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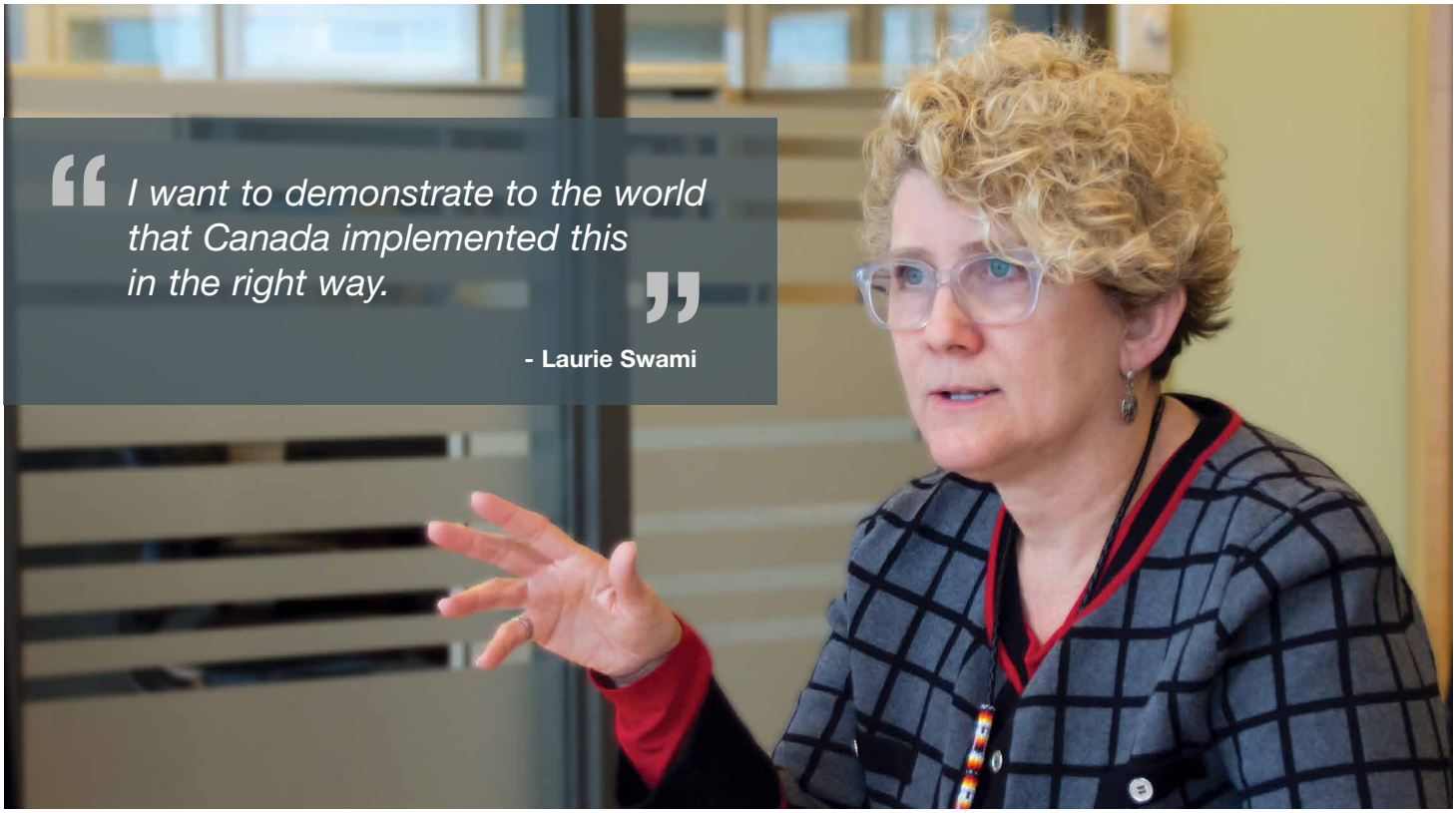
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nwmo news

Nuclear Waste Management Organization

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Getting to Know the NWMO's President and CEO, Laurie Swami



In November 2016, Laurie Swami was appointed to the role of President and CEO of the NWMO, putting her in the position of overseeing one of Canada's largest and most important infrastructure projects. As the NWMO continues to implement the country's plan for the safe, long-term management of used nuclear fuel, we sat down with the organization's new leader to discuss her experience, her vision, her inspiration and what drives her to succeed.

