended virtually for a $10 nominal administrative fee.

The Vancouver Island Engineering Society (VIES), our CSSE Victoria unit and EGBC (Engineers & Geoscientists BC) are pleased to jointly present these sessions.

Upcoming scheduled conferences for this year are:

5 November: ***Small Modular Reactors (SMRs)*** presented by **Brent Smith**, Manager Operational Readiness, Advanced Reactor Development.

3 December: ***The Emerging Hydrogen Economy***, presented by Dr. **David Layzell**, Professor & Director Canadian Energy Systems Analysis Research, University of Calgary.

Guy Van Uytven, P.Eng., MBA, FCSSE
President CSSE/SCIS

Nominations for CSSE and EIC Awards

Once again it is time to initiate our Society's Honors and Awards nominations process for awards to be presented in 2022. The process is not burdensome. The instructions are straight forward.

Please refer to our Standard Operating Procedures (SOP 6 & 7) - seniorengineers.ca/csse/wp-content/uploads/2019/10/CSSE-SCIS-SOPs-2018May12.pdf - which provide detailed guidance for Members wishing to submit nominations. It is hoped to attract accomplished nominees from our Members from across Canada. If, as a proposed nominator, you have any questions, please feel free to contact Colin Smith.

CSSE-SCIS Fellowship and Honorary Membership Nominations for 2022

Nominations are to be submitted by email to **Colin Smith** by November 30, 2021. (colinsmith.ca@gmail.com)

Engineering Institute of Canada (EIC) Honours and Awards for 2022

CSSE Members are also eligible to be nominated for EIC Fellowship and Medals. Please refer to EIC's website for nomination instructions eic-ici.ca/honours_awards/nomination/. EIC's deadline is November 15, 2021.

CSSE Director, Dr. **Robin Black**, FCSSE, is the CSSE Member on the EIC Honours, Awards and Fellowships (HAF) Committee.

Colin Smith, PEng, PE, FCSSE, Chair, CSSE Honors and Awards Committee

News from our Members

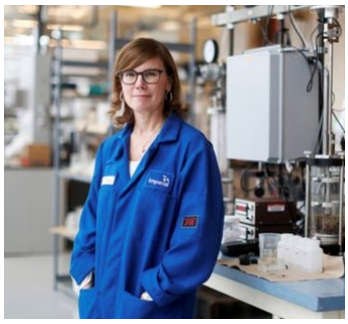
CSSE congratulates its Fellow Dr. **Dena McMartin** FEC, FCSSE for her appointment as University of Lethbridge Vice President (Research)

The CSSE extends its congratulations to Dr. **Dena McMartin** FEC, FCSSE for the appointment to her new position. Holding both professional engineer (PEng) and professional agrologist (PAg) credentials, she is well qualified for the position. She has served on national and regional boards.

Earlier this year, Dr. **Dena McMartin** was appointed to the position of the Vice-President (Research) at the University of Lethbridge, Lethbridge, Alberta.

Previous to this appointment, Dr. **McMartin** was Associate Vice-President (Academic and Research) and as a full professor in the Faculty of Engineering at the University of Saskatchewan. Having started her academic career at the University of Regina Faculty of Engineering and Applied Science, Dr. **McMartin** moved quickly through the academic world of engineering and science, being recognized for her leadership talent and knowledge in her fields of practice.

