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ATOMIC ENERGY OF CANADA LIMITED
 CHALK RIVER LABORATORIES
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On November 3, AECL, along with the entire Canadian nuclear industry, will celebrate the 50th birthday of one of our most valuable assets - the National Research Universal (NRU) reactor. Since its completion in 1957, NRU has been the foundation for the industry - a world-class science facility for students and academics, a tool in nuclear research and development, and the world's largest producer of medical isotopes. NRU is a true Canadian success story; certainly something worth celebrating.

Inside NRU a nuclear reaction occurs, much like a full-scale CANDU™ (Canadian Deuterium Uranium) reactor, but NRU

is strictly a research tool. It contains testing equipment that allows scientists and engineers to put new fuels or materials into the reactor and see how they behave. NRU is a unique facility in Canada providing knowledge that helps AECL build higher performing and more efficient nuclear power reactors, around the world and here in Canada.

Although NRU does not produce electrical power, this reactor serves as a cornerstone of the entire Canadian nuclear power industry, and continues to be an essential component in the development of the CANDU design of nuclear reactor. Domestic nuclear power generation prevents millions of tonnes of greenhouse gas emissions each year by reducing Canada's use of fossil fuels.

NRU is a unique and powerful science facility in Canada. Each year over 200 professors, students and scientists come to the Canadian Neutron Beam Centre (located at the Chalk River Labs) to make use of this national resource. Because neutrons can probe any kind of material, they can be applied to research in metals and alloys, polymers, biomaterials, glass and ceramics, thin films, cement and minerals. This work is leading to advances in medical, industrial and scientific fields to the benefit of all Canadians.

In addition to five decades of research and development, NRU is the source of the majority of the world's supply of medical isotopes. These materials are used in the diagnosis and treatment of cancer and other diseases. Isotopes from NRU benefit more than 76,000 people each day, or over 27 million people internationally each year: an irreplaceable contribution to world health. The application of the radioisotope Cobalt-60 as a treatment for some forms of cancer is a practice pioneered through work carried out in the Chalk River Labs more than 50 years ago.

Today, the NRU reactor continues to be a workhorse for the medical community, routinely producing over 50 per cent of the worldwide molybdenum-99 requirements, and capable of safely ramping up production to address short-term shortfalls in the world supply!



For more information on medical isotopes produced by the NRU reactor, see page 5.





I recently read an article that suggested “50 is the new 30”. Since I am now past the 50-year mark, I read the article with interest and spent the rest of the day feeling a little more energized, believing that life really does get better after 50. I am not sure I would have believed that when I was younger, so I may have a hard time convincing the younger group of readers, but in the case of NRU (the National Research Universal reactor), nothing could be more accurate.

In the lead story of this edition of *Contact* you will have read about NRU celebrating its 50th anniversary in November. Although this is a significant milestone for both people and machines, NRU is not showing its age. The operation and performance of the reactor continues to be very safe and very reliable, and we are always raising the bar on operating practices.

We continually drive improvements in our operations, maintenance, engineering, and radiation protection practices across the site, and all of these improvements are reflected in the high performance of NRU.

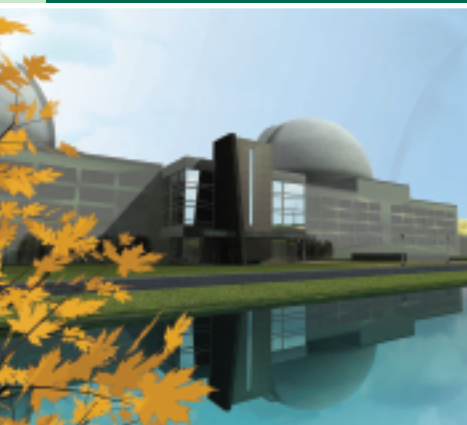
However, it is the human side of our operations – our commitment to world-class performance, no compromise – that really drives the success of NRU. The team at the Chalk River Labs who support and operate the reactor, process and produce isotopes, and carry out cutting-edge science are the ones who really make the difference. In testament to it’s design, NRU continues to perform remarkably, but it is the people who make it happen, and it is their dedication to NRU’s success that has made all the difference to its impressive longevity.

So to everyone involved with the safe and reliable operation of NRU over the past 50 years, congratulations. As I said, this milestone focused on the technology but it is really about the people.

Our plans are to continue to operate NRU safely and reliably for many more years—after all, life just gets better after 50!