(Continued on page 2)

Getting to Know Laurie Swami (Continued from page 1)

Experience

Ms. Swami, who grew up in Ottawa, obtained a Bachelor of Science in Engineering Chemistry from Queen's University. At the time, Engineering was an unusual choice for women, but it appealed to her. "I enjoyed studying science, and was certain it would take me in interesting directions," she said. Ms. Swami went on to combine that degree with a Master of Business Administration from the Schulich School of Business.

Ms. Swami is now one of the country's most senior women engineers, and she's passionate about promoting the STEM disciplines (Science, Technology, Engineering and Mathematics) among women and other under-represented groups such as Indigenous youth. Her own two daughters are both at university; one is studying Medicine and the other Mathematics.

Ms. Swami began her career at Ontario Power Generation (OPG) in 1986, and over the years held various roles in the nuclear division, always with increasing responsibility. Before coming to the NWMO, she served as Senior Vice-President of Decommissioning and Nuclear Waste Management at OPG.

She has broad experience in managing nuclear waste and regulatory approvals, having overseen the operation of OPG's nuclear waste management facilities and the planned implementation of OPG's deep geological repository for low- and intermediate-level nuclear waste.

Vision and driving principles

Ms. Swami's vision is to implement Canada's plan for the long-term management of nuclear waste in a manner that is socially acceptable, technically sound, environmentally responsible, and economically feasible. "My greatest wish is that we carry out this mandate, meeting or surpassing safety and quality standards, and to the satisfaction of all the different stakeholders. Second is that we do it cost effectively. I want to demonstrate to the world that Canada implemented this in the right way."

As she leads the NWMO towards these goals, Ms. Swami's guiding principles are several: to be well informed and well prepared, to work hard, to listen carefully and, above all, to communicate openly.

"This is a community-driven process," she says. "We need to be fair, open, and transparent with all of the communities that have raised their hands. It's not an easy thing to accept a nuclear waste facility. It's an altruistic act. So we need to treat those communities fairly and equitably and support them through this process, and recognize the good thing they have done by raising their hand."

In her previous roles, Ms. Swami has pushed hard for transparency in the nuclear industry. "We have a lot of good information to share with people, which gives them comfort. It is important for openness and transparency to exist," she says.

Ms. Swami is personally travelling to the areas involved in the study process to meet First Nation and Métis groups as well as leaders and others who live in the municipalities. She finds these meetings invigorating. "I love this job, and it's really important to me to get out into the communities and listen to different perspectives." Her other current areas of focus are getting to know the people who work at the NWMO, and clearly communicating the short- and long-term performance goals of the organization.

Ms. Swami's biggest professional challenge lies ahead. The next few years of the NWMO's operations, from 2017 to 2023, involve reducing the number of potential areas. This process will take into consideration technical factors, geologic factors, environmental factors and the outcome of engagement activities with municipalities, together with First Nations and Métis groups. "This will be a very important process. It will really help to focus our work. And as we get fewer sites involved in the process, we'll start to see the work accelerate even more, which makes it exciting," she says.

> *"I admire those who are good at having a vision for the future and bringing people along in an inspirational way.*
>
> *These are qualities I aspire to achieve."*
>
> **- Laurie Swami**

Inspiration

Ms. Swami draws inspiration from qualities she sees in others such as strength, optimism, resilience and approachability. "I admire those who are good at having a vision for the future and bringing people along in an inspirational way. These are qualities I aspire to achieve," she says.

The NWMO has a strong leader at the helm, one whose power comes from listening.

Careful Environmental Analyses Contribute to Protection of Land and Water

Careful analysis of vegetation, soil, water and animal habitats is one of the many components of the NWMO's process to identify a site for the long-term management of Canada's used nuclear fuel.

