

# NAYGN DURHAM



## Nuclear beyond Electricity

Isotopes and more



## Best Chapter in Canada 2018

NAYGN Durham wins  
the big award



## NAYGN Durham Lead Focus

Faces behind the  
scenes

# NEWSLETTER - AUGUST 2018

## Did You Know About Nuclear Advantage Beyond Electricity?

**In this edition, we introduce you to a different side of nuclear power and its benefits to the society**

When we talk about the utility of a nuclear power plant, the topic of discussion is usually around the production of electricity. How often do we bring up the other societal and economic benefits of a nuclear plant?

Let's start with examples from our own CANDU plants. A nuclear reactor is known to produce various isotopes as by-products that have positive implication in the medical and food industries as well as for industrial lighting and scientific research and development. The most widely known isotope which can be created in our reactors is Cobalt-60. It emits very high energy gamma-ray that is used in sterilization of many products. Some of the common uses are found in the medical and food industries to sterilize surgical instruments and packaged food respectively. The radiation emitted by Cobalt-60 eliminates harmful bacteria without compromising any properties of sterilized products. A fun fact for all: Cobalt-60 radiation was actually used in the first ever cancer treatment that took place on October 27, 1951 [1].

Another one of these byproducts of our CANDU reactors is tritium which is produced when deuterium in heavy water captures a neutron. It is used alongside phosphor to create luminescence that is used in self-powered lights. These lights are mostly used for emergency purposes where electricity can be a hazard and can be seen in common uses such as in airplanes [2].

And finally, OPG wholly owned subsidiary, Canadian Nuclear Partners (CNP) will work with BWX Technologies to produce Molybdenum-99 at the Darlington reactors starting as early as 2020, which is used in over 30 million medical/diagnostic imaging treatments around the world to detect cancer and heart diseases [3].

Outside of the CANDUs, nuclear reactors can be utilized for greater efficiency in producing power and managing one of the most important elements required for human survival, water. A recent article published by Shant Krikorian of International Atomic Energy Association (IAEA) Department of Nuclear Energy portrayed these benefits of nuclear power. The key topics addressed are: Co-generation and its use in seawater Desalination. A nuclear plant produces a large amount of heat along with electricity. Cogeneration allows for the usable heat to be combined with electricity that can decrease energy costs and lower carbon emissions significantly. According to IAEA, there are currently over 70 nuclear plants around the world that operate in cogeneration mode and provides efficiency (by eliminating separate heat and power source for a given output), reliability (less dependence of grid), lowers environment impact (less fuel needs to be burned) and reduces costs (due to high efficiency) [4]. Cogeneration via

nuclear plants also align with United Nation's Sustainable Development Goals (SDGs) to get access to water and energy for all and to tackle climate change [4].

Desalination of seawater is one of the many benefits of cogeneration that can not only supply water for the power plant but also water for use in domestic and industrial purposes. An example of one such plant is the Sudankulam Nuclear Power Plant in Tamil Nadu, India. Water management is key for places where water supply can be scarce at times and this can be a solution to that problem [4].

## NAYGN Durham Wins the Best Chapter in Canada Award 2018

**NAYGN Durham brings home two awards from this year's NAYGN-NEA professional development conference in Atlanta, Georgia, USA**

At this year's NAYGN-NEA Professional Development Conference held at Atlanta's Marriott Marquis on May 21-23, NAYGN Durham received two major awards. NAYGN Durham was adorned with the Best Chapter in Canada 2017 award as well as our President Matthew Mairinger received the Individual Achievement Award 2017. The Best Chapter in a region award recognizes the efforts of local NAYGN chapters for services related to the growth of members through social, community service, and professional growth activities. This award salutes chapters for overall excellence in supporting NAYGN's mission and members and serving the industry. The individual achievement award recognizes members that strongly exemplify the pillars and mission of NAYGN, as nominated by their peers. From the NAYGN Durham team, we would like to thank all our members and supporters for being with us always. The success and recognition we have achieved wouldn't have been possible without the collective effort from everyone involved. Since early 2017, we have been involved organizing or attending 36 events that ranges from lunch and learns to facility tours, professional conferences, technical seminars, exhibitions, community work, advocacy for nuclear power etc.



## NAYGN Durham Lead Focus

The success of our chapter is due to numerous individuals that show immense dedication, effort, professionalism and a genuine intent to support the future of nuclear power. From this edition onwards, we will be featuring one of our Leads in every newsletter for the great work they have been doing for us.



In this newsletter, please meet Hannah Bushby. She has been our Community Outreach Lead since June 2017. Here's what Hannah had to say about herself and her involvement with NAYGN Durham.

*"I graduated from Chemical Engineering at McMaster University in June 2017. I was an intern at OPG in the Computers and Control Design Department for 14 months in 2015/2016; and returned full time to OPG in June 2017 to the Darlington Chemistry Technical section in the Chemistry, Metallurgy, and Welding Department. I joined NAYGN Durham as a lead for Community Outreach in August 2017. Since joining NAYGN Durham I have mainly been involved in the organizing and running of Operation Cleansweep (OCS) - an event run twice a year where volunteers assist local seniors with their yard work. In addition to OCS, I also worked with the Public Relations team to submit a written intervention and present an oral intervention in support of CNL's relicensing hearings in January 2018.*

*The Community Outreach Lead position gives me the opportunity to combine two things that are important to me: volunteering and supporting nuclear power. Volunteering has always been a big part of my life (I volunteered at Soup Kitchens, for organizations like Let's Talk Science, and a humanitarian trip to El Salvador).*

*I also grew up in Deep River, Ontario (right next door to CNL) and because of that have always been supportive of nuclear research and power. **Being a part of NAYGN Durham has given me the opportunity to meet other young nuclear professionals and to give back to the local communities.**"*

Once again, we would like to thank Hannah for her insightful piece and we will be bringing you more stories from our NAYGN Durham family shortly in our upcoming newsletters.

### About the author



Tanvir Ahmed works in the Components Engineering department at OPG's Darlington Nuclear Generating Station. He obtained his Bachelor's Degree in Mechanical Engineering from the University of Toronto (U of T) with specialization in Energy Systems and Machine Design. His interest lies in leadership and professional development, advocacy for carbon-free energy sources and innovation in power generation technologies. He is an avid traveller who enjoys photography, sketching and sports.