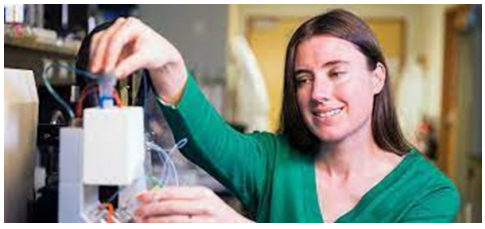
New Members



Cheryl Trudell, PhD, P.Eng., FCAE

Cheryl Trudell is Joint Interest Production Manager, Imperial. She is a director and president of both Imperial Oil Resources NWT Limited and XTO Energy Canada ULC. She is the chair elect on the Petroleum Technology Alliance Canada Board of Directors and Executive Committee, is on the 2023 World Petroleum Congress program planning and advisory committees, is a member of the Association of Professional Engineers and Geoscientists of Alberta and is a Canadian Academy of Engineering Fellow. **Cheryl** graduated from the University of Western Ontario in 1992 with a Bachelor of Science in Biochemical Engineering and a Ph.D. in Chemical Engineering in 1996. Over the last 25 years, she has held progressively more responsible positions in engineering, research, planning, operations and management disciplines in both Calgary and Houston. In her current role, **Cheryl** leads Imperial's joint interest production activities.

Stephanie Willerth, Canada Research Chair and Full Professor, University of Victoria



Stephanie leads a research group developing novel tools that help advance tissue engineering and regenerative medicine. The cornerstone of the research is improving strategies for engineering neural tissue, working with both embryonic stem cells and induced pluripotent stem cells. These cells can differentiate into any cell type found in the human body. This special property makes them attractive targets for regenerative medicine and tissue engineering. The end goal of the research is to engineer tissues suitable for transplantation in the human nervous system for treatment of diseases like Parkinson's or to repair damaged tissue found in the spinal cord to promote recovery of lost function.

Michael Bartlett, P.Eng., Professor Emeritus, Department of Civil and Environmental Engineering, Western University.

Michael is an international expert in the structural mechanics of highway bridges and buildings, has trained and led a generation of civil engineers across the continent. He earned his first engineering degree in 1979, his masters three years later, and his doctorate in 1994.

He is a fellow of the International Association for Bridge and Structural Engineering, the Canadian Society for Civil Engineering, and the American Concrete Institute. A recipient of the A.B. Sanderson award for outstanding contribution to the study and practice of structural engineering in Canada, he also served as Associate Dean (Undergraduate Studies) and taught and supervised Engineering students for a quarter-century.

Michael is leading the EIC Oral History project with Chair, **Suzelle Barrington**.

Articles of Interest

Advanced Small Modular Reactors—What does Modularity Mean?

Esam Hussein, P.Eng., FCSSE, Dean of Engineering and Applied Science, University of Regina

We all have heard of SMRs, small modular reactors, which have been considered by New Brunswick, Ontario and Saskatchewan, and more lately by Alberta. They are seen as effective means for addressing the climate change challenge because of their low carbon footprint and their ability to provide a steady supply of power. The smallness in size and power level (less than 300 MWe) makes them more adaptable to small electrical grids and for the incremental introduction in bigger grids as need arises. However, the modularity of these reactors is what makes them appealing, as they can be installed more rapidly at a lower cost than conventional reactors. But, what does modular exactly mean? The simple answer is: it depends on the stage and condition of system realization.

Modular, modularity and modularization are terminologies used in design, manufacturing and construction, and even in process intensification. A modular plant can also be simply a plant consisting of small units installed incrementally. The latter concept benefits from the so-called "economy of multiples", which reduces initial capital commitment and allows flexible adjustment to meet future market conditions and needs.

Esam Hussein, in an article posted on the CSSE website seniorengineers.ca, reviews the many definitions of modularity, and discusses their use in design, manufacturing and construction. **Hussein** contrasts the concept of economy of multiples with the traditional concept of economy of scale. He shows that modularity, whatever way is defined, offers economic and engineering advantages, but can come at the expense of hindering innovation and can result in overdesign.

As far as the emerging SMRs, the author argues that the concept of modularity is still ambiguous and its benefits may only be realized after learning from the construction and operation of a few SMRs. In **Hussein**'s opinion, even if the "M" is dropped off from SMRs, small reactors by virtue of their small size and lower power level are still a viable option, as they can be easily accommodated in large and small grids, and even in isolated and remote off-grid communities. The availability of these small reactors may also encourage further adoption of intermittent renewable energy sources, because such reactors provide the baseline power necessary to stabilize electrical grids.