Land and water studies, known as environmental characterization, can help identify sensitive areas, such as those housing a rare form of plant life, a bald eagle or Whip-poor-will nest, a critical wetland or the habitat of an endangered species.

"Protecting people and the environment will always be our top priority. We want to make sure the project proceeds in a manner that will ultimately cause as little disturbance to the land and water as possible," says Joanne Jacyk, Senior Environmental Scientist at the NWMO, who is leading some of the environmental studies.

The studies involve using the Ontario Ministry of Natural Resources and Forestry's ecological land classification (ELC) system, which defines natural regions based on ecological factors. This information is analyzed and supplemented with data gathered in the field.

Now, as the NWMO continues with its multi-year site selection process, nine potential areas are undergoing a series of progressively more detailed scientific, technical and social assessments. Ultimately, the project will only proceed at a site that can safely contain and isolate used nuclear fuel and with the involvement of the interested community, First Nations and Métis peoples and other surrounding communities.

Before undertaking environmental characterization studies, the NWMO sought input from the communities on how these studies might best be planned and executed to minimize disruption to current land-use activities. Field-based characterization plans and schedules were adjusted based on what we heard.

In 2016, the NWMO conducted its first four environmental characterization studies, in areas around Ignace, Hornepayne, Manitouwadge, and White River. Teams of specialists conducted non-obtrusive observations of features such as sizes and types of streams in the area, types of local plants and animals, and fragmentation of existing forest. Where appropriate, they collected small samples of soil or plant life for further characterization and study.



Scientists observe plant life as part of the site selection process

These environmental analyses will be added to geological, engineering, and hydro-geoscientific considerations and will be used to help identify a preferred site.

Once a site is selected, more detailed environmental characterization analysis will take place.

"The environment is just one of the many factors we are studying in a robust way," says Ms. Jacyk, who is trained as a biosystems engineer and environmental scientist. She works alongside geoscientists, transportation engineers, as well as experts in repository design and construction, social research, Indigenous Knowledge, municipal planning, public engagement, ethics, and finance, all collaboratively working to implement Canada's plan for the long-term management of used nuclear fuel.

"The level of attention that is being brought to every aspect of this project is really unique," she says.



Water habitats are assessed by experts

Engagement Expands As Winter Gives Way to Spring



Blind River Winter Carnival

As winter blanketed the countryside and then gradually retreated, the NWMO's conversations with people living and working near areas involved in the site selection process continued to expand and deepen.

"Engagement is a critical component of Canada's plan for the long-term management of used nuclear fuel," says Jo-Ann Facella, Director of Community Wellbeing, Assessment & Dialogue. "We are committed to broad engagement, promoting thoughtful reflection and facilitating a constructive dialogue."

Increasingly, the NWMO's engagement program encompasses not only communities that initiated their area's participation in the process and the First Nations and Métis communities in the area, but also people in surrounding communities. Key themes of discussion are safety, land use, and fostering community and area well-being through the project.

The engagement program took many forms over the winter, from meetings of community liaison committees and working groups, to open houses, to information sessions and conferences, to NWMO participation in community events such as winter carnivals, as well as individual conversations. "These communities have come forward to help implement Canada's plan, a plan that has our responsibility to future generations in mind," says Ms. Facella. "We continue to learn from communities as we advance plans and implement Canada's plan together."

Engagement activities are expanding to include individuals and groups involved in a broad cross-section of activities, including:

- Leadership and senior staff at local, surrounding, and regional communities;
- Economic development agencies;
- Environment and conservation organizations;
- Business and livelihood organizations, e.g., agricultural, trappers' councils, and chambers of commerce;
- Local businesses, including tourist camps and others;
- Health, safety, and emergency services;
- Social services;
- Recreation; and
- Local service groups

There are several ways to learn more about Canada's plan for used nuclear fuel. These include visiting our website at www.nwmo.ca, dropping in to an NWMO community office, or attending an open house.



Manitouwadge Winter Carnival cardboard box races held at Kiwassa Ski Hill


Parent and Tot Skate in Mildmay


Shinny hockey in Ripley

When the Glaciers Return: NWMO Geoscientist Describes New Research

How could future ice ages impact deep geological repositories? Representatives from the areas involved in the NWMO's site selection process are getting a chance to hear the latest scientific data on the subject.

