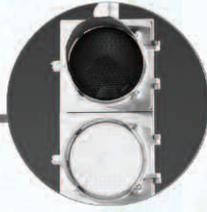


100 YEARS OF CANADIAN ENGINEERING



BY NICOLE AXWORTHY

Some examples of the milestones and accomplishments of Canadian engineering over the last century.

1907: Construction begins on the Quebec Bridge crossing the St. Lawrence River, but it collapses twice over 11 years of construction, killing 88 workers.

1910: Canadian J.A. McCurdy transmits a wireless message in flight—the world's first air-to-ground communication.

1916: The National Research Council (NRC) is established to coordinate and promote scientific and industrial research.

1919: The Canadian Standards Association (originally the Canadian Engineering Standards Association) receives its charter.

1920: Laws regulating engineering are passed in Nova Scotia, New Brunswick, Manitoba, Alberta and British Columbia. Similar laws are passed in Quebec in 1921 and Ontario in 1922.

1922: Quebecer J. Armand Bombardier builds his first snowmobile at the age of 15. His first version of the popular Ski-Doo is built in 1959.

The Association of Professional Engineers of Ontario (APEO) receives its provincial charter.

1925: The first Ritual of the Calling of an Engineer, or iron ring ceremony, is held at Camp One in Toronto.

The first sets of traffic lights in Canada are installed at the corners of King and Main Streets in Hamilton on July 11, and at Yonge and Bloor Streets in Toronto on August 8.

1927: Elizabeth M. (Elsie) Gregory MacGill is the first woman to graduate in electrical engineering from the University of Toronto.

1931: Canada's first toll telephone network is established when seven major Canadian companies founded the Trans-Canada Telephone System (now Stentor Alliance).

1935: The electron microscope is invented by James Hillier of Brantford, ON, and Albert Prebus of Edmonton, AB.

1936: A group of provincial licensing associations found the Dominion Council of Professional Engineers, which becomes the Canadian Council of Professional Engineers (now Engineers Canada) in 1957.

1937: The *Professional Engineers Act* is amended to require APEO membership as a prerequisite for an engineer to practise in Ontario.

The development of the first viable self-propelled combine at Massey Harris in Toronto is the culmination of 150 years' effort by farm implement manufacturers.

1939: The Queen Elizabeth Way is officially opened as the longest continuous divided highway in Canada and the longest continuous lighting system in the world.

To prevent pilots from blacking out while making tight turns or pulling out of power dives, W.R. Franks, PhD, and his colleagues invent the anti-gravity suit in Toronto.

1942: Polymer Corporation Limited is created in Sarnia, ON, to produce synthetic rubber for the war effort.

Donald Hings, P.Eng., invents the walkie-talkie for Canadian military use in World War II.

1945: Canada's ZEEP (Zero Energy Experimental Pile) reactor goes into operation at Chalk River, ON, creating the first controlled nuclear chain reaction in the country.

APEO adopts the initials "P.Eng." as the official abbreviation of professional engineers.

1948: The world's first commercial microwave system for voice transmission replaces underwater cables between Prince Edward Island and Nova Scotia.

1949: John Hopps, P.Eng., an Ontario electrical engineer, develops the first heart pacemaker while working at the NRC laboratories in Ottawa.

1953: A study team of Canadian engineers establishes the main features of the Canadian heavy water natural uranium reactor. The acronym "CANDU" (Canadian Deuterium Uranium) is coined at this time.



Image courtesy of TTC.

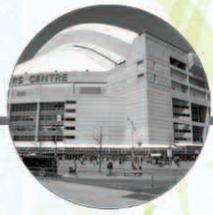


Image courtesy of Rogers Centre.



1954: Canada's first subway opens in Toronto. It extends 5.4 km and is the culmination of over four years of work.

1957: AECL's Nuclear Research Universal Reactor becomes operational. The 135-MW thermal power unit is the first reactor in the world to be refueled while at full power.

1958: Canada boasts the world's longest transcontinental microwave radio relay network stretching more than 6000 km from Nova Scotia to British Columbia. Its completion allows the CBC's first live coast-to-coast TV broadcast.

1959: The St. Lawrence Seaway is opened. More than 20,000 people, including 500 engineers, tackled this project on both sides of the border.

1962: The 7800-km Trans-Canada Highway between Victoria, BC, and St. John's, NF, is officially opened, even though one-third is unpaved. It is the world's longest national highway.

Canada's first satellite, Alouette I, is launched. Designed, built and assembled in Canada, the Alouette makes Canada the third nation in space. It is set to orbit the Earth for one year, but it lasts 10.

1965: The Canadian Engineering Accreditation Board (CEAB) is established by (now) Engineers Canada to accredit university undergraduate engineering programs.

1970: The IMAX film process is developed by four Canadians: Graeme Ferguson, Roman Kroitor, Robert Kerr and William C. Shaw, P.Eng.

1972: The Anik 1 satellite is launched as the world's first communications satellite operating in geostationary orbit.

Stelco develops the Coilbox process of steel production.

Roland Galarneau, with the help of Robert Dromer, an electrical engineer with Bell Canada, creates a computer to transpose printed material into Braille for the blind.

1973: Construction begins on Toronto's CN Tower, the world's tallest freestanding structure.

1975: Spar Aerospace begins construction on Canadarm, and in November 1981 the remote manipulator makes its debut in space on the second flight of the Columbia shuttle.

1978: In Toronto, Bell Canada begins the world's first field trials of a fibre-optic system designed for residential telephones. The world's first direct-to-home satellite TV broadcast is launched, broadcasting game two of the Stanley Cup from Canada to a

Canadian diplomat's home in Lima, Peru, via the Hermes satellite (score: Montreal Canadiens 3, Boston Bruins 2).

1984: Cyclosporine, a new type of immunosuppressant drug, sometimes called the penicillin of transplantation, is developed by Ontario engineer Argyrios Margaritis, P.Eng.

1985: Bell Canada introduces its cellular mobile telephone service.

1986: Construction of Skydome (now Rogers Centre) by Ellis-Don Limited begins. Known as Ontario's "domed" stadium, it is the world's first multi-purpose stadium with a retractable roof.

1988: The use of agriculture fertilizers to clean up marine oil spills captures worldwide interest after Canadian researchers apply biomediation treatment to 130 km of a BC shoreline contaminated by the Exxon Valdez oil spill.

1990: The world's first hydrogen fuel-cell bus is developed and demonstrated in Vancouver, BC, by Ballard Power Systems.

1995: Canada's first Earth observation satellite system, RADARSAT-1, is launched to provide images of the Earth's surface at any time of the day or night and in any climate condition.

1997: The Confederation Bridge connecting Prince Edward Island and New Brunswick is the first prominent Canadian structure to use fly-ash concrete, a byproduct of burning coal.

1998: The Communications Research Centre transmits the world's first two-way transcontinental HDTV demonstration—an open heart surgery—from Ottawa to Japan using broadband terrestrial and satellite connections.

Canada's national optical Internet network, CA*net3, is built in partnership with the federal government, the Canadian Network for the Advancement of Research, Industry and Education (CANARIE) and a Bell Canada consortium.

1999: With federal research funding, the final tests of the world's first mechanical heart are conducted in preparation for human application.

Mike Lazaridis, founder and co-CEO of Research in Motion (RIM), creates the BlackBerry wireless handheld device.

2001: Canadarm2, the Canadian-built space station remote manipulator system, is launched on space mission STS-100.

2006: The world's largest hard rock boring machine, nicknamed Big Becky, is built to drill a tunnel under Niagara Falls, as part of a large hydroelectric project to produce new, clean, renewable energy for the city.