Brian McGee
Vice-President, Nuclear Laboratories

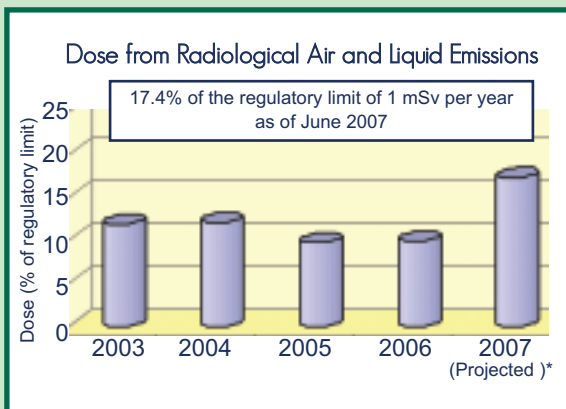
Good news for AECL from Western Canada



In August, Energy Alberta Corporation (Energy Alberta) filed an application for a License to Prepare Site with the Canadian Nuclear Safety Commission.

Energy Alberta has teamed with Atomic Energy of Canada Limited (AECL) to bring proven CANDU® nuclear technology to Alberta. The application is for siting up to two twin-unit ACR-1000® Advanced CANDU Reactors®.

Energy Alberta will initially build one twin-unit ACR-1000 that will ultimately produce a total net 2,200 MW of electricity with a targeted in-service date of early 2017.



As a certified ISO 14001:2004 Environmental Management Systems organization, AECL is committed to studying and reducing the low impact of our operations on the environment. The estimated annual dose to those living within a 8-kilometre radius of CRL is equivalent to roughly 1/4 of the amount of radiation that you would receive during a medical x-ray (0.4 millisieverts or mSv), and is well-below the regulatory limit for the public set by the Canadian Nuclear Safety Commission (1 mSv/year).

**Actual figures for 2007 will be made available when all data is collected and complete at the end of this year.*

Today's youth uncover the past at CRL

On August 8 and 9, Chalk River Labs (CRL) hosted two Ottawa Valley youth groups: the Earth-walkers from the Algonquins of Pikwàkanagàn, Golden Lake and the Ontario Stewardship Rangers from Pembroke. Both groups share a mandate of environmental activism, and were invited to the CRL site for a “pre-AECL” history lesson on the former Buchanan Township. The youth, aged 16 to 19, were led by Chalk River’s Heritage Management team; Ken Swayze, Elizabeth Bond, Gerald Nadeau and Ken Bresseau.

They were invited to visit several significant heritage sites located within the CRL Outer Area—including the former township’s oldest hotel and the site of the first schoolhouse. After observing artifacts and historic vegetation at the heritage sites, the youth learned about the manufacture of ancient stone tools from archaeologist Ken Swayze.



“There were some important finds made by the kids, including stone tools that probably date back to the Early Archaic* period,” noted Swayze. “The artifacts were all catalogued under the names of the participants who unearthed them, and will be housed as part of the First Nations’ collection of Pikwàkanagàn.”

“Canada’s history belongs to all communities of this nation. Protecting our finite cultural resources is the joint responsibility of all citizens. AECL is striving to protect the environment,” says Elizabeth, who is also an AECL summer student, “This includes the rich cultural resources of the Chalk River site it inherited. By incorporating local youth into this process, AECL is doing its part to encourage the upcoming generation to embrace our local history and continue in the same path.”

*Early Archaic Period – 8000-6000 B.C.



PROJECTS & Accomplishments

AECL sets industry standard for hot cell window changes



There is truth to the adage that putting safety above production does indeed reap rewards. It is this exact attitude that Chalk River Labs staff took from the outset of a recent change of a cell window in the Moly Production Facility (MPF). In very simple terms, AECL was proposing to remove a “hot cell” window – a window into small room (cell) where highly radioactive (hot) materials are handled by robotic arms (manipulators) – to be replaced with a refurbished unit. The glass had become cloudy and visibility into the cell was poor. The window needed to be replaced before visibility became an issue for the cell operator.

But this was no ordinary project, and this was no ordinary window. The window alone is 1 meter thick and weighs close to six tonnes. With the high levels of radioactivity from within the cell, safety had to take precedence over all other aspects.

The window change took place over a seven-day span, from June 20 until June 27, and involved staff from many different branches, working around the clock until the job was safely completed. Both the International Atomic Energy Association, and the Canadian Nuclear Safety Commission staff were on site, observing the work through a live video feed.

The cell was successfully returned to service at 5 a.m. Wednesday, June 27. The entire “outage” of the cell lasted 164.5 hours, roughly five per cent longer than the planned 156 hours. Using safe practices, making conservative decisions, and taking a questioning attitude into the task at hand ensured that the project was done right, the first time and allowed the schedule to be maintained.

“I am extremely proud of the dedicated staff who worked on this project,” explains Paul Tonner, Manager of the MPF. “Not only did they demonstrate good, safe work practices throughout, they shone as examples of how the safety culture has become commonplace on site. Attitudes are changing, performance is improving, and it reflects well on all aspects of the work we do at Chalk River.”

The project is considered to be a milestone, and external parties have expressed an interest in further discussion around the execution of the window change, and the lessons learned throughout.