This spring, Dr. Monique Hobbs, NWMO geoscientist and Siting Project Coordination Manager, is sharing with Community Liaison Committees in several regions results of the Greenland Analogue Project (GAP).

This collaborative research project, which ran from 2008 to 2013, was led by the NWMO and partner organizations SKB (Sweden) and Posiva (Finland). It brought together specialists, research scientists and engineers from six countries to study the Greenland Ice Sheet, which is comparable to the ice sheets predicted to cover Canada, Sweden and Finland in the future.

"In the past, Canada has experienced an ice age on average every 100,000 years," says Dr. Hobbs. "That is why it is important to understand the conditions at the surface and below an ice sheet when planning for the safe, long-term management of used fuel in a deep geological repository."

Dr. Hobbs, who holds a PhD in Earth Sciences and is a Professional Geoscientist, was one of several NWMO researchers who participated in and contributed to the GAP.

The completion of the GAP and publication of the final report in September 2016 provides new scientific information on the behavior of meltwater created when the edge of an ice sheet thaws: where the water forms, how much of it there is, and how it travels from the surface to the base, where the ice sheet meets the rock.

The project also provides, for the first time, a clear indication of the amount of downward pressure exerted on meltwater by the weight of more than a kilometre of ice. These measured values can now be used in the NWMO's safety cases – the comprehensive, detailed studies that evaluate the safety of a deep geological repository over a time frame of up to one million years.



The Greenland Analogue Project helped scientists understand conditions at the surface and below an ice sheet

"Before the Greenland Analogue Project," says Dr. Hobbs, "we were looking at a range of values for water pressure below an ice sheet. Now, we have actual measurements."

Reducing uncertainty through studies such as the GAP will further international understanding and best practices associated with the management of used nuclear fuel in deep geological repositories.



The project brought together specialists, research scientists and engineers from six countries to study the Greenland Ice Sheet

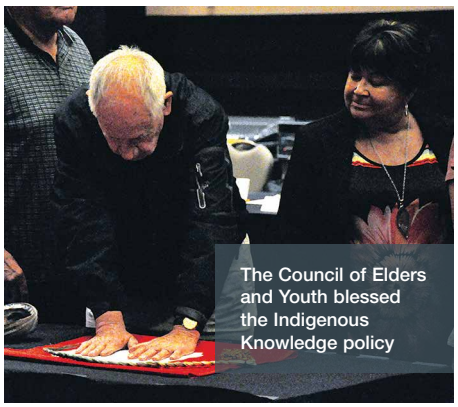
Ground-breaking Indigenous Knowledge Policy Launched Through Ceremony



The ground-breaking Indigenous Knowledge policy was launched through ceremony



The NWMO is committed to interweaving Indigenous Knowledge into all aspects of work



The Council of Elders and Youth blessed the Indigenous Knowledge policy

The NWMO broke new ground in the Fall of 2016 when it unveiled its Indigenous Knowledge policy. This unique policy, which was launched through ceremony, will ensure that Indigenous Knowledge is both respected and protected as the NWMO implements Canada's plan for the management of used nuclear fuel.

"We are leading the way in committing to interweave Indigenous Knowledge into all aspects of our work," says Jessica Perritt, Indigenous Knowledge coordinator at the NWMO.

Indigenous Knowledge is the unique understanding of, relationship with and connection to the land that defines the way of life of many First Nation and Métis communities. It is a complex and sophisticated system of knowledge that draws on millennia of wisdom and experience, and grows with the experience of each generation.

The Indigenous Knowledge policy was initiated and guided by the Council of Elders and Youth, an advisory body made up of 12 First Nation and Métis Elders and seven First Nation and Métis Youth. Members of the Council blessed the policy document through an Indigenous ceremony that included a pipe ceremony, a smudge, a traditional drum song and dance, as well as each member personally putting a hand on the document. These blessings signify that each member stands beside the policy and the NWMO as the organization puts the policy into action.