For more information:

E.M.A Hussein., "Emerging small modular nuclear power reactors: A critical review", Physics Open, Volume 5, 2020, 100038, doi.org/10.1016/j.physo.2020.100038.

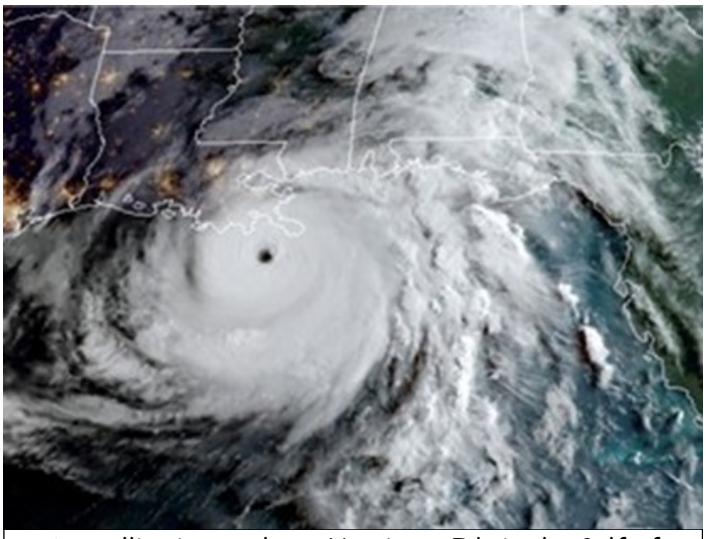
A.K. Upadhyay, **K. Jain**, "Modularity in nuclear power plants: a review", J. Eng. Des. Technol., 14 (3) (2016), pp. 526-542, emerald.com/insight/content/doi/10.1108/JEDT-11-2013-0080/full/html.

Articles of Interest *(Continued)*

Weather proofing our utility grids is well worth the cost *(Source: Regina Leader Post)*

Esam Hussein, P.Eng., FCCSE, Dean of Engineering and Applied Science, University of Regina

Investing in our infrastructure and grid resilience and in research is vital for protecting us against disasters. In Canada, a severe ice storm in January 1998 devastated the power grid from eastern Ontario to the Bay of Fundy. Thankfully, we have not had similar failures due to the efforts by our power utilities and their engineers to make our grids more resilient to ice storms. Another engineering success is the flood-defence network built in New Orleans in the aftermath of Hurricane Katrina, which caused $160 billion in damages and claimed more than 1,800 lives in 2005. The revamped flood-defence system, consisting of pumps, dikes, levees, floodwalls and floodgates, which cost billions of dollars, has largely protected the city from Ida's destructive storm surge.



A satellite image shows Hurricane Ida in the Gulf of Mexico and approaching the coast of Louisiana on Aug. 29, 2021.PHOTO BY NOAA /via REUTERS

With climate change, severe weather events are no longer rare. Regina and other parts of the province experienced this first-hand during a violent thunderstorm resulting in damages from hail, rain and wind on Aug. 31.

The weather will continue to threaten us. The choice we have is to spend the money now to protect ourselves from what seems to be inevitable disasters, or to wait to the aftermath and face lost and destroyed lives and spend even more money repairing damaged buildings and other infrastructure. We may not be able to eliminate the risk everywhere and all the time, but we can minimize the damage.

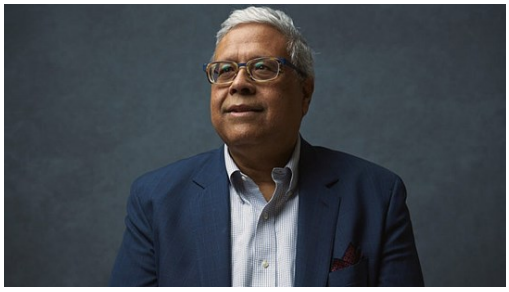
As was done in Canada to protect against ice storms, Florida Power & Light (FPL) is continuing a US$5 billion storm-hardening initiative since Hurricane Wilma hit the Gulf Coast in 2005. FPL is also investing an additional $1 billion annually in a 10-year storm hardening program that includes moving 300 to 500 power lines underground.