The entire job was completed without incident and the first isotopes were received for processing at 10 a.m. on June 27 (five hours after return to service). Processed product shipped to our partner, MDS Nordion, at 6 p.m. the same day – to the benefit of roughly 35,000 patients around the world!

Staff tee off in support of community

AECL’s Chalk River Labs enlisted two teams – “The Fireflies” and “The Glow Worms” – in support of Renfrew County Warden Janice Visneskie’s annual community fundraiser, the 2007 Warden’s Invitational Golf Tournament, held at the Oaks of Cobden on June 22. Front row from left: Jane Inch, Ellen O’Connor, Susan Sweet, Warden Visneskie, Joan Miller. Back row: Paul Bell, Jean-Pierre Letourneau, Wayne Inch and Dave Unrau.



Isotopes produced in Chalk River Laboratories:

Molybdenum-99: Used for medical diagnosis (imaging) of the brain, thyroid, heart, lungs, liver, kidney, spleen and bone marrow.

Iodine-131: An isotope used in therapy, imaging and diagnosis (primarily for thyroid cancer).

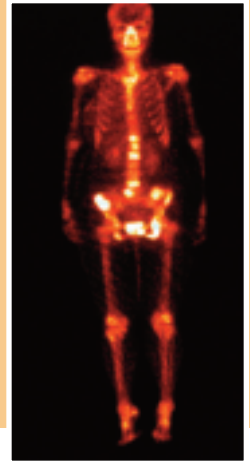
Iodine-125: Used in in-vitro diagnostic kits (radio immunoassays), bone densitometry devices, protein iodination and therapeutic seed (implants often used in prostate cancer treatment).

Xenon-133: A medical diagnosis tool, especially for scanning lungs.

High Specific Activity (SA) Cobalt-60: Nickel plated Cobalt-59 pellets are irradiated in NRU for two to four years, becoming High SA Co-60. The High SA Co-60 produced in NRU is primarily used in cancer treatment applications.

Carbon-14: Supplied in sealed aluminium containers and irradiated in NRU for five to seven years. Used as a radiotracer in a variety of biological compounds.

Iridium-192: Used as intense source of radiation for industrial imaging, including radiography and weld-inspection. Also used in portable units for cancer therapy and radiography.



Memories of the staff hotels

From 1945 until 1985, AECL and the former Atomic Energy Project (AECL's predecessor) operated four hotels to house up to 500 employees, and dormitories that each housed about 25 construction workers in the newly established Deep River. The Staff Hotel (later called Champlain House) had 211 rooms; the Annex (now Maple Lodge) had 63 rooms; and Forest Hall (now the J.L. Gray Engineering Building) had 210 rooms. During that 40-year period there were an estimated 5,000-10,000 different residents. Champlain House is still the home of two former AECL employees who have lived in the hotel buildings for more than 50 years.

Currently a register of former residents (roughly 1200 names to date) is being created, and a collection of stories and photographs are being catalogued to describe what life was like in the early days of Deep River. "Our intent is to write a book," says organizer Al Bancroft, himself a former resident of Forest House. "We hope to make it available for a Summerfest 2008 gathering of former residents."

For information on how you can contribute stories and photos to this important project, please contact Al Bancroft at 613-584-2777, or visit the website at:
http://bright-ideas-software.com/staff_hotel/



Construction of Forest Hall, 1958



STAFF in Action

CRL's Nuclear Response Force participates in First Annual Canadian Nuclear Security Officer Challenge

On September 11 and 12, eight of AECL's best Nuclear Response Force (NRF) guards participated in the First Annual Canadian Nuclear Security Office Challenge (CANSOC). The competition, hosted by Bruce Power, was held at Canadian Forces Base Meaford and attracted Nuclear Response personnel from all five Canadian nuclear utilities.

"The Bruce Power NRF have been involved in SWAT-type tactical challenges in the US for the past couple of years," explains Peter Graves, NRF tactical instructor for AECL's Chalk River Labs. "This is the first time that the Canadian nuclear facilities have hosted their own competition, and we're really proud of the way our team performed."

After a rigorous selection process held in July, the team of eight began serious training to further develop their fitness and shooting skills under the guidance and coaching of NRF Sergeant Jim Cotnam, whose experience includes five years with the NRF, as well as 22 years in the Canadian Armed Forces (14 of those with the Canadian Airborne Regiment).

"Competitions like this are great for team building, and the diversity of the events really pushes them to be at the top of all aspects of their game," says Cotnam. "They take this very seriously, and the team is one that I'm proud to be working with."

Participating in this year's competition were:

Corey Barnes
Jon Byers
Robin Hill
Ben Wilson
Chris Inch
Joe Birkus
Matt Stewart
Frase Curtis

Congratulations to all of you on your excellent performance. AECL is slated to host CANSOC 2008.



Closing Note

Remember, we want to hear from you and welcome any questions or comments you may have. Whether by phone, email, fax or snail-mail, we value your opinions, and hope you'll get in touch.

Shaun Cotnam

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