"This is really significant," said Bob Watts, Vice President of Indigenous Relations at the NWMO. "It is the first time we have put a policy in place through ceremony. It is a living document – it has a life, and it is going to inform what we do and guide what we do. It is already doing that."

Indigenous Knowledge systems recognize that people are part of and are one with Mother Earth, emphasizing the interrelationships among all components of the environment. They include important knowledge about the land and ecology, and about developing and maintaining effective and meaningful relationships between generations and within and between communities. The Indigenous Knowledge policy builds on existing positive relationships with Aboriginal peoples in Canada by providing a framework and principles to more readily apply Indigenous Knowledge.

"There are many opportunities to learn from local Indigenous Knowledge holders as we continue fieldwork in areas engaged in the site selection process," said Mahrez Ben Belfadhel, Vice President of Site Selection at the NWMO.

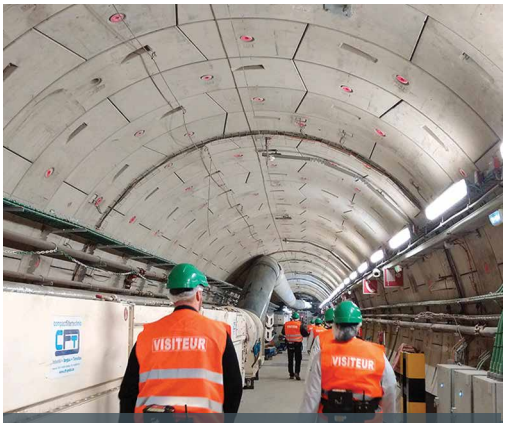
Canadian Representatives Attend International Conference on Geological Repositories

Representatives from the NWMO and several areas that are engaged in Canada's site selection process participated in the International Conference on Geological Repositories (ICGR).

The conference, held in Paris, France in December 2016, brought together waste management organizations, scientific and technical experts, regulatory and government bodies, and representatives of nuclear communities to learn more about international best practices in planning or constructing deep geological repositories. It provided a forum for Canadian municipal and Indigenous community representatives to benefit from other national and international perspectives.

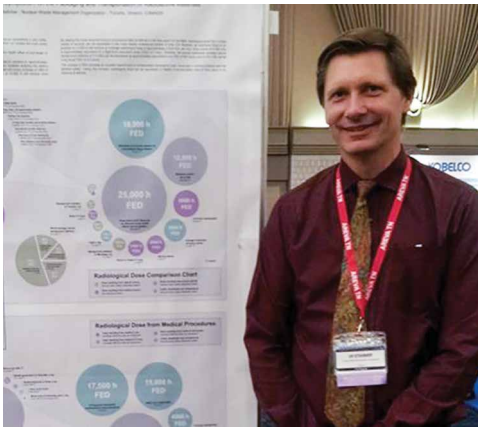
"It was so interesting to exchange views and experiences with others from around the world," says Sue Jensen, mayor of Blind River. "Along with the other delegates from municipalities, I am now sharing what I learned with members of my community."

The ICGR is hosted by the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development. It includes four intense days of discussion, learning and collaboration and brings together hundreds of leading researchers, technicians, geologists, and scientists from the international nuclear waste management community.



The Paris conference focused on international best practices in planning or constructing deep geological repositories.

Two NWMO Experts Win International Awards




NWMO engineers Ulf Stahmer (top) and Yang Sui win prestigious awards

Two NWMO specialists recently won prestigious Aoki Awards at PATRAM 2016, the 18th International Symposium on the Packaging and Transportation of Radioactive Materials, in Kobe, Japan.

Yang Sui, a design engineer who specializes in used nuclear fuel transportation, won for his presentation on the safety and robustness of transportation containers under very severe regulatory test conditions.

"PATRAM was a multi-national gathering of engineers, researchers, and scientists working towards safe radioactive materials transport," said Mr. Sui. "I was awe-struck by the high level of diversity, passion, and technical expertise there. I am proud to have represented NWMO on the world stage. I could not have done so without support, guidance and inspiration from my NWMO colleagues."

Senior transportation engineer Ulf Stahmer won for his poster on a simple way to explain the impact of radiological dose – by equating it to time spent on a flight.