For more information:
leaderpost.com/opinion/opinion-weather-proofing-our-utility-grids-is-well-worth-the-cost

To learn more about SMRs you can attend VIES's monthly conference this 5 November: ***Small Modular Reactors (SMRs)*** presented by **Brent Smith**, Manager Operational Readiness, Advanced Reactor Development. You can register at viengsoc.ca/events/small-modular-reactors-smr/

Articles of Interest *(Continued)*

Innovating in a bigger pond: McMaster's engineering dean heads to California



Dr. **Ishwar Puri**, until recently the dean of engineering at McMaster University in Hamilton, Ont., is moving to Los Angeles to become vice president (Research) at the University of Southern California.

Partly it's the scale of the challenge **Puri**'s been handed: USC's research budget is close to $2 billion in Canadian dollars, a 40-fold increase over the research budget at Mac's engineering school. Partly it's because Puri will be a hard act to follow. At McMaster, he designed The Pivot, an overhaul of undergraduate education to favour interdisciplinary, project-based approaches that put a premium on cooperation and fresh thinking in problem-solving.

That transformation is really only beginning at Mac. Now **Puri** is going to become a key player in the much larger U.S. innovation ecosystem. I decided to give him a call. His observations on research, education, politics, and the various ways the three can collide and interact, made me glad I did. Here's an edited transcript of our conversation.

For more information, checkout the Macleans article at www.macleans.ca/education/university/innovating-in-a-bigger-pond-mcmasters-engineering-dean-heads-to-california/

Correspondence with the CSSE Administration Office

All "snail-mail" correspondence, including cheques, and enquiries, should be sent to:

The Canadian Society of Senior Engineers
464 Briar Avenue
Ottawa, Ontario
K1H 5H6

administrator@seniorengineers.ca

Phone calls: 613-890-9363

Dues and donations can be paid securely by credit card by going to the "Members" page at the CSSE website seniorengineers.ca

Recruit a New Member!

If you have a friend who is not a CSSE member, simply refer them to the CSSE website at www.seniorengineers.ca

Changed Your Coordinates?

If you have a new mailing (or emailing) address, please inform the CSSE Administration Office at administrator@seniorengineers.ca or (613) 890-9363.

Regional Events

Vancouver Island

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To join a Vancouver Island Engineering Society (VIES) conference visit viengsoc.ca/events/.

Members who have left us

Clement W. Bowman *(1930 – 2021)*

"Saving Canada" was how **Clem Bowman** described his work. For over a decade he (and an increasing number of volunteers who want to work with him) discussed, designed and promoted projects. "Big Projects" **Clem** would say, are the way Canada was built. And Nation-Building Big Projects are needed now to achieve our environmental and economic goals.

Clement W. Bowman died October 7, 2021. His passing leaves Nancy, his son John and his family, and his daughter Ann and her family, to mourn.

Clem lived and worked across Canada and firmly believed that Canada is blessed with many natural resources to deliver an abundance of energy. Energy is needed to sustain and improve our quality of life. Throughout his career **Clem** reached out to build relationships and friendships with energy visionaries. Whether hydrogen, or hydropower, or nuclear, or hydrocarbons, or the means of transmission, **Clem** could encourage others to focus their efforts towards a sustainable energy future for Canada.

Clem often wished he were twenty years younger so he could be more active on pushing ideas to completion. We, the Associates of the Bowman Centre for Sustainable Energy, and everyone who respected **Clem** for his devotion to "Saving Canada", will continue to push Nation-Building Big Project ideas to completion.

We miss him. We thank him for his vision. We will continue his work.

Marshall Kern
President and Associate
bowmancentre.com

The Bowman Centre For Sustainable Energy