"I wanted to be able to communicate radiation dose in a manner that would take the fear away because it's difficult to learn if you are afraid," he said. "There was a need to contextualize the concept in a more personal manner that people would be more apt to remember."

Mr. Stahmer developed an idea and methodology to express radiological dose in terms of the dose one would receive during a commercial flight at altitude for a certain length of time. This method provides a more accessible way of discussing radiological dose than the internationally accepted, but less understood, unit of Sieverts.

For example, using Mr. Stahmer's method, the world average annual natural background radiation dose of 2.4 mSv, when equated to hours of flight-time, can be expressed as 600 flight-hours. A 0.01 mSv dose from a dental X-ray can be expressed as 2.5 flight-hours, and the 0.07 mSv annual dose someone would receive from living in a stone or brick building is equivalent to 17.5 flight-hours.

"It's simple, but not simple," Mr. Stahmer said, noting it was exciting to see how easily people at the conference (more than 600 in attendance) grasped the concept and how well understood it was.

The Aoki Awards recognize those who made outstanding contributions to the meeting.

Collaboration Strengthens Copper Corrosion Program


David Hall with Thalia Standish

A 2016 peer review report of the NWMO's copper corrosion technical program found that our program is on the right track, thanks in part to our success in building relationships with the next generation of scientific experts.

One such expert is Thalia Standish, a PhD student at Western University and intern at the NWMO, who is researching emerging techniques and quality assurance developments in galvanic corrosion. Her research focuses on a crucial question – if there's a defect in copper, what happens? While the question may seem simple, her research work is very cutting edge, leading to its inclusion in the international peer review report on our copper corrosion program. An emerging leader in the field, Thalia received the Mitacs Accelerate Scholarship for her work with NWMO.

"Thalia's work is incredibly relevant to our copper corrosion program and to our project overall," said David Hall, a Corrosion Scientist with the NWMO. "A big part of protecting people and the environment is making certain we understand how this copper coating will behave over a very long period of time."

The NWMO is tasked with implementing Adaptive Phased Management, Canada's plan for the long-term management of used nuclear fuel, and copper is a key part of our design for a used fuel container. The container will be protected by a corrosion-resistant copper coating. It is part of a larger system of engineered and natural barriers that will work together to help isolate the used nuclear fuel from the surrounding environment once it's in the underground repository.

"My time at the NWMO has been a great experience so far and has given me the opportunity to work side-by-side with engineering experts," said Ms. Standish. "It's been incredibly helpful in advancing my research and it's really gratifying to see my work used in a way that directly impacts the NWMO's project."

New Website Wins W3 Design Awards

The NWMO's website has won two W3 Awards from the Academy of Interactive & Visual Arts (AIVA) in New York. Website accolades for 2016 include a Silver Award in the Corporate Communications category and a Best in Show Award in the Energy category.

Our communications team worked with Toronto agency FCV Interactive to redesign our website, www.nwmo.ca.

"We want our website to inform and involve a diverse audience on a complex and challenging topic – the safe, long-term management of Canada's used nuclear fuel," said Lisa Frizzell, Vice President of Stakeholder Relations and leader of the team responsible for the work. "We also need the site to communicate the NWMO's core values of integrity, excellence, accountability and transparency, while prioritizing a huge amount of information so visitors can see basic information first, and then dig deeper if they want to."


NWMO's new website is accessible on a variety of devices

As the W3 Awards demonstrate, the site delivers on these goals. It is a highly accessible and engaging tool for educating Canadians – including the public, interested communities, First Nation and Métis groups, scientists, technical specialists, media, and youth – on Canada's long-term plan for safely storing nuclear waste.

"The new and enhanced features on the website are vital tools as we work to engage with people on this national infrastructure project," said Dr. Mahrez Ben Belfadhel, Vice President of Site Selection at the NWMO. "So far we've heard a lot of praise from users of the site, and we are continuing to make improvements based on comments we receive."

New features include the use of plain language to explain complex topics; lots of images, graphics and videos; easier navigation; and the ability to access the site using any device. The fully responsive website is also AODA Level AA compliant.

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NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

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